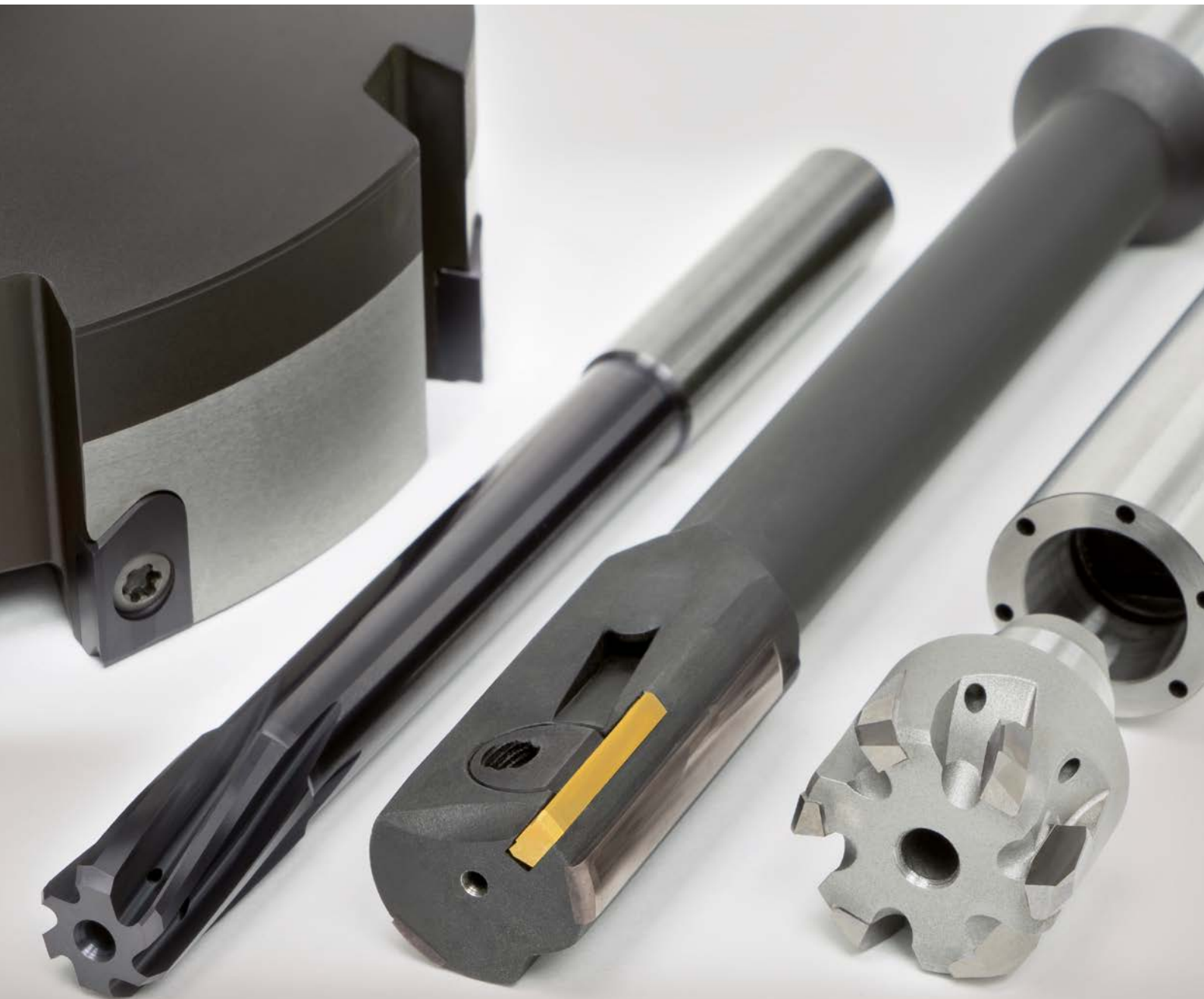




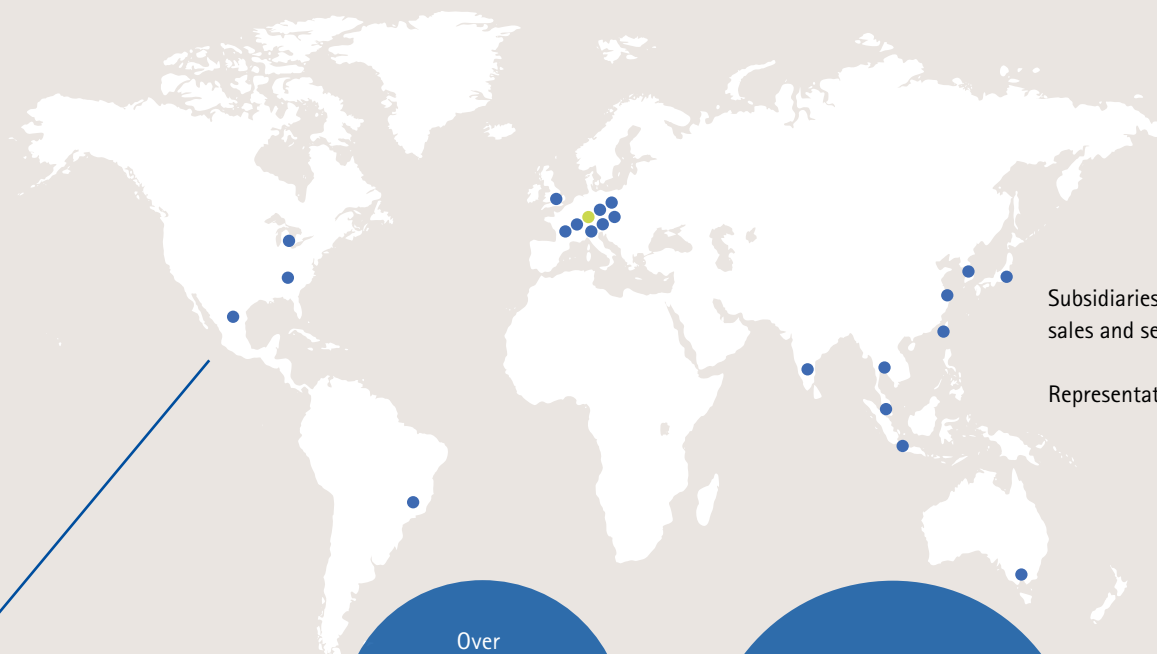
Your technology partner for cost-effective machining

REAMING | FINE BORING



When there's something more between you and us:
That's the MAPAL effect.





Subsidiaries with production, sales and service in 21 countries

Representatives in 25 countries

Over
4,800
staff worldwide

No. 1
technology leader for
the machining of cubic parts

Tool and process solutions combined with comprehensive services

We see ourselves as a technology partner, supporting you with the development of efficient and resource-saving manufacturing processes using standard tools, individual tool concepts and the optimisation of tool details. Our tools satisfy all the requirements on process reliability, precision and simple handling. How? Using advanced development and design methods as well as production using the latest manufacturing facilities.

You do not just need the optimal tool for your task, you are also looking for a partner who takes over the entire planning and management of your process? We are also there for you in this situation. We support you during all production phases and keep your manufacturing at the top level: highly productive, cost-effective and reliable. We also offer you complete networked solutions for all peripheral tasks related to the actual machining process.



Reaming and fine boring



Drilling from the solid, boring and countersinking



Milling



Turning



Actuating



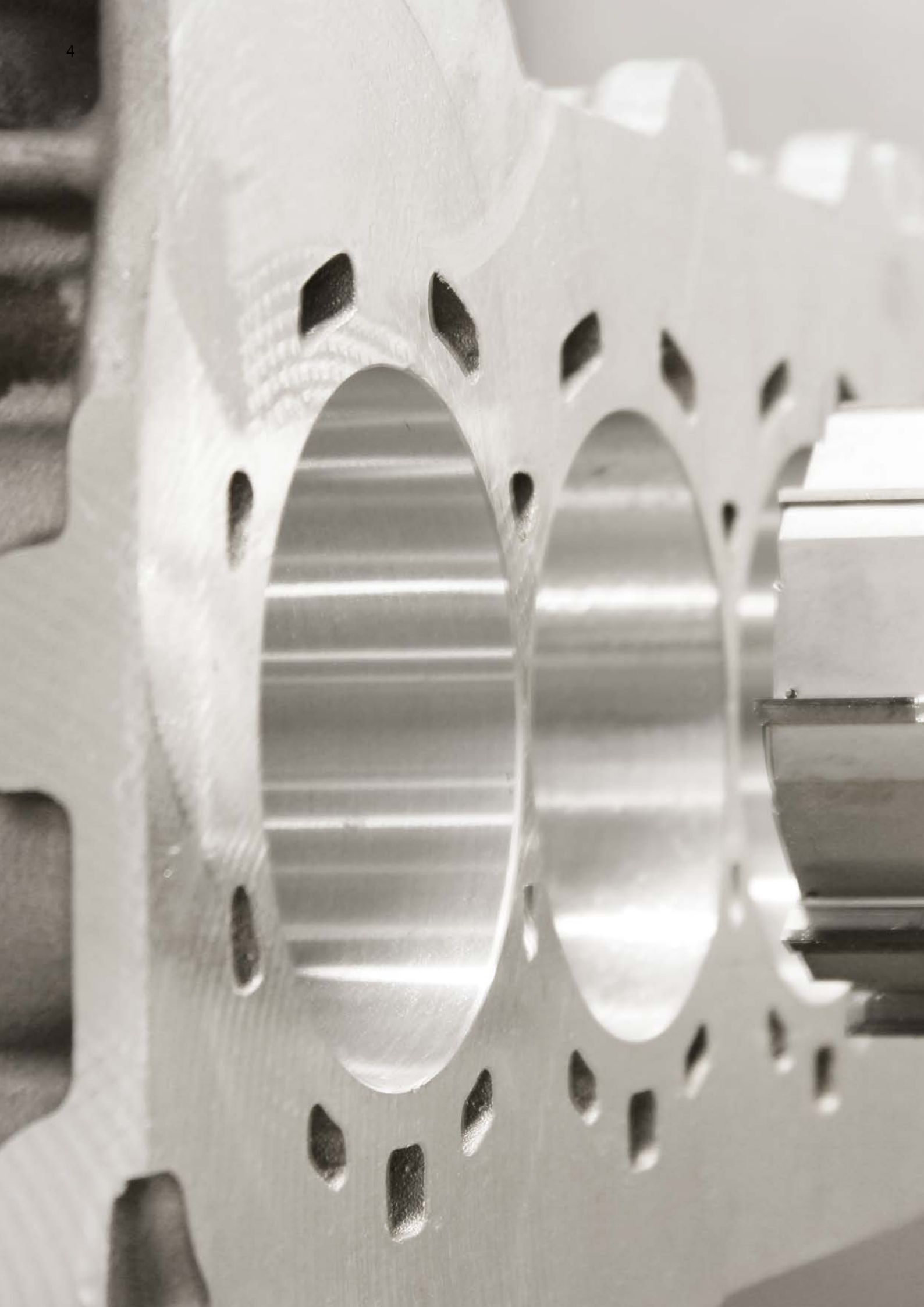
Clamping



Setting, measuring and dispensing



Services



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REAMING AND FINE BORING COMPETENCE

MAPAL offers innovative, cost-effective solutions for machining almost all materials. Today, MAPAL is continuing to write the success story related to the fine machining of bores that started with the "first reamer" in 1954. Thanks to decades of experiences as well as continuous further development and optimisation of the tool solutions, along with tailor-made custom solutions, today MAPAL offers a broad standard programme of tools for reaming and fine boring.

Reaming and fine boring are the most common methods for fine machining bores and impress with the most precise results. The manufacture of the tools is based on the same precision as MAPAL tools provide in practice. MAPAL offers a suitable solution to suit the complexity of the machining operation and the requirements on precision and surface finish: single and twin-bladed reamer reamers, fine boring tools with guide pads and WP or HX indexable inserts stand for the highest precision.

The programme also includes multi-bladed reamers: replaceable head reamers combined with high-accuracy clamping systems, monoblock reamers made of carbide, cermet or HSS as well as systems for machining large diameters.

Up to diameter 315 mm for every material

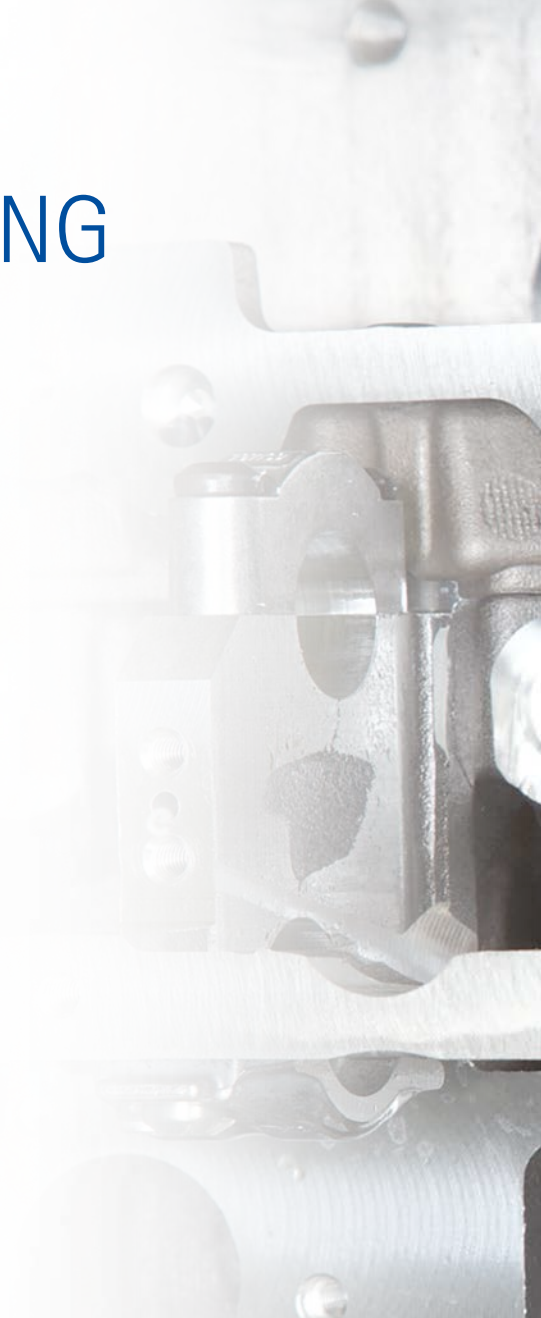
Along with the diameter and required bore tolerance, the workpiece material is the most important selection criterion for the appropriate reamer. The programme from MAPAL includes, along with tools for machining steel, inox, cast iron and aluminium, also solutions for the cost-effective, reliable reaming of titanium, super alloys, plastics and composite materials.

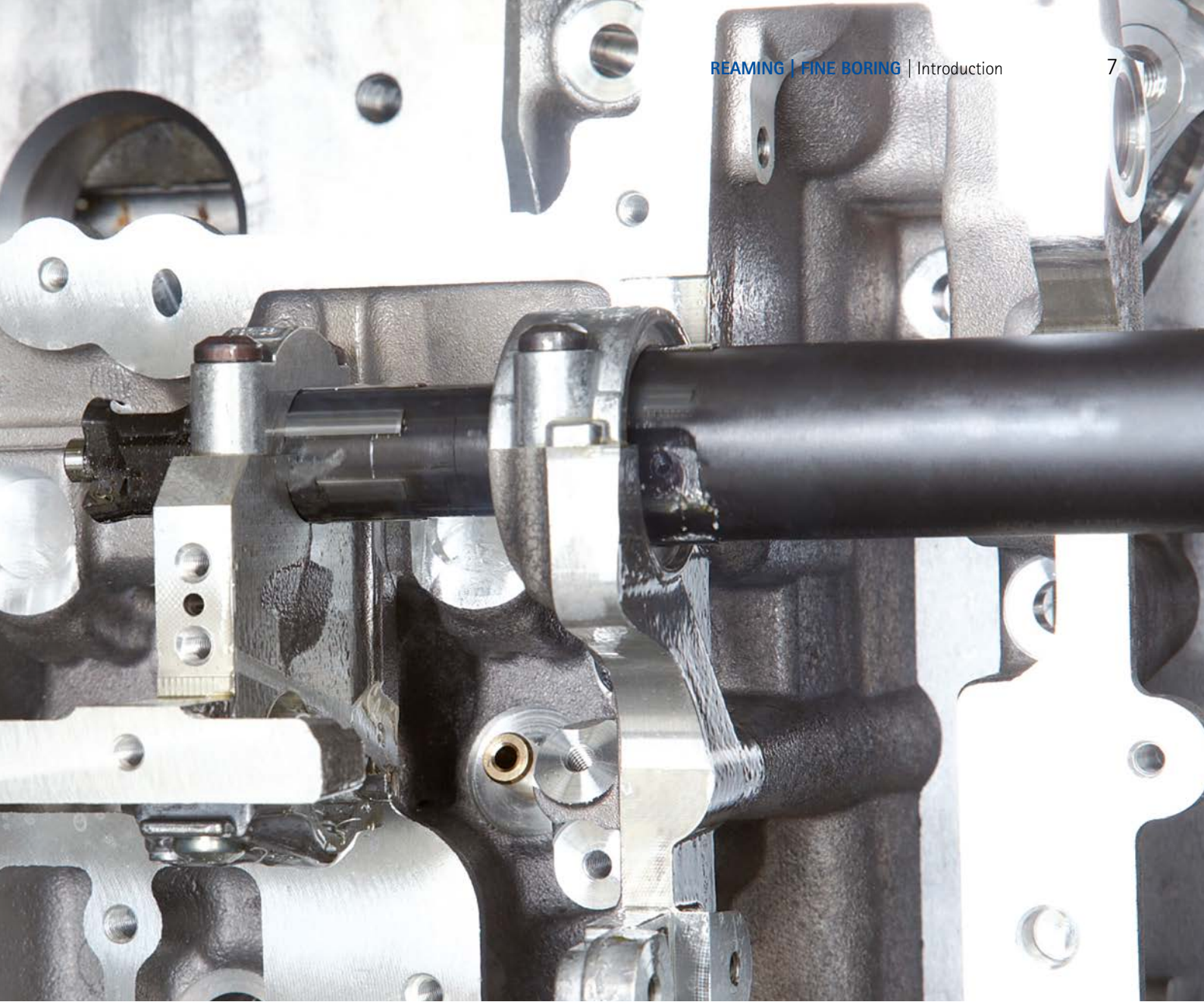
High-performance coatings

The coating on the cutting edges is a vital factor for the life of the tool and optimal machining results. MAPAL offers a large selection of substrates and coatings, each matched to the related machining case; some of these coatings are applied in the state-of-the-art in-house coating plant.

Reconditioning in original quality

Re-ground reaming tools and cutting edges that achieve a machining performance of up to 100 percent compared to new tools represent an important issue for production costs. For this reason MAPAL offers tool reconditioning in the form of re-grinding and re-coating in manufacturer quality. And that with comprehensive service, if required MAPAL organises for instance the collection and delivery of the tools and guarantees standardised original quality worldwide.



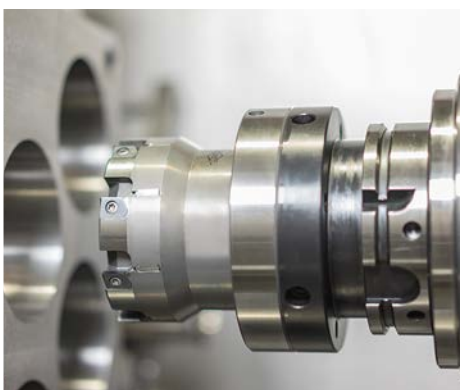


Latest production equipment

The latest 3D design and simulations form the basis for the manufacture of MAPAL tools. The data are transferred via interfaces to the related machining centre that forms part of the state-of-art range of machinery available on site. In this way MAPAL reaming tools are produced to the highest quality requirements with monitoring and control by experienced staff. Precision and effectiveness are guaranteed.

Custom solutions

Special machining tasks require special tools. For this reason MAPAL offers custom reaming tools individually tailored to the requirements of the customer. Requirements are met optimally with special lead geometry and coatings as well as multi-stepped tools. Combination solutions with other tool technologies from MAPAL can further increase the productivity and reduce non-productive times.



INNOVATIONS | HIGHLIGHTS

EasyAdjust system

Reduced setting effort with the same precision

► more from page 54



HX indexable insert with six usable cutting edges

MAPAL offers an innovative solution for the simple, precise settings of tools in a very short time with the EasyAdjust system. The EasyAdjust System consists of a precision cassette in which the back taper on the minor cutting edge is already integrated. The setting effort for the back taper is completely eliminated. Due to the exact guidance of the cassette on a precision guide pin, the back taper remains

unchanged even during diameter adjustments. The secure mounting of the indexable insert is ensured by a stable, force-closure system comprising a clamping groove and clamping jaw. Above all external reaming tools, on which the cutting edges are inside the tool and are difficult to access, profit from the simple, precise system.

AT A GLANCE

- Reduced setting effort
- Tools only have to be adjusted in diameter
- Cost-effectiveness, handling and process reliability improved
- Precision remains high

HPR400 with replaceable inserts

No time-consuming, expensive reconditioning due to insert change on site

► more from page 358



For fine machining bores with a large diameter, MAPAL has developed the HPR400. Time-consuming, expensive reconditioning is not required with this tool. The cutting edges are changed by the customer directly on site. The inserts cannot be fitted incorrectly, as only one installation orientation is possible and the inserts can be fitted at any position. Subsequent setting is not required, and the logistics effort is cut. The number of tools in circulation is reduced and the costs per part

are significantly lowered. The customer thus achieves high-precision bores with minimum expense. The tools that can be cost-effectively fitted with various indexable inserts made of carbide, cermet and the highly modern cutting materials PCD and PcBN.

AT A GLANCE

- Independent insert change by the user on site
- Insert arrangement independent of the insert seat
- Reduction of the cost per part
- Reduced coating costs
- Reduction of the number of tools in circulation
- Tolerance H7

CVD cutting material series

Optimally matched to reaming



The cutting material types were developed especially for reaming. Although the CVD coatings known to date are wear-resistant thanks to the extremely hard elements in the coating, they are at the same time very brittle and susceptible to fracture. The special process control in the production of the new CVD coating, however, makes the coating far more ductile than in the past while retaining

its good wear resistance. The CVD grades are therefore very well suited to reaming ductile cast iron materials (GJL, GJS, GJV) and difficult machining situations with interrupted cut or unstable conditions. By using CVD, increases in tool lives from 50 to 300 percent are obtained in the material GJV450.

AT A GLANCE

- Coating ideally matched to reaming
- High wear resistance with good ductility at the same time
- Longer tool lives with cast materials and in difficult conditions

FixReam HSS reamer with internal cooling

High-performance reamer for small-scale series production manufacture

► [more from page 96](#)



MAPAL now offers the proven FixReam high-performance reamers in a variant made of coated high-speed steel (HSS) with internal cooling. Bore qualities in the range of IT7 are reliably achieved using the straight fluted tool. The range includes high-performance reamers in the diameter range from 3 to 40 mm for machining steel, cast iron, aluminium, as well as CFRP and GFRP. Compared with standard HSS reamers, the FixReam high-performance reamer made of HSS achieves three times the

performance and thereby it is at the same level as a reamer made of solid carbide without internal cooling. The new reamer is 30 percent cheaper than a comparable DIN reamer made of solid carbide and therefore an economically appropriate alternative for small-scale series production. The cost saving is more significant above all on large diameters.

AT A GLANCE

- Straight fluted high-performance reamer made of HSS with internal cooling
- Performance level of solid carbide reamers without internal cooling
- 30 percent cheaper than a comparable DIN reamer made of solid carbide
- Large diameters particularly more economical

PRODUCT OVERVIEW

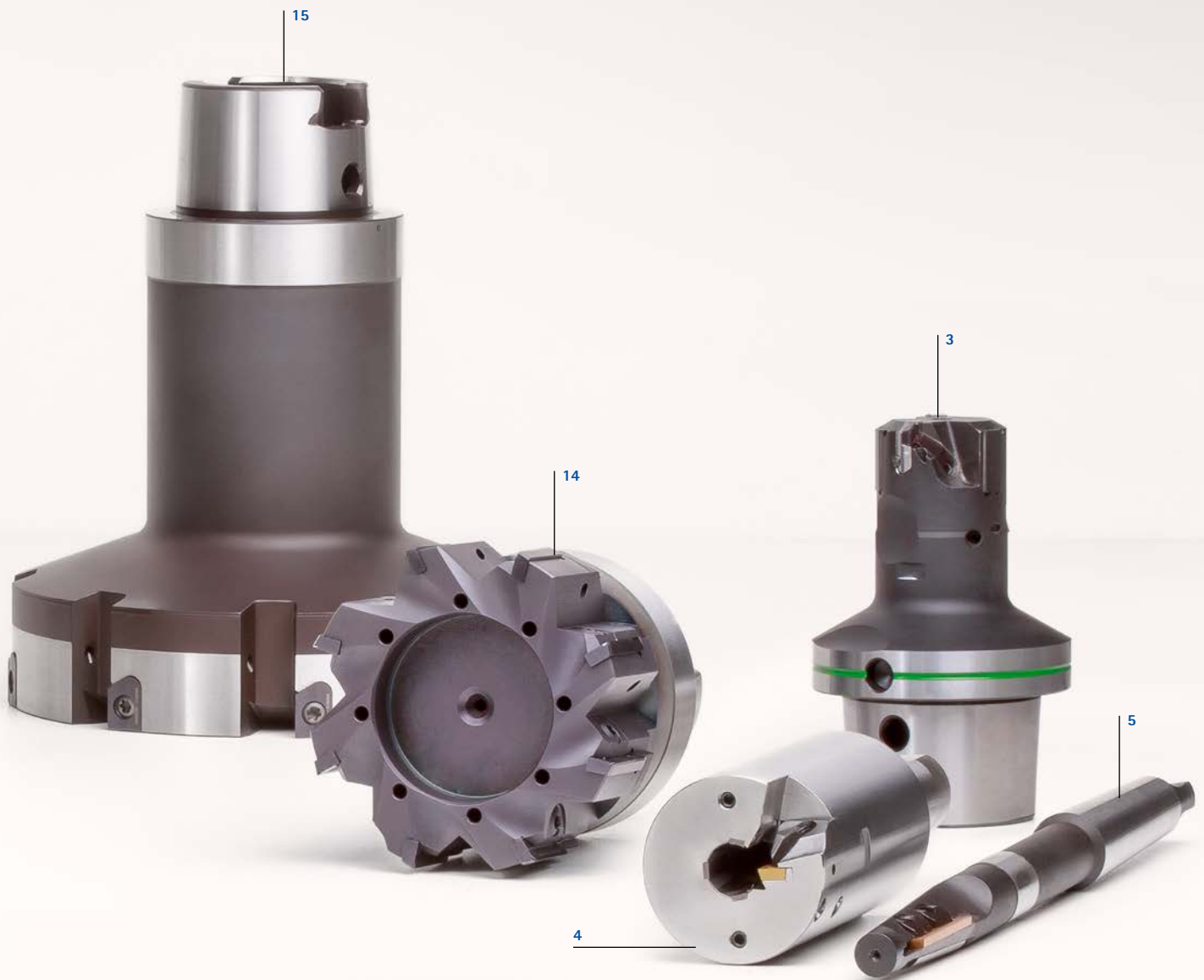


Tools with guide pads

- 1 Single-bladed reamers**
One-insert reaming tool with guide pads for direct guiding in the bore
- 2 Twin-bladed reamers**
Two-cutting edge reaming tool with guide pads makes higher cutting speeds and feeds possible
- 3 Fine boring tools with EasyAdjust system**
Reduction of the setting effort for tools with guide pad technology
- 4 External reamers**
Machining of external diameters and shafts to the μ
- 5 Single-bladed taper reamer**

High-performance reamers with cylindrical shank

- 6 FixReam**
High-performance reamers made of HSS, solid carbide, solid cermet and with PcBN head
- 7 MonoReam**
Tipped high-performance reamers in fixed, expanding and finely adjustable designs
- 8 MonoReam Plus**
Cast iron specialist with optimised coolant supply
- 9 FeedPlus**
Maximum number of cutting edges without chip flutes for highest performance



Replaceable head reamers

- 10 HPR100**
Fixed design with brazed cutting edges
- 11 HPR200**
Tipped high-performance reamers in fixed, expanding and finely adjustable designs
- 12 CPR500**
Solid carbide design
- 13 CPR600**
Design with brazed cutting edges

Solutions for large diameters

- 14 HPR300**
Optimised for economical reconditioning
- 15 HPR400**
Simple insert change on site
- 16 MultiCut**
Cutting rings with matching holder range

SELECTION SYSTEM

Tools with guide pads | Fixed multi-bladed reamers


Tools with guide pads

First choice for following applications:

- Unstable machining conditions
 - Optimal with floating holder on the lathe
 - Rib machining and thin-walled parts
 - Unfavourable length/diameter ratios
 - Extremely high shape and positional tolerances
-

Fixed multi-bladed reamers

First choice for following applications:

- Machining with high feed rates
 - Maximum output in series production
 - Abrasive and hard workpiece materials
 - Multiple spindle machining operations
 - Machining operations with diameter < 5 mm
- 



MAPAL guide pad technology is unrivalled when it comes to the fine machining of bores in any material. The precision of the bore diameter, circularity and cylindrical form as well as the surface finish cannot be produced

by other production means, or at least cannot be achieved cost-effectively.

► [more from page 24](#)

TOOL PROPERTIES

- Highest accuracies due to exact setting to the μ
- Indexable insert technology for highest flexibility during cutting material selection
- Intermediate sizes and all tolerances available at short notice



Drastically reduced machining times are possible using fixed multi-bladed reamers. The multiple cutting edges permit higher feed values, which at the end of the day define the machining times. Due to specifically de-

veloped systems and the latest manufacturing technology, MAPAL also offers these tools with the highest accuracies.

► [more from page 82](#)

TOOL PROPERTIES

- No setting effort
- High-accuracy replaceable head systems with simple handling
- Different performance classes in the standard programme
- Can be re-ground

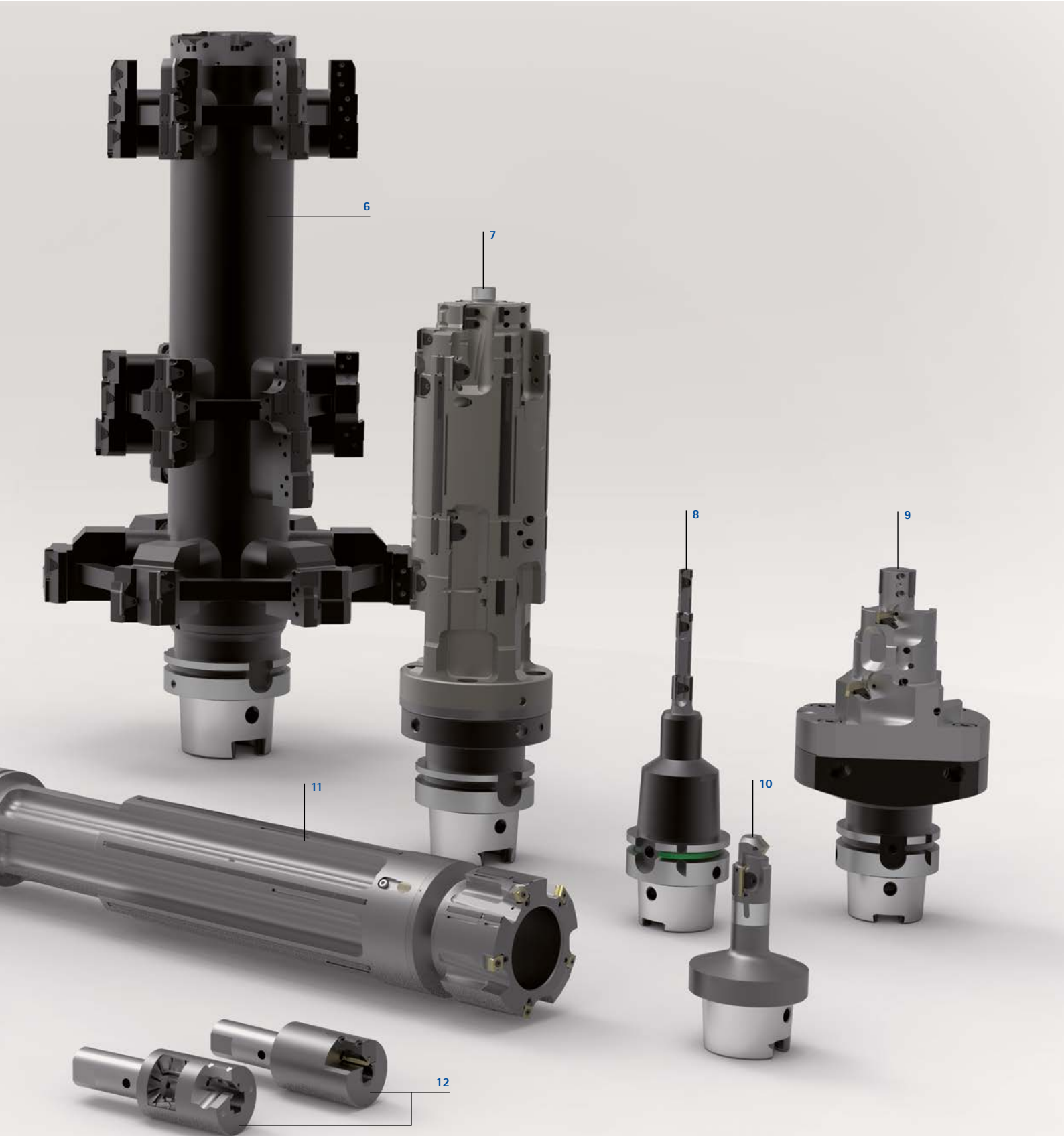
CUSTOM SOLUTIONS

Tools with guide pads

Application-specific tool solutions

- 1 Guided boring tool with ISO cartridges in lightweight design made of aluminium for machining a gearbox housing
- 2 Fine boring tool with indexable insert system for the combined internal and external machining of a planetary carrier
- 3 External reamer with EasyAdjust system and TEC inserts for machining an exhaust manifold with MAPAL floating holder
- 4 Fine boring tool with ISO pre-machining step and connection for HPR reaming head for machining a cylinder block
- 5 Fine boring tool with EasyAdjust system with HX inserts for machining a crankshaft bore
- 6 Fine boring tool in lightweight design as welded design for machining a gearbox housing
- 7 Multi-stepped / multi-cutting edge fine boring tool in lightweight design made of titanium for machining a steering housing
- 8 Fine boring tool designed for minimum quantity lubrication (MQL) with indexable insert system for machining a valve housing
- 9 Multi-stepped fine boring tool with indexable insert system with contour cutting edges and face machining a pump housing
- 10 Fine boring tool with indexable insert system for the combined machining of a planetary carrier
- 11 Tangential fine boring tool for semifinish machining with a modular cutting head for machining a crankshaft bearing bore
- 12 External reamer with indexable insert system for machining a valve body pin, manufactured additively as lightweight design



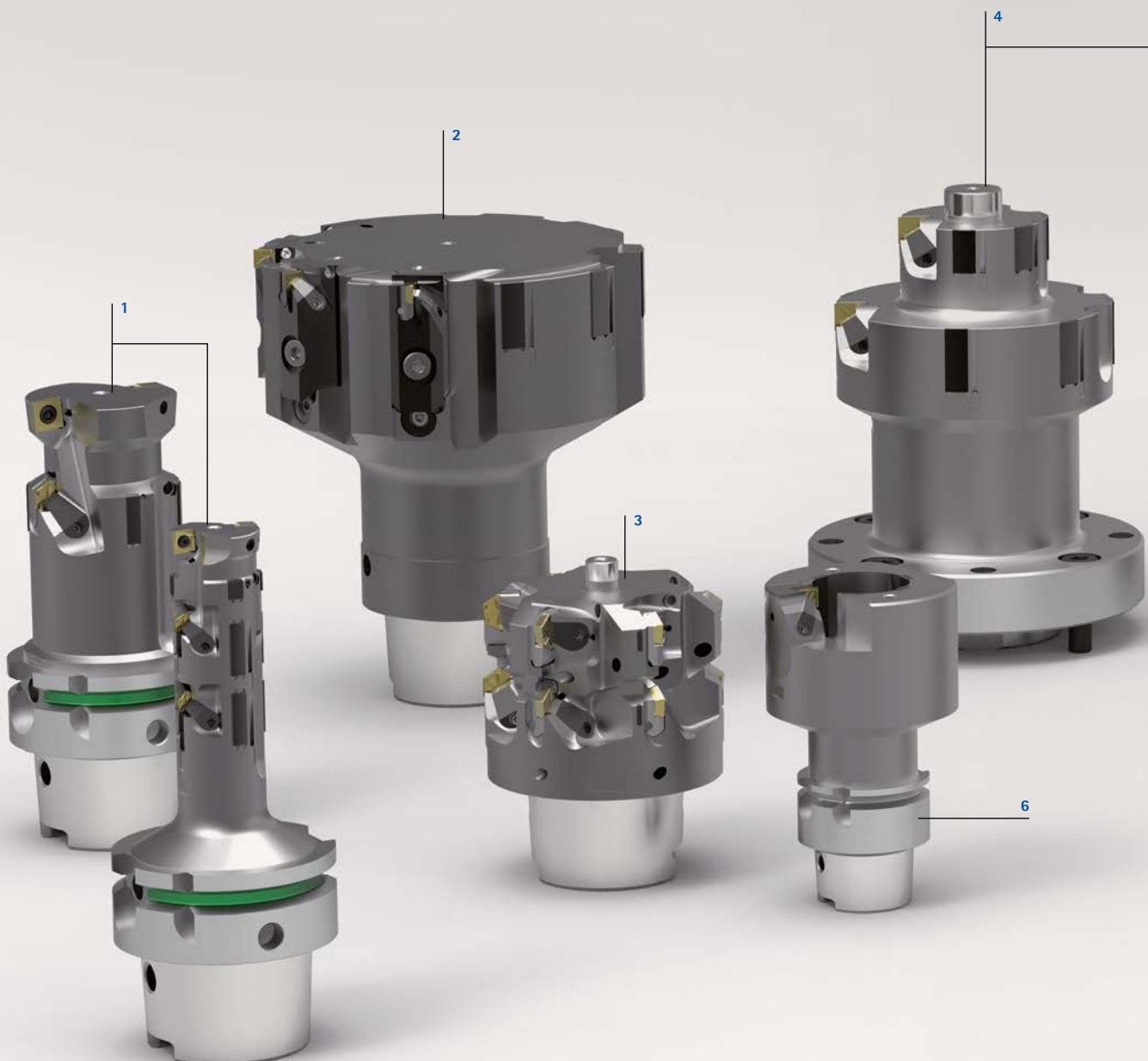


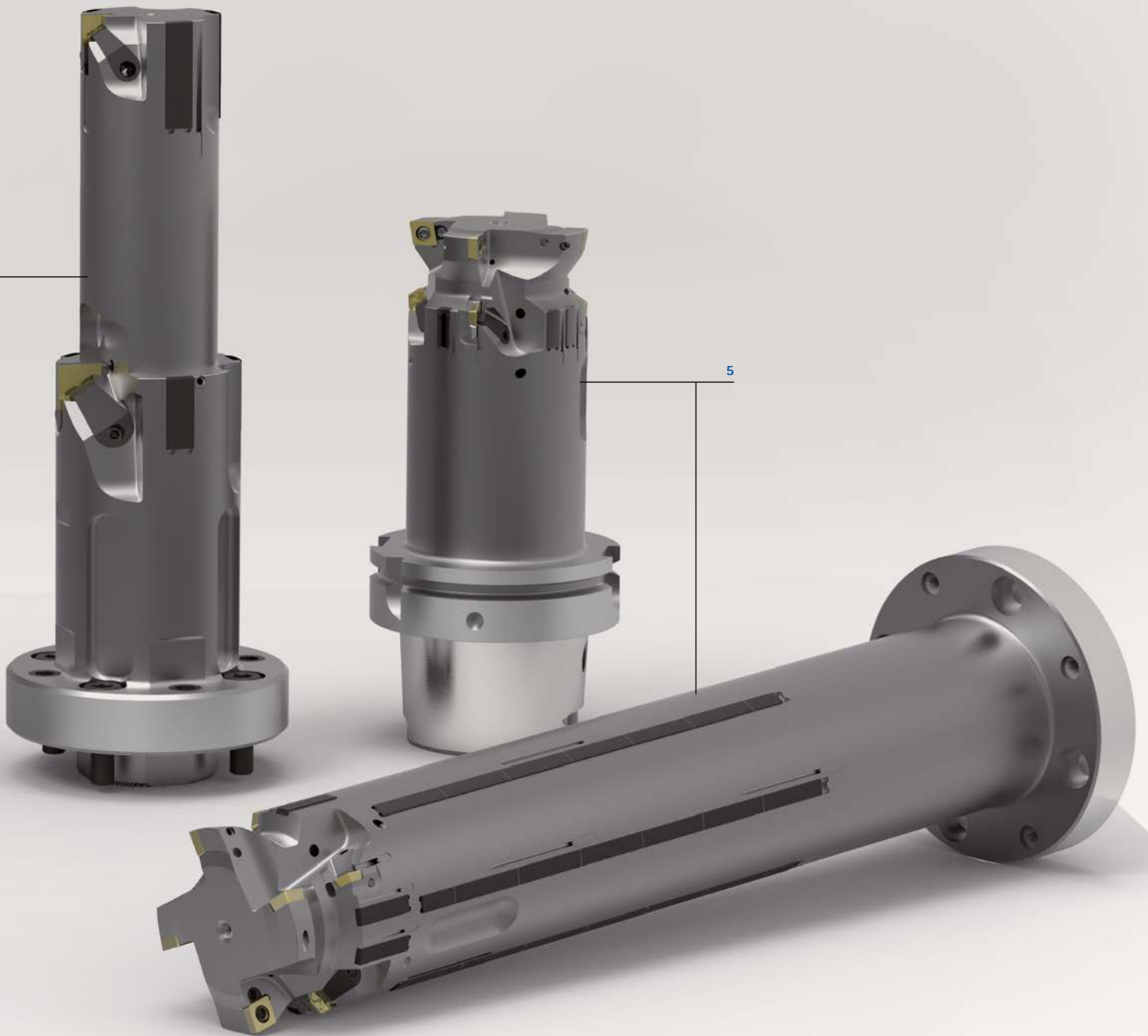
CUSTOM SOLUTIONS

Tools with EasyAdjust system

Custom solutions with EasyAdjust system

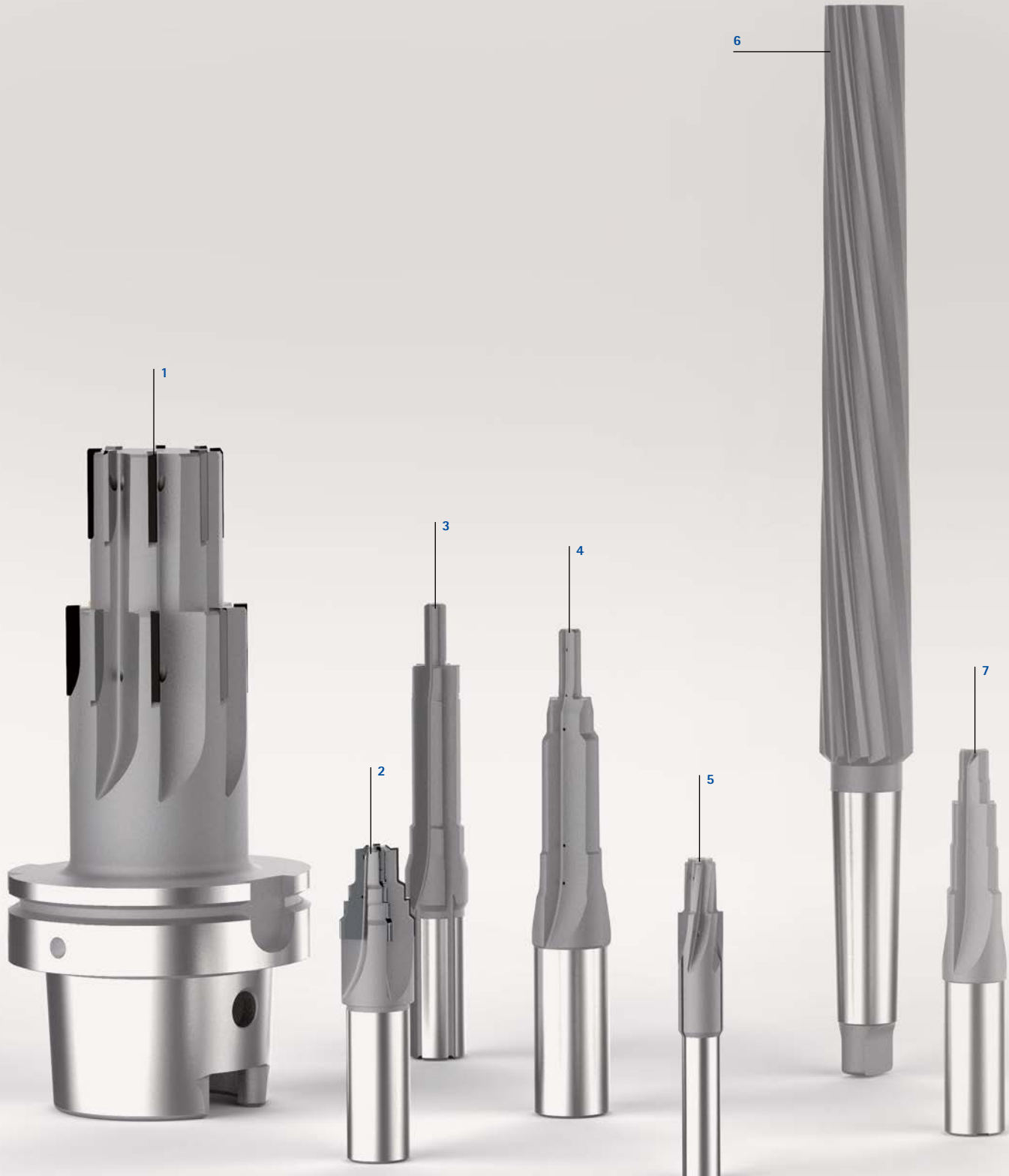
- 1 Combination tools for pre-machining and fine machining the large and small connecting rod bores. With ISO inserts for pre-machining and EasyAdjust system for fine machining
- 2 Custom tool with EasyAdjust system with four TEC inserts ($z = 4$) and guide pads arranged on one side for machining a heavily interrupted cut in a pump housing made of GJS-400
- 3 Six-cutting edge tool with cut distribution 4+2 and EasyAdjust system with HX inserts for machining a cylinder bore
- 4 Multi-stepped fine boring tool with EasyAdjust System with TEC inserts for machining the blind bores in gearbox and valve housings with IT5 and IT6 requirements on the dimensional accuracy
- 5 Semi-machining and finish machining of a crankshaft bearing bore made of a bi-metallic combination Alu-GJL
- 6 External reamer with EasyAdjust system with TEC inserts replaces conventional turning of a part made of GJS with better dimensional accuracy

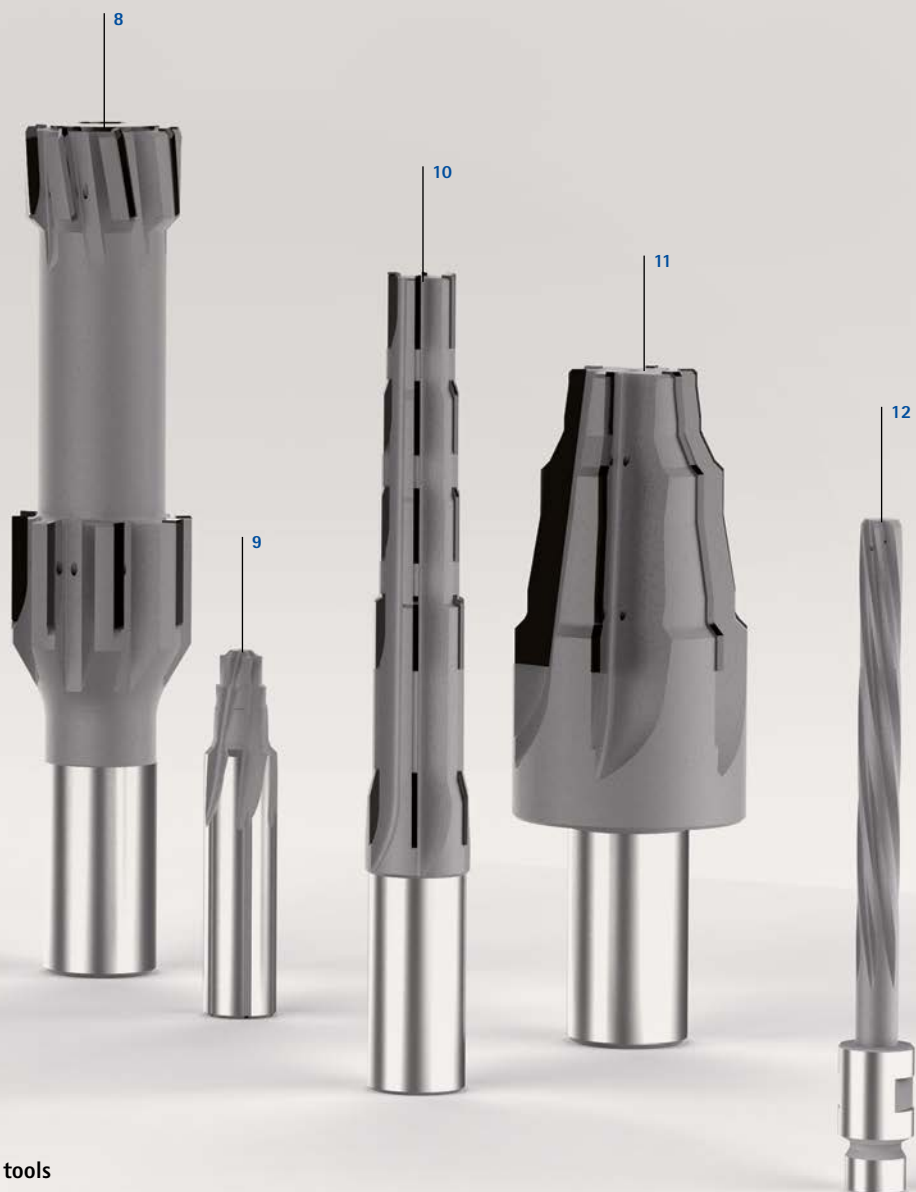




CUSTOM SOLUTIONS

Multi-bladed reamers





Custom solutions solid carbide tools

- 1 Two-step custom tool with brazed cutting edges for machining a hydraulic housing made of EN-GJS-500-7
- 2 Multi-stepped coated solid carbide custom tool with chamfer and radius machining for a steel cylinder holder
- 3 Coated solid carbide step reamer for machining the injector bore in a cylinder head
- 4 Coated solid carbide step reamer for fine machining the contour of the spark plug bore in EN-GJL-250
- 5 Two-step solid carbide step reamer with additional chamfer machining for a high-pressure pump made of stainless steel
- 6 HSS machine taper reamer with MK shank
- 7 Solid carbide step reamer with VA geometry for machining a stainless steel valve block
- 8 Two-step custom reamer with brazed cermet cutting edges with combined straight and left-hand spiral fluted design
- 9 Coated multi-stepped solid carbide reamer with internal cooling on the shank for machining a rail
- 10 Step reamer with brazed half-round embedded cermet cutting edges for machining a steel nozzle holder
- 11 Coated carbide-tipped form reamer for machining special turned parts
- 12 High-performance reamer with brazed on blunt carbide head with custom connection for the aerospace industry for machining a titanium, aluminium and high-alloy steel rivet hole combination

CUSTOM SOLUTIONS

HPR - High-Performance-Reamer



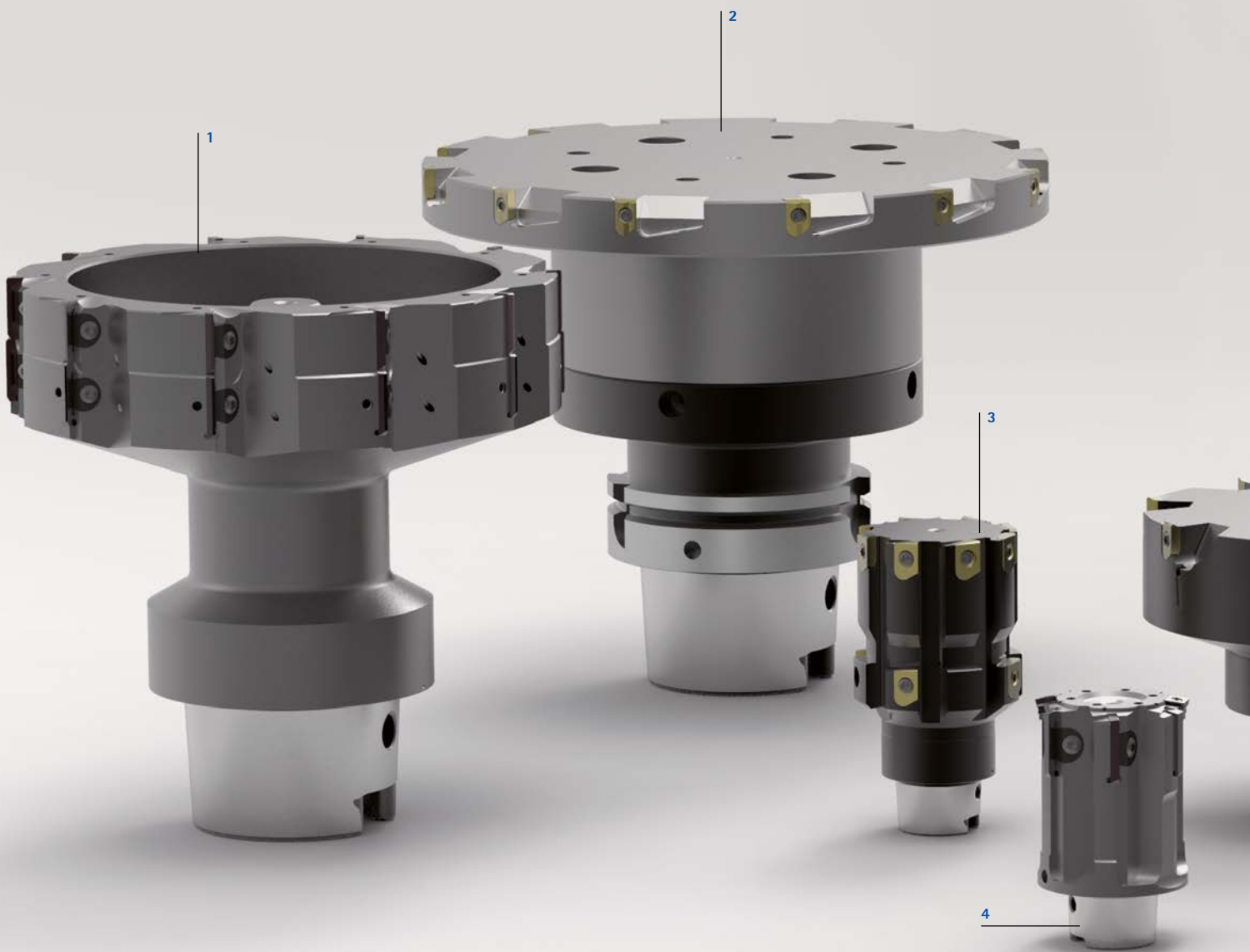


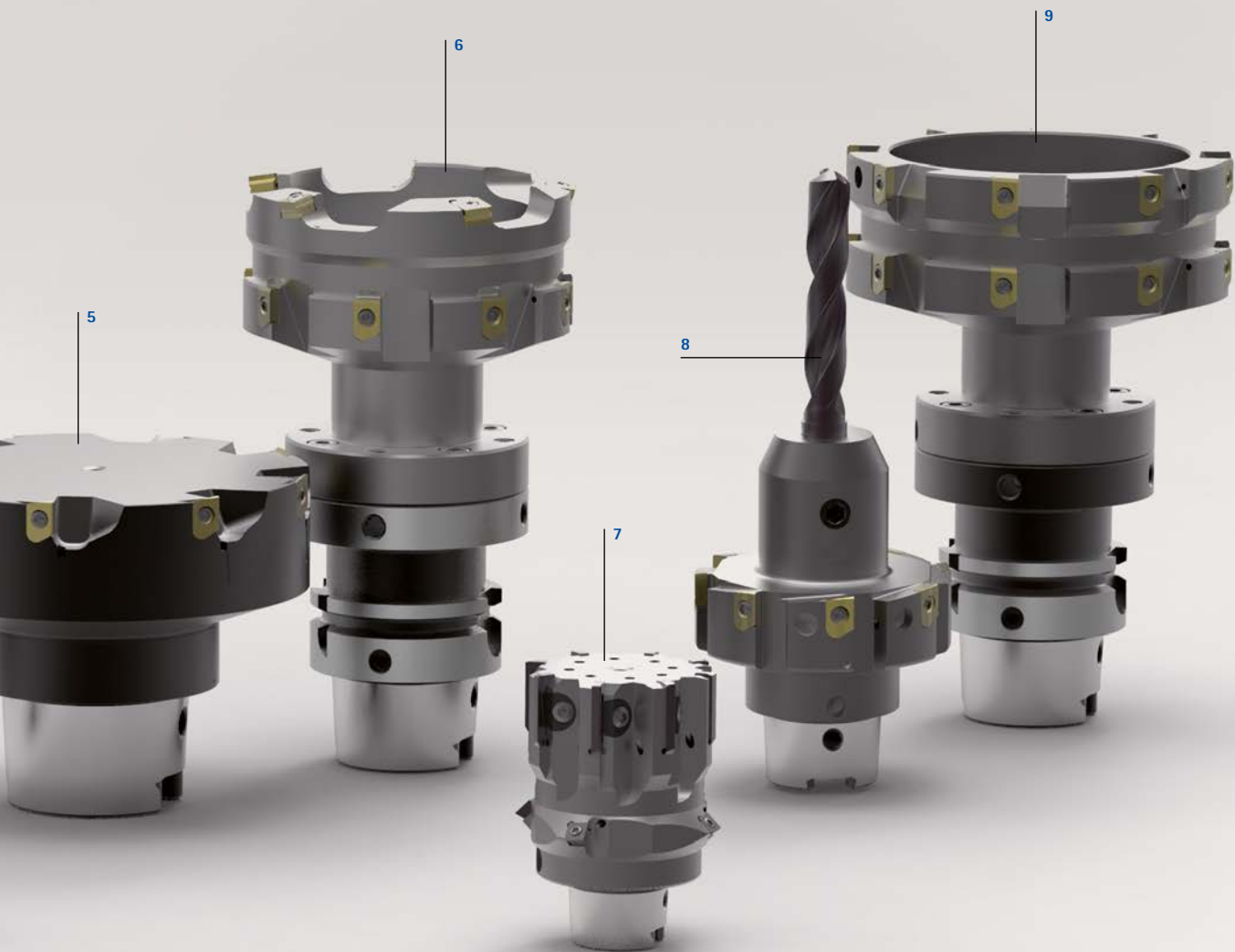
Custom solutions HPR

- 1 Custom solution with modular HPR multiple cutting edge ring and solid carbide step reamer with additively manufactured holder with hydraulic clamping technology for internal and external clamping for valve seat machining without setting effort
- 2 Multi-stepped modular combination tool with integrated CFS connection for a fixed, brazed CPR tool, with ISO tangential inserts for pre-machining and HPR300 system for fine machining a brake calliper
- 3 Multi-stepped PCD-tipped custom tool with countersink step for machining a part in the aerospace industry
- 4 Multi-stepped HPR custom tool with HFS connection for machining the bore and contour countersink on a turbocharger made of GJL250
- 5 Multi-stepped custom tool for housing machining with tangentially arranged reaming cutting edges
- 6 Custom tool for machining a rivet bore in the aerospace industry
- 7 Right-cutting tool for blind bore machining for optimal chip removal
- 8 Multi-stepped custom tool with special cutting edge geometries and HFS connection
- 9 Custom tool in fixed design with brazed cutting edges for the stepped machining of face and chamfer transitions on the actuator bore in a brake calliper

CUSTOM SOLUTIONS

Multi-bladed reamers for large diameters





Custom solutions HPR300 and HPR400

- 1 Two-step HPR300 custom solution for machining the bearing bore in a gearbox housing
- 2 HPR400 with CVD-coated inserts in the diameter 160 mm for machining a differential housing with module interface that can be aligned
- 3 Two-step HPR400 tool with eight inserts for the piston bore and four inserts for the control cut on a brake calliper
- 4 Combination tool with ISO tangential inserts for pre-machining and HPR300 with PCD-tipped inserts for fine machining a brass bush
- 5 HPR400 custom tool for an axle beam made of GJS-400 with CVD custom inserts for bearing seat machining and for an axial recess
- 6 Combination tool in lightweight design with module connection that can be aligned on HSK adapter for machining a bevel wheel housing. With ISO tangential inserts for pre-machining and HPR400 system for finish machining
- 7 HPR300 with chamfer machining step
- 8 Combination tool with solid carbide drill as integrated solution and HPR400 reaming stage for machining a swivel bearing
- 9 HPR400 multi-stepped tool in lightweight design with module connection that can be aligned for machining a bevel wheel housing



TOOLS WITH GUIDE PADS

Highest accuracies with the MAPAL principle



PRODUCT OVERVIEW

Tools with guide pads

Guided tools have high accuracy and performance due to the direct guiding in the bore using guide pads and the high quality of the precision-ground indexable inserts. Particularly on the fine machining of bores, the requirements are exceptionally high on the cutting material, coating, cutting edge

geometry and the quality of the grinding. Due to the highly accurate adjusting systems, the required diameter is produced to the μm from the first part. The setting effort is significantly reduced by the EasyAdjust system, as it is only necessary to set the diameter of the tools.



Basic Line:
Universal tools, broad application area, low procurement costs

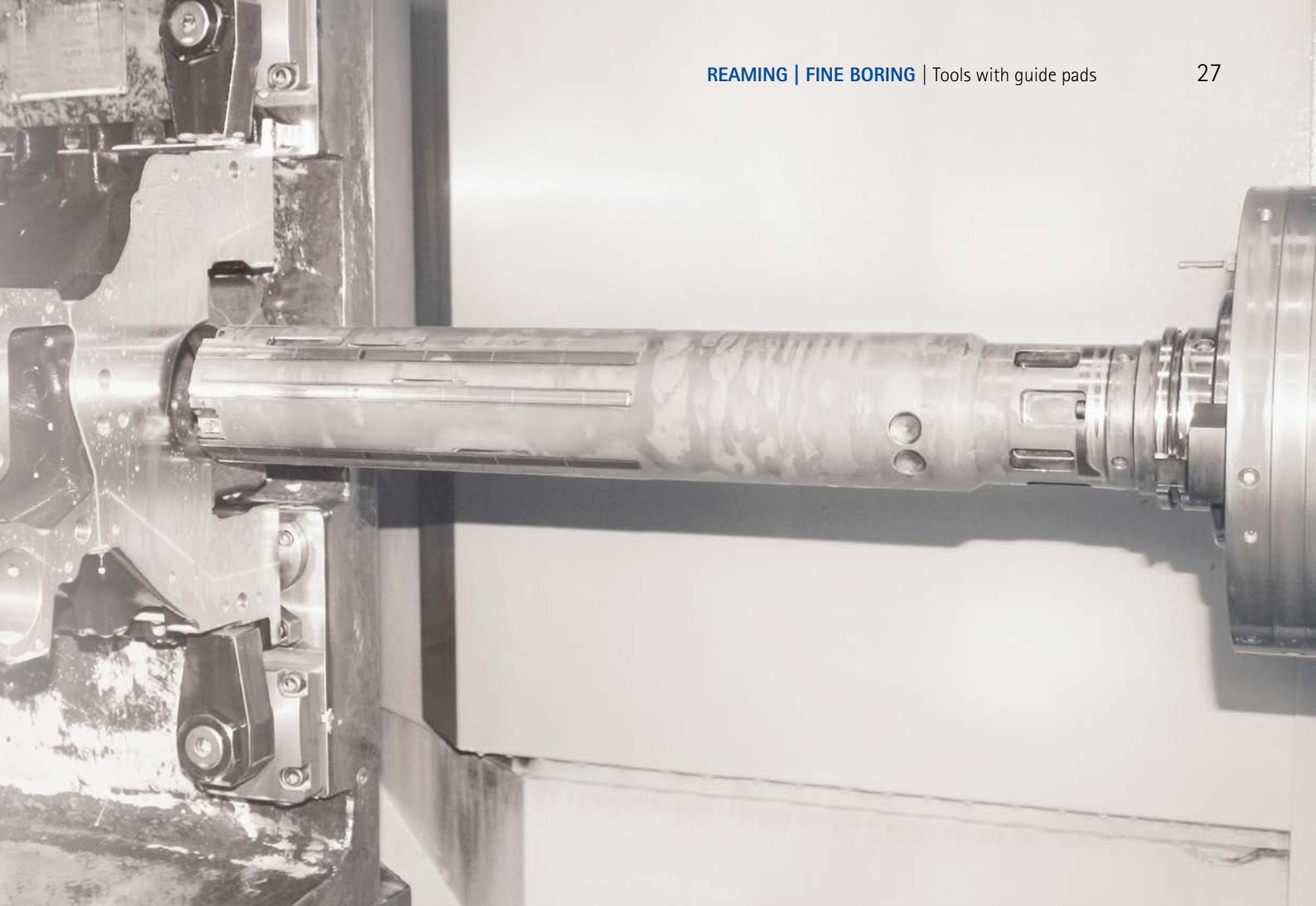


Performance Line:
High-performance tools, broad application area, high productivity in series production manufacturing



Expert Line:
Specialist tools for selected applications, maximum precision and productivity

Single-bladed reamers	Twin-bladed reamers	EasyAdjust system
		
<p>The MAPAL single-bladed reamers are built using the proven MAPAL principle. The machining of the workpiece material and the guiding of the reamer in the bore are undertaken by precision-ground indexable inserts and guide pads at the best geometric positions. Special leads and exact adjustability of the diameter and the back taper characterise the WP cutting system with two cutting edges. With its hexagonal indexable insert, the HX cutting system offers six usable cutting edges. Optimum backlash-free mounting of the inserts is guaranteed by the specially designed adjustment and clamping systems.</p> 	<p>Twin-bladed reamers allow the cutting speeds and feed rates to be increased compared with single-bladed reamers with guide pads. The inserts are installed and adjusted so that they are staggered radially and axially. Dividing the cutting depth into a premachining and finishing cut with only a few hundredths of a millimetre chip thickness ensures very good surface finishes and long tool lives, even in materials that are difficult to machine. Based on this principle, MAPAL also offers multi-cutting edge adjustable tools with guide pads designed, for example, according to the 4+2 principle, i.e. with four leading inserts and two finishing inserts for even higher feed rates.</p> 	<p>The goal of the development of the EasyAdjust system was a drastic reduction in the setting effort for tools with guide pad technology.</p> <p>The heart of the system is an innovative cassette that stably holds the indexable inserts with their six or four cutting edges without any play. The back taper on the minor cutting edge is already integrated into this cassette, thus eliminating this setting effort. Due to the exact guidance in the cassette on a precision guide pin, the back taper remains unchanged even during diameter setting.</p> 
<p>Page 32</p>	<p>Page 50</p>	<p>Page 54</p>



Indexable inserts



Along with the selection and design of the tool construction, the correct cutting material is of great importance for the quality and cost-effectiveness of machining. Carbide, cermet, coatings, PCD and PcBN, the entire range of modern cutting materials is available from MAPAL for every workpiece material and for every machining task. The latest manufacturing technology employed in the production of the indexable inserts today enables any chip former and chip breaker shape to be achieved – even on extremely hard cutting materials such as PcBN and PCD.

External and taper reamers



External reaming tools allow outside diameters and shafts to be machined efficiently and to the μm . The principle of MAPAL external reaming is based on optimally absorbing and dispersing the cutting forces using guide pads so that no displacement forces and bending moments are exerted on the workpiece.







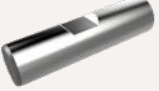
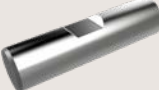

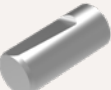
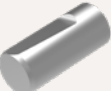
Taper fits in machine engineering place very high demands on surface finish, lead accuracy and circularity deviations to ensure the crucial contact ratio of the fit. The MAPAL principle is also applied to taper reamers to machine reliably to the tightest tolerances.


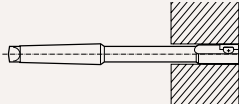
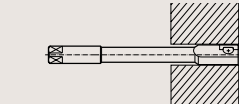

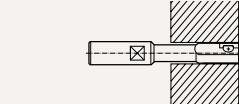
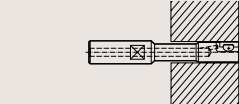
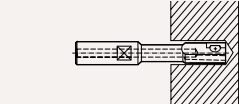
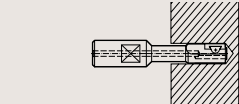

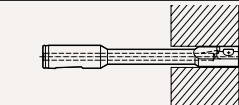
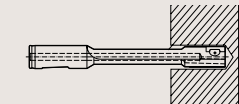
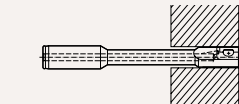
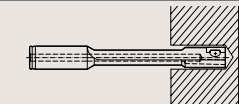

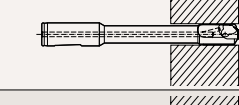
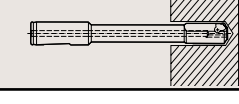
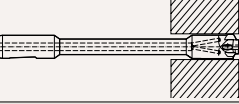
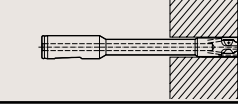
Custom solutions



The primary application for guide pad-tools is mostly in large-scale series production. In addition to its standard programme, MAPAL also offers custom tools specially matched to the customer's application. By means of special geometries, cutting materials and coatings, the tool can be designed for optimal machining results and high cost-effectiveness. Combination solutions with other tools also make it possible to undertake complex tasks cost-effectively with only one tool.

Selection overview – single and twin-bladed reamers

Machine concept		Type of coolant supply		Type of bore		Number of cutting edges	Shank form	
								
Single-bladed reamers	Drills		✓	✓		1		Morse taper shank
			✓	✓		1		Cylindrical shank with squired end
Single-bladed reamers	Automated lathes (with floating holder)		✓	✓		1		Cylindrical shank with clamping surface for floating holders
		✓		✓		1		Cylindrical shank with clamping surface
		✓			✓	1		
		✓			✓	1		
Single-bladed reamers	Machining centres	✓		✓		1		
		✓			✓	1		Cylindrical shank smooth
		✓		✓		1		
		✓			✓	1		
		✓		✓		1		
		✓			✓	1		
✓			✓	1		Cylindrical shank with NC clamping surface		
Twin-bladed reamers	Machining centres	✓		✓		2		Cylindrical shank with NC clamping surface

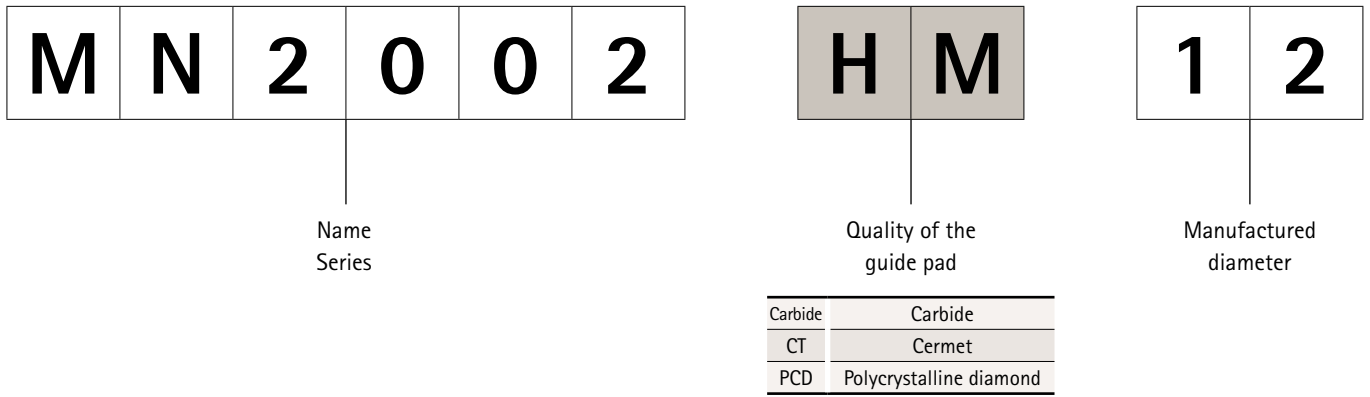
	Tool	Insert		Page
	Series	Model		
	MN2000	WP reamer 		34
	MN2001			36
	MN2002	WP reamer 		38
	MN2003			40
	MN2004			42
	MN2034 (short form)			43
	MN2023	WP NC reamer 		44
	MN2024			45
	MN2043			46
	MN2044			47
	MN6023	HX NC reamer 		48
	MN6024			49
	MN6223	HX NC reamer		53
	MN2223	WP NC reamer		52

Leads	
WP	<p>WP leads:</p> <p>AS: Suitable for all materials, high surface finish even with high cutting speeds.</p> <p>EK: Suitable for all materials, only use if short lead length of 0.6 mm is required. Do not exceed maximum feed of 0.2 mm/rev.</p> <p>AZ: Particularly suitable for machining aluminium. For high cutting speeds.</p> <p>DZ: Especially for machining cast and sintered materials. For increased requirements on the position accuracy.</p>
HX	<p>HX leads:</p> <p>4 = R0.4</p> <p>8 = R0.8</p>
WP	See above "WP leads"

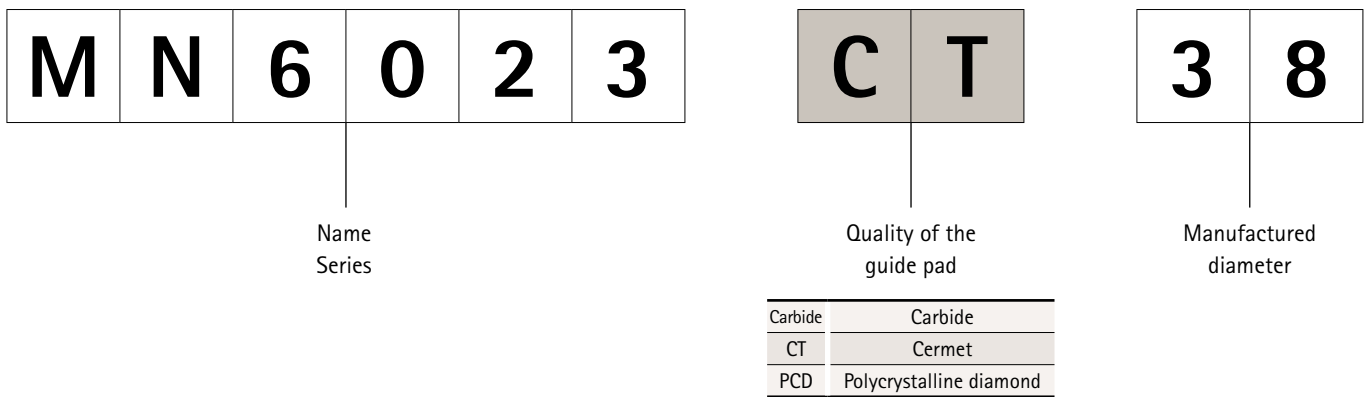
Designation key

WP, HX reamers and EasyAdjust system

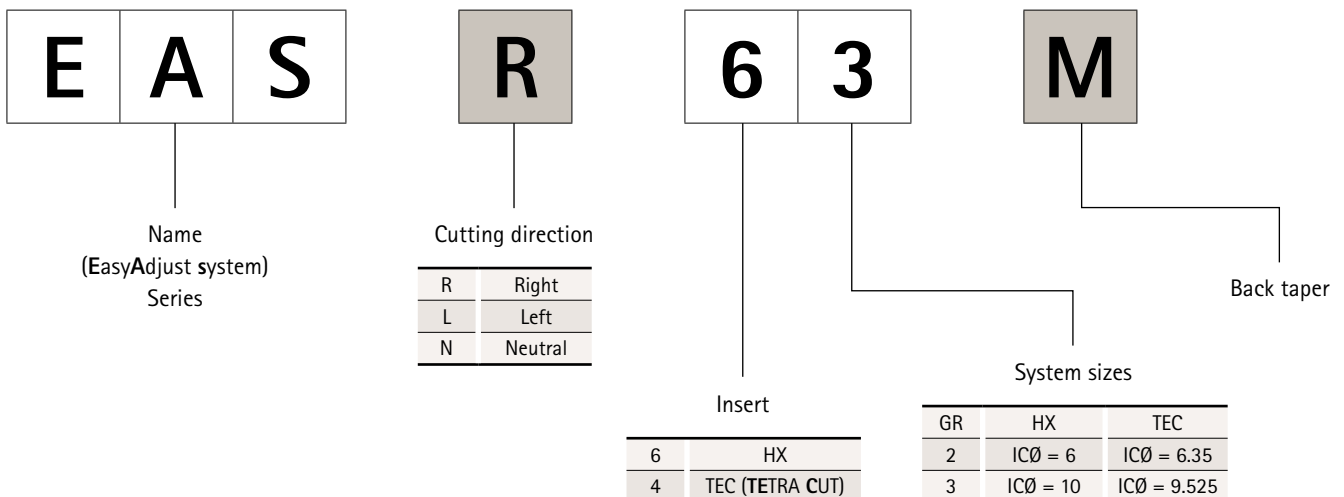
WP reamer



HX reamer



EasyAdjust system



H	6
----------	----------

Tolerance
(IT or allowance)

A	S
----------	----------

Lead
designation

AS	Information on usage on page 29
AZ	
DZ	
EK	

+ 0,009
- 0,007

Tolerance
(IT or allowance)

4

Lead
designation

4	RO.4
8	RO.8



SINGLE-BLADED REAMERS

WP single-bladed reamers

MN2000 Morse taper shank (MK) _____	34
MN2001 Cylindrical shank with clamping surface _____	36
MN2002 Cylindrical shank with clamping surface _____	38
MN2003 Cylindrical shank with clamping surface _____	40
MN2004 Cylindrical shank with clamping surface _____	42
MN2034 Cylindrical shank with clamping surface _____	43
MN2023 Cylindrical shank with NC clamping surface _____	44
MN2024 Cylindrical shank with NC clamping surface _____	45
MN2043 Smooth cylindrical shank _____	46
MN2044 Smooth cylindrical shank _____	47

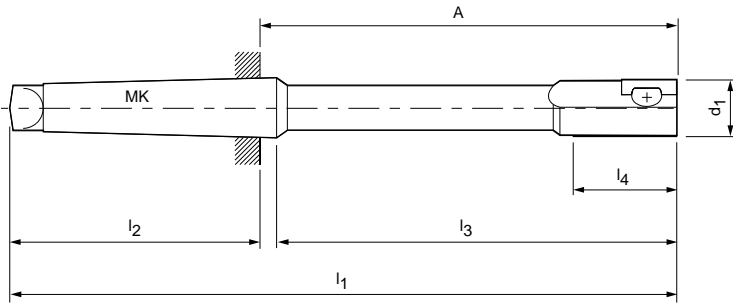
HX single-bladed reamers

MN6023 Cylindrical shank with NC clamping surface _____	48
MN6024 Cylindrical shank with NC clamping surface _____	49



WP single-bladed reamers MN2000

Design with MK shank



Dimensions							Indexable insert size	Accessories				
d ₁ *	l ₁	l ₂	l ₃	l ₄	MK	A		Clamping		Adjusting		
								Torx screw/ threaded spindle	Clamping plate	Threaded pin MN 620	Adjusting wedge MN 619	
Order No. (size)												
5,00-5,29	126**	62	60,5	15	1	64	(SP) 81	Torx screw	10036776 (M1,6x3,9)	30026285 (GR-1YN)	10036736 (M2x1,8)	30026239 (GR-06)
5,30-5,49	126**	62	60,5	15	1	64	(SP) 81		10036778 (M1,6x4,4)	30026285 (GR-1YN)	10036737 (M2x2)	30026239 (GR-06)
5,50-6,19	126**	62	60,5	15	1	64	(SP) 81		10036780 (M2x4)	30026286 (GR-1X)	10036737 (M2x2)	30026260 (GR-07)
6,20-6,90	126**	62	60,5	15	1	64	(SP) 81		10036781 (M2x5)	30026286 (GR-1X)	10036738 (M2x2,5)	30026260 (GR-07)
6,91-7,49	136**	62	70,5	15	1	74	90		10036783 (M2,5x4,8)	30026287 (GR-1W)	10036730 (M2,5x2,2)	30026261 (GR-08)
7,50-7,79	136**	62	70,5	15	1	74	90		10036784 (M2,5x5,2)	30026287 (GR-1W)	10036731 (M2,5x2,5)	30026262 (GR-09)
7,80-7,99	155	62	89,5	30	1	93	90		10036711 (M3LH/RHx5)	30026288 (GR-0F)	10036743 (M3x2,5)	30026238 (GR-0)
8,00-8,79	155	62	89,5	30	1	93	90		10036711 (M3LH/RHx5)	30026288 (GR-0F)	10036743 (M3x2,5)	30026238 (GR-0)
8,80-9,29	160	62	94,5	30	1	98	90		10036722 (M3LH/RHx6)	30026289 (GR-0N)	10036744 (M3x3)	30026238 (GR-0)
9,30-9,79	170	62	104,5	30	1	108	91	10036722 (M3LH/RHx6)	30026292 (GR-1N)	10036744 (M3x3)	30026238 (GR-0)	
9,80-11,29	170	62	104,5	30	1	108	91	10036722 (M3LH/RHx6)	30026292 (GR-1N)	10036744 (M3x3)	30026263 (GR-1)	
11,30-11,79	170	62	104,5	30	1	108	92	10036724 (M4x0,5LH/RHx6,5)	30026294 (GR-2F)	10036751 (M4x3)	30026266 (GR-2)	
11,80-12,29	170	62	104,5	30	1	108	92	10036724 (M4x0,5LH/RHx6,5)	30026294 (GR-2F)	10036751 (M4x3)	30026266 (GR-2)	
12,30-13,29	180	62	114,5	30	1	118	92	10036724 (M4x0,5LH/RHx6,5)	30026294 (GR-2F)	10036752 (M4x4)	30026266 (GR-2)	
13,30-14,29	180	62	114,5	30	1	118	92	10036725 (M4x0,5LH/RHx9)	30026296 (GR-2N)	10036753 (M4x5)	30026266 (GR-2)	
14,30-15,29	180	62	114,5	30	1	118	92	10036725 (M4x0,5LH/RHx9)	30026296 (GR-2N)	10036753 (M4x5)	30026266 (GR-2)	
15,30-16,29	200	75	120	30	2	125	92	10036725 (M4x0,5LH/RHx9)	30026296 (GR-2N)	10036753 (M4x5)	30026266 (GR-2)	
16,30-18,29	210	75	130	30	2	135	92	10036725 (M4x0,5LH/RHx9)	30026296 (GR-2N)	10036753 (M4x5)	30026266 (GR-2)	
18,30-20,29	220	75	140	30	2	145	92	10036725 (M4x0,5LH/RHx9)	30026296 (GR-2N)	10036755 (M4x8)	30026266 (GR-2)	
20,30-22,29	230	75	150	30	2	155	92	10036725 (M4x0,5LH/RHx9)	30026296 (GR-2N)	10036755 (M4x8)	30026266 (GR-2)	
22,30-23,29	240	75	160	30	2	165	92	10036725 (M4x0,5LH/RHx9)	30026296 (GR-2N)	10036755 (M4x8)	30026266 (GR-2)	
23,30-26,29	260	94	161	30	3	166	92	10036725 (M4x0,5LH/RHx9)	30026296 (GR-2N)	10036755 (M4x8)	30026266 (GR-2)	
26,30-28,29	270	94	171	30	3	176	92	10036725 (M4x0,5LH/RHx9)	30026296 (GR-2N)	10036755 (M4x8)	30026266 (GR-2)	
28,30-29,29	280	94	181	30	3	186	92	10036725 (M4x0,5LH/RHx9)	30026296 (GR-2N)	10036755 (M4x8)	30026266 (GR-2)	

WP single-bladed reamers MN2000

Dimensions							Indexable insert size	Accessories				
d ₁ *	l ₁	l ₂	l ₃	l ₄	MK	A		Clamping		Adjusting		
								Threaded spindle	Clamping plate	Threaded pin MN 620	Adjusting wedge MN 619	
												Order No. (size)
29,30-32,29	290	94	191	30	3	196	92	Threaded spindle MN 618	10036725 (M4x0,5LH/RHx9)	30026296 (GR-2N)	10036755 (M4x8)	30026266 (GR-2)
32,30-35,29	290	117,5	166	30	4	172,5	92		10036725 (M4x0,5LH/RHx9)	30026296 (GR-2N)	10036755 (M4x8)	30026266 (GR-2)
35,30-40,29	310	117,5	186	30	4	192,5	92		10036725 (M4x0,5LH/RHx9)	30026296 (GR-2N)	10036755 (M4x8)	30026266 (GR-2)
40,30-48,29	325	117,5	201	30	4	207,5	93		10036725 (M4x0,5LH/RHx9)	30026298 (GR-3N)	10036764 (M6x15)	30026279 (GR-4)
48,30-59,79	340	117,5	216	30	4	222,5	93		10036725 (M4x0,5LH/RHx9)	30026298 (GR-3N)	10036764 (M6x15)	30026279 (GR-4)
59,80-79,79	340	117,5	216	45	4	222,5	93		10036725 (M4x0,5LH/RHx9)	30026298 (GR-3N)	10036764 (M6x15)	30026279 (GR-4)
79,80-	340	149,5	184	45	5	190,5	93		10036725 (M4x0,5LH/RHx9)	30026298 (GR-3N)	10036764 (M6x15)	30026279 (GR-4)

Ordering example (see page 30):
MN2000 HM 20,99 H6 AS

Dimensions in mm.

SP = insert, cannot be rotated.

For matching floating holders see section: Floating holders.

For setting instructions and installation of accessories, see Technical appendix.

* Values indicate the sizes for different diameters (adjustable only within a tolerance range), not the adjustment range.

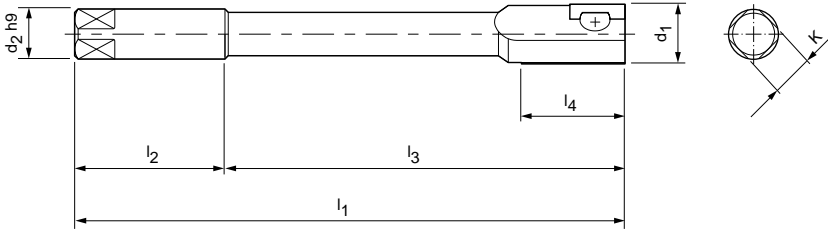
** With 2.5 mm long center spigot by d₁ less than 7.8 mm.

Please indicate the required guide pad quality (carbide, cermet or PCD) when ordering.

Unless otherwise indicated, the guide pads will be delivered in carbide quality.

For matching indexable inserts, see section Indexable inserts from page 60.

WP single-bladed reamers MN2001



Dimensions							Indexable insert size	Accessories				
d ₁ *	d ₂ h ₉	l ₁	l ₂	l ₃	l ₄	K h ₁₂		Clamping		Adjusting		
							Torx screw/ threaded spindle		Clamping plate	Threaded pin MN 620	Adjusting wedge MN 619	
							Order No. (size)					
5,00-5,29	5	85**	25	60	15	-	(SP) 81	Torx screw	10036776 (M1,6x3,9)	30026285 (GR-1YN)	10036736 (M2x1,8)	30026239 (GR-06)
5,30-5,49	5	85**	25	60	15	-	(SP) 81		10036778 (M1,6x4,4)	30026285 (GR-1YN)	10036737 (M2x2)	30026239 (GR-06)
5,50-6,19	5	85**	25	60	15	-	(SP) 81		10036780 (M2x4)	30026286 (GR-1X)	10036737 (M2x2)	30026260 (GR-07)
6,20-6,90	6	85**	25	60	15	-	(SP) 81		10036781 (M2x5)	30026286 (GR-1X)	10036738 (M2x2,5)	30026260 (GR-07)
6,91-7,49	7	100**	28	72	15	-	90		10036783 (M2,5x4,8)	30026287 (GR-1W)	10036730 (M2,5x2,2)	30026261 (GR-08)
7,50-7,79	7	100**	28	72	15	-	90		10036784 (M2,5x5,2)	30026287 (1W)	10036731 (M2,5x2,5)	30026262 (GR-09)
7,80-7,99	8	120	28	92	30	-	90		10036711 (M3LH/RHx5)	30026288 (GR-0F)	10036743 (M3x2,5)	30026238 (GR-0)
8,00-8,29	8	120	28	92	30	-	90		10036711 (M3LH/RHx5)	30026288 (GR-0F)	10036743 (M3x2,5)	30026238 (GR-0)
8,30-8,79	9	130	30	100	30	-	90		10036711 (M3LH/RHx5)	30026288 (GR-0F)	10036744 (M3x3)	30026238 (GR-0)
8,80-9,29	9	130	30	100	30	-	90	10036722 (M3LH/RHx6)	30026289 (GR-0N)	10036744 (M3x3)	30026238 (GR-0)	
9,30-9,79	10	140	32	108	30	-	91	10036722 (M3LH/RHx6)	30026292 (GR-1N)	10036744 (M3x3)	30026238 (GR-0)	
9,80-10,29	10	140	32	108	30	-	91	10036722 (M3LH/RHx6)	30026292 (GR-1N)	10036744 (M3x3)	30026263 (GR-0)	
10,30-11,29	9	145	36	109	30	7	91	10036722 (M3LH/RHx6)	30026292 (GR-1N)	10036744 (M3x3)	30026263 (GR-1)	
11,30-12,29	10	155	40	115	30	8	92	10036724 (M4x0,5LH/RHx6,5)	30026294 (GR-2F)	10036751 (M4x3)	30026266 (GR-2)	
12,30-13,29	11	160	45	115	30	9	92	10036724 (M4x0,5LH/RHx6,5)	30026294 (GR-2F)	10036752 (M4x4)	30026266 (GR-2)	
13,30-14,29	11	170	45	125	30	9	92	10036725 (M4x0,5LH/RHx9)	30026296 (GR-2N)	10036753 (M4x5)	30026266 (GR-2)	
14,30-15,29	13	175	45	130	30	10	92	10036725 (M4x0,5LH/RHx9)	30026296 (GR-2N)	10036753 (M4x5)	30026266 (GR-2)	
15,30-16,29	13	180	50	130	30	10	92	10036725 (M4x0,5LH/RHx9)	30026296 (GR-2N)	10036753 (M4x5)	30026266 (GR-2)	
16,30-17,29	14	190	50	140	30	11	92	10036725 (M4x0,5LH/RHx9)	30026296 (GR-2N)	10036753 (M4x5)	30026266 (GR-2)	
17,30-18,29	14	195	50	145	30	11	92	10036725 (M4x0,5LH/RHx9)	30026296 (GR-2N)	10036753 (M4x5)	30026266 (GR-2)	
18,30-19,29	16	205	56	149	30	12	92	10036725 (M4x0,5LH/RHx9)	30026296 (GR-2N)	10036755 (M4x8)	30026266 (GR-2)	
19,30-20,29	16	210	56	154	30	12	92	10036725 (M4x0,5LH/RHx9)	30026296 (GR-2N)	10036755 (M4x8)	30026266 (GR-2)	
20,30-21,29	18	215	56	159	30	14,5	92	10036725 (M4x0,5LH/RHx9)	30026296 (GR-2N)	10036755 (M4x8)	30026266 (GR-2)	
21,30-22,29	18	225	63	162	30	14,5	92	10036725 (M4x0,5LH/RHx9)	30026296 (GR-2N)	10036755 (M4x8)	30026266 (GR-2)	
								Threaded spindle MN 618				

WP single-bladed reamers MN2001

Dimensions							Indexable insert size	Accessories			
d ₁ *	d ₂ h9	l ₁	l ₂	l ₃	l ₄	K h12		Clamping		Adjusting	
								Threaded spindle	Clamping plate	Threaded pin MN 620	Adjusting wedge MN 619
								Order No. (size)			
22,30-23,29	18	230	63	167	30	14,5	92	10036725 (M4x0,5LH/RHx9)	30026296 (GR-2N)	10036755 (M4x8)	30026266 (GR-2)
23,30-24,29	20	240	63	177	30	16	92	10036725 (M4x0,5LH/RHx9)	30026296 (GR-2N)	10036755 (M4x8)	30026266 (GR-2)
24,30-25,29	20	245	63	182	30	16	92	10036725 (M4x0,5LH/RHx9)	30026296 (GR-2N)	10036755 (M4x8)	30026266 (GR-2)
25,30-26,29	20	250	70	180	30	16	92	10036725 (M4x0,5LH/RHx9)	30026296 (GR-2N)	10036755 (M4x8)	30026266 (GR-2)
26,30-27,29	22	260	70	190	30	18	92	10036725 (M4x0,5LH/RHx9)	30026296 (GR-2N)	10036755 (M4x8)	30026266 (GR-2)
27,30-29,29	22	270	70	200	30	18	92	10036725 (M4x0,5LH/RHx9)	30026296 (GR-2N)	10036755 (M4x8)	30026266 (GR-2)
29,30-30,29	24	280	80	200	30	18	92	10036725 (M4x0,5LH/RHx9)	30026296 (GR-2N)	10036755 (M4x8)	30026266 (GR-2)
30,30-32,29	24	290	80	210	30	18	92	10036725 (M4x0,5LH/RHx9)	30026296 (GR-2N)	10036755 (M4x8)	30026266 (GR-2)

Ordering example (see page 30):

MN2001 HM 20,99 H6 AS

Dimensions in mm.

SP = insert, cannot be rotated.

For matching floating holders see section: Floating holders.

For setting instructions and installation of accessories, see Technical appendix.

* Values indicate the sizes for different diameters (adjustable only within a tolerance range), not the adjustment range.

** With 2.5 mm long center spigot by d₁ less than 7.8 mm.

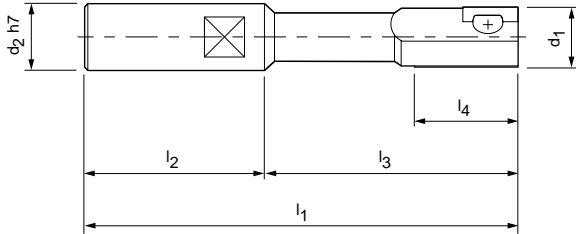
Please indicate the required guide pad quality (carbide, cermet or PCD) when ordering.

Unless otherwise indicated, the guide pads will be delivered in carbide quality.

For matching indexable inserts, see section Indexable inserts from page 60.

WP single-bladed reamers MN2002

Short design



Dimensions							Accessories				
d ₁ *	d ₂ h7	l ₁	l ₂	l ₃	l ₄	Indexable insert size	Clamping		Adjusting		
							Torx screw/ threaded spindle	Clamping plate	Threaded pin MN 620	Adjusting wedge MN 619	
							Order No. (size)				
5,00-5,29	10	90**	30	60	15	(SP) 81	Torx screw	10036776 (M1,6x3,9)	30026285 (GR-1YN)	10036736 (M2x1,8)	30026239 (GR-06)
5,30-5,49	10	90**	30	60	15	(SP) 81		10036778 (M1,6x4,4)	30026285 (GR-1YN)	10036737 (M2x2)	30026239 (GR-06)
5,50-6,19	10	90**	30	60	15	(SP) 81		10036780 (M2x4)	30026286 (GR-1X)	10036737 (M2x2)	30026260 (GR-07)
6,20-6,90	10	90**	30	60	15	(SP) 81		10036781 (M2x5)	30026286 (GR-1X)	10036738 (M2x2,5)	30026260 (GR-07)
6,91-7,49	10	100**	30	70	15	90		10036783 (M2,5x4,8)	30026287 (GR-1W)	10036730 (M2,5x2,2)	30026261 (GR-08)
7,50-7,79	10	100**	30	70	15	90		10036784 (M2,5x5,2)	30026287 (GR-1W)	10036731 (M2,5x2,5)	30026262 (GR-09)
7,80-8,29	16	120	45	75	30	90		10036711 (M3LH/RHx5)	30026288 (GR-0F)	10036743 (M3x2,5)	30026238 (GR-0)
8,30-8,79	16	120	45	75	30	90		10036711 (M3LH/RHx5)	30026288 (GR-0F)	10036744 (M3x3)	30026238 (GR-0)
8,80-9,29	16	120	45	75	30	90		10036722 (M3LH/RHx6)	30026289 (GR-0N)	10036744 (M3x3)	30026238 (GR-0)
9,30-9,79	16	120	45	75	30	91	10036722 (M3LH/RHx6)	30026292 (GR-1N)	10036744 (M3x3)	30026238 (GR-0)	
9,80-11,29	16	120	45	75	30	91	10036722 (M3LH/RHx6)	30026292 (GR-1N)	10036744 (M3x3)	30026263 (GR-1)	
11,30-11,79	16	120	45	75	30	92	10036724 (M4x0,5LH/RHx6,5)	30026294 (GR-2F)	10036751 (M4x3)	30026266 (GR-2)	
11,80-12,29	16	120	45	75	30	92	10036724 (M4x0,5LH/RHx6,5)	30026294 (GR-2F)	10036751 (M4x3)	30026266 (GR-2)	
12,30-13,29	16	120	45	75	30	92	10036724 (M4x0,5LH/RHx6,5)	30026294 (GR-2F)	10036752 (M4x4)	30026266 (GR-2)	
13,30-14,29	16	120	45	75	30	92	10036725 (M4x0,5LH/RHx9)	30026296 (GR-2N)	10036753 (M4x5)	30026266 (GR-2)	
14,30-18,29	20	130	55	75	30	92	10036725 (M4x0,5LH/RHx9)	30026296 (GR-2N)	10036753 (M4x5)	30026266 (GR-2)	
18,30-19,79	20	130	55	75	30	92	10036725 (M4x0,5LH/RHx9)	30026296 (GR-2N)	10036755 (M4x8)	30026266 (GR-2)	
19,80-20,29	20	150	55	95	30	92	10036725 (M4x0,5LH/RHx9)	30026296 (GR-2N)	10036755 (M4x8)	30026266 (GR-2)	
							Threaded spindle MN 618				

WP single-bladed reamers MN2002

Dimensions						Indexable insert size	Accessories				
d ₁ *	d ₂ h7	l ₁	l ₂	l ₃	l ₄		Clamping		Adjusting		
							Torx screw/ threaded spindle	Clamping plate	Threaded pin MN 620	Adjusting wedge MN 619	
							Order No. (size)				
20,30-26,29	20	150	55	95	30	92	Threaded spindle MN 618	10036725 (M4x0,5LH/RHx9)	30026296 (GR-2N)	10036755 (M4x8)	30026266 (GR-2)
26,30-40,29	25	160	65	95	30	92		10036725 (M4x0,5LH/RHx9)	30026296 (GR-2N)	10036755 (M4x8)	30026266 (GR-2)
40,30-59,79	25	180	65	115	30	93		10036725 (M4x0,5LH/RHx9)	30026298 (GR-3N)	10036764 (M6x15)	30026279 (GR-4)
59,80-	25	180	65	115	45	93		10036725 (M4x0,5LH/RHx9)	30026298 (GR-3N)	10036764 (M6x15)	30026279 (GR-4)

Ordering example (see page 30):
MN2002 HM 20,99 H6 AS

Dimensions in mm.

SP = insert, cannot be rotated.

For matching floating holders see section: Floating holders.

For setting instructions and installation of accessories, see Technical appendix.

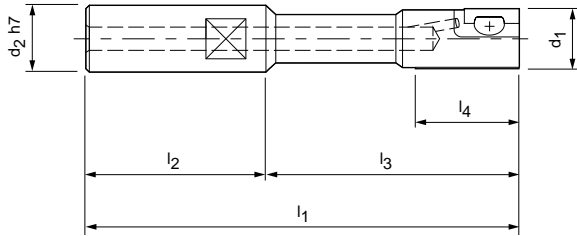
* Values indicate the sizes for different diameters (adjustable only within a tolerance range), not the adjustment range.

** With 2.5 mm long center spigot by d₁ less than 7.8 mm.

Please indicate the required guide pad quality (carbide, cermet or PCD) when ordering. Unless otherwise indicated, the guide pads will be delivered in carbide quality. For matching indexable inserts, see section Indexable inserts from page 60.

WP single-bladed reamers MN2003

Long design with internal cooling



Dimensions							Accessories				
d ₁ *	d ₂ h7	l ₁	l ₂	l ₃	l ₄	Indexable insert size	Clamping		Adjusting		
							Torx screw/ threaded spindle	Clamping plate	Threaded pin MN 620	Adjusting wedge MN 619	
							Order No. (size)				
5,00-5,29	10	90**	30	60	15	(SP) 81	Torx screw	10036776 (M1,6x3,9)	30026285 (GR-1YN)	10036736 (M2x1,8)	30026239 (GR-06)
5,30-5,49	10	90**	30	60	15	(SP) 81		10036778 (M1,6x4,4)	30026285 (GR-1YN)	10036737 (M2x2)	30026239 (GR-06)
5,50-6,19	10	90**	30	60	15	(SP) 81		10036780 (M2x4)	30026286 (GR-1X)	10036737 (M2x2)	30026260 (GR-07)
6,20-6,90	10	90**	30	60	15	(SP) 81		10036781 (M2x5)	30026286 (GR-1X)	10036738 (M2x2,5)	30026260 (GR-07)
6,91-7,49	10	100**	30	70	15	90		10036783 (M2,5x4,8)	30026287 (GR-1W)	10036730 (M2,5x2,2)	30026261 (GR-08)
7,50-7,79	10	100**	30	70	15	90		10036784 (M2,5x5,2)	30026287 (GR-1W)	10036731 (M2,5x2,5)	30026262 (GR-09)
7,80-8,29	16	120	45	75	30	90		10036711 (M3LH/RHx5)	30026288 (GR-0F)	10036743 (M3x2,5)	30026238 (GR-0)
8,30-8,79	16	120	45	75	30	90		10036711 (M3LH/RHx5)	30026288 (GR-0F)	10036744 (M3x3)	30026238 (GR-0)
8,80-9,29	16	120	45	75	30	90		10036722 (M3LH/RHx6)	30026289 (GR-0N)	10036744 (M3x3)	30026238 (GR-0)
9,30-9,79	16	120	45	75	30	91	10036722 (M3LH/RHx6)	30026292 (GR-1N)	10036744 (M3x3)	30026238 (GR-0)	
9,80-11,29	16	120	45	75	30	91	Threaded spindle MN 618	10036722 (M3LH/RHx6)	30026292 (GR-1N)	10036744 (M3x3)	30026263 (GR-1)
11,30-11,79	16	120	45	75	30	92		10036724 (M4x0,5LH/RHx6,5)	30026294 (GR-2F)	10036751 (M4x3)	30026266 (GR-2)
11,80-12,29	16	120	45	75	30	92		10036724 (M4x0,5LH/RHx6,5)	30026294 (GR-2F)	10036751 (M4x3)	30026266 (GR-2)
12,30-13,29	16	120	45	75	30	92		10036724 (M4x0,5LH/RHx6,5)	30026294 (GR-2F)	10036752 (M4x4)	30026266 (GR-2)
13,30-14,29	16	120	45	75	30	92		10036725 (M4x0,5LH/RHx9)	30026296 (GR-2N)	10036755 (M4x8)	30026266 (GR-2)
14,30-18,29	20	130	55	75	30	92		10036725 (M4x0,5LH/RHx9)	30026296 (GR-2N)	10036755 (M4x8)	30026266 (GR-2)
18,30-19,79	20	130	55	75	30	92		10036725 (M4x0,5LH/RHx9)	30026298 (GR-3N)	10036764 (M6x15)	30026279 (GR-4)
19,80-20,29	20	150	55	95	30	92		10036725 (M4x0,5LH/RHx9)	30026298 (GR-3N)	10036764 (M6x15)	30026279 (GR-4)

WP single-bladed reamers MN2003

Dimensions						Indexable insert size	Accessories				
d ₁ *	d ₂ h7	l ₁	l ₂	l ₃	l ₄		Clamping		Adjusting		
							Torx screw/ threaded spindle	Clamping plate	Threaded pin MN 620	Adjusting wedge MN 619	
											Order No. (size)
20,30-26,29	20	150	55	95	30	92	Threaded spindle MN 618	10036725 (M4x0,5LH/RHx9)	30026296 (GR-2N)	10036755 (M4x8)	30026266 (GR-2)
26,30-40,29	25	160	65	95	30	92		10036725 (M4x0,5LH/RHx9)	30026296 (GR-2N)	10036755 (M4x8)	30026266 (GR-2)
40,30-59,79	25	180	65	115	30	93		10036725 (M4x0,5LH/RHx9)	30026298 (GR-3N)	10036764 (M6x15)	30026279 (GR-4)
59,80-	25	180	65	115	45	93		10036725 (M4x0,5LH/RHx9)	30026298 (GR-3N)	10036764 (M6x15)	30026279 (GR-4)

Ordering example (see page 30):
MN2003 HM 20,99 H6 AS

Dimensions in mm.

SP = insert, cannot be rotated.

For matching floating holders see section: Floating holders.

For setting instructions and installation of accessories, see Technical appendix.

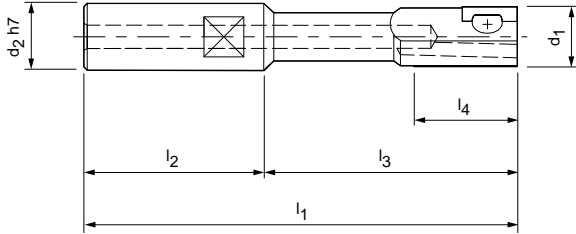
* Values indicate the sizes for different diameters (adjustable only within a tolerance range), not the adjustment range.

** With 2.5 mm long center spigot by d₁ less than 7.8 mm.

Please indicate the required guide pad quality (carbide, cermet or PCD) when ordering. Unless otherwise indicated, the guide pads will be delivered in carbide quality. For matching indexable inserts, see section Indexable inserts from page 60.

WP single-bladed reamers MN2004

Short design



Dimensions							Accessories				
d ₁ *	d ₂ h7	l ₁	l ₂	l ₃	l ₄	Indexable insert size	Clamping		Adjusting		
							Torx screw/ threaded spindle	Clamping plate	Threaded pin MN 620	Adjusting wedge MN 619	
							Order No. (size)				
5,90-6,29	10	90**	30	60	15	(SP) 81	Torx screw	10036776 (M1,6x3,9)	30026285 (GR-1YN)	10036737 (M2x2)	30026239 (GR-06)
6,30-6,90	10	90**	30	60	15	(SP) 81		10036778 (M1,6x4,4)	30026285 (GR-1YN)	10036738 (M2x2,5)	30026239 (GR-06)
6,91-7,29	10	100**	30	70	15	(SP) 81		10036778 (M1,6x4,4)	30026285 (GR-1YN)	10036738 (M2x2,5)	30026239 (GR-06)
7,30-7,79	10	100**	30	70	15	(SP) 81		10036781 (M2x5)	30026286 (GR-1X)	10036739 (M2x3)	30026260 (GR-07)
7,80-8,29	16	120**	45	75	15	(SP) 81		10036781 (M2x5)	30026286 (GR-1X)	10036739 (M2x3)	30026260 (GR-07)
8,30-9,79	16	120	45	75	15	90		10036784 (M2,5x5,2)	30026287 (GR-1W)	10036732 (M2,5x3)	30026262 (GR-09)
9,80-10,29	16	120	45	75	15	90		10036784 (M2,5x5,2)	30026287 (GR-1W)	10036733 (M2,5x4)	30026262 (GR-09)
10,30-11,29	16	120	45	75	30	90		10036722 (M3LH/RHx6)	30026289 (GR-0N)	10036744 (M3x3)	30026263 (GR-1)
11,30-12,29	16	120	45	75	30	90		10036722 (M3LH/RHx6)	30026289 (GR-0N)	10036745 (M3x4)	30026263 (GR-1)
12,30-14,29	16	120	45	75	30	91	10036722 (M3LH/RHx6)	30026292 (GR-1N)	10036745 (M3x4)	30026263 (GR-1)	
14,30-16,29	20	130	55	75	30	91	10036722 (M3LH/RHx6)	30026292 (GR-1N)	10036747 (M3x6)	30026263 (GR-1)	
16,30-17,29	20	130	55	75	30	92	10036725 (M4x0,5LH/RHx9)	30026296 (GR-2N)	10036753 (M4x5)	30026266 (GR-2)	
17,30-19,79	20	130	55	75	30	92	10036725 (M4x0,5LH/RHx9)	30026296 (GR-2N)	10036754 (M4x6)	30026266 (GR-2)	
19,80-26,29	20	150	55	95	30	92	10036725 (M4x0,5LH/RHx9)	30026296 (GR-2N)	10036755 (M4x8)	30026266 (GR-2)	
26,30-40,29	25	160	65	95	30	92	10036725 (M4x0,5LH/RHx9)	30026296 (GR-2N)	10036755 (M4x8)	30026266 (GR-2)	
40,30-59,79	25	180	65	115	30	93	10036725 (M4x0,5LH/RHx9)	30026298 (GR-3N)	10036764 (M6x15)	30026279 (GR-4)	
59,80-	25	180	65	115	45	93	10036725 (M4x0,5LH/RHx9)	30026298 (GR-3N)	10036764 (M6x15)	30026279 (GR-4)	

Ordering example (see page 30):
MN2004 HM 20,99 H6 AS

Dimensions in mm.

For matching floating holders see section: Floating holders.

For setting instructions and installation of accessories, see Technical appendix.

* Values indicate the sizes for different diameters (adjustable only within a tolerance range), not the adjustment range.

** With 1 mm long center spigot by d₁ less than 8.3 mm.

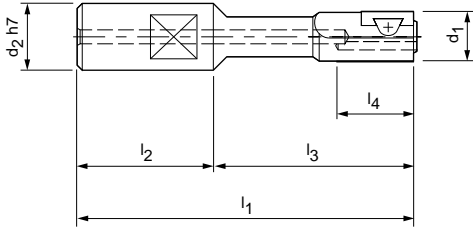
Please indicate the required guide pad quality (carbide, cermet or PCD) when ordering.

Unless otherwise indicated, the guide pads will be delivered in carbide quality.

For matching indexable inserts, see section Indexable inserts from page 60.

WP single-bladed reamers MN2034

Extra long design



Dimensions							Accessories				
d ₁ *	d ₂ h7	l ₁	l ₂	l ₃	l ₄	Indexable insert size	Clamping		Adjusting		
							Torx screw/ threaded spindle	Clamping plate	Threaded pin MN 620	Adjusting wedge MN 619	
							Order No. (size)				
5,90-6,29	16	85**	27	58	15	(SP) 81	Torx screw	10036776 (M1,6x3,9)	30026285 (GR-1YN)	10036737 (M2x2)	30026239 (GR-06)
6,30-7,29	16	85**	27	58	15	(SP) 81		10036778 (M1,6x4,4)	30026285 (GR-1YN)	10036738 (M2x2,5)	30026239 (GR-06)
7,30-8,29	16	85**	27	58	15	(SP) 81		10036781 (M2x5)	30026286 (GR-1X)	10036739 (M2x3)	30026260 (GR-07)
8,30-9,79	16	85	27	58	15	90		10036784 (M2,5x5,2)	30026287 (GR-1W)	10036732 (M2,5x3)	30026262 (GR-09)
9,80-10,29	16	85	27	58	15	90		10036784 (M2,5x5,2)	30026287 (GR-1W)	10036733 (M2,5x4)	30026262 (GR-09)
10,30-11,29	16	85	27	58	30	90	Threaded spindle MN 618	10036722 (M3LH/RHx6)	30026289 (GR-0N)	10036744 (M3x3)	30026263 (GR-1)
11,30-12,29	16	85	27	58	30	90		10036722 (M3LH/RHx6)	30026289 (GR-0N)	10036745 (M3x4)	30026263 (GR-1)
12,30-14,29	16	85	27	58	30	91		10036722 (M3LH/RHx6)	30026292 (GR-1N)	10036745 (M3x4)	30026263 (GR-1)
14,30-16,29	16	85	27	58	30	91		10036722 (M3LH/RHx6)	30026292 (GR-1N)	10036747 (M3x6)	30026263 (GR-1)
16,30-17,29	16	85	27	58	30	92		10036725 (M4x0,5LH/RHx9)	30026296 (GR-2N)	10036753 (M4x5)	30026266 (GR-2)
17,30-19,79	16	85	27	58	30	92		10036725 (M4x0,5LH/RHx9)	30026296 (GR-2N)	10036754 (M4x6)	30026266 (GR-2)
19,80-20,29	16	85	27	58	30	92		10036725 (M4x0,5LH/RHx9)	30026296 (GR-2N)	10036755 (M4x8)	30026266 (GR-2)
20,30-26,29	20	90	30	60	30	92		10036725 (M4x0,5LH/RHx9)	30026296 (GR-2N)	10036755 (M4x8)	30026266 (GR-2)
26,30-40,29	25	95	35	60	30	92		10036725 (M4x0,5LH/RHx9)	30026296 (GR-2N)	10036755 (M4x8)	30026266 (GR-2)

Ordering example (see page 30):

MN2034 HM 20,99 H6 AS

Dimensions in mm.

SP = insert, cannot be rotated.

For matching floating holders see section: Floating holders.

For setting instructions and installation of accessories, see Technical appendix.

* Values indicate the sizes for different diameters (adjustable only within a tolerance range), not the adjustment range.

** With 1 mm long center spigot by d₁ less than 8.3 mm.

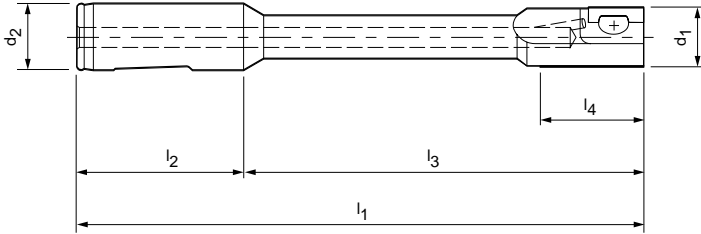
Please indicate the required guide pad quality (carbide, cermet or PCD) when ordering.

Unless otherwise indicated, the guide pads will be delivered in carbide quality.

For matching indexable inserts, see section Indexable inserts from page 60.

WP single-bladed reamers MN2023

NC design



Dimensions							Accessories			
d ₁ *	d ₂ (-0.003)	l ₁	l ₂	l ₃	l ₄	Indexable insert size	Clamping		Adjusting	
							Threaded spindle MN 618	Clamping plate	Threaded pin MN 620	Adjusting wedge MN 619
							Order No. (size)			
7,80-8,29	16	133	48	85	30	90	10036711 (M3LH/RHx5)	30026288 (GR-0F)	10036743 (M3x2,5)	30026238 (GR-0)
8,30-8,79	16	133	48	85	30	90	10036711 (M3LH/RHx5)	30026288 (GR-0F)	10036744 (M3x3)	30026238 (GR-0)
8,80-9,29	16	133	48	85	30	90	10036711 (M3LH/RHx5)	30026289 (GR-0N)	10036744 (M3x3)	30026238 (GR-0)
9,30-11,29	16	133	48	85	30	91	10036722 (M3LH/RHx6)	30026292 (GR-1N)	10036744 (M3x3)	30026263 (GR-1)
11,30-11,79	16	133	48	85	30	92	10036724 (M4x0,5LH/RHx6,5)	30026294 (GR-2F)	10036751 (M4x3)	30026266 (GR-2)
11,80-12,29	16	168	48	120	30	92	10036724 (M4x0,5LH/RHx6,5)	30026294 (GR-2F)	10036751 (M4x3)	30026266 (GR-2)
12,30-13,29	16	168	48	120	30	92	10036724 (M4x0,5LH/RHx6,5)	30026294 (GR-2F)	10036752 (M4x4)	30026266 (GR-2)
13,30-14,29	16	168	48	120	30	92	10036725 (M4x0,5LH/RHx9)	30026296 (GR-2N)	10036753 (M4x5)	30026266 (GR-2)
14,30-15,79	20	170	50	120	30	92	10036725 (M4x0,5LH/RHx9)	30026296 (GR-2N)	10036753 (M4x5)	30026266 (GR-2)
15,80-17,79	20	170	50	120	30	92	10036725 (M4x0,5LH/RHx9)	30026296 (GR-2N)	10036753 (M4x5)	30026266 (GR-2)
17,80-18,29	20	170	50	120	30	92	10036725 (M4x0,5LH/RHx9)	30026296 (GR-2N)	10036753 (M4x5)	30026266 (GR-2)
18,30-19,79	20	170	50	120	30	92	10036725 (M4x0,5LH/RHx9)	30026296 (GR-2N)	10036754 (M4x6)	30026266 (GR-2)
19,80-24,79	20	170	50	120	30	92	10036725 (M4x0,5LH/RHx9)	30026296 (GR-2N)	10036755 (M4x8)	30026266 (GR-2)
24,80-28,79	20	170	50	120	30	93	10036725 (M4x0,5LH/RHx9)	30026298 (GR-3N)	10036761 (M6x10)	30026279 (GR-4)
28,80-31,79	20	170	50	120	30	93	10036725 (M4x0,5LH/RHx9)	30026298 (GR-3N)	10036762 (M6x12)	30026279 (GR-4)
31,80-37,79	20	170	50	120	30	93	10036725 (M4x0,5LH/RHx9)	30026298 (GR-3N)	10036764 (M6x15)	30026279 (GR-4)
37,80-50,29	25	176	56	120	30	93	10036725 (M4x0,5LH/RHx9)	30026298 (GR-3N)	10036764 (M6x15)	30026279 (GR-4)
50,30-80,29	40	190	70	120	30	93	10036725 (M4x0,5LH/RHx9)	30026298 (GR-3N)	10036764 (M6x15)	30026279 (GR-4)

Ordering example (see page 30):

MN2023 HM 20,99 H6 AS

Dimensions in mm.

For setting instructions and installation of accessories, see Technical appendix.

* Values indicate the sizes for different diameters (adjustable only within a tolerance range), not the adjustment range.

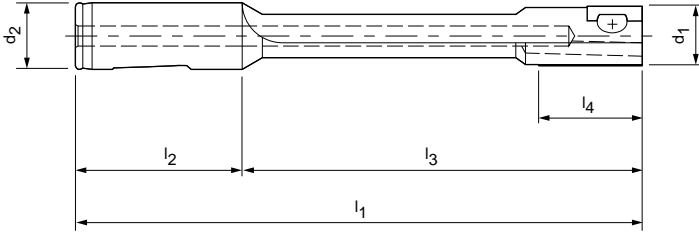
Please indicate the required guide pad quality (carbide, cermet or PCD) when ordering.

Unless otherwise indicated, the guide pads will be delivered in carbide quality.

For matching indexable inserts, see section Indexable inserts from page 60.

WP single-bladed reamers MN2024

NC design



Dimensions							Accessories			
d_1^*	d_2 (-0.003)	l_1	l_2	l_3	l_4	Indexable insert size	Clamping		Adjusting	
							Threaded spindle MN 618	Clamping plate	Threaded pin MN 620	Adjusting wedge MN 619
							Order No. (size)			
7,80-8,29	16	133	48	85	30	90	10036711 (M3LH/RHx5)	30026291 (GR-0Z)	10036743 (M3x2,5)	30026238 (GR-0)
8,30-8,79	16	133	48	85	30	90	10036711 (M3LH/RHx5)	30026291 (GR-0Z)	10036744 (M3x3)	30026238 (GR-0)
8,80-9,29	16	133	48	85	30	90	10036711 (M3LH/RHx5)	30026291 (GR-0Z)	10036744 (M3x3)	30026238 (GR-0)
9,30-11,29	16	133	48	85	30	90	10036722 (M3LH/RHx6)	30026289 (GR-0N)	10036744 (M3x3)	30026263 (GR-1)
11,30-11,79	16	133	48	85	30	90	10036722 (M3LH/RHx6)	30026289 (GR-0N)	10036745 (M3x4)	30026263 (GR-1)
11,80-12,29	16	168	48	120	30	90	10036722 (M3LH/RHx6)	30026289 (GR-0N)	10036745 (M3x4)	30026263 (GR-1)
12,30-14,29	16	168	48	120	30	91	10036722 (M3LH/RHx6)	30026292 (GR-1N)	10036745 (M3x4)	30026263 (GR-1)
14,30-16,29	20	170	50	120	30	91	10036722 (M3LH/RHx6)	30026292 (GR-1N)	10036747 (M3x6)	30026263 (GR-1)
16,30-17,29	20	170	50	120	30	92	10036725 (M4x0,5LH/RHx9)	30026296 (GR-2N)	10036753 (M4x5)	30026266 (GR-2)
17,30-19,79	20	170	50	120	30	92	10036725 (M4x0,5LH/RHx9)	30026296 (GR-2N)	10036754 (M4x6)	30026266 (GR-2)
19,80-24,79	20	170	50	120	30	92	10036725 (M4x0,5LH/RHx9)	30026296 (GR-2N)	10036755 (M4x8)	30026266 (GR-2)
24,80-27,79	20	170	50	120	30	93	10036725 (M4x0,5LH/RHx9)	30026298 (GR-3N)	10036761 (M6x10)	30026279 (GR-4)
27,80-28,79	20	170	50	120	30	93	10036725 (M4x0,5LH/RHx9)	30026298 (GR-3N)	10036761 (M6x10)	30026279 (GR-4)
28,80-31,79	20	170	50	120	30	93	10036725 (M4x0,5LH/RHx9)	30026298 (GR-3N)	10036762 (M6x12)	30026279 (GR-4)
31,80-37,79	20	170	50	120	30	93	10036725 (M4x0,5LH/RHx9)	30026298 (GR-3N)	10036764 (M6x15)	30026279 (GR-4)
37,80-50,29	25	176	56	120	30	93	10036725 (M4x0,5LH/RHx9)	30026298 (GR-3N)	10036764 (M6x15)	30026279 (GR-4)

Ordering example (see page 30):
MN2024 HM 20,99 H6 AS

Dimensions in mm.

For setting instructions and installation of accessories, see Technical appendix.

* Values indicate the sizes for different diameters (adjustable only within a tolerance range), not the adjustment range.

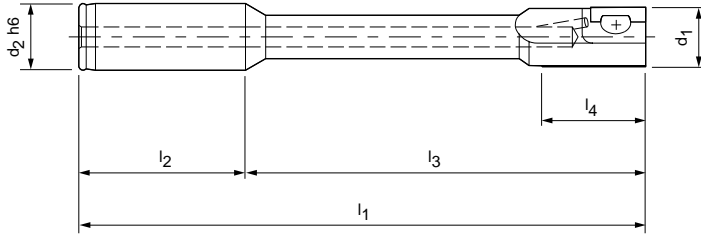
Please indicate the required guide pad quality (carbide, cermet or PCD) when ordering.

Unless otherwise indicated, the guide pads will be delivered in carbide quality.

For matching indexable inserts, see section Indexable inserts from page 60.

WP single-bladed reamers MN2043

NC design



Dimensions							Accessories			
d ₁ *	d ₂ h6	l ₁	l ₂	l ₃	l ₄	Indexable insert size	Clamping		Adjusting	
							Threaded spindle MN 618	Clamping plate	Threaded pin MN 620	Adjusting wedge MN 619
							Order No. (size)			
7,80-8,29	16	133	48	85	30	90	10036711 (M3LH/RHx5)	30026288 (GR-0F)	10036743 (M3x2,5)	30026238 (GR-0)
8,30-8,79	16	133	48	85	30	90	10036711 (M3LH/RHx5)	30026288 (GR-0F)	10036744 (M3x3)	30026238 (GR-0)
8,80-9,29	16	133	48	85	30	90	10036711 (M3LH/RHx5)	30026289 (GR-0N)	10036744 (M3x3)	30026238 (GR-0)
9,30-11,29	16	133	48	85	30	91	10036722 (M3LH/RHx6)	30026292 (GR-1N)	10036744 (M3x3)	30026263 (GR-1)
11,30-11,79	16	133	48	85	30	92	10036724 (M4x0,5LH/RHx6,5)	30026294 (GR-2F)	10036751 (M4x3)	30026266 (GR-2)
11,80-12,29	16	168	48	120	30	92	10036724 (M4x0,5LH/RHx6,5)	30026294 (GR-2F)	10036751 (M4x3)	30026266 (GR-2)
12,30-13,29	16	168	48	120	30	92	10036724 (M4x0,5LH/RHx6,5)	30026294 (GR-2F)	10036752 (M4x4)	30026266 (GR-2)
13,30-14,29	16	168	48	120	30	92	10036725 (M4x0,5LH/RHx9)	30026296 (GR-2N)	10036753 (M4x5)	30026266 (GR-2)
14,30-15,79	20	170	50	120	30	92	10036725 (M4x0,5LH/RHx9)	30026296 (GR-2N)	10036753 (M4x5)	30026266 (GR-2)
15,80-17,79	20	170	50	120	30	92	10036725 (M4x0,5LH/RHx9)	30026296 (GR-2N)	10036753 (M4x5)	30026266 (GR-2)
17,80-18,29	20	170	50	120	30	92	10036725 (M4x0,5LH/RHx9)	30026296 (GR-2N)	10036753 (M4x5)	30026266 (GR-2)
18,30-19,79	20	170	50	120	30	92	10036725 (M4x0,5LH/RHx9)	30026296 (GR-2N)	10036754 (M4x6)	30026266 (GR-2)
19,80-24,79	20	170	50	120	30	92	10036725 (M4x0,5LH/RHx9)	30026296 (GR-2N)	10036755 (M4x8)	30026266 (GR-2)
24,80-28,79	20	170	50	120	30	93	10036725 (M4x0,5LH/RHx9)	30026298 (GR-3N)	10036761 (M6x10)	30026279 (GR-4)
28,80-31,79	20	170	50	120	30	93	10036725 (M4x0,5LH/RHx9)	30026298 (GR-3N)	10036762 (M6x12)	30026279 (GR-4)
31,80-37,79	20	170	50	120	30	93	10036725 (M4x0,5LH/RHx9)	30026298 (GR-3N)	10036764 (M6x15)	30026279 (GR-4)
37,80-50,29	25	176	56	120	30	93	10036725 (M4x0,5LH/RHx9)	30026298 (GR-3N)	10036764 (M6x15)	30026279 (GR-4)
50,30-80,29	40	190	70	120	30	93	10036725 (M4x0,5LH/RHx9)	30026298 (GR-3N)	10036764 (M6x15)	30026279 (GR-4)

Ordering example (see page 30):

MN2043 HM 20,99 H6 AS

Dimensions in mm.

For setting instructions and installation of accessories, see Technical appendix.

* Values indicate the sizes for different diameters (adjustable only within a tolerance range), not the adjustment range.

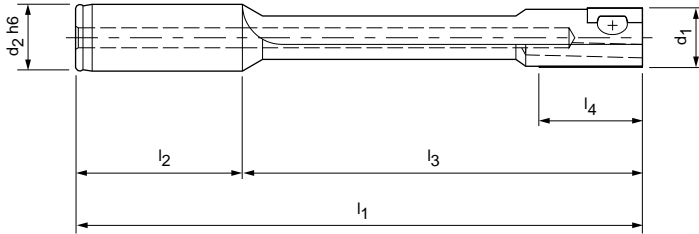
Please indicate the required guide pad quality (carbide, cermet or PCD) when ordering.

Unless otherwise indicated, the guide pads will be delivered in carbide quality.

For matching indexable inserts, see section Indexable inserts from page 60.

WP single-bladed reamers MN2044

NC design



Dimensions							Accessories			
d ₁ *	d ₂ h6	l ₁	l ₂	l ₃	l ₄	Indexable insert size	Clamping		Adjusting	
							Threaded spindle MN 618	Clamping plate	Threaded pin MN 620	Adjusting wedge MN 619
							Order No. (size)			
7,80-8,29	16	133	48	85	30	90	10036711 (M3LH/RHx5)	30026291 (GR-0Z)	10036743 (M3x2,5)	30026238 (GR-0)
8,30-8,79	16	133	48	85	30	90	10036711 (M3LH/RHx5)	30026291 (GR-0Z)	10036744 (M3x3)	30026238 (GR-0)
8,80-9,29	16	133	48	85	30	90	10036711 (M3LH/RHx5)	30026291 (GR-0Z)	10036744 (M3x3)	30026238 (GR-0)
9,30-11,29	16	133	48	85	30	90	10036722 (M3LH/RHx6)	30026289 (GR-0N)	10036744 (M3x3)	30026263 (GR-1)
11,30-11,79	16	133	48	85	30	90	10036722 (M3LH/RHx6)	30026289 (GR-0N)	10036745 (M3x4)	30026263 (GR-1)
11,80-12,29	16	168	48	120	30	90	10036722 (M3LH/RHx6)	30026289 (GR-0N)	10036745 (M3x4)	30026263 (GR-1)
12,30-14,29	16	168	48	120	30	91	10036722 (M3LH/RHx6)	30026292 (GR-1N)	10036745 (M3x4)	30026263 (GR-1)
14,30-16,29	20	170	50	120	30	91	10036722 (M3LH/RHx6)	30026292 (GR-1N)	10036747 (M3x6)	30026263 (GR-1)
16,30-17,29	20	170	50	120	30	92	10036725 (M4x0,5LH/RHx9)	30026296 (GR-2N)	10036753 (M4x5)	30026266 (GR-2)
17,30-19,79	20	170	50	120	30	92	10036725 (M4x0,5LH/RHx9)	30026296 (GR-2N)	10036754 (M4x6)	30026266 (GR-2)
19,80-24,79	20	170	50	120	30	92	10036725 (M4x0,5LH/RHx9)	30026296 (GR-2N)	10036755 (M4x8)	30026266 (GR-2)
24,80-27,79	20	170	50	120	30	93	10036725 (M4x0,5LH/RHx9)	30026298 (GR-3N)	10036761 (M6x10)	30026279 (GR-4)
27,80-28,79	20	170	50	120	30	93	10036725 (M4x0,5LH/RHx9)	30026298 (GR-3N)	10036761 (M6x10)	30026279 (GR-4)
28,80-31,79	20	170	50	120	30	93	10036725 (M4x0,5LH/RHx9)	30026298 (GR-3N)	10036762 (M6x12)	30026279 (GR-4)
31,80-37,79	20	170	50	120	30	93	10036725 (M4x0,5LH/RHx9)	30026298 (GR-3N)	10036764 (M6x15)	30026279 (GR-4)
37,80-50,29	25	176	56	120	30	93	10036725 (M4x0,5LH/RHx9)	30026298 (GR-3N)	10036764 (M6x15)	30026279 (GR-4)

Ordering example (see page 30):
MN2044 HM 20,99 H6 AS

Dimensions in mm.

For setting instructions and installation of accessories, see Technical appendix.

* Values indicate the sizes for different diameters (adjustable only within a tolerance range), not the adjustment range.

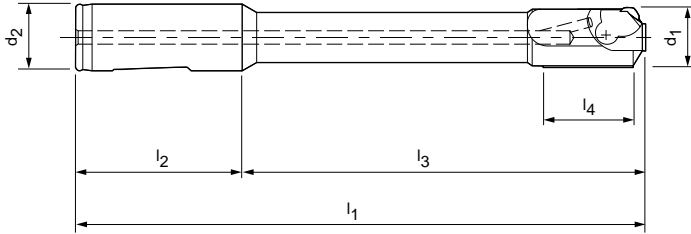
Please indicate the required guide pad quality (carbide, cermet or PCD) when ordering.

Unless otherwise indicated, the guide pads will be delivered in carbide quality.

For matching indexable inserts, see section Indexable inserts from page 60.

HX single-bladed reamers MN6023

NC design



Dimensions							Accessories			
d ₁ *	d ₂ (-0.003)	l ₁	l ₂	l ₃	l ₄	Indexable insert size	Clamping		Adjusting	
							Threaded spindle MN 618	Clamping plate	Threaded pin MN 620	Adjusting wedge MN 619
							Order No. (size)			
13,83-14,49	16	168**	48	120	30	2	10036724 (M4x0,5LH/RHx6,5)	30026300 (PX25R)	10036743 (M3x2,5)	30026264 (GR-12)
14,50-14,82	20	170**	50	120	30	2	10036724 (M4x0,5LH/RHx6,5)	30026300 (PX25R)	10036743 (M3x2,5)	30026264 (GR-12)
14,83-16,49	20	170**	50	120	30	2	10036724 (M4x0,5LH/RHx6,5)	30026300 (PX25R)	10036744 (M3x3)	30026264 (GR-12)
16,50-16,82	20	170**	50	120	30	2	10036724 (M4x0,5LH/RHx6,5)	30026300 (PX25R)	10036745 (M3x4)	30026264 (GR-12)
16,83-17,82	20	170**	50	120	30	2	10036725 (M4x0,5LH/RHx9)	30026300 (PX25R)	10036745 (M3x4)	30026264 (GR-12)
17,83-19,82	20	170**	50	120	30	2	10036725 (M4x0,5LH/RHx9)	30026300 (PX25R)	10036751 (M4x3)	30026265 (GR-13)
19,83-21,82	20	170**	50	120	30	2	10036725 (M4x0,5LH/RHx9)	30026301 (PX26R)	10036752 (M4x4)	30026265 (GR-13)
21,83-24,82	20	170**	50	120	30	2	10036725 (M4x0,5LH/RHx9)	30026301 (PX26R)	10036754 (M4x6)	30026265 (GR-13)
24,83-37,82	20	170	50	120	30	2	10036725 (M4x0,5LH/RHx9)	30026301 (PX26R)	10036755 (M4x8)	30026265 (GR-13)
37,83-50,16	25	176	56	120	30	2	10036725 (M4x0,5LH/RHx9)	30026301 (PX26R)	10036755 (M4x8)	30026265 (GR-13)
50,17-80,16	40	190	70	120	30	2	10036725 (M4x0,5LH/RHx9)	30026301 (PX26R)	10036755 (M4x8)	30026265 (GR-13)

Ordering example (see page 30):

MN6023 CT 24,99 H6 4

Dimensions in mm.

For setting instructions and installation of accessories, see Technical appendix.

* Values indicate the sizes for different diameters (adjustable only within a tolerance range), not the adjustment range.

** With 1 mm long center spigot by d₁ less than 22.50 mm.

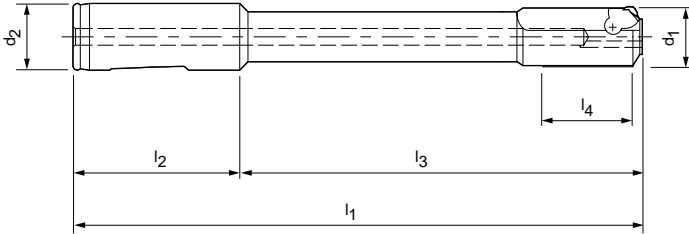
Please indicate the required guide pad quality (carbide, cermet or PCD) when ordering.

Unless otherwise indicated, the guide pads will be delivered in cermet quality.

For matching indexable inserts, see section Indexable inserts from page 60.

HX single-bladed reamers MN6024

NC design



Dimensions							Accessories			
d ₁ *	d ₂ (-0.003)	l ₁	l ₂	l ₃	l ₄	Indexable insert size	Clamping		Adjusting	
							Threaded spindle MN 618	Clamping plate	Threaded pin MN 620	Adjusting wedge MN 619
							Order No. (size)			
14,83-16,49	20	170**	50	120	30	2	10036724 (M4x0,5LH/RHx6,5)	30026300 (PX25R)	10036744 (M3x3)	30026264 (GR-12)
16,50-16,82	20	170**	50	120	30	2	10036724 (M4x0,5LH/RHx6,5)	30026300 (PX25R)	10036745 (M3x4)	30026264 (GR-12)
16,83-17,82	20	170**	50	120	30	2	10036725 (M4x0,5LH/RHx9)	30026300 (PX25R)	10036745 (M3x4)	30026264 (GR-12)
17,83-19,82	20	170**	50	120	30	2	10036725 (M4x0,5LH/RHx9)	30026300 (PX25R)	10036751 (M4x3)	30026265 (GR-13)
19,83-21,82	20	170**	50	120	30	2	10036725 (M4x0,5LH/RHx9)	30026301 (PX26R)	10036752 (M4x4)	30026265 (GR-13)
21,83-24,82	20	170**	50	120	30	2	10036725 (M4x0,5LH/RHx9)	30026301 (PX26R)	10036754 (M4x6)	30026265 (GR-13)
24,83-37,82	20	170	50	120	30	2	10036725 (M4x0,5LH/RHx9)	30026301 (PX26R)	10036755 (M4x8)	30026265 (GR-13)
37,83-50,16	25	176	56	120	30	2	10036725 (M4x0,5LH/RHx9)	30026301 (PX26R)	10036755 (M4x8)	30026265 (GR-13)
50,17-80,16	40	190	70	120	30	2	10036725 (M4x0,5LH/RHx9)	30026301 (PX26R)	10036755 (M4x8)	30026265 (GR-13)

Ordering example (see page 30):

MN6024 CT 16,99 H6 4

Dimensions in mm.

Quality of the guide pads: Cermet

For setting instructions and installation of accessories, see Technical appendix.

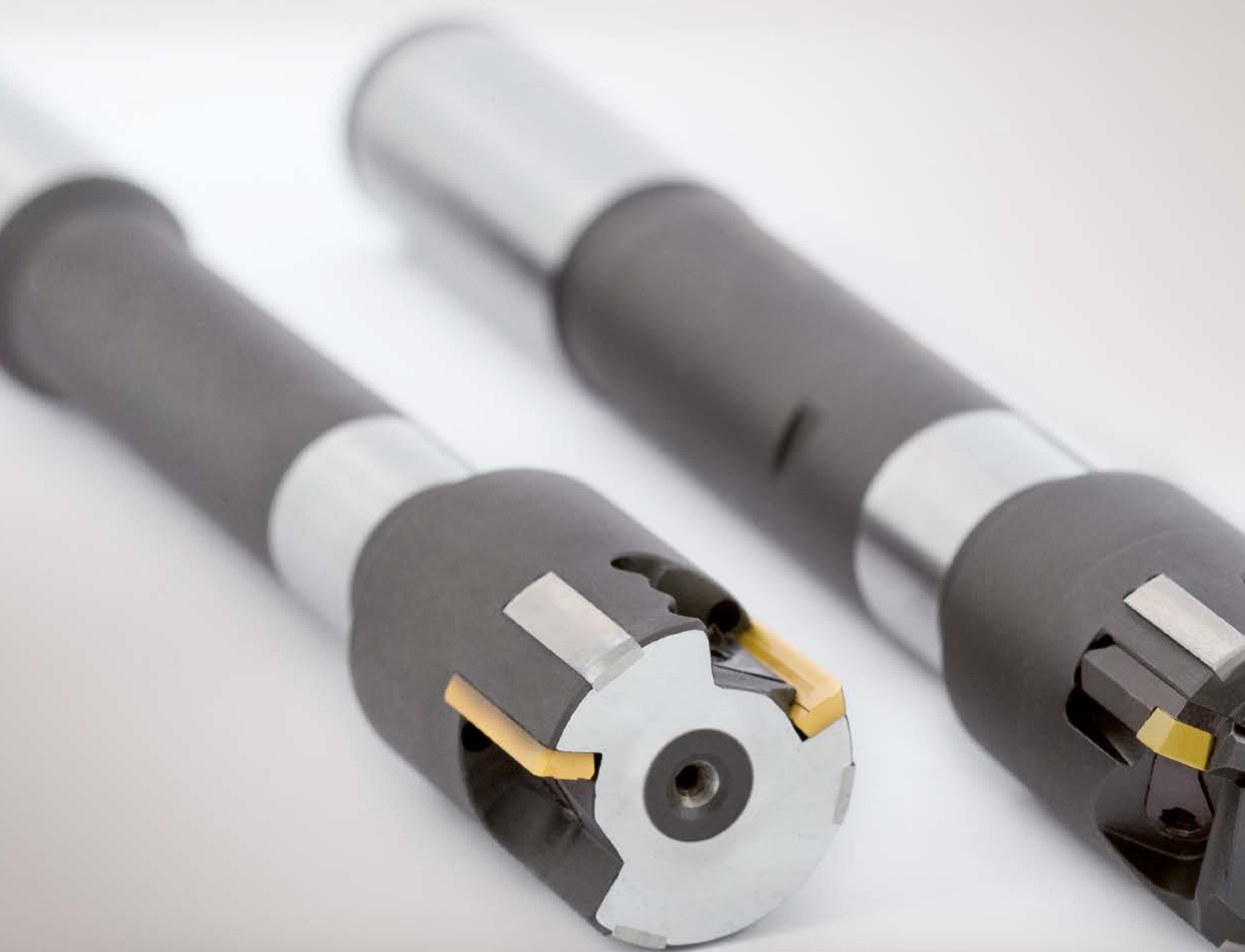
* Values indicate the sizes for different diameters (adjustable only within a tolerance range), not the adjustment range.

** With 1 mm long center spigot by d₁ less than 22.50 mm.

Please indicate the required guide pad quality (carbide, cermet or PCD) when ordering.

Unless otherwise indicated, the guide pads will be delivered in cermet quality.

For matching indexable inserts, see section Indexable inserts from page 60.



TWIN-BLADED REAMERS

WP twin-bladed reamers

MN2223 | Cylindrical shank with NC clamping surface _____ 52

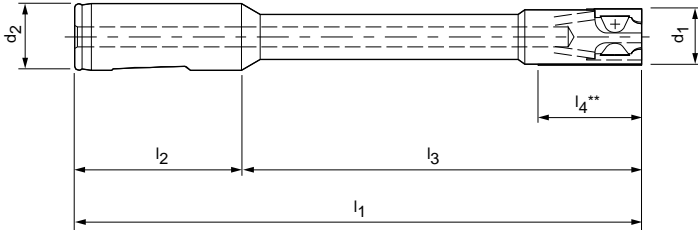
HX twin-bladed reamers

MN6223 | Cylindrical shank with NC clamping surface _____ 53



WP twin-bladed reamers MN2223

NC design



Dimensions						Accessories				
d ₁ *	d ₂ (-0.003)	l ₁	l ₂	l ₃	Indexable insert size	Clamping		Adjusting		
						Torx screw/ threaded spindle	Clamping plate	Threaded pin MN 620	Adjusting wedge MN 619	
						Order No. (size)				
14,30-15,29	20	170	50	120	90	Torx screw	10036784 (M2,5x5,2)	30026287 (GR-1W)	10036732 (M2,5x3)	30026274 (GR-33)
15,30-16,29	20	170	50	120	90		10036784 (M2,5x5,2)	30026287 (GR-1W)	10036733 (M2,5x4)	30026274 (GR-33)
16,30-18,29	20	170	50	120	90		10036722 (M3LH/RHx6)	30026290 (GR-0V)	10036733 (M2,5x4)	30026274 (GR-33)
18,30-19,29	20	170	50	120	91	Threaded spindle MN 618	10036722 (M3LH/RHx6)	30026293 (GR-1V)	10036744 (M3x3)	30026272 (GR-31)
19,30-20,29	20	170	50	120	91		10036722 (M3LH/RHx6)	30026293 (GR-1V)	10036745 (M3x4)	30026272 (GR-31)
20,30-22,29	20	170	50	120	92		10036722 (M3LH/RHx6)	30026295 (GR-2KV)	10036745 (M3x4)	30026272 (GR-31)
22,30-24,29	20	170	50	120	92		10036722 (M3LH/RHx6)	30026295 (GR-2KV)	10036747 (M3x6)	30026272 (GR-31)
24,30-26,29	20	170	50	120	92		10036725 (M4x0,5LH/RHx9)	30026297 (GR-2KV)	10036753 (M4x5)	30026275 (GR-34)
26,30-28,29	20	170	50	120	92		10036725 (M4x0,5LH/RHx9)	30026297 (GR-2KV)	10036754 (M4x6)	30026275 (GR-34)
28,30-29,29	20	170	50	120	92		10036725 (M4x0,5LH/RHx9)	30026297 (GR-2KV)	10036755 (M4x8)	30026275 (GR-34)
29,30-32,29	20	170	50	120	93		10036725 (M4x0,5LH/RHx9)	30026299 (GR-3V)	10036754 (M4x6)	30026273 (GR-32)
32,30-37,79	20	170	50	120	93		10036725 (M4x0,5LH/RHx9)	30026299 (GR-3V)	10036755 (M4x8)	30026273 (GR-32)
37,80-40,29	25	176	56	120	93		10036725 (M4x0,5LH/RHx9)	30026299 (GR-3V)	10036755 (M4x8)	30026273 (GR-32)

Ordering example (see page 30):
MN2223 CT 21,99 H6 AS

Dimensions in mm.

For setting instructions and installation of accessories, see Technical appendix.

* Values indicate the sizes for different diameters (adjustable only within a tolerance range), not the adjustment range.

** Pad length l₄ generally 15 mm.

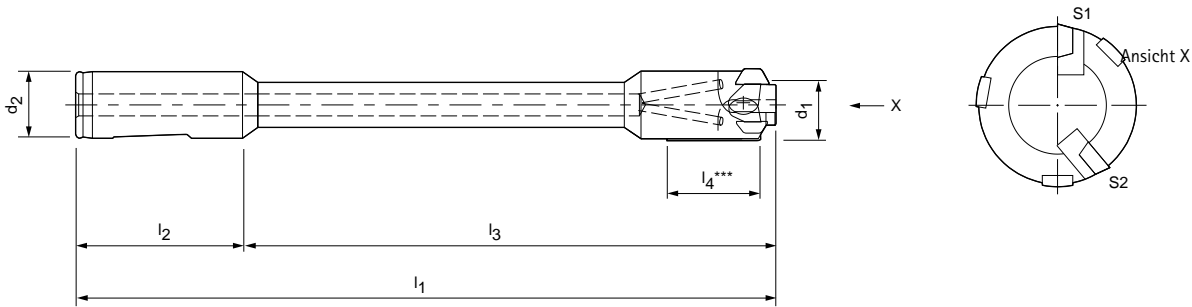
Please indicate the required guide pad quality (carbide, cermet or PCD) when ordering.

Unless otherwise indicated, the guide pads will be delivered in cermet quality.

For matching indexable inserts, see section Indexable inserts from page 60.

WP twin-bladed reamers MN6223

NC design



Dimensions					Indexable insert size	Accessories				
d ₁ *	d ₂ (-0.003)	l ₁	l ₂	l ₃		Clamping			Adjusting	
						Cassette	Threaded spindle MN 618	Clamping plate	Threaded pin MN 620	Adjusting wedge MN 619
Order No. (size)										
21,83-25,82	20**	170	50	120	2	30026280 (KX24R)	10036722 (M3LH/RHx6)	30026302 (SX22R)	10036744 (M3x3)	30026276 (GR-35/S2)
										30026278 (GR-37/S1)
25,83-29,82	20**	170	50	120	2	30026282 (KX26R)	10036722 (M3LH/RHx6)	30026303 (SX24R)	10036745 (M3x4)	30026276 (GR-35)
29,83-31,82	20**	170	50	120	2	30026282 (KX26R)	10036725 (M4x0,5LH/RHx9)	30026305 (SX26R)	10036747 (M3x6)	30026276 (GR-35)
31,83-37,82	20**	170	50	120	2	30026282 (KX26R)	10036725 (M4x0,5LH/RHx9)	30026304 (SX25R)	10036747 (M3x6)	30026276 (GR-35)
37,83-39,82	25	176	56	120	3	30026283 (KX35R)	10036725 (M4x0,5LH/RHx9)	30026306 (SX35R)	10036753 (M4x5)	30026277 (GR-36)
39,83-42,82	25	176	56	120	3	30026283 (KX35R)	10036725 (M4x0,5LH/RHx9)	30026306 (SX35R)	10036754 (M4x6)	30026277 (GR-36)
42,83-47,82	25	176	56	120	3	30026283 (KX35R)	10036725 (M4x0,5LH/RHx9)	30026306 (SX35R)	10036755 (M4x8)	30026277 (GR-36)

Ordering example (see page 30):
MN6223 CT 31,99 H6 4

Dimensions in mm.

For setting instructions and installation of accessories, see Technical appendix.

* Values indicate the sizes for different diameters (adjustable only within a tolerance range), not the adjustment range.

** With 1.5 mm long center spigot by d₁ less than 37.83 mm.

***Pad length l₄ generally 15 mm.

Please indicate the required guide pad quality (carbide, cermet or PCD) when ordering. Unless otherwise indicated, the guide pads will be delivered in cermet quality. For matching indexable inserts, see section Indexable inserts from page 60.





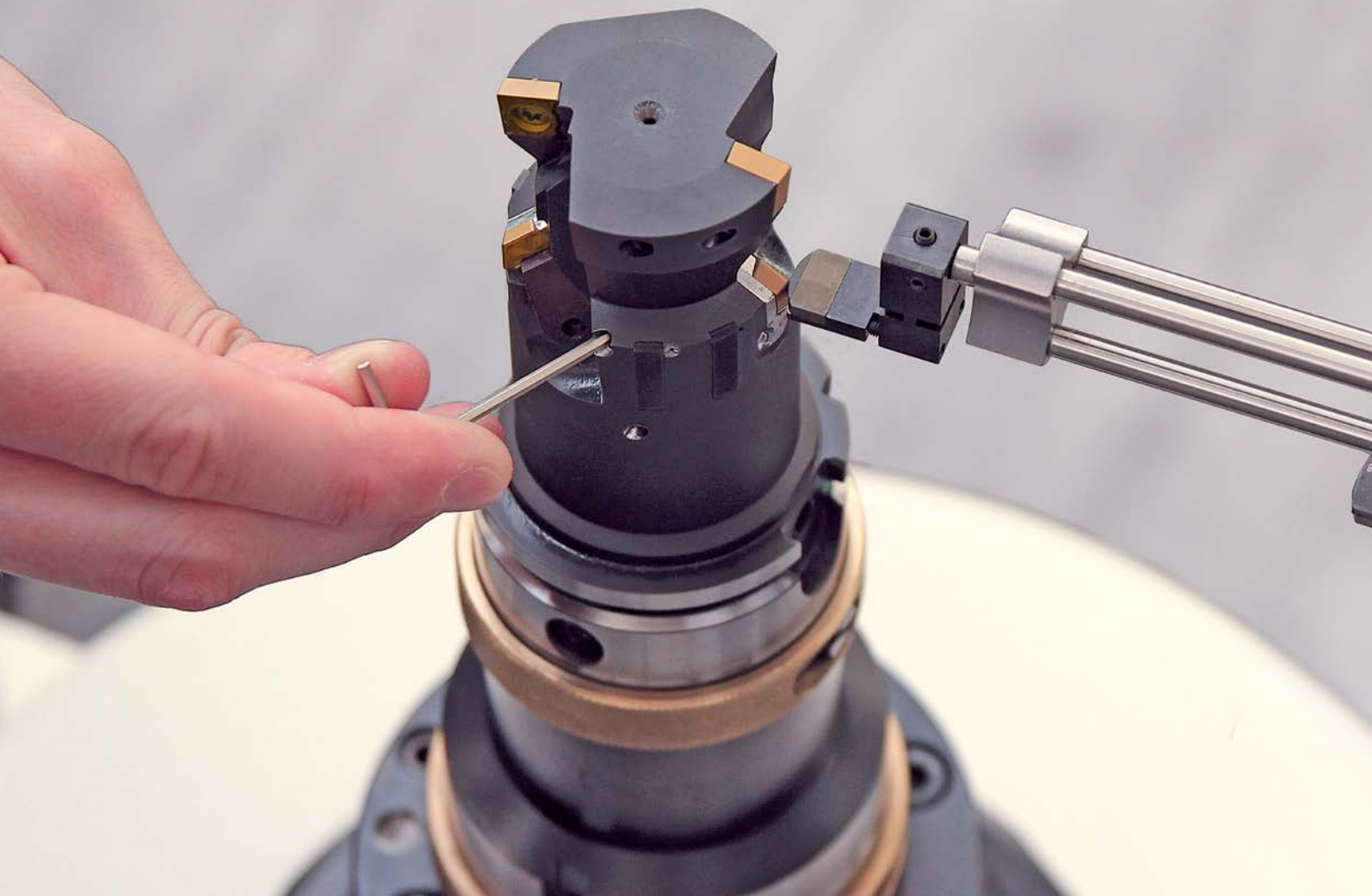
EasyAdjust System

Introduction

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Selection overview

EasyAdjust system with HX indexable inserts	59
EasyAdjust system with TEC indexable inserts	59



EasyAdjust System

Straightforward setting of tools in the shortest time

The goal of the development of the EasyAdjust system was a drastic reduction in the setting effort for tools with guide pad technology.

The heart of the EasyAdjust system is an innovative cassette that stably holds the indexable inserts with their six or four cutting edges without any play. The back taper on the minor cutting edge is already integrated into this cassette, thus eliminating this setting effort.

Due to the exact guidance of the cassette on a precision guide pin, the back taper remains unchanged even while setting the diameter. Matching cassettes are available for different back tapers; these cassettes can be selected and employed depending on the application – irrespective of the indexable insert and the tool.

Significant economic benefits

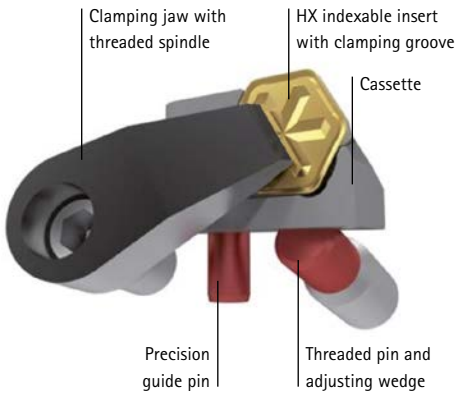
In practice this system offers economic benefits: the HX indexable inserts with six usable cutting edges can be inserted quickly and precisely in cassettes with different back tapers. Tools with EasyAdjust System only have to be adjusted in diameter. That increases process reliability during insert changes – an effect that becomes all the more significant, the more inserts are mounted in a tool. And the time for setting effort per cutting edge is reduced to a fraction by this new development.

ADVANTAGES

- Setting effort drastically reduced – tools only have to be adjusted in diameter
- Cost-effectiveness, handling and process reliability significantly increased
- Precision remains high

System overview

The EasyAdjust system in detail

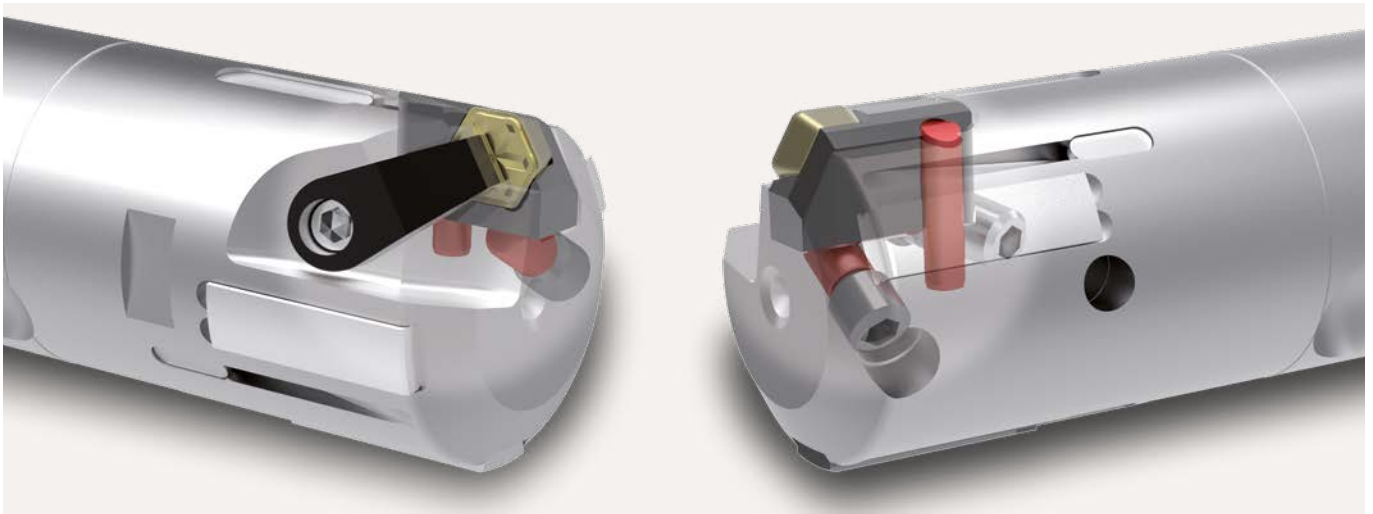


The EasyAdjust system consists of a precision cassette which holds the indexable insert. The cassette is guided by a precision guide pin during adjustment. A clamping groove, which together with the clamping jaw forms a force-closure system, ensures that the indexable insert is securely retained.

Tools with EasyAdjust System only have to be adjusted in diameter. The back taper is already integrated into the cassette and remains unchanged as the diameter changes.

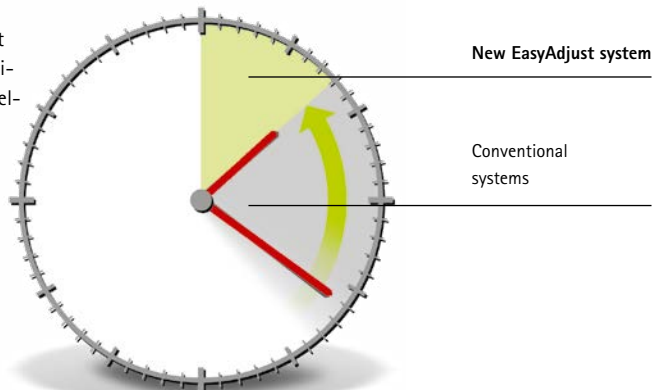
ADVANTAGES

- Half the setting time for indexable inserts
- Exact guidance of the system on precision guide pin
- Back taper already integrated into the cassette
- Optimum cutting material utilisation thanks to indexable inserts with four and six cutting edges



Comparison of the setting times

The time for the setting effort per cutting edge can be drastically reduced by the new development.

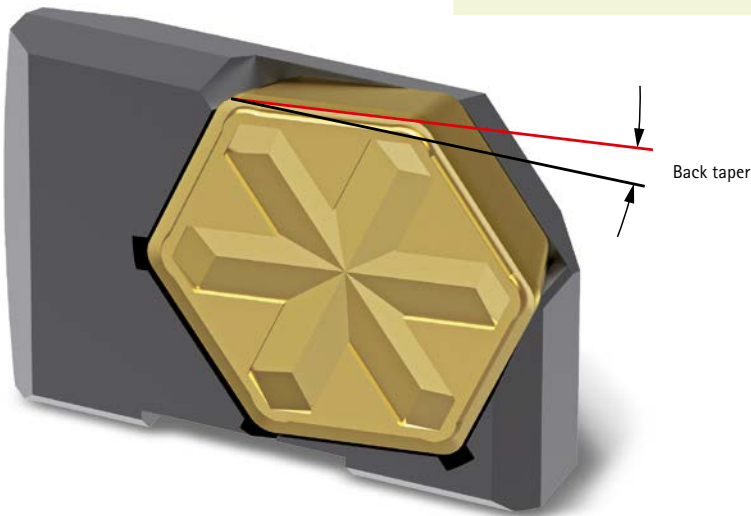


Back taper

The back taper on the insert has a major influence on the bore quality. MAPAL selects the back taper on the cassette required for the machining application according to the demands of the material and the feed rate.

ADVANTAGES

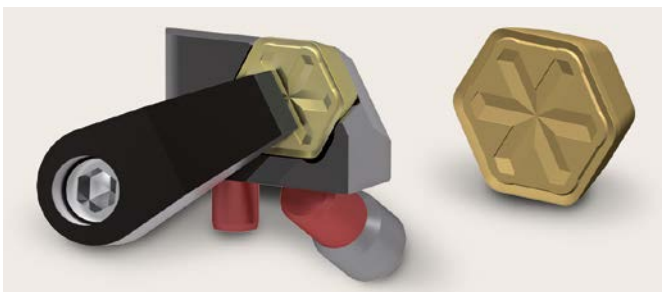
- Adaptation of the back taper, irrespective of indexable insert and tool body
- Production of defined roughnesses thanks to different back tapers
- Optimum surface finish for subsequent processes (for example honing)



Two variants of the indexable inserts

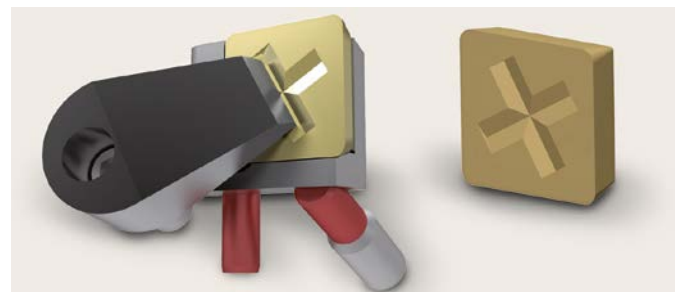
The EasyAdjust system is available with two different insert types for through bores and blind bores:

HX indexable insert



The HX indexable insert with six cutting edges for high cost-effectiveness.

TEC indexable insert



The TEC indexable insert with four cutting edges and different lead geometries for blind bore and face shoulder machining.



Through bore

Suitable for open bores. Not suitable for shoulder machining if 90° is required.







Blind bore and face shoulder bore

Suitable for closed bores and machining shoulders taking into account the cutting edge length.

Selection overview


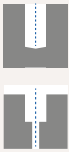




EasyAdjust System with HX indexable inserts

Selection criteria				System sizes			
Type of bore	∅ range tool	 Graduation of the back taper*		Insert type	Cutting edge size	System designation	
Through bore 	From ∅ 20	B	Special requirements	Back taper ↓ - +	HX 	2	EAS-R-62-B
		D	Recommended standard				EAS-R-62-D
		F	Special requirements				EAS-R-62-F
		H					EAS-R-62-H
		K					EAS-R-62-K
		M					EAS-R-62-M
		P					EAS-R-62-P
		R					EAS-R-62-R
	From ∅ 30	B	Special requirements	Back taper ↓ - +	HX 	3	EAS-R-63-B
		D	Recommended standard				EAS-R-63-D
		F	Special requirements				EAS-R-63-F
		H					EAS-R-63-H
		K					EAS-R-63-K
		M					EAS-R-63-M
P	EAS-R-63-P						
R	EAS-R-63-R						



Easy Adjust system with TEC indexable inserts

Selection criteria				System sizes			
Type of bore	∅ range tool	 Graduation of the back taper*		Insert type	Cutting edge size	System designation	
Blind bore / face shoulder 	From ∅ 20	B	Special requirements	Back taper ↓ - +	TEC 	2	EAS-R-42-B
		D	Recommended standard				EAS-R-42-D
		F	Special requirements				EAS-R-42-F
		H					EAS-R-42-H
		K					EAS-R-42-K
		M					EAS-R-42-M
		P					EAS-R-42-P
		R					EAS-R-42-R
	From ∅ 30	B	Special requirements	Back taper ↓ - +	TEC 	3	EAS-R-43-B
		D	Recommended standard				EAS-R-43-D
		F	Special requirements				EAS-R-43-F
		H					EAS-R-43-H
		K					EAS-R-43-K
		M					EAS-R-43-M
P	EAS-R-43-P						
R	EAS-R-43-R						

Dimensions in mm.

For matching indexable inserts, see section "Indexable inserts" from page 60.

* Selection by agreement with MAPAL, depending on the demands of the part.



INDEXABLE INSERTS

Carbide, cermet, coatings, PCD and PcBN – the entire range of modern cutting materials for every workpiece material and for every machining task is available for the range of tools with guide pads. The latest manufacturing technology employed in the production of the indexable inserts enables any chip former and chip breaker shape to be achieved – even with the super-hard materials such as PCD and PcBN. A clamping groove ensures the indexable inserts are securely retained; together with the clamping plate and adjusting elements the clamping groove forms a force-closure system. This stability is a prerequisite for long tool lives and prevents the indexable inserts settling.

Introduction

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-----------------------	----

WP indexable inserts

Indexable inserts with AS lead	64
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HX indexable inserts

HX indexable inserts without clamping groove	74
HX indexable inserts with clamping groove	76
HX indexable inserts for EasyAdjust system	78

TEC indexable inserts

TEC indexable inserts for EasyAdjust system	80
---	----



Designation key

Indexable inserts

WP indexable inserts



A	S
---	---

Lead geometry

9	2
---	---

Indexable insert size

R

Cutting direction

0

Rake angle size

HX indexable inserts



H	X
---	---

Lead geometry

1

Chip form geometry

3

Blade size

8

Cutting lead

TEC indexable inserts



T	E	C
---	---	---

Insert form

2

Indexable insert size

F	0	1
---	---	---

Cutting edge design

H	U	6	1	5
---	---	---	---	---

Cutting material

R	L
---	---

Cutting direction

C	U	1	3	4
---	---	---	---	---

Cutting material

R

Cutting direction

F

Additional clearance angle (if present)

1	G	A
---	---	---

Position of the chip groove

Only if corner tipped

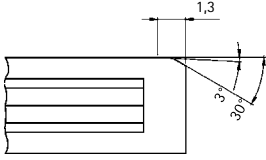
Chip groove

C	U	1	4	0
---	---	---	---	---

Cutting material

Indexable inserts with AS lead

For tools with guide pads



Cutting material	Carbide						
MMG*	P	M	K			N	
	1 - 6	1 - 3	1.1	2 - 3	1.1 - 1.2		2
Cutting material types	HP425	HP425	HC418		HP612	HP115	HU615
							Short chipping Long chipping

Rake angle	Size	Specification	Order No.						
Negative	81	SP-AS81R0-...							
	90	SP-AS90R0-...							
	91	SP-AS91R0-...							
	92	SP-AS92R0-...							
	93	SP-AS93R0-...							

Neutral	81	SP-AS81R0-...			30685593				30669433
	90	WP-AS90R0-...			30685594				30668828
	91	WP-AS91R0-...			30655643				30668841
	92	WP-AS92R0-...			30667458				30668851
	93	WP-AS93R0-...			30685595				30668860

Positive	81	SP-AS81R6-...	30669444	30669444	30685596	30685596	30685601	30669442	30669441	30669441
	90	WP-AS90R6-...	30668839	30668839	30595623	30595623	30685602	30668837	30668836	30668836
	91	WP-AS91R6-...	30668850	30668850	30644887	30644887	30685603	30668848	30668847	30668847
	92	WP-AS92R6-...	30668859	30668859	30586603	30586603	30685604	30668858	30668857	30668857
	93	WP-AS93R6-...	30250310	30250310	30606052	30606052	30404618	30668869	30668868	30668868

Highly positive	81	SP-AS81R2-...	30669439	30669439			30685605	30669438		30669437
	90	WP-AS90R2-...	30218895	30218895			30685606	30668835		30668833
	91	WP-AS91R2-...	30543337	30543337			30685607	30668845		30668844
	92	WP-AS92R2-...	30668856	30668856			30685608	30668854		30668853
	93	WP-AS93R2-...	30668865	30668865			30685609	30668864		30668863

* MAPAL machining groups.
The order number for the MAPAL recommendation / first choice is printed in bold.



Carbide		
S		H
1 - 2	2	1.1
HU615		HP454

Cermet	
P	
1 2.1 3.1	
CP122	CU134

PCD	
N	
1 - 2	
PU620	

PcBN	
K	H
1.1 2.1	1.1 - 1.2
FU485	FU801

Order No.	

Order No.	

Order No.	

Order No.	
30685610	30038481
30685611	30669193
30170242	30018103
30685612	30043230

		30685598
		30685599
		30292770
		30292768

	30669441	
	30668836	
	30668847	
	30668857	
	30668868	

30668838	30668772	
30668849	30668775	
30357069	30668778	
30305745	30668867	

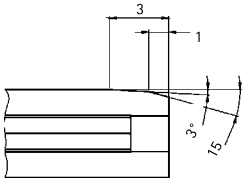
	30669189	
	30669191	
	30669194	
	30669197	
	30669199	

	30669437	
	30668833	
	30668844	
	30668853	
	30668863	

30222409	30668832	
30668846	30668843	
30668855	30668777	
30668866	30668862	

Indexable inserts with AD lead

For tools with guide pads



Cutting material	Carbide					
MMG*	P	M	K		N	
	1 - 6	1 - 3	1.1	2 - 3	1.2	2
Cutting material types	HP425	HP425	HC418		HP115	HU615
						Short chipping Long chipping

Rake angle	Size	Specification	Order No.						
Negative	81	SP-AD81R0-...							
	90	SP-AD90R0-...							
	91	SP-AD91R0-...							
	92	SP-AD92R0-...							
	93	SP-AD93R0-...							

Neutral	81	SP-AD81R0-...			30685613			30669381	
	90	WP-AD90R0-...			30685614			30669388	
	91	WP-AD91R0-...			30655644			30669398	
	92	WP-AD92R0-...			30605079			30669409	
	93	WP-AD93R0-...			30678199			30669417	

Positive	81	SP-AD81R6-...	30689243	30689243	30685615	30685615	30669385	30669384	30669384
	90	WP-AD90R6-...	30669397	30669397	30685616	30685616	30669396	30669395	30669395
	91	WP-AD91R6-...	30669407	30669407	30685617	30685617	30669406	30669405	30669405
	92	WP-AD92R6-...	30669416	30669416	30630630	30630630	30669415	30669414	30669414
	93	WP-AD93R6-...	30244016	30244016	30606054	30606054	30669424	30669423	30669423

Highly positive	81	SP-AD81R2-...	30324210	30324210			30669383		30669382
	90	WP-AD90R2-...	30669393	30669393			30669392		30669391
	91	WP-AD91R2-...	30306945	30306945			30669403		30669402
	92	WP-AD92R2-...	30543329	30543329			30669413		30669412
	93	WP-AD93R2-...	30543326	30543326			30669421		30669420

* MAPAL machining groups.

The order number for the MAPAL recommendation / first choice is printed in bold.



Carbide		
S		H
1	2	
HU615		HP454

Cermet	
P	
CP122	CU134

PCD	
N	
PU620	

PcBN	
K	H
FU485	FU801

Order No.	

Order No.	

Order No.	

Order No.	

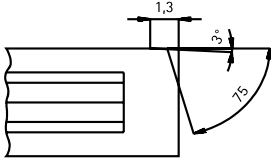
	30669384	
	30669395	
	30669405	
	30669414	
	30669423	

	30669382	
	30669391	
	30669402	
	30669412	
	30669420	

Cutting data recommendation from page 436.
Cutting edges also available with special lead on request.

Indexable inserts with AZ lead

For tools with guide pads



Cutting material	Carbide							
MMG*	P	M	K		N			
	1 - 6	1 - 3	1.1	2 - 3	1.1 - 1.2	2		
Cutting material types	HP425	HP425	HC418		HP612	HP115	HU615	
							Short chipping	Long chipping

Rake angle	Size	Specification	Order No.							
Negative	81	SP-AZ81R0-...								
	90	SP-AZ90R0-...								
	91	SP-AZ91R0-...								
	92	SP-AZ92R0-...								
	93	SP-AZ93R0-...								

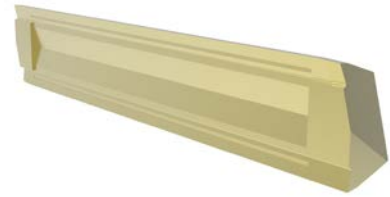
Neutral	81	SP-AZ81R0-...			30685624					30668873
	90	WP-AZ90R0-...			30670062					30668879
	91	WP-AZ91R0-...			30685625					30668887
	92	WP-AZ92R0-...			30664930					30668895
	93	WP-AZ93R0-...			30664935					30668905

Positive	81	SP-AZ81R6-...	30685622	30685622	30685626	30685626	30685634	30668877	30668876	30668876
	90	WP-AZ90R6-...	30668886	30668886	30658176	30658176	30685635	30668885	30668884	30668884
	91	WP-AZ91R6-...	30668894	30668894	30655755	30655755	30685636	30668892	30668891	30668891
	92	WP-AZ92R6-...	30250608	30250608	30664472	30664472	30685637	30668904	30668903	30668903
	93	WP-AZ93R6-...	30668914	30668914	30636429	30636429	30685638	30668913	30668912	30668912

Highly positive	81	SP-AZ81R2-...	30685623	30685623			30685639	30685633		30668875
	90	WP-AZ90R2-...	30586217	30586217			30685640	30668882		30668881
	91	WP-AZ91R2-...	30310878	30310878			30685641	30681700		30668889
	92	WP-AZ92R2-...	30668901	30668901			30685642	30668900		30668899
	93	WP-AZ93R2-...	30668910	30668910			30685643	30668909		30668908

* MAPAL machining groups.

The order number for the MAPAL recommendation / first choice is printed in bold.



Carbide		
S		H
1	2	1.1
HU615		HP454

Cermet	
P	
1 2.1 3.1	
CP122	CU134

PCD	
N	
1 - 2	
PU620	

PcBN	
K	H
1.1 - 2.1	1.1 - 1.2
FU485	FU801

Order No.	

Order No.	

Order No.	

Order No.	
30685648	30685651
30685649	30014568
30685650	30669213
30530294	30019399

	30685628
	30685629
	30685630
	30283100

	30668876
	30668884
	30668891
	30668903
	30668912

30685644	30668883
30668893	30668890
30412539	30668902
30668915	30668911

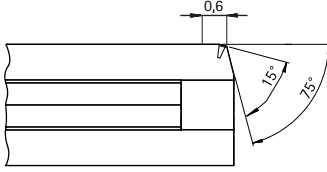
	30669205
	30669207
	30669210
	30669215
	30669218

	30668875
	30668881
	30668889
	30668899
	30668908

Cutting data recommendation from page 436.
Cutting edges also available with special lead on request.

Indexable inserts with DZ lead

For tools with guide pads



Cutting material	Carbide						
MMG*	P	M	K		N		
	1 - 6	1 - 3	1.1	2 - 3	1.1 - 1.2	2	
Cutting material types	HP425	HP425	HC418		HP612	HP115	HU615
							Short chipping Long chipping

Rake angle	Size	Specification	Order No.							
Negative	81	SP-DZ81R0-...								
	90	SP-DZ90R0-...								
	91	SP-DZ91R0-...								
	92	SP-DZ92R0-...								
	93	SP-DZ93R0-...								

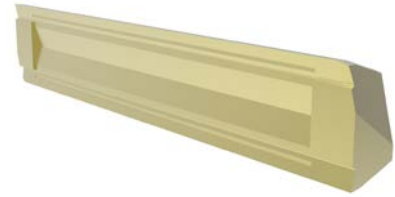
Neutral	81	SP-DZ81R0-...			30685653				30668920	
	90	WP-DZ90R0-...			30685654				30668930	
	91	WP-DZ91R0-...			30664932				30668938	
	92	WP-DZ92R0-...			30685655				30668953	
	93	WP-DZ93R0-...			30667699				30668962	

Positive	81	SP-DZ81R6-...	30668928	30668928	30685656	30685656	30685660	30668927	30668926	30668926
	90	WP-DZ90R6-...	30668785	30668785	30651866	30651866	30685661	30668936	30668935	30668935
	91	WP-DZ91R6-...	30668950	30668950	30596193	30596193	30685662	30668949	30668947	30668947
	92	WP-DZ92R6-...	30668961	30668961	30601514	30601514	30641835	30668960	30668959	30668959
	93	WP-DZ93R6-...	30668970	30668970	30641280	30641280	30328346	30668969	30668968	30668968

Highly positive	81	SP-DZ81R2-...	30325543	30325543			30685663	30668924		30668923
	90	WP-DZ90R2-...	30204674	30204674			30685664	30668934		30668933
	91	WP-DZ91R2-...	30685652	30685652			30685665	30668943		30668942
	92	WP-DZ92R2-...	30285943	30285943			30685666	30668957		30668956
	93	WP-DZ93R2-...	30668967	30668967			30685667	30668966		30668965

* MAPAL machining groups.

The order number for the MAPAL recommendation / first choice is printed in bold.



Carbide	
S	H
1 - 2	1.1
HU615	HP454

Cermet	
P	
CP122	CU134

PCD	
N	
1 - 2	
PU620	

PcBN	
K	H
1.1 - 2.1	1.1 - 1.2
FU485	FU801

Order No.	

Order No.	

Order No.	

Order No.	
30262157	30011418
30490660	30020729
30174899	30669469
30502436	30669472

	30615403
	30685658
	30685659
	30567615

	30668926
	30668935
	30668947
	30668959
	30668968

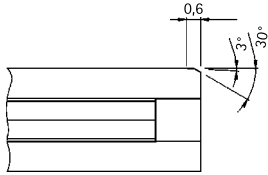
	30669224
	30669464
	30669467
	30669471
	30669473

	30668923
	30668933
	30668942
	30668956
	30668965

Cutting data recommendation from page 436.
Cutting edges also available with special lead on request.

Indexable inserts with EK lead

For tools with guide pads



Cutting material	Carbide						
MMG*	P	M	K		N		
	1 - 6	1 - 3	1.1	2 - 3	1.1 - 1.2	2	
Cutting material types	HP425	HP425	HC418		HP612	HP115	HU615
							Short chipping Long chipping

Rake angle	Size	Specification	Order No.						
Negative	181	SP-EK181R0-...							
	150	SP-EK150R0-...							
	151	SP-EK151R0-...							
	152	SP-EK152R0-...							
	153	SP-EK153R0-...							

Neutral	181	SP-EK181R0-...			30685668				30681701	
	150	WP-EK150R0-...			30685669				30668971	
	151	WP-EK151R0-...			30685670				30668980	
	152	WP-EK152R0-...			30685671				30668989	
	153	WP-EK153R0-...			30685672				30669002	

Positive	181	SP-EK181R6-...	30681707	30681707	30685673	30685673	30685684	30681706	30681705	30681705
	150	WP-EK150R6-...	30668979	30668979	30685674	30685674	30685685	30668978	30668977	30668977
	151	WP-EK151R6-...	30389077	30389077	30685675	30685675	30685686	30668987	30668986	30668986
	152	WP-EK152R6-...	30669000	30669000	30685676	30685676	30685687	30668999	30668998	30668998
	153	WP-EK153R6-...	30669010	30669010	30685677	30685677	30685688	30669009	30669008	30669008

Highly positive	181	SP-EK181R2-...	30681704	30681704			30685689	30681703		30681702
	150	WP-EK150R2-...	30668976	30668976			30685690	30668975		30668974
	151	WP-EK151R2-...	30208444	30208444			30685691	30668984		30668983
	152	WP-EK152R2-...	30668996	30668996			30685692	30668994		30668993
	153	WP-EK153R2-...	30208445	30208445			30685693	30669007		30669006

* MAPAL machining groups.
The order number for the MAPAL recommendation / first choice is printed in bold.



Carbide	
S	H
1 - 2	1.1
HU615	HP454

Cermet	
P	
1 2.1 3.1	
CP122	CU134

PCD	
N	
1 - 2	
PU620	

PcBN	
K	H
1.1 - 1.2	
FU485	FU801

Order No.	

Order No.	

Order No.	

Order No.	
	30023640
	30007296
	30669476
	30669478

	30685679
	30685680
	30685681
	30685682

	30681705
	30668977
	30668986
	30668998
	30669008

30685694	30252793
30685695	30668985
30313884	30668997
30543106	30243943

	30681710
	30669474
	30669475
	30669477
	30669479

	30681702
	30668974
	30668983
	30668993
	30669006

30685696	30668973
30313432	30668982
30668995	30668992
30206105	30669005

Cutting data recommendation from page 436.
Cutting edges also available with special lead on request.

HX indexable inserts without clamping groove (for series MN6023/MN6024)

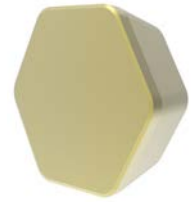
For tools with guide pads

Cutting material				Carbide						
MMG*	P	M	K	N						
	1 - 6	1 - 3	1.1	2 - 3	1.1 - 1.2		2			
Cutting material types				HP425	HP425	HC418		HP115	HU615	
									Short chipping	Long chipping

Rake angle	Size	Lead	Specification	Order No.							
Negative	2	R0,8	WP-HX28RL-...								
	3	R0,8	WP-HX38RL-...								
Neutral	2	R0,8	WP-HX28RL-...			30685698				30669061	
	3	R0,8	WP-HX38RL-...			30685699				30669110	
Positive	2	R0,8	WP-HX28R-...	30513105	30513105	30809524	30809524	30669077			30669076
	3	R0,8	WP-HX38R-...	30685697	30685697	30809525	30809525	30685702			30669123

* MAPAL machining groups.

The order number for the MAPAL recommendation / first choice is printed in bold.



Carbide			
S		H	
1 - 2		1.1	
HU615		HP454	

Cermet	
P	
1 2.1 3.1	
CP140	CU140

PCD	
N	
1 - 2	
PU620	

PcBN	
K	H
1.1 - 2.1	1.1 - 1.2
FU485	FU801

Order No.	

Order No.	

Order No.	

Order No.	
30026939	30011956
30007569	30020309

	30685700
	30685701

	30669555
	30669556

	30669076
	30669123

30669079	30669075
30685703	30669122

HX indexable inserts with clamping groove

For tools with guide pads

Cutting material		Carbide							
MMG*	P	M	K	N					
	1 - 6	1 - 3	1.1	2 - 3	1.1 - 1.2	2			
Cutting material types		HP122	HP342	HC419		HP612	HU612		
							Short chipping	Long chipping	

Rake angle	Size	Lead	Specification	Order No.						
Negative	2	R0,8	WP- K1288-2133-...							
	3	R0,8	WP- K1288-2123-...							
Neutral	2	R0,8	WP- 606087689-...	30688942		30688944			30687082	
	3	R0,8	WP- 606087714-...	30688973		30688981			30688971	
Positive	2	R0,8	WP-HX228RL-...	30197811	30685704	30685706	30685706		30320977	30320977
	3	R0,8	WP-HX238RL-...	30669024	30685705	30670511	30670511		30669021	30669021
Highly positive	2	R0,8	WP-HX128RL-...	30669014	30669012		30672598	30685707		30669011
	3	R0,8	WP-HX138RL-...	30669018	30669016		30630602	30685708		30669015

* MAPAL machining groups.

The order number for the MAPAL recommendation / first choice is printed in bold.



Carbide			
S		H	
1 - 2		1.1	
HU612		HP141	

Cermet	
P	
1 2.1 3.1	
CP122	CU134

PCD	
N	
1 - 2	
PU620	

PcBN	
K	H
1.1 - 2.1	1.1 - 1.2
FU485	FU801

Order No.	

Order No.	

Order No.	

Order No.	
30009396	30033403
30008170	30097476

	30688948
	30688982

	30538941
	30538988

30222667	30669019
30222666	30668789

	30669011
	30669015

30308283	30495194
30304830	30668788

	30538957
	30539009

HX indexable inserts for EasyAdjust system

For tools with guide pads

Cutting material		Carbide							
MMG*	P	M	K	N					
	1 - 6	1 - 3	1.1	2 - 3	1.1 - 1.2	2			
Cutting material types		HP122	HP342	HC419		HP612	HU612		
							Short chipping	Long chipping	

Rake angle	Size	Lead	Specification	Order No.							
Negative	2	R0,8	WP-K1288-2133-...								
	3	R0,8	WP-K1288-2123-...								
Neutral	2	R0,8	WP-606087689-...	30688942		30688944				30687082	
	3	R0,8	WP-606087714-...	30688973		30688981				30688971	
Positive	2	R0,8	WP-HX228RL-...	30197811	30685704	30685706	30685706			30320977	30320977
	3	R0,8	WP-HX238RL-...	30669024	30685705	30670511	30670511			30669021	30669021
Highly positive	2	R0,8	WP-HX128RL-...	30669014	30669012		30672598		30685707		30669011
	3	R0,8	WP-HX138RL-...	30669018	30669016		30630602		30685708		30669015

* MAPAL machining groups.

The order number for the MAPAL recommendation / first choice is printed in bold.



Carbide			
S		H	
1 - 2		1.1	
HU612		HP141	

Cermet			
P			
1 2.1 3.1			
CP122	CU134		

PCD	
N	
1 - 2	
PU620	

PcBN			
K		H	
1.1 - 2.1		1.1 - 1.2	
FU485		FU801	

Order No.		

Order No.	

Order No.

Order No.	
30009396	30033403
30008170	30097476

	30688948
	30688982

30538941
30538988

30222667	30669019
30222666	30668789

30669011
30669015

30308283	30495194
30304830	30668788

30538957
30539009

TEC indexable insert for EasyAdjust system

For tools with guide pads

Cutting material		Carbide							
MMG*		P	M	K			N		
		1 - 6	1 - 3	1.1	2 - 3	1.1 - 1.2		2	
Cutting material types		HP122	HP342	HC419		HP612		HU612	
							Short chipping	Long chipping	

Rake angle	Size	Lead	Specification	Order No.						
Negative	2	R0,4	WP-TEC2-04-...							
	3	R0,8	WP-TEC3-08-...							
Neutral	2	R0,4	WP-TEC2-04-...	30688949		30688951			30688954	
	3	R0,8	WP-TEC3-08-...	30688955		30688956			30688960	
Highly positive	2	R0,4	WP-TEC2-04-...	30689032	30685235		30689041	30685231		30685213
	3	R0,8	WP-TEC3-08-...	30689043	30539043		30685911	30665767		30689046

* MAPAL machining groups.

The order number for the MAPAL recommendation / first choice is printed in bold.



Carbide			
S		H	
1 - 2		1.1	
HU612		HP141	

Cermet			
P			
1 2.1 3.1			
CP122	CU134		

PCD	
N	
1 - 2	
PU620	

PcBN			
K		H	
1.1 - 2.1		1.1 - 1.2	
FU485		FU801	

Order No.		

Order No.	

Order No.

Order No.	
30539027	30688967
30539039	30688969

	30688952
	30688958

30539029
30539040

30685213	
30689046	

30539033	30689042
30689049	30689048

30539034
30539046

FIXED MULTI- BLADED REAMERS

High performance for optimal results





PROGRAMME OVERVIEW

Fixed multi-bladed reamers

Drastically reduced machining times are possible using fixed multi-bladed reamers. The multiple cutting edges permit higher feed values, which at the end of the day define the machining times. Due to specifically developed systems and the latest manufacturing technology, MAPAL guarantees the highest accuracies on these tools. The product portfolio offers a wide variety that will satisfy all the requirements of the machining task: from monoblock designs to modern replaceable head systems.

A modular HPR program as well as the MultiCut range with cutting rings and tool holders is available for large diameters starting from 65 mm. The standard programmes are complemented by custom solutions that are adapted specifically to the related machining case.

In addition to the high-performance programme with internally cooled tools, a broad machine reamer programme without internal cooling in accordance with DIN or similar to DIN is available ex stock.



Basic Line:

Universal tools, broad application area, low procurement costs



Performance Line:

High-performance tools, broad application area, high productivity in series production manufacturing



Expert Line:

Specialist tools for selected applications, maximum precision and productivity



High-performance reamers with cylindrical shank	Replaceable head reamers	Solutions for large diameters
		
<p>The innovative and further developed monoblock tools allow practically all materials to be machined. Even difficult to machine workpiece materials can be machined due to the ideal combination of geometry, cutting material and coating with high performance. MAPAL high-performance reamers with cylindrical shank are available in two different designs. On the one hand as tipped design with a tool body and separately attached blades made of carbide, cermet, PcBN and PCD, on the other hand as a monolithic design made of solid carbide, HSS and solid cermet with cutting edges that are machined from the tool body material.</p>	<p>MAPAL offers replaceable head reamers with different head systems. The replaceable head systems impress with exact radial run-out and changeover accuracy, and with safe and simple handling, particularly during assembly and dismantling. The standard programme covers versions for through bores and blind bores as well as a broad choice of cutting materials.</p>	<p>Especially for machining from a diameter of 40 mm, a program of high-performance reamers with individual configuration options and HSK or module shank is available. From the simple cutting ring to high-performance tools with straightforward insert change on site – for every application MAPAL offers a suitable solution for the high-accuracy and cost-effective machining of almost all workpiece materials.</p>
<p>Page 90</p>	<p>Page 198</p>	<p>Page 352</p>



Custom solutions



MAPAL also offers all reamers as custom solutions specifically tailored to the customer's requirements. The combination of step, chamfer and face surface machining makes these tools highly cost-effective. Productive and non-productive times are shortened and productivity is significantly increased.

Reconditioning



To be able to exploit the full potential of the fixed multi-bladed reamers, MAPAL offers a re-grinding and repair service for used tools. The reamers can generally be re-ground several times after reaching the end of their tool life. Especially with high-performance reamers, the level of utilisation of any tool can be considerably improved by re-tipping or re-grinding.

Machine reamers in accordance with DIN and similar to DIN








NC machine reamers are a particularly inexpensive variant for the production of precision bores. Although the performance data are below those of high-performance reamers, these tools are widely used since they are characterised in particular by their simple handling. Here again, MAPAL offers a broad range of tools which are mostly available from stock or that can be delivered in intermediate dimensions at short notice. In addition, machine reamers similar to DIN with straight shank diameters are available. The tools are available on request.

SELECTION OF MULTI-BLADED REAMERS

Step by step to the right reamer

This selection aid guides you step by step to the right reamer.

1	Design	Select your preferred design (monolithic or modular).	➤		Monolithic		Modular connection CFS
2	Bore features	Check whether the geometric features meet your requirements. Select the diameter range and the required tolerance.	➤	Diameter range	≤ IT7 ≥ IT7	Achievable bore tolerance	
3	Product class	Decide for a product class.	➤	Basic LINE	Basic Line: Universal tools, broad application area, low procurement costs		
4	Material suitability	Identify your workpiece material as per the MMG (MAPAL machining group).	➤	P	Steel	M	Stainless steel
5	Type of bore	Check the requirements that are placed on your tool by the type of bore.	➤		Through bore		Blind bore
6	Product	Select your reamer. Select a pre-configured preferred series or configure as required.	➤	Configuration as required			





Modular connection HFS



Cutting ring



Performance Line:
High-performance tools, broad application area, high productivity in series production manufacturing



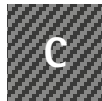
Expert Line:
Specialist tools for selected applications, maximum precision and productivity



Cast iron



Non-ferrous metals and plastics



Composite materials



Super alloys and titanium



Hardened steel and cast steel



Interrupted cut



H7 preferred series



G variant preferred series

Schritt 1: Design										Schritt 2: Bohrungsmerkmale			Schritt 3: Produktklasse			Schritt 4: Materialeignung			Schritt 5: Bohrungsart																																
Materialeignung										Bohrungsart			Produkt																																						
													Durchmesserbereich (konfigurierbar)						Seite																																
<table border="1"> <tr> <th colspan="2">P</th> <th colspan="2">M</th> <th colspan="2">K</th> <th colspan="2">N</th> <th colspan="2">C</th> <th colspan="2">S</th> <th colspan="2">H</th> </tr> <tr> <td>1-2</td><td>3</td> <td>4</td><td>5</td> <td>6</td> <td>1-3</td> <td>1</td><td>2</td> <td>3</td> <td>1-2</td> <td>3.1</td> <td>4.1</td> <td>1</td> <td>1-5</td> <td>1</td> <td>2</td> </tr> </table>										P		M		K		N		C		S		H		1-2	3	4	5	6	1-3	1	2	3	1-2	3.1	4.1	1	1-5	1	2				2,81 - 20,20						94		
P		M		K		N		C		S		H																																							
1-2	3	4	5	6	1-3	1	2	3	1-2	3.1	4.1	1	1-5	1	2																																				
													2,81 - 20,20																																						
													3,70 - 12,10																																						
													3,00 - 10,00																																						
													7,70 - 40,20						136																																



Reamer | Selection system

Design	Recommended diameter range [mm]	Tolerance	Series				Product class	
				Diameter	Series			
Fixed multi-bladed reamers	6,00 - 40,00 (HSS)	IT7	FixReam		Standard reamers made of solid carbide, solid cermet, PcBN and HSS for almost all workpiece materials from ø 3 mm.	6,00 - 40,00	Series 500 HSS-coated	Basic LINE
	3,00 - 14,00					3,00 - 14,00	Series 500 Solid carbide	Performance LINE
						4,00 - 12,00	Series 512 Solid cermet	Performance LINE
						3,00 - 10,00	Series 500 PcBN head	Expert LINE
	14,00 - 40,00	IT7	MonoReam		Reamer system with brazed cutting edges in fixed, expanding and finely adjustable design.		Series 600 Fixed	Basic LINE
							Series 700 Expandable	Performance LINE
							Series 800 Finely adjustable	Expert LINE
	4,00 - 40,00	IT7	MonoReamPlus		Coolant supply optimised especially for machining castings with HPC geometry in solid cermet and cermet-tipped.	4,00 - 20,00	Series 500 Solid cermet head	Expert LINE
						21,00 - 40,00	Series 600 Cermet-tipped	Expert LINE
						21,00 - 40,00	Series 710 Cermet-tipped, expandable	
6,00 - 40,00	IT7	FeedPlus		Maximum number of teeth for maximum feeds and optimal circularity for through bores.	6,00 - 12,00	Series 500 Solid carbide	Expert LINE	
					10,00 - 40,00	Series 610 Tipped	Expert LINE	
Solutions for large diameters	40,00 - 310,00	≤IT7	HPR300		Ground system optimised for economical reconditioning due to innovative cutting edge clamping.		Configurable with HSK and module connection	Performance LINE
	80,00 - 400,00	≥IT7	HPR400		System with simple and highly accurate insert change on site.		Configurable with HSK and module connection	Expert LINE
Modular	16,00 - 65,00	IT7	HPR		High-accuracy replaceable head system in fixed and finely adjustable design.	7,00 - 65,00	Series 100 Fixed	Performance LINE
		≤IT7				7,00 - 65,00	Series 200 Finely adjustable	Expert LINE
	8,00 - 40,00	IT7	CPR		Replaceable head system in solid carbide and tipped design from diameter ø 8.00 mm.	8,00 - 40,00	Series 500 Solid carbide	Performance LINE
						Series 600 Tipped	Performance LINE	
	21,60 - 200,59		MultiCut		Adjustable cutting rings and related holder range.	21,60 - 200,59		Basic LINE

Step 1:
Design



Step 2:
Bore features



Step 3:
Product class



Step 4:
Material suitability



Step 5:
Type of bore



	Material suitability																Type of bore			Product	
	P						M	K			N			C	S	H		Diameter range (configurable)	Page		
	1-2	3	4	5	6	1-3	1	2	3	1-2	3.1	4.1	1	1-5	1	2					
	■	■	■	■			■	■	■								■	■	■	6,00 - 40,00	94
	■	■	■	■	■	■	■	■	■	■				■	■	■	■	■	■	2,81 - 20,20	
	■	■	■	■				■											3,70 - 12,10		
							■	■										■	3,00 - 10,00		
	■	■	■	■			■	■	■	■							■	■	■	7,70 - 40,20	136
	■	■		■				★	■								■	■	■	3,85 - 20,20	166
	■	■		■				★	■								■	■	■	20,21 - 40,20	
	■	■		■				★	■								■		■	7,70 - 40,20	
	■	■	■														■		★	5,71 - 12,20	178
	■	■	■	■			■	■	■	■										9,76 - 40,25	
	■	■	■	■			■	■	■	■									■	40,00 - 310,00	356
	■	■	■	■			■	■	■	■									■	65,00 - 400,00	358
	■	■	■	■	■	■	■	■	■	■	■						■	■	■	7,00 - 65,00	202
	■	■	■	■			■	■	■								■	■	■	8,00 - 40,20	326
			■	■			■	■	■	■	■	■							■	21,60 - 200,59	360





HIGH-PERFORMANCE REAMERS WITH CYLINDRICAL SHANK

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Reamers

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MonoReam Plus	166
FeedPlus	178

PROGRAMME OVERVIEW

High-performance reamers with cylindrical shank

The product range of high-performance reamers with cylindrical shank includes HSS, solid carbide and solid cermet reamers as well as tipped tools with HA shank. All tools have an internal coolant supply. Through and blind bores can be machined cost-effectively and reliably in almost all workpiece materials. The reamers can be configured individually via the configuration key stated or ordered directly from the large H7 preferred series programme. In addition, a broad programme is available

for selected FixReam as G variant. These reamers are ground in steps of one tenth with a tolerance of +4 µm on the tool diameter and are available as standard ex stock. Customer-specific custom solutions with multi-stepped tools, special coatings and geometries as well as combination solutions can be supplied in a short time.



Basic Line:
Universal tools, broad application area, low procurement costs



Performance Line:
High-performance tools, broad application area, high productivity in series production manufacturing



Expert Line:
Specialist tools for selected applications, maximum precision and productivity



FixReam | FXR

High-performance reamers made of solid carbide, solid cermet and PcBN with internal cooling.

Ø range: 3.00 - 40.00 mm*



MonoReam | MOR

Tipped high-performance reamers in fixed, expanding and finely adjustable designs.

Ø range: 8.00 - 40.00 mm*

Series 600 and 700

Series 800



* The diameter range can vary, depending on the series.



MonoReam Plus | MRP

FeedPlus | FPR



High-performance reamers for steel and cast machining with optimised coolant supply in fixed and expanding design in solid cermet or tipped with cermet cutting edges.

Ø range: 4.00 - 40.00 mm*



High-performance multi-tooth reamer with maximum number of cutting edges for highest performance made of solid carbide or as tipped design.

Ø range: 6.00 - 40.00 mm*





FixReam - FXR

Introduction

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FixReam FXR preferred series H7 and G variant*

FXR510 _____	100
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FXR512 solid cermet _____	109
FXR512G solid cermet _____	110
FXR500 _____	111
FXR500G _____	112
FXR505 _____	118
FXR505G _____	119
FXR503 short _____	134

* G variant:

On the G variant the tool diameter d_1 and the related tolerance are stated as the "tool grinding diameter".

PRODUCT OVERVIEW

FixReam: FXR500 | FXR510 | FXR512 | FXR505 | FXR503

The series of high-performance reamers FXR made of solid carbide, solid cermet, PcBN and HSS covers a broad range of applications. Depending on the diameter, the high-performance reamers FixReam have between four and eight cutting edges with internal cooling and achieve correspondingly high feed rates. Due to the usage of different cutting materials and coatings, all workpiece materials

can be machined economically and reliably in the diameter range 3.00 to 40.00 mm* to IT7 without an adjustment process. In addition, the new series now allows extremely hard cutting materials such as PcBN or PCD to be used for reaming.

For usage in tight spaces, for example on automated lathes, short designs are available.



FixReam FXR500 Solid carbide, HSS and PcBN	FixReam FXR510 Solid carbide	FixReam FXR512 Solid cermet
		
<p>Straight fluted high-performance reamers with internal cooling made of solid carbide, HSS or with PcBN head. H7 and G variants as preferred series with ground tool diameter. Eco design as coated HSS design.</p> <p>Ø range: 4.00 - 40.00 mm*</p> <p>HSS Solid carbide PcBN</p> <p>Basic Perfor Expert LINE LINE LINE</p> <p>+4 µm H7</p> <p>P K N H</p>	<p>Left-hand spiral fluted high-performance reamers with internal cooling made of solid carbide. H7 and G variants as preferred series with ground tool diameter.</p> <p>Ø range: 3.00 - 20.00 mm*</p> <p>Perfor LINE</p> <p>+4 µm H7</p> <p>P M K N C S</p>	<p>Left-hand spiral fluted high-performance reamers with internal cooling made of solid cermet. H7 and G variants as preferred series with ground tool diameter.</p> <p>Ø range: 3.97 - 12.03 mm*</p> <p>Perfor LINE</p> <p>+4 µm H7</p> <p>P K</p>
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* The diameter range can vary, depending on the series.



FixReam | FXR505
Solid carbide, HSS and PcBN

FixReam | FXR503
Solid carbide – short



Straight fluted high-performance reamers with internal cooling made of solid carbide, HSS or with PcBN head. H7 and G variants as preferred series with ground tool diameter.

Extra short FixReam reamer made of solid carbide that is specially designed for usage on automated lathes.

Ø range: 3.00 - 40.00 mm*



Ø range: 3.00 - 20.00 mm*

HSS Solid carbide PcBN



Selection overview FixReam | Ordering example

1. Series

Type of bore	Material	Coolant supply	Fixed design made of solid carbide, solid cermet or short version
	P M N	✓	505 Solid carbide
	K S H		505 PcBN
	K H	✓	503 Short
	P K		
	N H	✓	500 Solid carbide
	P K		500 HSS
	K H		500 PcBN
	P M N	✓	510 Solid carbide
	K S C		
	P K2		512 Solid cermet

3. Lead and cutting material

510 505 Solid carbide	Lead
	Cutting material
	Preferred series H7
	Preferred series G variant
512 Solid cermet	Lead
	Cutting material
	Preferred series H7
500 Solid carbide	Lead
	Cutting material
	Preferred series H7
500 505 HSS	Lead
	Cutting material
	Preferred series H7
500 505 PcBN	Lead
	Cutting material
	Preferred series H7
503 Solid carbide	Lead
	Cutting material
	Preferred series H7

2. Tool dimensions

FXR510 | 505 | 500

ød ₁	ød ₂	l ₁	l ₂	l ₃	l ₄	z FXR510	z FXR505 500
2,81-3,70	4	65	12	37	28	4	4
3,71-6,20	6	75	12	39	36	4	4
6,21-8,20	8	100	16	64	36	6	6
8,21-9,20	10	100	20	60	40	6	6
9,21-10,20	10	120	20	80	40	6	6
10,21-12,20	12	120	20	75	45	6	6
12,21-14,20	14	130	22	85	45	6	6
14,21-15,20	16	130	22	82	48	6	6
15,21-16,20	16	150	25	102	48	6	6
16,21-18,20	18	150	25	102	48	8	6
18,21-20,20	20	150	25	100	50	8	6

FXR512 | 503

	ød ₁	ød ₂	l ₁	l ₂	l ₃	l ₄	z
FXR512	3,70-5,70	6	70	36	34	10	4
	5,71-6,20	6	70	36	34	10	6
	6,21-8,20	8	75	36	39	15	6
	8,21-9,70	10	75	40	35	15	6
	9,71-10,20	10	100	40	60	20	6
10,21-12,10	12	100	45	55	20	6	
FXR503	2,81-4,05	4	56	28	28	12	4
	4,06-6,10	6	64	36	28	12	4
	6,11-8,10	8	75	36	39	16	6
	8,11-10,10	8	75	36	39	20	6
	10,11-11,60	10	80	40	40	20	6
	11,61-13,10	12	90	45	45	22	6
	13,11-15,10	14	90	45	45	22	6
	15,11-18,10	16	100	48	52	25	8
18,11-20,10	18	100	48	52	25	8	

Ordering example:

1. Series

F X R

FixReam

2. Diameter

5 0 0

G

∅ 2 0

. 0 0 0

Tolerance

+ 4

Designs:
Solid carbide
Solid cermet
HSS

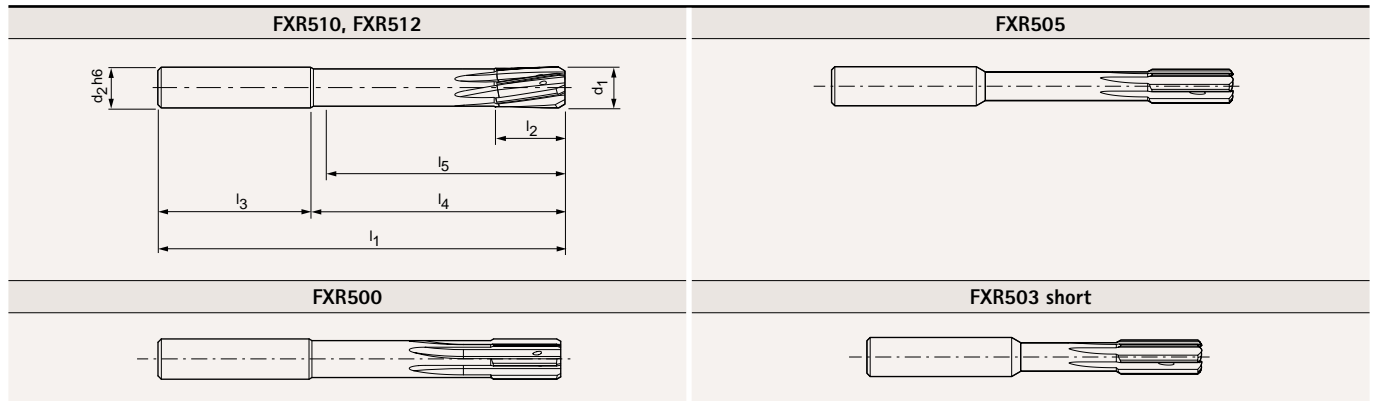
Flute helix angle on the cutting edges:
0 = Straight fluted
1 = Left-hand spiral fluted

Type of bore:
0 | 2 = Through bore
3 | 5 = Blind bore

Bore diameter
Information ground tool diameter (digit is only used for G variant)

IT or allowance in µm (example: +30+10) or for G variant Information on the manufacturing tolerance for the ground tool diameter +4 µm / +5 µm

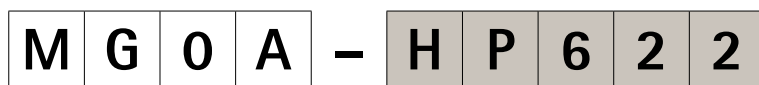
Tool dimensions



P		M		K						N		C			S		H		
P1 - P5		P6		M1 - M3		K1		K2		K3		N1 - N4		C1.1	C1.2	C1.3	S1 - S5		H1
MVOA	MG1M	MT0A	MF1M	MT0A	MF1M	MVOA	MG1M	MVOA	MG1M	MVOA	MG1M	MVOA	MG1M	MVOA	MF1M	MT0A	MF1M	MT0A	
HP145	HP145	HP145	HP145	HP145	HP145	HP145	HP145	HP145	HP145	HP145	HP145	HU612	HU612	HC614	HC614	HP613	HP613	HP141	
P. 120	P. 102	P. 124	P. 104	P. 124	P. 104	P. 120	P. 102	P. 120	P. 102	P. 120	P. 102	P. 118	P. 100	P. 129	P. 108	P. 126	P. 106	P. 122	
P. 121	P. 103	P. 125	P. 105	P. 125	P. 105	P. 121	P. 103	P. 121	P. 103	P. 121	P. 103	P. 119	P. 101			P. 127	P. 107	P. 123	
												MVOA							
												HP622							
												P. 128							
	MG1M								MG1M										
	CU154								CU154										
	P. 109								P. 109										
	P. 110								P. 110										
														MG0A					MFOA
														HP622					HP141
														P. 113					P. 111
																			P. 112
MVOA	MG1M					MVOA	MG1M	MVOA	MG1M	MVOA	MG1M								
SP346	SP346					SP346	SP346	SP346	SP346	SP346	SP346								
P. 130	P. 114					P. 130	P. 114	P. 130	P. 114	P. 130	P. 114								
P. 132	P. 116					P. 132	P. 113	P. 132	P. 113	P. 132	P. 116								
						MI3F	MH3F	MI3F	MH3F									MI3F	MH3F
						FU840	FU840	FU840	FU840									FU840	FU840
						P. 133	P. 117	P. 133	P. 117									P. 133	P. 117
MC1F						MC1F		MC1F		MC1F									
HP145						HP145		HP145		HP145									
P. 134						P. 134		P. 134		P. 134									

3. Lead

Cutting material



Lead geometry and rake angle:

- MG0A
- MG1M
- MF1M
- MVOA
- MH3F
- MT0A
- MFOA
- MC1F

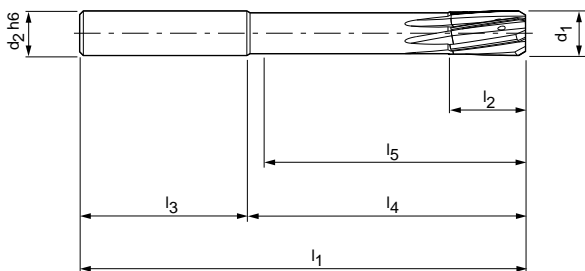
For an explanation of the lead geometry see pages 432/433.

Cutting material:

- HP145
- HU612
- CU154
- FU840
- HP622
- HC614
- HP141
- HP613
- SP346

FixReam FXR510

Design: Solid carbide
Reamer diameter: 3.00 - 20.00 mm
Lead: MG1M
Cutting material: HU612



Dimensions							z	Specification	Order No.
d_1	$d_2 h6$	l_1	l_2	l_3	l_4	l_5			
3,00	4	65	12	28	37	34	4	FXR510Ø3H7MG1M-HU612	30570662
3,20	4	65	12	28	37	34	4	FXR510Ø3.2H7MG1M-HU612	30570663
3,50	4	65	12	28	37	34	4	FXR510Ø3.5H7MG1M-HU612	30570664
4,00	6	75	12	36	39	34	4	FXR510Ø4H7MG1M-HU612	30570665
4,50	6	75	12	36	39	34	4	FXR510Ø4.5H7MG1M-HU612	30570666
5,00	6	75	12	36	39	35	4	FXR510Ø5H7MG1M-HU612	30570667
5,50	6	75	12	36	39	35	4	FXR510Ø5.5H7MG1M-HU612	30570668
6,00	6	75	12	36	39	35	4	FXR510Ø6H7MG1M-HU612	30570669
6,50	8	100	16	36	64	59	6	FXR510Ø6.5H7MG1M-HU612	30570670
7,00	8	100	16	36	64	59	6	FXR510Ø7H7MG1M-HU612	30570671
7,50	8	100	16	36	64	60	6	FXR510Ø7.5H7MG1M-HU612	30570672
8,00	8	100	16	36	64	60	6	FXR510Ø8H7MG1M-HU612	30570673
8,50	10	100	20	40	60	55	6	FXR510Ø8.5H7MG1M-HU612	30570674
9,00	10	100	20	40	60	55	6	FXR510Ø9H7MG1M-HU612	30570675
9,50	10	120	20	40	80	76	6	FXR510Ø9.5H7MG1M-HU612	30570676
10,00	10	120	20	40	80	76	6	FXR510Ø10H7MG1M-HU612	30570677
10,50	12	120	20	45	75	70	6	FXR510Ø10.5H7MG1M-HU612	30570678
11,00	12	120	20	45	75	70	6	FXR510Ø11H7MG1M-HU612	30570679
11,50	12	120	20	45	75	71	6	FXR510Ø11.5H7MG1M-HU612	30570681
12,00	12	120	20	45	75	71	6	FXR510Ø12H7MG1M-HU612	30570682
13,00	14	130	22	45	85	80	6	FXR510Ø13H7MG1M-HU612	30570683
14,00	14	130	22	45	85	80	6	FXR510Ø14H7MG1M-HU612	30570684
15,00	16	130	22	48	82	77	6	FXR510Ø15H7MG1M-HU612	30570685
16,00	16	150	25	48	102	97	6	FXR510Ø16H7MG1M-HU612	30570686
17,00	18	150	25	48	102	97	8	FXR510Ø17H7MG1M-HU612	30570687
18,00	18	150	25	48	102	97	8	FXR510Ø18H7MG1M-HU612	30570688
19,00	20	150	25	50	100	95	8	FXR510Ø19H7MG1M-HU612	30570689
20,00	20	150	25	50	100	95	8	FXR510Ø20H7MG1M-HU612	30570690

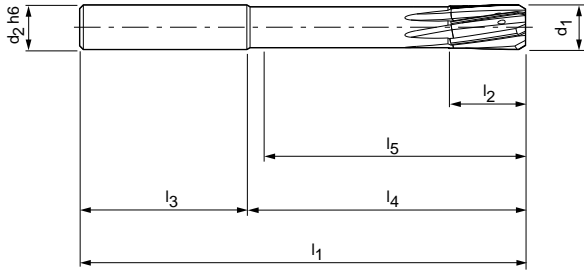
Dimensions in mm.

Cutting data recommendation from page 436.

Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "High-performance reamers FixReam".

FixReam FXR510G

Design: Solid carbide
Reamer diameter: 3.97 - 12.03 mm
Lead: MG1M
Cutting material: HU612



Dimensions							z	Specification	Order No.
d ₁ +0.004	d ₂ h6	l ₁	l ₂	l ₃	l ₄	l ₅			
3,97	6	75	12	36	39	34	4	FXR510GØ3.97+4MG1M-HU612	30571087
3,98	6	75	12	36	39	34	4	FXR510GØ3.98+4MG1M-HU612	30571088
3,99	6	75	12	36	39	34	4	FXR510GØ3.99+4MG1M-HU612	30571089
4,01	6	75	12	36	39	34	4	FXR510GØ4.01+4MG1M-HU612	30571090
4,02	6	75	12	36	39	34	4	FXR510GØ4.02+4MG1M-HU612	30571091
4,03	6	75	12	36	39	34	4	FXR510GØ4.03+4MG1M-HU612	30571092
4,97	6	75	12	36	39	35	4	FXR510GØ4.97+4MG1M-HU612	30571093
4,98	6	75	12	36	39	35	4	FXR510GØ4.98+4MG1M-HU612	30571094
4,99	6	75	12	36	39	35	4	FXR510GØ4.99+4MG1M-HU612	30571095
5,01	6	75	12	36	39	35	4	FXR510GØ5.01+4MG1M-HU612	30571096
5,02	6	75	12	36	39	35	4	FXR510GØ5.02+4MG1M-HU612	30571097
5,03	6	75	12	36	39	35	4	FXR510GØ5.03+4MG1M-HU612	30571098
5,97	6	75	12	36	39	35	4	FXR510GØ5.97+4MG1M-HU612	30571099
5,98	6	75	12	36	39	35	4	FXR510GØ5.98+4MG1M-HU612	30571100
5,99	6	75	12	36	39	35	4	FXR510GØ5.99+4MG1M-HU612	30571101
6,01	6	75	12	36	39	35	4	FXR510GØ6.01+4MG1M-HU612	30571102
6,02	6	75	12	36	39	35	4	FXR510GØ6.02+4MG1M-HU612	30571103
6,03	6	75	12	36	39	35	4	FXR510GØ6.03+4MG1M-HU612	30571104
7,97	8	100	16	36	64	60	6	FXR510GØ7.97+4MG1M-HU612	30571105
7,98	8	100	16	36	64	60	6	FXR510GØ7.98+4MG1M-HU612	30571106
7,99	8	100	16	36	64	60	6	FXR510GØ7.99+4MG1M-HU612	30571107
8,01	8	100	16	36	64	60	6	FXR510GØ8.01+4MG1M-HU612	30571108
8,02	8	100	16	36	64	60	6	FXR510GØ8.02+4MG1M-HU612	30571109
8,03	8	100	16	36	64	60	6	FXR510GØ8.03+4MG1M-HU612	30571110
9,97	10	120	20	40	80	76	6	FXR510GØ9.97+4MG1M-HU612	30571111
9,98	10	120	20	40	80	76	6	FXR510GØ9.98+4MG1M-HU612	30571112
9,99	10	120	20	40	80	76	6	FXR510GØ9.99+4MG1M-HU612	30571113
10,01	10	120	20	40	80	76	6	FXR510GØ10.01+4MG1M-HU612	30571114
10,02	10	120	20	40	80	76	6	FXR510GØ10.02+4MG1M-HU612	30571115
10,03	10	120	20	40	80	76	6	FXR510GØ10.03+4MG1M-HU612	30571116
11,97	12	120	20	45	75	71	6	FXR510GØ11.97+4MG1M-HU612	30571117
11,98	12	120	20	45	75	71	6	FXR510GØ11.98+4MG1M-HU612	30571118
11,99	12	120	20	45	75	71	6	FXR510GØ11.99+4MG1M-HU612	30571119
12,01	12	120	20	45	75	71	6	FXR510GØ12.01+4MG1M-HU612	30571120
12,02	12	120	20	45	75	71	6	FXR510GØ12.02+4MG1M-HU612	30571121
12,03	12	120	20	45	75	71	6	FXR510GØ12.03+4MG1M-HU612	30571122

Dimensions in mm.

Cutting data recommendation from page 436.

Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "High-performance reamers FixReam".

FixReam FXR510

Design:

Reamer diameter:

Lead:

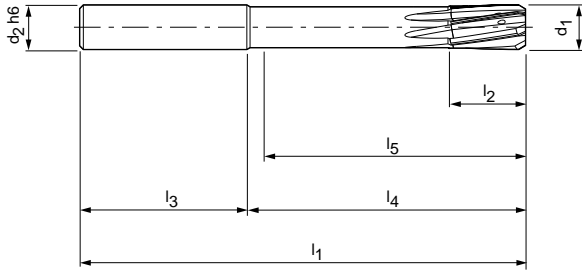
Cutting material:

Solid carbide

3.00 - 20.00 mm

MG1M

HP145



Dimensions							z	Specification	Order No.
d_1	$d_2 h6$	l_1	l_2	l_3	l_4	l_5			
3,00	4	65	12	28	37	34	4	FXR510Ø3H7MG1M-HP145	30570719
3,20	4	65	12	28	37	34	4	FXR510Ø3.2H7MG1M-HP145	30570720
3,50	4	65	12	28	37	34	4	FXR510Ø3.5H7MG1M-HP145	30570721
4,00	6	75	12	36	39	34	4	FXR510Ø4H7MG1M-HP145	30570722
4,50	6	75	12	36	39	34	4	FXR510Ø4.5H7MG1M-HP145	30570723
5,00	6	75	12	36	39	35	4	FXR510Ø5H7MG1M-HP145	30570724
5,50	6	75	12	36	39	35	4	FXR510Ø5.5H7MG1M-HP145	30570725
6,00	6	75	12	36	39	35	4	FXR510Ø6H7MG1M-HP145	30570726
6,50	8	100	16	36	64	59	6	FXR510Ø6.5H7MG1M-HP145	30570727
7,00	8	100	16	36	64	59	6	FXR510Ø7H7MG1M-HP145	30570728
7,50	8	100	16	36	64	60	6	FXR510Ø7.5H7MG1M-HP145	30570729
8,00	8	100	16	36	64	60	6	FXR510Ø8H7MG1M-HP145	30570730
8,50	10	100	20	40	60	55	6	FXR510Ø8.5H7MG1M-HP145	30570731
9,00	10	100	20	40	60	55	6	FXR510Ø9H7MG1M-HP145	30570732
9,50	10	120	20	40	80	76	6	FXR510Ø9.5H7MG1M-HP145	30570733
10,00	10	120	20	40	80	76	6	FXR510Ø10H7MG1M-HP145	30570734
10,50	12	120	20	45	75	70	6	FXR510Ø10.5H7MG1M-HP145	30570735
11,00	12	120	20	45	75	70	6	FXR510Ø11H7MG1M-HP145	30570736
11,50	12	120	20	45	75	71	6	FXR510Ø11.5H7MG1M-HP145	30570737
12,00	12	120	20	45	75	71	6	FXR510Ø12H7MG1M-HP145	30570738
13,00	14	130	22	45	85	80	6	FXR510Ø13H7MG1M-HP145	30570739
14,00	14	130	22	45	85	80	6	FXR510Ø14H7MG1M-HP145	30570740
15,00	16	130	22	48	82	77	6	FXR510Ø15H7MG1M-HP145	30570741
16,00	16	150	25	48	102	97	6	FXR510Ø16H7MG1M-HP145	30570742
17,00	18	150	25	48	102	97	8	FXR510Ø17H7MG1M-HP145	30570743
18,00	18	150	25	48	102	97	8	FXR510Ø18H7MG1M-HP145	30570744
19,00	20	150	25	50	100	95	8	FXR510Ø19H7MG1M-HP145	30570745
20,00	20	150	25	50	100	95	8	FXR510Ø20H7MG1M-HP145	30570746

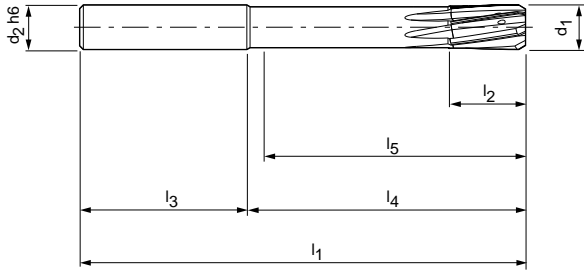
Dimensions in mm.

Cutting data recommendation from page 436.

Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "High-performance reamers FixReam".

FixReam FXR510G

Design: Solid carbide
Reamer diameter: 3.97 - 12.03 mm
Lead: MG1M
Cutting material: HP145



Dimensions							z	Specification	Order No.
d ₁ +0.004	d ₂ h6	l ₁	l ₂	l ₃	l ₄	l ₅			
3,97	6	75	12	36	39	34	4	FXR510GØ3.97+4MG1M-HP145	30571159
3,98	6	75	12	36	39	34	4	FXR510GØ3.98+4MG1M-HP145	30571160
3,99	6	75	12	36	39	34	4	FXR510GØ3.99+4MG1M-HP145	30571161
4,01	6	75	12	36	39	34	4	FXR510GØ4.01+4MG1M-HP145	30571162
4,02	6	75	12	36	39	34	4	FXR510GØ4.02+4MG1M-HP145	30571163
4,03	6	75	12	36	39	34	4	FXR510GØ4.03+4MG1M-HP145	30571164
4,97	6	75	12	36	39	35	4	FXR510GØ4.97+4MG1M-HP145	30571165
4,98	6	75	12	36	39	35	4	FXR510GØ4.98+4MG1M-HP145	30571166
4,99	6	75	12	36	39	35	4	FXR510GØ4.99+4MG1M-HP145	30571167
5,01	6	75	12	36	39	35	4	FXR510GØ5.01+4MG1M-HP145	30571168
5,02	6	75	12	36	39	35	4	FXR510GØ5.02+4MG1M-HP145	30571169
5,03	6	75	12	36	39	35	4	FXR510GØ5.03+4MG1M-HP145	30571170
5,97	6	75	12	36	39	35	4	FXR510GØ5.97+4MG1M-HP145	30571171
5,98	6	75	12	36	39	35	4	FXR510GØ5.98+4MG1M-HP145	30571172
5,99	6	75	12	36	39	35	4	FXR510GØ5.99+4MG1M-HP145	30571173
6,01	6	75	12	36	39	35	4	FXR510GØ6.01+4MG1M-HP145	30571174
6,02	6	75	12	36	39	35	4	FXR510GØ6.02+4MG1M-HP145	30571175
6,03	6	75	12	36	39	35	4	FXR510GØ6.03+4MG1M-HP145	30571176
7,97	8	100	16	36	64	60	6	FXR510GØ7.97+4MG1M-HP145	30571177
7,98	8	100	16	36	64	60	6	FXR510GØ7.98+4MG1M-HP145	30571178
7,99	8	100	16	36	64	60	6	FXR510GØ7.99+4MG1M-HP145	30571179
8,01	8	100	16	36	64	60	6	FXR510GØ8.01+4MG1M-HP145	30571180
8,02	8	100	16	36	64	60	6	FXR510GØ8.02+4MG1M-HP145	30571181
8,03	8	100	16	36	64	60	6	FXR510GØ8.03+4MG1M-HP145	30571182
9,97	10	120	20	40	80	76	6	FXR510GØ9.97+4MG1M-HP145	30571183
9,98	10	120	20	40	80	76	6	FXR510GØ9.98+4MG1M-HP145	30571184
9,99	10	120	20	40	80	76	6	FXR510GØ9.99+4MG1M-HP145	30571185
10,01	10	120	20	40	80	76	6	FXR510GØ10.01+4MG1M-HP145	30571186
10,02	10	120	20	40	80	76	6	FXR510GØ10.02+4MG1M-HP145	30571187
10,03	10	120	20	40	80	76	6	FXR510GØ10.03+4MG1M-HP145	30571188
11,97	12	120	20	45	75	71	6	FXR510GØ11.97+4MG1M-HP145	30571189
11,98	12	120	20	45	75	71	6	FXR510GØ11.98+4MG1M-HP145	30571190
11,99	12	120	20	45	75	71	6	FXR510GØ11.99+4MG1M-HP145	30571191
12,01	12	120	20	45	75	71	6	FXR510GØ12.01+4MG1M-HP145	30571192
12,02	12	120	20	45	75	71	6	FXR510GØ12.02+4MG1M-HP145	30571193
12,03	12	120	20	45	75	71	6	FXR510GØ12.03+4MG1M-HP145	30571194

Dimensions in mm.

Cutting data recommendation from page 436.

Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "High-performance reamers FixReam".

FixReam FXR510

Design:

Reamer diameter:

Lead:

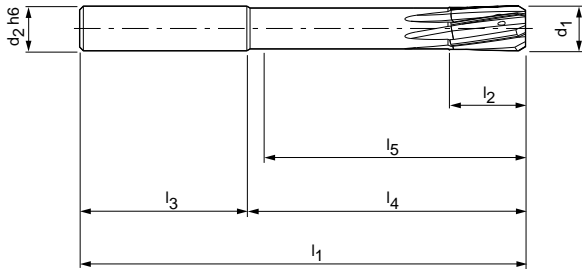
Cutting material:

Solid carbide

4.00 - 20.00 mm

MF1M

HP145



Dimensions							z	Specification	Order No.
d_1	d_2 h6	l_1	l_2	l_3	l_4	l_5			
4,00	6	75	12	36	39	34	4	FXR51004H7MF1M-HP145	30570772
4,50	6	75	12	36	39	34	4	FXR51004.5H7MF1M-HP145	30570773
5,00	6	75	12	36	39	35	4	FXR51005H7MF1M-HP145	30570774
5,50	6	75	12	36	39	35	4	FXR51005.5H7MF1M-HP145	30570775
6,00	6	75	12	36	39	35	4	FXR51006H7MF1M-HP145	30570776
6,50	8	100	16	36	64	59	6	FXR51006.5H7MF1M-HP145	30570777
7,00	8	100	16	36	64	59	6	FXR51007H7MF1M-HP145	30570778
7,50	8	100	16	36	64	60	6	FXR51007.5H7MF1M-HP145	30570779
8,00	8	100	16	36	64	60	6	FXR51008H7MF1M-HP145	30570780
8,50	10	100	20	40	60	55	6	FXR51008.5H7MF1M-HP145	30570781
9,00	10	100	20	40	60	55	6	FXR51009H7MF1M-HP145	30570782
9,50	10	120	20	40	80	76	6	FXR51009.5H7MF1M-HP145	30570783
10,00	10	120	20	40	80	76	6	FXR51010H7MF1M-HP145	30570784
10,50	12	120	20	45	75	70	6	FXR51010.5H7MF1M-HP145	30570785
11,00	12	120	20	45	75	70	6	FXR51011H7MF1M-HP145	30570786
11,50	12	120	20	45	75	71	6	FXR51011.5H7MF1M-HP145	30570787
12,00	12	120	20	45	75	71	6	FXR51012H7MF1M-HP145	30570788
13,00	14	130	22	45	85	80	6	FXR51013H7MF1M-HP145	30570789
14,00	14	130	22	45	85	80	6	FXR51014H7MF1M-HP145	30570790
15,00	16	130	22	48	82	77	6	FXR51015H7MF1M-HP145	30570791
16,00	16	150	25	48	102	97	6	FXR51016H7MF1M-HP145	30570792
17,00	18	150	25	48	102	97	8	FXR51017H7MF1M-HP145	30570793
18,00	18	150	25	48	102	97	8	FXR51018H7MF1M-HP145	30570794
19,00	20	150	25	50	100	95	8	FXR51019H7MF1M-HP145	30570795
20,00	20	150	25	50	100	95	8	FXR51020H7MF1M-HP145	30570796

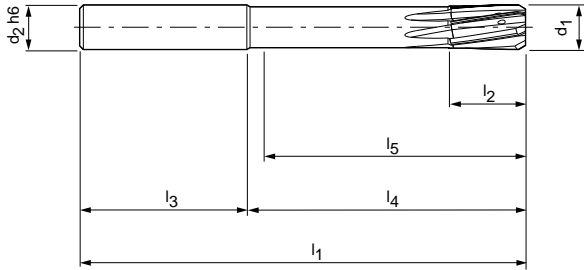
Dimensions in mm.

Cutting data recommendation from page 436.

Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "High-performance reamers FixReam".

FixReam FXR510G

Design: Solid carbide
Reamer diameter: 3.97 - 12.03 mm
Lead: MF1M
Cutting material: HP145



Dimensions							z	Specification	Order No.
d ₁ +0.004	d ₂ h6	l ₁	l ₂	l ₃	l ₄	l ₅			
3,97	6	75	12	36	39	34	4	FXR510GØ3.97+4MF1M-HP145	30571231
3,98	6	75	12	36	39	34	4	FXR510GØ3.98+4MF1M-HP145	30571232
3,99	6	75	12	36	39	34	4	FXR510GØ3.99+4MF1M-HP145	30571233
4,01	6	75	12	36	39	34	4	FXR510GØ4.01+4MF1M-HP145	30571234
4,02	6	75	12	36	39	34	4	FXR510GØ4.02+4MF1M-HP145	30571235
4,03	6	75	12	36	39	34	4	FXR510GØ4.03+4MF1M-HP145	30571236
4,97	6	75	12	36	39	35	4	FXR510GØ4.97+4MF1M-HP145	30571237
4,98	6	75	12	36	39	35	4	FXR510GØ4.98+4MF1M-HP145	30571238
4,99	6	75	12	36	39	35	4	FXR510GØ4.99+4MF1M-HP145	30571239
5,01	6	75	12	36	39	35	4	FXR510GØ5.01+4MF1M-HP145	30571240
5,02	6	75	12	36	39	35	4	FXR510GØ5.02+4MF1M-HP145	30571241
5,03	6	75	12	36	39	35	4	FXR510GØ5.03+4MF1M-HP145	30571242
5,97	6	75	12	36	39	35	4	FXR510GØ5.97+4MF1M-HP145	30571243
5,98	6	75	12	36	39	35	4	FXR510GØ5.98+4MF1M-HP145	30571244
5,99	6	75	12	36	39	35	4	FXR510GØ5.99+4MF1M-HP145	30571245
6,01	6	75	12	36	39	35	4	FXR510GØ6.01+4MF1M-HP145	30571246
6,02	6	75	12	36	39	35	4	FXR510GØ6.02+4MF1M-HP145	30571247
6,03	6	75	12	36	39	35	4	FXR510GØ6.03+4MF1M-HP145	30571248
7,97	8	100	16	36	64	60	6	FXR510GØ7.97+4MF1M-HP145	30571249
7,98	8	100	16	36	64	60	6	FXR510GØ7.98+4MF1M-HP145	30571250
7,99	8	100	16	36	64	60	6	FXR510GØ7.99+4MF1M-HP145	30571251
8,01	8	100	16	36	64	60	6	FXR510GØ8.01+4MF1M-HP145	30571252
8,02	8	100	16	36	64	60	6	FXR510GØ8.02+4MF1M-HP145	30571253
8,03	8	100	16	36	64	60	6	FXR510GØ8.03+4MF1M-HP145	30571254
9,97	10	120	20	40	80	76	6	FXR510GØ9.97+4MF1M-HP145	30571255
9,98	10	120	20	40	80	76	6	FXR510GØ9.98+4MF1M-HP145	30571256
9,99	10	120	20	40	80	76	6	FXR510GØ9.99+4MF1M-HP145	30571257
10,01	10	120	20	40	80	76	6	FXR510GØ10.01+4MF1M-HP145	30571258
10,02	10	120	20	40	80	76	6	FXR510GØ10.02+4MF1M-HP145	30571259
10,03	10	120	20	40	80	76	6	FXR510GØ10.03+4MF1M-HP145	30571260
11,97	12	120	20	45	75	71	6	FXR510GØ11.97+4MF1M-HP145	30571261
11,98	12	120	20	45	75	71	6	FXR510GØ11.98+4MF1M-HP145	30571262
11,99	12	120	20	45	75	71	6	FXR510GØ11.99+4MF1M-HP145	30571263
12,01	12	120	20	45	75	71	6	FXR510GØ12.01+4MF1M-HP145	30571264
12,02	12	120	20	45	75	71	6	FXR510GØ12.02+4MF1M-HP145	30571265
12,03	12	120	20	45	75	71	6	FXR510GØ12.03+4MF1M-HP145	30571266

Dimensions in mm.

Cutting data recommendation from page 436.

Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "High-performance reamers FixReam".

FixReam FXR510

Design:

Reamer diameter:

Lead:

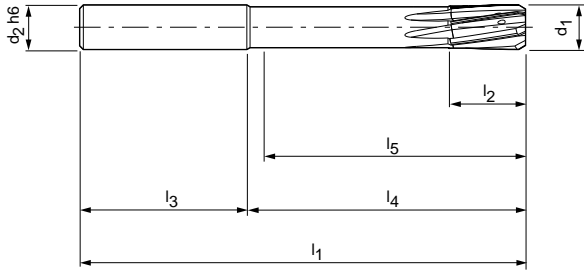
Cutting material:

Solid carbide

4.00 - 20.00 mm

MF1M

HP613



Dimensions							z	Specification	Order No.
d_1	$d_2 h6$	l_1	l_2	l_3	l_4	l_5			
4,00	6	75	12	36	39	34	4	FXR51004H7MF1M-HP613	30584871
4,50	6	75	12	36	39	34	4	FXR51004.5H7MF1M-HP613	30584872
5,00	6	75	12	36	39	35	4	FXR51005H7MF1M-HP613	30584873
5,50	6	75	12	36	39	35	4	FXR51005.5H7MF1M-HP613	30584874
6,00	6	75	12	36	39	35	4	FXR51006H7MF1M-HP613	30584875
6,50	8	100	16	36	64	59	6	FXR51006.5H7MF1M-HP613	30584876
7,00	8	100	16	36	64	59	6	FXR51007H7MF1M-HP613	30584877
7,50	8	100	16	36	64	60	6	FXR51007.5H7MF1M-HP613	30584878
8,00	8	100	16	36	64	60	6	FXR51008H7MF1M-HP613	30584879
8,50	10	100	20	40	60	55	6	FXR51008.5H7MF1M-HP613	30584880
9,00	10	100	20	40	60	55	6	FXR51009H7MF1M-HP613	30584881
9,50	10	120	20	40	80	76	6	FXR51009.5H7MF1M-HP613	30584882
10,00	10	120	20	40	80	76	6	FXR51010H7MF1M-HP613	30584883
10,50	12	120	20	45	75	70	6	FXR51010.5H7MF1M-HP613	30584884
11,00	12	120	20	45	75	70	6	FXR51011H7MF1M-HP613	30584885
11,50	12	120	20	45	75	71	6	FXR51011.5H7MF1M-HP613	30584886
12,00	12	120	20	45	75	71	6	FXR51012H7MF1M-HP613	30584887
13,00	14	130	22	45	85	80	6	FXR51013H7MF1M-HP613	30584888
14,00	14	130	22	45	85	80	6	FXR51014H7MF1M-HP613	30584889
15,00	16	130	22	48	82	77	6	FXR51015H7MF1M-HP613	30584890
16,00	16	150	25	48	102	97	6	FXR51016H7MF1M-HP613	30584891
17,00	18	150	25	48	102	97	8	FXR51017H7MF1M-HP613	30584892
18,00	18	150	25	48	102	97	8	FXR51018H7MF1M-HP613	30584893
19,00	20	150	25	50	100	95	8	FXR51019H7MF1M-HP613	30584894
20,00	20	150	25	50	100	95	8	FXR51020H7MF1M-HP613	30584895

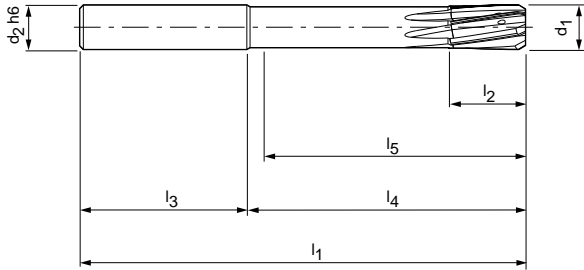
Dimensions in mm.

Cutting data recommendation from page 436.

Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "High-performance reamers FixReam".

FixReam FXR510G

Design: Solid carbide
Reamer diameter: 3.97 - 12.03 mm
Lead: MF1M
Cutting material: HP613



Dimensions							z	Specification	Order No.
d ₁ +0.004	d ₂ h6	l ₁	l ₂	l ₃	l ₄	l ₅			
3,97	6	75	12	36	39	39	4	FXR510GØ3.97+4MF1M-HP613	30584896
3,98	6	75	12	36	39	39	4	FXR510GØ3.98+4MF1M-HP613	30584897
3,99	6	75	12	36	39	39	4	FXR510GØ3.99+4MF1M-HP613	30584898
4,01	6	75	12	36	39	39	4	FXR510GØ4.01+4MF1M-HP613	30584899
4,02	6	75	12	36	39	39	4	FXR510GØ4.02+4MF1M-HP613	30584900
4,03	6	75	12	36	39	39	4	FXR510GØ4.03+4MF1M-HP613	30584901
4,97	6	75	12	36	39	39	4	FXR510GØ4.97+4MF1M-HP613	30584902
4,98	6	75	12	36	39	39	4	FXR510GØ4.98+4MF1M-HP613	30584903
4,99	6	75	12	36	39	39	4	FXR510GØ4.99+4MF1M-HP613	30584904
5,01	6	75	12	36	39	39	4	FXR510GØ5.01+4MF1M-HP613	30584905
5,02	6	75	12	36	39	39	4	FXR510GØ5.02+4MF1M-HP613	30584906
5,03	6	75	12	36	39	39	4	FXR510GØ5.03+4MF1M-HP613	30584907
5,97	6	75	12	36	39	39	4	FXR510GØ5.97+4MF1M-HP613	30584908
5,98	6	75	12	36	39	39	4	FXR510GØ5.98+4MF1M-HP613	30584909
5,99	6	75	12	36	39	39	4	FXR510GØ5.99+4MF1M-HP613	30584910
6,01	6	75	12	36	39	39	4	FXR510GØ6.01+4MF1M-HP613	30584911
6,02	6	75	12	36	39	39	4	FXR510GØ6.02+4MF1M-HP613	30584912
6,03	6	75	12	36	39	39	4	FXR510GØ6.03+4MF1M-HP613	30584913
7,97	8	100	16	36	64	60	6	FXR510GØ7.97+4MF1M-HP613	30584914
7,98	8	100	16	36	64	60	6	FXR510GØ7.98+4MF1M-HP613	30584915
7,99	8	100	16	36	64	60	6	FXR510GØ7.99+4MF1M-HP613	30584916
8,01	8	100	16	36	64	60	6	FXR510GØ8.01+4MF1M-HP613	30584917
8,02	8	100	16	36	64	60	6	FXR510GØ8.02+4MF1M-HP613	30584918
8,03	8	100	16	36	64	60	6	FXR510GØ8.03+4MF1M-HP613	30584919
9,97	10	120	20	40	80	76	6	FXR510GØ9.97+4MF1M-HP613	30584920
9,98	10	120	20	40	80	76	6	FXR510GØ9.98+4MF1M-HP613	30584921
9,99	10	120	20	40	80	76	6	FXR510GØ9.99+4MF1M-HP613	30584922
10,01	10	120	20	40	80	76	6	FXR510GØ10.01+4MF1M-HP613	30584923
10,02	10	120	20	40	80	76	6	FXR510GØ10.02+4MF1M-HP613	30584924
10,03	10	120	20	40	80	76	6	FXR510GØ10.03+4MF1M-HP613	30584925
11,97	12	120	20	45	75	71	6	FXR510GØ11.97+4MF1M-HP613	30584926
11,98	12	120	20	45	75	71	6	FXR510GØ11.98+4MF1M-HP613	30584927
11,99	12	120	20	45	75	71	6	FXR510GØ11.99+4MF1M-HP613	30584928
12,01	12	120	20	45	75	71	6	FXR510GØ12.01+4MF1M-HP613	30584929
12,02	12	120	20	45	75	71	6	FXR510GØ12.02+4MF1M-HP613	30584930
12,03	12	120	20	45	75	71	6	FXR510GØ12.03+4MF1M-HP613	30584931

Dimensions in mm.

Cutting data recommendation from page 436.

Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "High-performance reamers FixReam".

FixReam FXR510

Design:

Reamer diameter:

Lead:

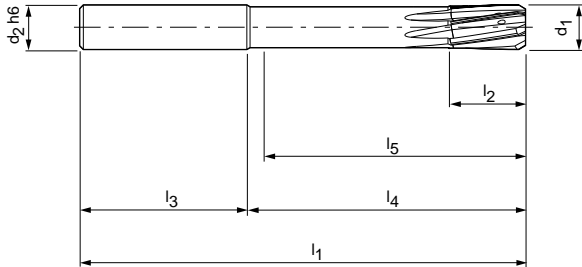
Cutting material:

Solid carbide

3.00 - 20.00 mm

MF1M

HC614



N	1.1	1.2	1.3	1.4	2.1	2.2	2.3	3.1	4.1	4.2	4.3	C	1.1	1.2	1.3	2.1	3.1	4.1	4.2	4.3	4.4	5.1	5.2
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Dimensions							z	Specification	Order No.
d_1	d_2 h6	l_1	l_2	l_3	l_4	l_5			
3,00	4	65	12	28	37	34	4	FXR51003H7MF1M-HC614	30601253
3,20	4	65	12	28	37	34	4	FXR51003.2H7MF1M-HC614	30601254
3,50	4	65	12	28	37	34	4	FXR51003.5H7MF1M-HC614	30601255
4,00	6	75	12	36	39	34	4	FXR51004H7MF1M-HC614	30570922
4,50	6	75	12	36	39	34	4	FXR51004.5H7MF1M-HC614	30570923
5,00	6	75	12	36	39	35	4	FXR51005H7MF1M-HC614	30570924
5,50	6	75	12	36	39	35	4	FXR51005.5H7MF1M-HC614	30570925
6,00	6	75	12	36	39	35	4	FXR51006H7MF1M-HC614	30570926
6,50	8	100	16	36	64	59	6	FXR51006.5H7MF1M-HC614	30570927
7,00	8	100	16	36	64	59	6	FXR51007H7MF1M-HC614	30570928
7,50	8	100	16	36	64	60	6	FXR51007.5H7MF1M-HC614	30570929
8,00	8	100	16	36	64	60	6	FXR51008H7MF1M-HC614	30570930
8,50	10	100	20	40	60	55	6	FXR51008.5H7MF1M-HC614	30570931
9,00	10	100	20	40	60	55	6	FXR51009H7MF1M-HC614	30570932
9,50	10	120	20	40	80	76	6	FXR51009.5H7MF1M-HC614	30570933
10,00	10	120	20	40	80	76	6	FXR510010H7MF1M-HC614	30570934
10,50	12	120	20	45	75	70	6	FXR510010.5H7MF1M-HC614	30570935
11,00	12	120	20	45	75	70	6	FXR510011H7MF1M-HC614	30570936
11,50	12	120	20	45	75	71	6	FXR510011.5H7MF1M-HC614	30570937
12,00	12	120	20	45	75	71	6	FXR510012H7MF1M-HC614	30570938
13,00	14	130	22	45	85	80	6	FXR510013H7MF1M-HC614	30570939
14,00	14	130	22	45	85	80	6	FXR510014H7MF1M-HC614	30570940
15,00	16	130	22	48	82	77	6	FXR510015H7MF1M-HC614	30570941
16,00	16	150	25	48	102	97	6	FXR510016H7MF1M-HC614	30570942
17,00	18	150	25	48	102	97	8	FXR510017H7MF1M-HC614	30570943
18,00	18	150	25	48	102	97	8	FXR510018H7MF1M-HC614	30570944
19,00	20	150	25	50	100	95	8	FXR510019H7MF1M-HC614	30570945
20,00	20	150	25	50	100	95	8	FXR510020H7MF1M-HC614	30570946

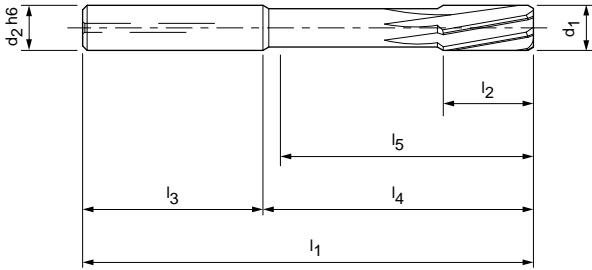
Dimensions in mm.

Cutting data recommendation from page 436.

Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "High-performance reamers FixReam".

FixReam FXR512

Design: Solid cermet
 Reamer diameter: 4.00 - 12.00 mm
 Lead: MG1M
 Cutting material: CU154



Dimensions							z	Specification	Order No.
d_1	$d_2\ h6$	l_1	l_2	l_3	l_4	l_5			
4,00	6	70	10	36	34	29	4	FXR512Ø4H7MG1M-CU154	30570645
4,50	6	70	10	36	34	29	4	FXR512Ø4.5H7MG1M-CU154	30570646
5,00	6	70	10	36	34	29	4	FXR512Ø5H7MG1M-CU154	30570647
5,50	6	70	10	36	34	29	4	FXR512Ø5.5H7MG1M-CU154	30570648
6,00	6	70	10	36	34	29	6	FXR512Ø6H7MG1M-CU154	30570649
6,50	8	75	15	36	39	34	6	FXR512Ø6.5H7MG1M-CU154	30570650
7,00	8	75	15	36	39	34	6	FXR512Ø7H7MG1M-CU154	30570651
7,50	8	75	15	36	39	34	6	FXR512Ø7.5H7MG1M-CU154	30570652
8,00	8	75	15	36	39	34	6	FXR512Ø8H7MG1M-CU154	30570653
8,50	10	75	15	40	35	30	6	FXR512Ø8.5H7MG1M-CU154	30570654
9,00	10	75	15	40	35	30	6	FXR512Ø9H7MG1M-CU154	30570655
9,50	10	75	15	40	35	30	6	FXR512Ø9.5H7MG1M-CU154	30570656
10,00	10	100	20	40	60	55	6	FXR512Ø10H7MG1M-CU154	30570657
10,50	12	100	20	45	55	50	6	FXR512Ø10.5H7MG1M-CU154	30570658
11,00	12	100	20	45	55	50	6	FXR512Ø11H7MG1M-CU154	30570659
11,50	12	100	20	45	55	50	6	FXR512Ø11.5H7MG1M-CU154	30570660
12,00	12	100	20	45	55	50	6	FXR512Ø12H7MG1M-CU154	30570661

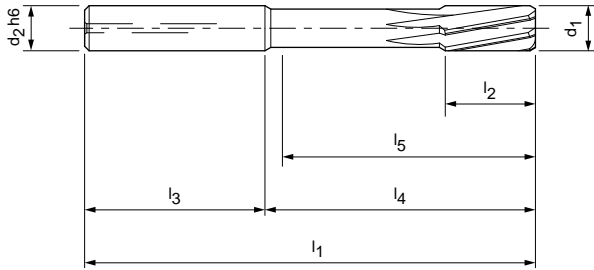
Dimensions in mm.

Cutting data recommendation from page 436.

Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "High-performance reamers FixReam".

FixReam FXR512G

Design: Solid cermet
Reamer diameter: 3.97 - 12.03 mm
Lead: MG1M
Cutting material: CU154



Dimensions							z	Specification	Order No.
$d_1 +0.004$	$d_2 h_6$	l_1	l_2	l_3	l_4	l_5			
3,97	6	70	10	36	34	29	4	FXR512GØ3.97+4MG1M-CU154	30601242
3,98	6	70	10	36	34	29	4	FXR512GØ3.98+4MG1M-CU154	30571052
3,99	6	70	10	36	34	29	4	FXR512GØ3.99+4MG1M-CU154	30571053
4,01	6	70	10	36	34	29	4	FXR512GØ4.01+4MG1M-CU154	30571054
4,02	6	70	10	36	34	29	4	FXR512GØ4.02+4MG1M-CU154	30571055
4,03	6	70	10	36	34	29	4	FXR512GØ4.03+4MG1M-CU154	30571056
4,97	6	70	10	36	34	29	4	FXR512GØ4.97+4MG1M-CU154	30571057
4,98	6	70	10	36	34	29	4	FXR512GØ4.98+4MG1M-CU154	30571058
4,99	6	70	10	36	34	29	4	FXR512GØ4.99+4MG1M-CU154	30571059
5,01	6	70	10	36	34	29	4	FXR512GØ5.01+4MG1M-CU154	30571060
5,02	6	70	10	36	34	29	4	FXR512GØ5.02+4MG1M-CU154	30571061
5,03	6	70	10	36	34	29	4	FXR512GØ5.03+4MG1M-CU154	30571062
5,97	6	70	10	36	34	29	6	FXR512GØ5.97+4MG1M-CU154	30571063
5,98	6	70	10	36	34	29	6	FXR512GØ5.98+ 4MG1M-CU154	30571064
5,99	6	70	10	36	34	29	6	FXR512GØ5.99+4MG1M-CU154	30571065
6,01	6	70	10	36	34	29	6	FXR512GØ6.01+4MG1M-CU154	30571066
6,02	6	70	10	36	34	29	6	FXR512GØ6.02+4MG1M-CU154	30571067
6,03	6	70	10	36	34	29	6	FXR512GØ6.03+4MG1M-CU154	30571068
7,97	8	75	15	36	39	34	6	FXR512GØ7.97+4MG1M-CU154	30571069
7,98	8	75	15	36	39	34	6	FXR512GØ7.98+4MG1M-CU154	30571070
7,99	8	75	15	36	39	34	6	FXR512GØ7.99+4MG1M-CU154	30571071
8,01	8	75	15	36	39	34	6	FXR512GØ8.01+4MG1M-CU154	30571072
8,02	8	75	15	36	39	34	6	FXR512GØ8.02+4MG1M-CU154	30571073
8,03	8	75	15	36	39	34	6	FXR512GØ8.03+4MG1M-CU154	30571074
9,97	10	100	20	40	60	55	6	FXR512GØ9.97+4MG1M-CU154	30571075
9,98	10	100	20	40	60	55	6	FXR512GØ9.98+4MG1M-CU154	30571076
9,99	10	100	20	40	60	55	6	FXR512GØ9.99+4MG1M-CU154	30571077
10,01	10	100	20	40	60	55	6	FXR512GØ10.01+4MG1M-CU154	30571078
10,02	10	100	20	40	60	55	6	FXR512GØ10.02+4MG1M-CU154	30571079
10,03	10	100	20	40	60	55	6	FXR512GØ10.03+4MG1M-CU154	30571080
11,97	12	100	20	45	55	50	6	FXR512GØ11.97+4MG1M-CU154	30571081
11,98	12	100	20	45	55	50	6	FXR512GØ11.98+4MG1M-CU154	30571082
11,99	12	100	20	45	55	50	6	FXR512GØ11.99+4MG1M-CU154	30571083
12,01	12	100	20	45	55	50	6	FXR512GØ12.01+4MG1M-CU154	30571084
12,02	12	100	20	45	55	50	6	FXR512GØ12.02+4MG1M-CU154	30571085
12,03	12	100	20	45	55	50	6	FXR512GØ12.03+4MG1M-CU154	30571086

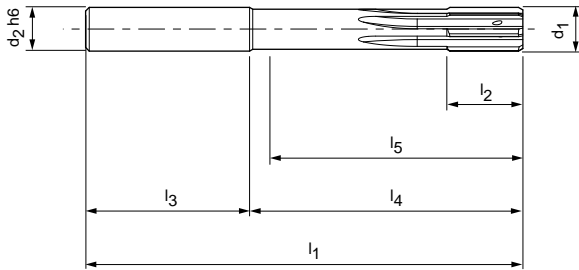
Dimensions in mm.

Cutting data recommendation from page 436.

Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "High-performance reamers FixReam".

FixReam FXR500

Design: Solid carbide
Reamer diameter: 4.00 - 20.00 mm
Lead: MFOA
Cutting material: HP141



Dimensions							z	Specification	Order No.
d_1	$d_2 \text{ h}6$	l_1	l_2	l_3	l_4	l_5			
4,00	6	75	12	36	39	34	4	FXR500Ø4H7MF0A-HP141	30570822
4,50	6	75	12	36	39	34	4	FXR500Ø4.5H7MF0A-HP141	30570823
5,00	6	75	12	36	39	35	4	FXR500Ø5H7MF0A-HP141	30570824
5,50	6	75	12	36	39	35	4	FXR500Ø5.5H7MF0A-HP141	30570825
6,00	6	75	12	36	39	35	4	FXR500Ø6H7MF0A-HP141	30570826
6,50	8	100	16	36	64	59	6	FXR500Ø6.5H7MF0A-HP141	30570827
7,00	8	100	16	36	64	59	6	FXR500Ø7H7MF0A-HP141	30570828
7,50	8	100	16	36	64	60	6	FXR500Ø7.5H7MF0A-HP141	30570829
8,00	8	100	16	36	64	60	6	FXR500Ø8H7MF0A-HP141	30570830
8,50	10	100	20	40	60	55	6	FXR500Ø8.5H7MF0A-HP141	30570831
9,00	10	100	20	40	60	55	6	FXR500Ø9H7MF0A-HP141	30570832
9,50	10	120	20	40	80	76	6	FXR500Ø9.5H7MF0A-HP141	30570833
10,00	10	120	20	40	80	76	6	FXR500Ø10H7MF0A-HP141	30570834
10,50	12	120	20	45	75	70	6	FXR500Ø10.5H7MF0A-HP141	30570835
11,00	12	120	20	45	75	70	6	FXR500Ø11H7MF0A-HP141	30570836
11,50	12	120	20	45	75	71	6	FXR500Ø11.5H7MF0A-HP141	30570837
12,00	12	120	20	45	75	71	6	FXR500Ø12H7MF0A-HP141	30570838
13,00	14	130	22	45	85	80	6	FXR500Ø13H7MF0A-HP141	30570839
14,00	14	130	22	45	85	80	6	FXR500Ø14H7MF0A-HP141	30570840
15,00	16	130	22	48	82	77	6	FXR500Ø15H7MF0A-HP141	30570841
16,00	16	150	25	48	102	97	6	FXR500Ø16H7MF0A-HP141	30570842
17,00	18	150	25	48	102	97	6	FXR500Ø17H7MF0A-HP141	30570843
18,00	18	150	25	48	102	97	6	FXR500Ø18H7MF0A-HP141	30570844
19,00	20	150	25	50	100	95	6	FXR500Ø19H7MF0A-HP141	30570845
20,00	20	150	25	50	100	95	6	FXR500Ø20H7MF0A-HP141	30570846

Dimensions in mm.

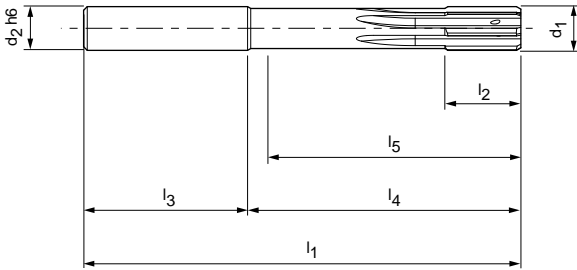
Cutting data recommendation from page 436.

If necessary, the diameter of the reamer must be adapted to the hardening process and the hardness of the parts.

Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "High-performance reamers FixReam".

FixReam FXR500G

Design: Solid carbide
Reamer diameter: 3.97 - 12.03 mm
Lead: MFOA
Cutting material: HP141



Dimensions							z	Specification	Order No.
d ₁ +0.004	d ₂ h6	l ₁	l ₂	l ₃	l ₄	l ₅			
3,97	6	75	12	36	39	34	4	FXR500GØ3.97+4MFOA-HP141	30571303
3,98	6	75	12	36	39	34	4	FXR500GØ3.98+4MFOA-HP141	30571304
3,99	6	75	12	36	39	34	4	FXR500GØ3.99+4MFOA-HP141	30571305
4,01	6	75	12	36	39	34	4	FXR500GØ4.01+4MFOA-HP141	30571306
4,02	6	75	12	36	39	34	4	FXR500GØ4.02+4MFOA-HP141	30571307
4,03	6	75	12	36	39	34	4	FXR500GØ4.03+4MFOA-HP141	30571308
4,97	6	75	12	36	39	35	4	FXR500GØ4.97+4MFOA-HP141	30571309
4,98	6	75	12	36	39	35	4	FXR500GØ4.98+4MFOA-HP141	30571310
4,99	6	75	12	36	39	35	4	FXR500GØ4.99+4MFOA-HP141	30571311
5,01	6	75	12	36	39	35	4	FXR500GØ5.01+4MFOA-HP141	30571312
5,02	6	75	12	36	39	35	4	FXR500GØ5.02+4MFOA-HP141	30571313
5,03	6	75	12	36	39	35	4	FXR500GØ5.03+4MFOA-HP141	30571314
5,97	6	75	12	36	39	35	4	FXR500GØ5.97+4MFOA-HP141	30571315
5,98	6	75	12	36	39	35	4	FXR500GØ5.98+4MFOA-HP141	30571316
5,99	6	75	12	36	39	35	4	FXR500GØ5.99+4MFOA-HP141	30571317
6,01	6	75	12	36	39	35	4	FXR500GØ6.01+4MFOA-HP141	30571318
6,02	6	75	12	36	39	35	4	FXR500GØ6.02+4MFOA-HP141	30571319
6,03	6	75	12	36	39	35	4	FXR500GØ6.03+4MFOA-HP141	30571320
7,97	8	100	16	36	64	60	6	FXR500GØ7.97+4MFOA-HP141	30571321
7,98	8	100	16	36	64	60	6	FXR500GØ7.98+4MFOA-HP141	30571322
7,99	8	100	16	36	64	60	6	FXR500GØ7.99+4MFOA-HP141	30571323
8,01	8	100	16	36	64	60	6	FXR500GØ8.01+4MFOA-HP141	30571324
8,02	8	100	16	36	64	60	6	FXR500GØ8.02+4MFOA-HP141	30571325
8,03	8	100	16	36	64	60	6	FXR500GØ8.03+4MFOA-HP141	30571326
9,97	10	120	20	40	80	76	6	FXR500GØ9.97+4MFOA-HP141	30571327
9,98	10	120	20	40	80	76	6	FXR500GØ9.98+4MFOA-HP141	30571328
9,99	10	120	20	40	80	76	6	FXR500GØ9.99+4MFOA-HP141	30571329
10,01	10	120	20	40	80	76	6	FXR500GØ10.01+4MFOA-HP141	30571330
10,02	10	120	20	40	80	76	6	FXR500GØ10.02+4MFOA-HP141	30571331
10,03	10	120	20	40	80	76	6	FXR500GØ10.03+4MFOA-HP141	30571332
11,97	12	120	20	45	75	71	6	FXR500GØ11.97+4MFOA-HP141	30571333
11,98	12	120	20	45	75	71	6	FXR500GØ11.98+4MFOA-HP141	30571334
11,99	12	120	20	45	75	71	6	FXR500GØ11.99+4MFOA-HP141	30571335
12,01	12	120	20	45	75	71	6	FXR500GØ12.01+4MFOA-HP141	30571336
12,02	12	120	20	45	75	71	6	FXR500GØ12.02+4MFOA-HP141	30571337
12,03	12	120	20	45	75	71	6	FXR500GØ12.03+4MFOA-HP141	30571338

Dimensions in mm.

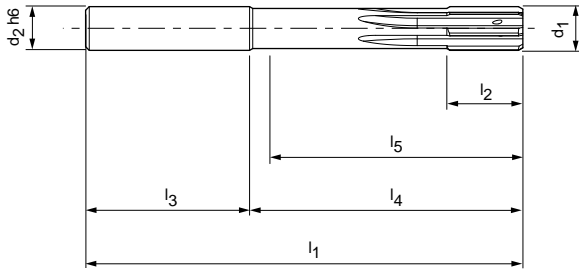
Cutting data recommendation from page 436.

If necessary, the diameter of the reamer must be adapted to the hardening process and the hardness of the parts.

Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "High-performance reamers FixReam".

FixReam FXR500

Design: Solid carbide
Reamer diameter: 4.00 - 20.00 mm
Lead: MG0A
Cutting material: HP622



Dimensions							z	Specification	Order No.
d_1	$d_2 \text{ h}6$	l_1	l_2	l_3	l_4	l_5			
4,00	6	75	12	36	39	34	4	FXR50004H7MG0A-HP622	30570872
4,50	6	75	12	36	39	34	4	FXR50004.5H7MG0A-HP622	30570873
5,00	6	75	12	36	39	35	4	FXR50005H7MG0A-HP622	30570874
5,50	6	75	12	36	39	35	4	FXR50005.5H7MG0A-HP622	30570875
6,00	6	75	12	36	39	35	4	FXR50006H7MG0A-HP622	30570876
6,50	8	100	16	36	64	59	6	FXR50006.5H7MG0A-HP622	30570877
7,00	8	100	16	36	64	59	6	FXR50007H7MG0A-HP622	30570878
7,50	8	100	16	36	64	60	6	FXR50007.5H7MG0A-HP622	30570879
8,00	8	100	16	36	64	60	6	FXR50008H7MG0A-HP622	30570880
8,50	10	100	20	40	60	55	6	FXR50008.5H7MG0A-HP622	30570881
9,00	10	100	20	40	60	55	6	FXR50009H7MG0A-HP622	30570882
9,50	10	120	20	40	80	76	6	FXR50009.5H7MG0A-HP622	30570883
10,00	10	120	20	40	80	76	6	FXR500010H7MG0A-HP622	30570884
10,50	12	120	20	45	75	70	6	FXR500010.5H7MG0A-HP622	30570885
11,00	12	120	20	45	75	70	6	FXR500011H7MG0A-HP622	30570886
11,50	12	120	20	45	75	71	6	FXR500011.5H7MG0A-HP622	30570887
12,00	12	120	20	45	75	71	6	FXR500012H7MG0A-HP622	30570888
13,00	14	130	22	45	85	80	6	FXR500013H7MG0A-HP622	30570889
14,00	14	130	22	45	85	80	6	FXR500014H7MG0A-HP622	30570890
15,00	16	130	22	48	82	77	6	FXR500015H7MG0A-HP622	30570891
16,00	16	150	25	48	102	97	6	FXR500016H7MG0A-HP622	30570892
17,00	18	150	25	48	102	97	6	FXR500017H7MG0A-HP622	30570893
18,00	18	150	25	48	102	97	6	FXR500018H7MG0A-HP622	30570894
19,00	20	150	25	50	100	95	6	FXR500019H7MG0A-HP622	30570895
20,00	20	150	25	50	100	95	6	FXR500020H7MG0A-HP622	30570896

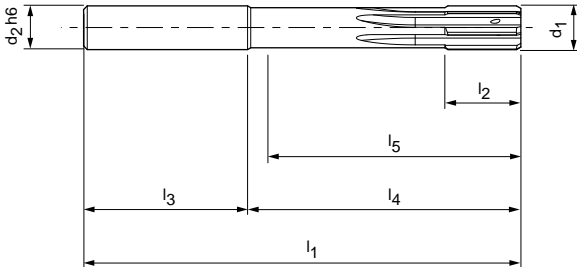
Dimensions in mm.

Cutting data recommendation from page 436.

Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "High-performance reamers FixReam".

FixReam FXR500

Design: HSS
Reamer diameter: 6.00 - 40.00 mm
Lead: MG1M
Cutting material: SP346



Dimensions							z	Specification	Order No.
d_1	$d_2 h6$	l_1	l_2	l_3	l_4	l_5			
6,00	8	100	16	36	64	58	6	FXR50006H7MG1M-SP346	30817465
6,50	8	100	16	36	64	58	6	FXR50006.5H7MG1M-SP346	30817469
7,00	8	100	16	36	64	58	6	FXR50007H7MG1M-SP346	30817470
7,50	8	100	16	36	64	59	6	FXR50007.5H7MG1M-SP346	30817471
8,00	8	100	16	36	64	59	6	FXR50008H7MG1M-SP346	30817475
8,50	10	100	20	40	60	54	6	FXR50008.5H7MG1M-SP346	30817479
9,00	10	100	20	40	60	54	6	FXR50009H7MG1M-SP346	30817480
9,50	10	120	20	40	80	75	6	FXR50009.5H7MG1M-SP346	30817482
10,00	10	120	20	40	80	75	6	FXR500010H7MG1M-SP346	30817486
10,50	12	120	20	45	75	69	6	FXR500010.5H7MG1M-SP346	30817490
11,00	12	120	20	45	75	69	6	FXR500011H7MG1M-SP346	30817491
11,50	12	120	20	45	75	70	6	FXR500011.5H7MG1M-SP346	30817492
12,00	12	120	20	45	75	70	6	FXR500012H7MG1M-SP346	30817496
13,00	14	130	22	45	85	79	6	FXR500013H7MG1M-SP346	30817500
14,00	14	130	22	45	85	80	6	FXR500014H7MG1M-SP346	30817501
15,00	16	130	22	48	82	76	6	FXR500015H7MG1M-SP346	30817502
16,00	16	150	25	48	102	97	6	FXR500016H7MG1M-SP346	30817503
17,00	18	150	25	48	102	96	8	FXR500017H7MG1M-SP346	30817504
18,00	18	150	25	48	102	97	8	FXR500018H7MG1M-SP346	30817505
19,00	20	150	25	50	100	94	8	FXR500019H7MG1M-SP346	30817506
20,00	20	150	25	50	100	95	8	FXR500020H7MG1M-SP346	30817507
21,00	20	160	25	50	110	105	8	FXR500021H7MG1M-SP346	30817508
22,00	20	160	25	50	110	105	8	FXR500022H7MG1M-SP346	30817509
23,00	20	180	25	50	130	125	8	FXR500023H7MG1M-SP346	30817510
24,00	20	180	25	50	130	125	8	FXR500024H7MG1M-SP346	30817511
25,00	20	180	25	50	130	125	8	FXR500025H7MG1M-SP346	30817512
26,00	20	180	25	50	130	125	8	FXR500026H7MG1M-SP346	30817513
27,00	20	180	25	50	130	125	8	FXR500027H7MG1M-SP346	30817514
28,00	25	180	25	56	124	119	8	FXR500028H7MG1M-SP346	30817515
29,00	25	180	25	56	124	119	8	FXR500029H7MG1M-SP346	30817516
30,00	25	200	25	56	144	139	8	FXR500030H7MG1M-SP346	30817517
31,00	25	200	25	56	144	139	8	FXR500031H7MG1M-SP346	30817518
32,00	25	200	25	56	144	139	8	FXR500032H7MG1M-SP346	30817519
33,00	25	200	25	56	144	139	8	FXR500033H7MG1M-SP346	30817520
34,00	25	200	25	56	144	139	8	FXR500034H7MG1M-SP346	30817521
35,00	25	200	25	56	144	139	8	FXR500035H7MG1M-SP346	30817522
36,00	25	200	25	56	144	139	8	FXR500036H7MG1M-SP346	30817523
37,00	25	200	25	56	144	139	8	FXR500037H7MG1M-SP346	30817524
38,00	25	200	25	56	144	139	8	FXR500038H7MG1M-SP346	30817525

FixReam FXR500

Dimensions							z	Specification	Order No.
d ₁	d ₂ h6	l ₁	l ₂	l ₃	l ₄	l ₅			
39,00	25	200	25	56	144	139	8	FXR500Ø39H7MG1M-SP346	30817526
40,00	25	200	25	56	144	139	8	FXR500Ø40H7MG1M-SP346	30817527

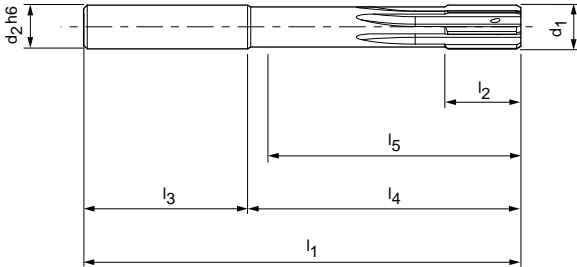
Dimensions in mm.

Cutting data recommendation from page 436.

Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "High-performance reamers FixReam".

FixReam FXR500G

Design: HSS
Reamer diameter: 6.01 - 12.03 mm
Lead: MG1M
Cutting material: SP346



Dimensions							z	Specification	Order No.
d ₁ +0.004	d ₂ h6	l ₁	l ₂	l ₃	l ₄	l ₅			
6,01	8	100	16	36	64	58	6	FXR500GØ6.01+5MG1M-SP346	30817466
6,02	8	100	16	36	64	58	6	FXR500GØ6.02+5MG1M-SP346	30817467
6,03	8	100	16	36	64	58	6	FXR500GØ6.03+5MG1M-SP346	30817468
7,97	8	100	16	36	64	59	6	FXR500GØ7.97+5MG1M-SP346	30817472
7,98	8	100	16	36	64	59	6	FXR500GØ7.98+5MG1M-SP346	30817473
7,99	8	100	16	36	64	59	6	FXR500GØ7.99+5MG1M-SP346	30817474
8,01	8	100	16	36	64	59	6	FXR500GØ8.01+5MG1M-SP346	30817476
8,02	8	100	16	36	64	59	6	FXR500GØ8.02+5MG1M-SP346	30817477
8,03	8	100	16	36	64	59	6	FXR500GØ8.03+5MG1M-SP346	30817478
9,97	10	120	20	40	80	75	6	FXR500GØ9.97+5MG1M-SP346	30817483
9,98	10	120	20	40	80	75	6	FXR500GØ9.98+5MG1M-SP346	30817484
9,99	10	120	20	40	80	75	6	FXR500GØ9.99+5MG1M-SP346	30817485
10,01	10	120	20	40	80	75	6	FXR500GØ10.01+5MG1M-SP346	30817487
10,02	10	120	20	40	80	75	6	FXR500GØ10.02+5MG1M-SP346	30817488
10,03	10	120	20	40	80	75	6	FXR500GØ10.03+5MG1M-SP346	30817489
11,97	12	120	20	45	75	70	6	FXR500GØ11.97+5MG1M-SP346	30817493
11,98	12	120	20	45	75	70	6	FXR500GØ11.98+5MG1M-SP346	30817494
11,99	12	120	20	45	75	70	6	FXR500GØ11.99+5MG1M-SP346	30817495
12,01	12	120	20	45	75	70	6	FXR500GØ12.01+5MG1M-SP346	30817497
12,02	12	120	20	45	75	70	6	FXR500GØ12.02+5MG1M-SP346	30817498
12,03	12	120	20	45	75	70	6	FXR500GØ12.03+5MG1M-SP346	30817499

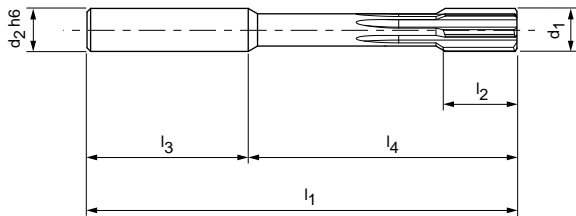
Dimensions in mm.

Cutting data recommendation from page 436.

Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "High-performance reamers FixReam".

FixReam FXR500 PcBN

Design: PcBN head
 Reamer diameter: 3.00 - 10.00 mm
 Lead: MH3F
 Cutting material: FU840



Dimensions						z	Specification	Order No.
d_1	d_2 h6	l_1	l_2	l_3	l_4			
3,00	4	65	12	28	37	6	FXR500Ø3H7MH3F-FU840	30571011
3,50	4	65	12	28	37	6	FXR500Ø3.5H7MH3F-FU840	30571012
4,00	6	75	12	36	39	6	FXR500Ø4H7MH3F-FU840	30571013
4,50	6	75	12	36	39	6	FXR500Ø4.5H7MH3F-FU840	30571014
5,00	6	75	12	36	39	6	FXR500Ø5H7MH3F-FU840	30571015
5,50	6	75	12	36	39	6	FXR500Ø5.5H7MH3F-FU840	30571016
6,00	6	75	12	36	39	8	FXR500Ø6H7MH3F-FU840	30571017
6,50	8	100	16	36	64	8	FXR500Ø6.5H7MH3F-FU840	30571018
7,00	8	100	16	36	64	8	FXR500Ø7H7MH3F-FU840	30571019
7,50	8	100	16	36	64	8	FXR500Ø7.5H7MH3F-FU840	30571020
8,00	8	100	16	36	64	10	FXR500Ø8H7MH3F-FU840	30571021
8,50	10	100	16	40	60	10	FXR500Ø8.5H7MH3F-FU840	30571022
9,00	10	100	16	40	60	10	FXR500Ø9H7MH3F-FU840	30571023
9,50	10	120	20	40	80	10	FXR500Ø9.5H7MH3F-FU840	30571024
10,00	10	120	20	40	80	10	FXR500Ø10H7MH3F-FU840	30571025

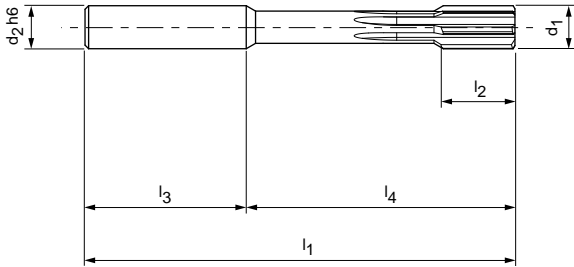
Dimensions in mm.

Cutting data recommendation from page 436.

Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "High-performance reamers FixReam".

FixReam FXR505

Design: Solid carbide
Reamer diameter: 3.00 - 20.00 mm
Lead: MV0A
Cutting material: HU612



Dimensions							z	Specification	Order No.
d_1	$d_2\ h6$	l_1	l_2	l_3	l_4	l_5			
3,00	4	65	12	28	37	33	4	FXR50503H7MV0A-HU612	30570691
3,20	4	65	12	28	37	33	4	FXR50503.2H7MV0A-HU612	30570692
3,50	4	65	12	28	37	33	4	FXR50503.5H7MV0A-HU612	30570693
4,00	6	75	12	36	39	34	4	FXR50504H7MV0A-HU612	30570694
4,50	6	75	12	36	39	34	4	FXR50504.5H7MV0A-HU612	30570695
5,00	6	75	12	36	39	34	4	FXR50505H7MV0A-HU612	30570696
5,50	6	75	12	36	39	34	4	FXR50505.5H7MV0A-HU612	30570697
6,00	6	75	12	36	39	34	4	FXR50506H7MV0A-HU612	30570698
6,50	8	100	16	36	64	58	6	FXR50506.5H7MV0A-HU612	30570699
7,00	8	100	16	36	64	58	6	FXR50507H7MV0A-HU612	30570700
7,50	8	100	16	36	64	58	6	FXR50507.5H7MV0A-HU612	30570701
8,00	8	100	16	36	64	58	6	FXR50508H7MV0A-HU612	30570702
8,50	10	100	20	40	60	54	6	FXR50508.5H7MV0A-HU612	30570703
9,00	10	100	20	40	60	54	6	FXR50509H7MV0A-HU612	30570704
9,50	10	120	20	40	80	74	6	FXR50509.5H7MV0A-HU612	30570705
10,00	10	120	20	40	80	74	6	FXR505010H7MV0A-HU612	30570706
10,50	12	120	20	45	75	68	6	FXR505010.5H7MV0A-HU612	30570707
11,00	12	120	20	45	75	68	6	FXR505011H7MV0A-HU612	30570708
11,50	12	120	20	45	75	68	6	FXR505011.5H7MV0A-HU612	30570709
12,00	12	120	20	45	75	68	6	FXR505012H7MV0A-HU612	30570710
13,00	14	130	22	45	85	78	6	FXR505013H7MV0A-HU612	30570711
14,00	14	130	22	45	85	78	6	FXR505014H7MV0A-HU612	30570712
15,00	16	130	22	48	82	75	6	FXR505015H7MV0A-HU612	30570713
16,00	16	150	25	48	102	95	6	FXR505016H7MV0A-HU612	30570714
17,00	18	150	25	48	102	95	6	FXR505017H7MV0A-HU612	30570715
18,00	18	150	25	48	102	95	6	FXR505018H7MV0A-HU612	30570716
19,00	20	150	25	50	100	92	6	FXR505019H7MV0A-HU612	30570717
20,00	20	150	25	50	100	92	6	FXR505020H7MV0A-HU612	30570718

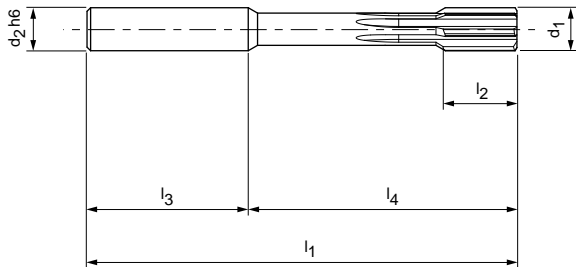
Dimensions in mm.

Cutting data recommendation from page 436.

Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "High-performance reamers FixReam".

FixReam FXR505G

Design: Solid carbide
Reamer diameter: 3.97 - 12.03 mm
Lead: MVOA
Cutting material: HU612



Dimensions							z	Specification	Order No.
d ₁ +0.004	d ₂ h6	l ₁	l ₂	l ₃	l ₄	l ₅			
3,97	6	75	12	36	39	34	4	FXR505G03.97+4MV0A-HU612	30571123
3,98	6	75	12	36	39	34	4	FXR505G03.98+4MV0A-HU612	30571124
3,99	6	75	12	36	39	34	4	FXR505G03.99+4MV0A-HU612	30571125
4,01	6	75	12	36	39	34	4	FXR505G04.01+4MV0A-HU612	30571126
4,02	6	75	12	36	39	34	4	FXR505G04.02+4MV0A-HU612	30571127
4,03	6	75	12	36	39	34	4	FXR505G04.03+4MV0A-HU612	30571128
4,97	6	75	12	36	39	34	4	FXR505G04.97+4MV0A-HU612	30571129
4,98	6	75	12	36	39	34	4	FXR505G04.98+4MV0A-HU612	30571130
4,99	6	75	12	36	39	34	4	FXR505G04.99+4MV0A-HU612	30571131
5,01	6	75	12	36	39	34	4	FXR505G05.01+4MV0A-HU612	30571132
5,02	6	75	12	36	39	34	4	FXR505G05.02+4MV0A-HU612	30571133
5,03	6	75	12	36	39	34	4	FXR505G05.03+4MV0A-HU612	30571134
5,97	6	75	12	36	39	34	4	FXR505G05.97+4MV0A-HU612	30571135
5,98	6	75	12	36	39	34	4	FXR505G05.98+4MV0A-HU612	30571136
5,99	6	75	12	36	39	34	4	FXR505G05.99+4MV0A-HU612	30571137
6,01	6	75	12	36	39	34	4	FXR505G06.01+4MV0A-HU612	30571138
6,02	6	75	12	36	39	34	4	FXR505G06.02+4MV0A-HU612	30571139
6,03	6	75	12	36	39	34	4	FXR505G06.03+4MV0A-HU612	30571140
7,97	8	100	16	36	64	58	6	FXR505G07.97+4MV0A-HU612	30571141
7,98	8	100	16	36	64	58	6	FXR505G07.98+4MV0A-HU612	30571142
7,99	8	100	16	36	64	58	6	FXR505G07.99+4MV0A-HU612	30571143
8,01	8	100	16	36	64	58	6	FXR505G08.01+4MV0A-HU612	30571144
8,02	8	100	16	36	64	58	6	FXR505G08.02+4MV0A-HU612	30571145
8,03	8	100	16	36	64	58	6	FXR505G08.03+4MV0A-HU612	30571146
9,97	10	120	20	40	80	74	6	FXR505G09.97+4MV0A-HU612	30571147
9,98	10	120	20	40	80	74	6	FXR505G09.98+4MV0A-HU612	30571148
9,99	10	120	20	40	80	74	6	FXR505G09.99+4MV0A-HU612	30571149
10,01	10	120	20	40	80	74	6	FXR505G010.01+4MV0A-HU612	30571150
10,02	10	120	20	40	80	74	6	FXR505G010.02+4MV0A-HU612	30571151
10,03	10	120	20	40	80	74	6	FXR505G010.03+4MV0A-HU612	30571152
11,97	12	120	20	45	75	68	6	FXR505G011.97+4MV0A-HU612	30571153
11,98	12	120	20	45	75	68	6	FXR505G011.98+4MV0A-HU612	30571154
11,99	12	120	20	45	75	68	6	FXR505G011.99+4MV0A-HU612	30571155
12,01	12	120	20	45	75	68	6	FXR505G012.01+4MV0A-HU612	30571156
12,02	12	120	20	45	75	68	6	FXR505G012.02+4MV0A-HU612	30571157
12,03	12	120	20	45	75	68	6	FXR505G012.03+4MV0A-HU612	30571158

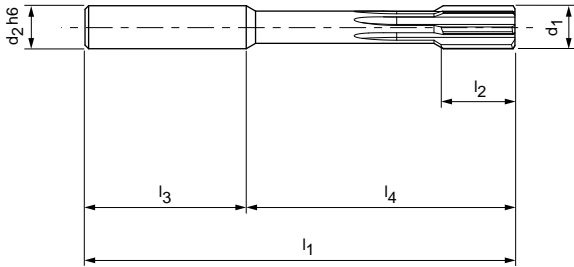
Dimensions in mm.

Cutting data recommendation from page 436.

Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "High-performance reamers FixReam".

FixReam FXR505

Design: Solid carbide
Reamer diameter: 3.00 - 20.00 mm
Lead: MV0A
Cutting material: HP145



Dimensions							z	Specification	Order No.
d_1	$d_2\ h6$	l_1	l_2	l_3	l_4	l_5			
3,00	4	65	12	28	37	33	4	FXR505Ø3H7MV0A-HP145	30601767
3,20	4	65	12	28	37	33	4	FXR505Ø3.2H7MV0A-HP145	30601768
3,50	4	65	12	28	37	33	4	FXR505Ø3.5H7MV0A-HP145	30601770
4,00	6	75	12	36	39	34	4	FXR505Ø4H7MV0A-HP145	30570747
4,50	6	75	12	36	39	34	4	FXR505Ø4.5H7MV0A-HP145	30570748
5,00	6	75	12	36	39	34	4	FXR505Ø5H7MV0A-HP145	30570749
5,50	6	75	12	36	39	34	4	FXR505Ø5.5H7MV0A-HP145	30570750
6,00	6	75	12	36	39	34	4	FXR505Ø6H7MV0A-HP145	30570751
6,50	8	100	16	36	64	58	6	FXR505Ø6.5H7MV0A-HP145	30570752
7,00	8	100	16	36	64	58	6	FXR505Ø7H7MV0A-HP145	30570753
7,50	8	100	16	36	64	58	6	FXR505Ø7.5H7MV0A-HP145	30570754
8,00	8	100	16	36	64	58	6	FXR505Ø8H7MV0A-HP145	30570755
8,50	10	100	20	40	60	54	6	FXR505Ø8.5H7MV0A-HP145	30570756
9,00	10	100	20	40	60	54	6	FXR505Ø9H7MV0A-HP145	30570757
9,50	10	120	20	40	80	74	6	FXR505Ø9.5H7MV0A-HP145	30570758
10,00	10	120	20	40	80	74	6	FXR505Ø10H7MV0A-HP145	30570759
10,50	12	120	20	45	75	68	6	FXR505Ø10.5H7MV0A-HP145	30570760
11,00	12	120	20	45	75	68	6	FXR505Ø11H7MV0A-HP145	30570761
11,50	12	120	20	45	75	68	6	FXR505Ø11.5H7MV0A-HP145	30570762
12,00	12	120	20	45	75	68	6	FXR505Ø12H7MV0A-HP145	30570763
13,00	14	130	22	45	85	78	6	FXR505Ø13H7MV0A-HP145	30570764
14,00	14	130	22	45	85	78	6	FXR505Ø14H7MV0A-HP145	30570765
15,00	16	130	22	48	82	75	6	FXR505Ø15H7MV0A-HP145	30570766
16,00	16	150	25	48	102	95	6	FXR505Ø16H7MV0A-HP145	30570767
17,00	18	150	25	48	102	95	6	FXR505Ø17H7MV0A-HP145	30570768
18,00	18	150	25	48	102	95	6	FXR505Ø18H7MV0A-HP145	30570769
19,00	20	150	25	50	100	92	6	FXR505Ø19H7MV0A-HP145	30570770
20,00	20	150	25	50	100	92	6	FXR505Ø20H7MV0A-HP145	30570771

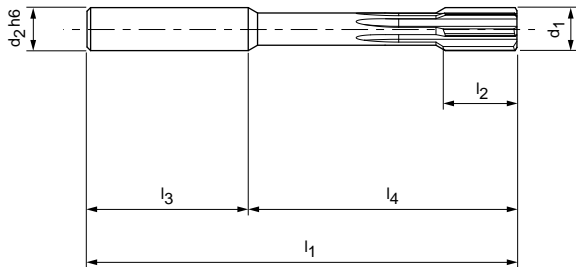
Dimensions in mm.

Cutting data recommendation from page 436.

Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "High-performance reamers FixReam".

FixReam FXR505G

Design: Solid carbide
Reamer diameter: 3.97 - 12.03 mm
Lead: MV0A
Cutting material: HP145



Dimensions							z	Specification	Order No.
d ₁ +0.004	d ₂ h6	l ₁	l ₂	l ₃	l ₄	l ₅			
3,97	6	75	12	36	39	34	4	FXR505GØ3.97+4MV0A-HP145	30571267
3,98	6	75	12	36	39	34	4	FXR505GØ3.98+4MV0A-HP145	30571268
3,99	6	75	12	36	39	34	4	FXR505GØ3.99+4MV0A-HP145	30571269
4,01	6	75	12	36	39	34	4	FXR505GØ4.01+4MV0A-HP145	30571270
4,02	6	75	12	36	39	34	4	FXR505GØ4.02+4MV0A-HP145	30571271
4,03	6	75	12	36	39	34	4	FXR505GØ4.03+4MV0A-HP145	30571272
4,97	6	75	12	36	39	34	4	FXR505GØ4.97+4MV0A-HP145	30571273
4,98	6	75	12	36	39	34	4	FXR505GØ4.98+4MV0A-HP145	30571274
4,99	6	75	12	36	39	34	4	FXR505GØ4.99+4MV0A-HP145	30571275
5,01	6	75	12	36	39	34	4	FXR505GØ5.01+4MV0A-HP145	30571276
5,02	6	75	12	36	39	34	4	FXR505GØ5.02+4MV0A-HP145	30571277
5,03	6	75	12	36	39	34	4	FXR505GØ5.03+4MV0A-HP145	30571278
5,97	6	75	12	36	39	34	4	FXR505GØ5.97+4MV0A-HP145	30571279
5,98	6	75	12	36	39	34	4	FXR505GØ5.98+4MV0A-HP145	30571280
5,99	6	75	12	36	39	34	4	FXR505GØ5.99+4MV0A-HP145	30571281
6,01	6	75	12	36	39	34	4	FXR505GØ6.01+4MV0A-HP145	30571282
6,02	6	75	12	36	39	34	4	FXR505GØ6.02+4MV0A-HP145	30571283
6,03	6	75	12	36	39	34	4	FXR505GØ6.03+4MV0A-HP145	30571284
7,97	8	100	16	36	64	58	6	FXR505GØ7.97+4MV0A-HP145	30571285
7,98	8	100	16	36	64	58	6	FXR505GØ7.98+4MV0A-HP145	30571286
7,99	8	100	16	36	64	58	6	FXR505GØ7.99+4MV0A-HP145	30571287
8,01	8	100	16	36	64	58	6	FXR505GØ8.01+4MV0A-HP145	30571288
8,02	8	100	16	36	64	58	6	FXR505GØ8.02+4MV0A-HP145	30571289
8,03	8	100	16	36	64	58	6	FXR505GØ8.03+4MV0A-HP145	30571290
9,97	10	120	20	40	80	74	6	FXR505GØ9.97+4MV0A-HP145	30571291
9,98	10	120	20	40	80	74	6	FXR505GØ9.98+4MV0A-HP145	30571292
9,99	10	120	20	40	80	74	6	FXR505GØ9.99+4MV0A-HP145	30571293
10,01	10	120	20	40	80	74	6	FXR505GØ10.01+4MV0A-HP145	30571294
10,02	10	120	20	40	80	74	6	FXR505GØ10.02+4MV0A-HP145	30571295
10,03	10	120	20	40	80	74	6	FXR505GØ10.03+4MV0A-HP145	30571296
11,97	12	120	20	45	75	68	6	FXR505GØ11.97+4MV0A-HP145	30571297
11,98	12	120	20	45	75	68	6	FXR505GØ11.98+4MV0A-HP145	30571298
11,99	12	120	20	45	75	68	6	FXR505GØ11.99+4MV0A-HP145	30571299
12,01	12	120	20	45	75	68	6	FXR505GØ12.01+4MV0A-HP145	30571300
12,02	12	120	20	45	75	68	6	FXR505GØ12.02+4MV0A-HP145	30571301
12,03	12	120	20	45	75	68	6	FXR505GØ12.03+4MV0A-HP145	30571302

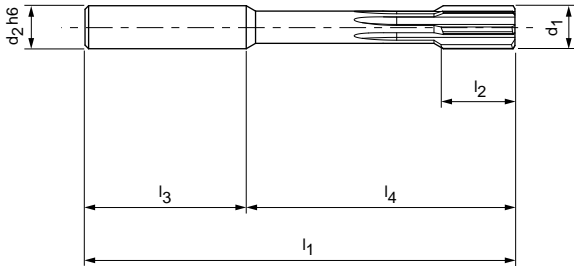
Dimensions in mm.

Cutting data recommendation from page 436.

Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "High-performance reamers FixReam".

FixReam FXR505

Design: Solid carbide
Reamer diameter: 4.00 - 20.00 mm
Lead: MT0A
Cutting material: HP141



Dimensions							z	Specification	Order No.
d_1	$d_2 h_6$	l_1	l_2	l_3	l_4	l_5			
4,00	6	75	12	36	39	34	4	FXR505Ø4H7MT0A-HP141	30570847
4,50	6	75	12	36	39	34	4	FXR505Ø4.5H7MT0A-HP141	30570848
5,00	6	75	12	36	39	34	4	FXR505Ø5H7MT0A-HP141	30570849
5,50	6	75	12	36	39	34	4	FXR505Ø5.5H7MT0A-HP141	30570850
6,00	6	75	12	36	39	34	4	FXR505Ø6H7MT0A-HP141	30570851
6,50	8	100	16	36	64	58	6	FXR505Ø6.5H7MT0A-HP141	30570852
7,00	8	100	16	36	64	58	6	FXR505Ø7H7MT0A-HP141	30570853
7,50	8	100	16	36	64	58	6	FXR505Ø7.5H7MT0A-HP141	30570854
8,00	8	100	16	36	64	58	6	FXR505Ø8H7MT0A-HP141	30570855
8,50	10	100	20	40	60	54	6	FXR505Ø8.5H7MT0A-HP141	30570856
9,00	10	100	20	40	60	54	6	FXR505Ø9H7MT0A-HP141	30570857
9,50	10	120	20	40	80	74	6	FXR505Ø9.5H7MT0A-HP141	30570858
10,00	10	120	20	40	80	74	6	FXR505Ø10H7MT0A-HP141	30570859
10,50	12	120	20	45	75	68	6	FXR505Ø10.5H7MT0A-HP141	30570860
11,00	12	120	20	45	75	68	6	FXR505Ø11H7MT0A-HP141	30570861
11,50	12	120	20	45	75	68	6	FXR505Ø11.5H7MT0A-HP141	30570862
12,00	12	120	20	45	75	68	6	FXR505Ø12H7MT0A-HP141	30570863
13,00	14	130	22	45	85	78	6	FXR505Ø13H7MT0A-HP141	30570864
14,00	14	130	22	45	85	78	6	FXR505Ø14H7MT0A-HP141	30570865
15,00	16	130	22	48	82	75	6	FXR505Ø15H7MT0A-HP141	30570866
16,00	16	150	25	48	102	95	6	FXR505Ø16H7MT0A-HP141	30570867
17,00	18	150	25	48	102	95	6	FXR505Ø17H7MT0A-HP141	30570868
18,00	18	150	25	48	102	95	6	FXR505Ø18H7MT0A-HP141	30570869
19,00	20	150	25	50	100	92	6	FXR505Ø19H7MT0A-HP141	30570870
20,00	20	150	25	50	100	92	6	FXR505Ø20H7MT0A-HP141	30570871

Dimensions in mm.

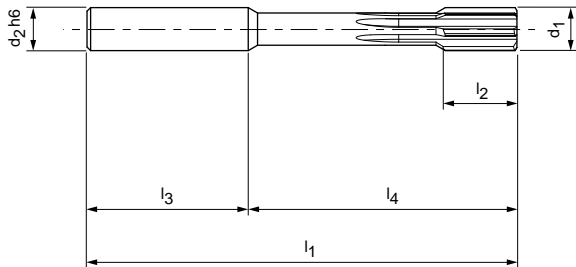
Cutting data recommendation from page 436.

If necessary, the diameter of the reamer must be adapted to the hardening process and the hardness of the parts.

Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "High-performance reamers FixReam".

FixReam FXR505G

Design: Solid carbide
Reamer diameter: 3.97 - 12.03 mm
Lead: MTOA
Cutting material: HP141



Dimensions							z	Specification	Order No.
d ₁ +0.004	d ₂ h6	l ₁	l ₂	l ₃	l ₄	l ₅			
3,97	6	75	12	36	39	34	4	FXR505GØ3.97+4MTOA-HP141	30571339
3,98	6	75	12	36	39	34	4	FXR505GØ3.98+4MTOA-HP141	30571340
3,99	6	75	12	36	39	34	4	FXR505GØ3.99+4MTOA-HP141	30571341
4,01	6	75	12	36	39	34	4	FXR505GØ4.01+4MTOA-HP141	30571342
4,02	6	75	12	36	39	34	4	FXR505GØ4.02+4MTOA-HP141	30571343
4,03	6	75	12	36	39	34	4	FXR505GØ4.03+4MTOA-HP141	30571344
4,97	6	75	12	36	39	34	4	FXR505GØ4.97+4MTOA-HP141	30571345
4,98	6	75	12	36	39	34	4	FXR505GØ4.98+4MTOA-HP141	30571346
4,99	6	75	12	36	39	34	4	FXR505GØ4.99+4MTOA-HP141	30571347
5,01	6	75	12	36	39	34	4	FXR505GØ5.01+4MTOA-HP141	30571348
5,02	6	75	12	36	39	34	4	FXR505GØ5.02+4MTOA-HP141	30571349
5,03	6	75	12	36	39	34	4	FXR505GØ5.03+4MTOA-HP141	30571350
5,97	6	75	12	36	39	34	4	FXR505GØ5.97+4MTOA-HP141	30571351
5,98	6	75	12	36	39	34	4	FXR505GØ5.98+4MTOA-HP141	30571352
5,99	6	75	12	36	39	34	4	FXR505GØ5.99+4MTOA-HP141	30571353
6,01	6	75	12	36	39	34	4	FXR505GØ6.01+4MTOA-HP141	30571354
6,02	6	75	12	36	39	34	4	FXR505GØ6.02+4MTOA-HP141	30571355
6,03	6	75	12	36	39	34	4	FXR505GØ6.03+4MTOA-HP141	30571356
7,97	8	100	16	36	64	58	6	FXR505GØ7.97+4MTOA-HP141	30571357
7,98	8	100	16	36	64	58	6	FXR505GØ7.98+4MTOA-HP141	30571358
7,99	8	100	16	36	64	58	6	FXR505GØ7.99+4MTOA-HP141	30571359
8,01	8	100	16	36	64	58	6	FXR505GØ8.01+4MTOA-HP141	30571360
8,02	8	100	16	36	64	58	6	FXR505GØ8.02+4MTOA-HP141	30571361
8,03	8	100	16	36	64	58	6	FXR505GØ8.03+4MTOA-HP141	30571362
9,97	10	120	20	40	80	74	6	FXR505GØ9.97+4MTOA-HP141	30571363
9,98	10	120	20	40	80	74	6	FXR505GØ9.98+4MTOA-HP141	30571364
9,99	10	120	20	40	80	74	6	FXR505GØ9.99+4MTOA-HP141	30571365
10,01	10	120	20	40	80	74	6	FXR505GØ10.01+4MTOA-HP141	30571366
10,02	10	120	20	40	80	74	6	FXR505GØ10.02+4MTOA-HP141	30571367
10,03	10	120	20	40	80	74	6	FXR505GØ10.03+4MTOA-HP141	30571368
11,97	12	120	20	45	75	68	6	FXR505GØ11.97+4MTOA-HP141	30571369
11,98	12	120	20	45	75	68	6	FXR505GØ11.98+4MTOA-HP141	30571370
11,99	12	120	20	45	75	68	6	FXR505GØ11.99+4MTOA-HP141	30571371
12,01	12	120	20	45	75	68	6	FXR505GØ12.01+4MTOA-HP141	30571372
12,02	12	120	20	45	75	68	6	FXR505GØ12.02+4MTOA-HP141	30571373
12,03	12	120	20	45	75	68	6	FXR505GØ12.03+4MTOA-HP141	30571374

Dimensions in mm.

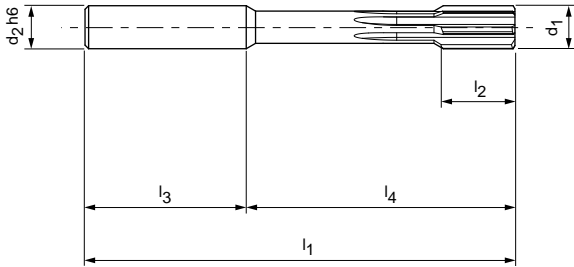
Cutting data recommendation from page 436.

If necessary, the diameter of the reamer must be adapted to the hardening process and the hardness of the parts.

Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "High-performance reamers FixReam".

FixReam FXR505

Design: Solid carbide
Reamer diameter: 4.00 - 20.00 mm
Lead: MT0A
Cutting material: HP145



Dimensions							z	Specification	Order No.
d_1	$d_2\ h6$	l_1	l_2	l_3	l_4	l_5			
4,00	6	75	12	36	39	34	4	FXR505Ø4H7MT0A-HP145	30570797
4,50	6	75	12	36	39	34	4	FXR505Ø4.5H7MT0A-HP145	30570798
5,00	6	75	12	36	39	34	4	FXR505Ø5H7MT0A-HP145	30570799
5,50	6	75	12	36	39	34	4	FXR505Ø5.5H7MT0A-HP145	30570800
6,00	6	75	12	36	39	34	4	FXR505Ø6H7MT0A-HP145	30570801
6,50	8	100	16	36	64	58	6	FXR505Ø6.5H7MT0A-HP145	30570802
7,00	8	100	16	36	64	58	6	FXR505Ø7H7MT0A-HP145	30570803
7,50	8	100	16	36	64	58	6	FXR505Ø7.5H7MT0A-HP145	30570804
8,00	8	100	16	36	64	58	6	FXR505Ø8H7MT0A-HP145	30570805
8,50	10	100	20	40	60	54	6	FXR505Ø8.5H7MT0A-HP145	30570806
9,00	10	100	20	40	60	54	6	FXR505Ø9H7MT0A-HP145	30570807
9,50	10	120	20	40	80	74	6	FXR505Ø9.5H7MT0A-HP145	30570808
10,00	10	120	20	40	80	74	6	FXR505Ø10H7MT0A-HP145	30570809
10,50	12	120	20	45	75	68	6	FXR505Ø10.5H7MT0A-HP145	30570810
11,00	12	120	20	45	75	68	6	FXR505Ø11H7MT0A-HP145	30570811
11,50	12	120	20	45	75	68	6	FXR505Ø11.5H7MT0A-HP145	30570812
12,00	12	120	20	45	75	68	6	FXR505Ø12H7MT0A-HP145	30570813
13,00	14	130	22	45	85	78	6	FXR505Ø13H7MT0A-HP145	30570814
14,00	14	130	22	45	85	78	6	FXR505Ø14H7MT0A-HP145	30570815
15,00	16	130	22	48	82	75	6	FXR505Ø15H7MT0A-HP145	30570816
16,00	16	150	25	48	102	95	6	FXR505Ø16H7MT0A-HP145	30570817
17,00	18	150	25	48	102	95	6	FXR505Ø17H7MT0A-HP145	30570818
18,00	18	150	25	48	102	95	6	FXR505Ø18H7MT0A-HP145	30570819
19,00	20	150	25	50	100	92	6	FXR505Ø19H7MT0A-HP145	30570820
20,00	20	150	25	50	100	92	6	FXR505Ø20H7MT0A-HP145	30570821

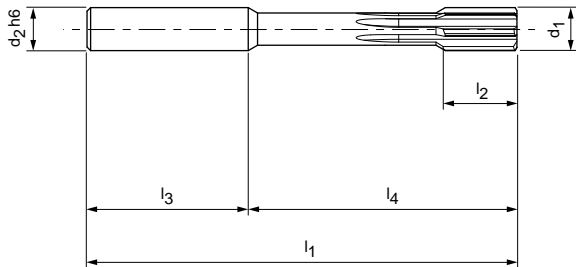
Dimensions in mm.

Cutting data recommendation from page 436.

Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "High-performance reamers FixReam".

FixReam FXR505G

Design: Solid carbide
Reamer diameter: 3.97 - 12.03 mm
Lead: MTOA
Cutting material: HP145



Dimensions							z	Specification	Order No.
d ₁ +0.004	d ₂ h6	l ₁	l ₂	l ₃	l ₄	l ₅			
3,97	6	75	12	36	39	34	4	FXR505GØ3.97+4MT0A-HP145	30571195
3,98	6	75	12	36	39	34	4	FXR505GØ3.98+4MT0A-HP145	30571196
3,99	6	75	12	36	39	34	4	FXR505GØ3.99+4MT0A-HP145	30571197
4,01	6	75	12	36	39	34	4	FXR505GØ4.01+4MT0A-HP145	30571198
4,02	6	75	12	36	39	34	4	FXR505GØ4.02+4MT0A-HP145	30571199
4,03	6	75	12	36	39	34	4	FXR505GØ4.03+4MT0A-HP145	30571200
4,97	6	75	12	36	39	34	4	FXR505GØ4.97+4MT0A-HP145	30571201
4,98	6	75	12	36	39	34	4	FXR505GØ4.98+4MT0A-HP145	30571202
4,99	6	75	12	36	39	34	4	FXR505GØ4.99+4MT0A-HP145	30571203
5,01	6	75	12	36	39	34	4	FXR505GØ5.01+4MT0A-HP145	30571204
5,02	6	75	12	36	39	34	4	FXR505GØ5.02+4MT0A-HP145	30571205
5,03	6	75	12	36	39	34	4	FXR505GØ5.03+4MT0A-HP145	30571206
5,97	6	75	12	36	39	34	4	FXR505GØ5.97+4MT0A-HP145	30571207
5,98	6	75	12	36	39	34	4	FXR505GØ5.98+4MT0A-HP145	30571208
5,99	6	75	12	36	39	34	4	FXR505GØ5.99+4MT0A-HP145	30571209
6,01	6	75	12	36	39	34	4	FXR505GØ6.01+4MT0A-HP145	30571210
6,02	6	75	12	36	39	34	4	FXR505GØ6.02+4MT0A-HP145	30571211
6,03	6	75	12	36	39	34	4	FXR505GØ6.03+4MT0A-HP145	30571212
7,97	8	100	16	36	64	58	6	FXR505GØ7.97+4MT0A-HP145	30571213
7,98	8	100	16	36	64	58	6	FXR505GØ7.98+4MT0A-HP145	30571214
7,99	8	100	16	36	64	58	6	FXR505GØ7.99+4MT0A-HP145	30571215
8,01	8	100	16	36	64	58	6	FXR505GØ8.01+4MT0A-HP145	30571216
8,02	8	100	16	36	64	58	6	FXR505GØ8.02+4MT0A-HP145	30571217
8,03	8	100	16	36	64	58	6	FXR505GØ8.03+4MT0A-HP145	30571218
9,97	10	120	20	40	80	74	6	FXR505GØ9.97+4MT0A-HP145	30571219
9,98	10	120	20	40	80	74	6	FXR505GØ9.98+4MT0A-HP145	30571220
9,99	10	120	20	40	80	74	6	FXR505GØ9.99+4MT0A-HP145	30571221
10,01	10	120	20	40	80	74	6	FXR505GØ10.01+4MT0A-HP145	30571222
10,02	10	120	20	40	80	74	6	FXR505GØ10.02+4MT0A-HP145	30571223
10,03	10	120	20	40	80	74	6	FXR505GØ10.03+4MT0A-HP145	30571224
11,97	12	120	20	45	75	68	6	FXR505GØ11.97+4MT0A-HP145	30571225
11,98	12	120	20	45	75	68	6	FXR505GØ11.98+4MT0A-HP145	30571226
11,99	12	120	20	45	75	68	6	FXR505GØ11.99+4MT0A-HP145	30571227
12,01	12	120	20	45	75	68	6	FXR505GØ12.01+4MT0A-HP145	30571228
12,02	12	120	20	45	75	68	6	FXR505GØ12.02+4MT0A-HP145	30571229
12,03	12	120	20	45	75	68	6	FXR505GØ12.03+4MT0A-HP145	30571230

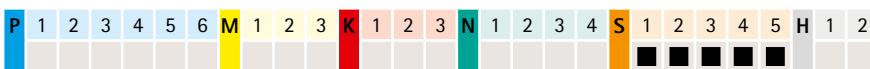
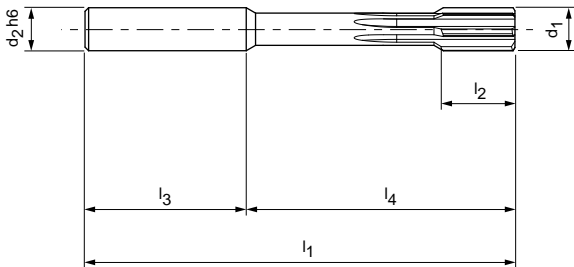
Dimensions in mm.

Cutting data recommendation from page 436.

Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "High-performance reamers FixReam".

FixReam FXR505

Design: Solid carbide
Reamer diameter: 4.00 - 20.00 mm
Lead: MT0A
Cutting material: HP613



Dimensions							z	Specification	Order No.
d_1	$d_2 h_6$	l_1	l_2	l_3	l_4	l_5			
4,00	6	75	12	36	39	34	4	FXR505Ø4H7MT0A-HP613	30584932
4,50	6	75	12	36	39	34	4	FXR505Ø4.5H7MT0A-HP613	30584933
5,00	6	75	12	36	39	34	4	FXR505Ø5H7MT0A-HP613	30584934
5,50	6	75	12	36	39	34	4	FXR505Ø5.5H7MT0A-HP613	30584935
6,00	6	75	12	36	39	34	4	FXR505Ø6H7MT0A-HP613	30584936
6,50	8	100	16	36	64	58	6	FXR505Ø6.5H7MT0A-HP613	30584937
7,00	8	100	16	36	64	58	6	FXR505Ø7H7MT0A-HP613	30584938
7,50	8	100	16	36	64	58	6	FXR505Ø7.5H7MT0A-HP613	30584939
8,00	8	100	16	36	64	58	6	FXR505Ø8H7MT0A-HP613	30584940
8,50	10	100	20	40	60	54	6	FXR505Ø8.5H7MT0A-HP613	30584941
9,00	10	100	20	40	60	54	6	FXR505Ø9H7MT0A-HP613	30584942
9,50	10	120	20	40	80	74	6	FXR505Ø9.5H7MT0A-HP613	30584943
10,00	10	120	20	40	80	74	6	FXR505Ø10H7MT0A-HP613	30584944
10,50	12	120	20	45	75	68	6	FXR505Ø10.5H7MT0A-HP613	30584945
11,00	12	120	20	45	75	68	6	FXR505Ø11H7MT0A-HP613	30584946
11,50	12	120	20	45	75	68	6	FXR505Ø11.5H7MT0A-HP613	30584947
12,00	12	120	20	45	75	68	6	FXR505Ø12H7MT0A-HP613	30584948
13,00	14	130	22	45	85	78	6	FXR505Ø13H7MT0A-HP613	30584949
14,00	14	130	22	45	85	78	6	FXR505Ø14H7MT0A-HP613	30584950
15,00	16	130	22	48	82	75	6	FXR505Ø15H7MT0A-HP613	30584951
16,00	16	150	25	48	102	95	6	FXR505Ø16H7MT0A-HP613	30584952
17,00	18	150	25	48	102	95	8	FXR505Ø17H7MT0A-HP613	30584953
18,00	18	150	25	48	102	95	8	FXR505Ø18H7MT0A-HP613	30584954
19,00	20	150	25	50	100	92	8	FXR505Ø19H7MT0A-HP613	30584955
20,00	20	150	25	50	100	92	8	FXR505Ø20H7MT0A-HP613	30584956

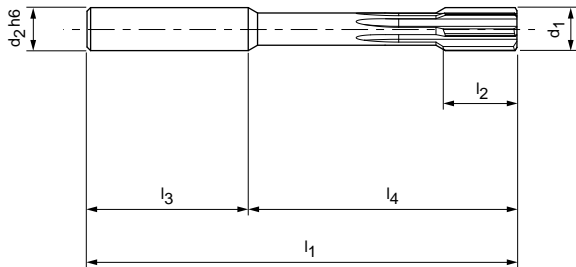
Dimensions in mm.

Cutting data recommendation from page 436.

Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "High-performance reamers FixReam".

FixReam FXR505G

Design: Solid carbide
Reamer diameter: 3.97 - 12.03 mm
Lead: MTOA
Cutting material: HP613



Dimensions							z	Specification	Order No.
$d_1 +0.004$	$d_2 h6$	l_1	l_2	l_3	l_4	l_5			
3,97	6	75	12	36	39	34	4	FXR505GØ3.97+4MT0A-HP613	30584957
3,98	6	75	12	36	39	34	4	FXR505GØ3.98+4MT0A-HP613	30584958
3,99	6	75	12	36	39	34	4	FXR505GØ3.99+4MT0A-HP613	30584959
4,01	6	75	12	36	39	34	4	FXR505GØ4.01+4MT0A-HP613	30584960
4,02	6	75	12	36	39	34	4	FXR505GØ4.02+4MT0A-HP613	30584961
4,03	6	75	12	36	39	34	4	FXR505GØ4.03+4MT0A-HP613	30584962
4,97	6	75	12	36	39	34	4	FXR505GØ4.97+4MT0A-HP613	30584963
4,98	6	75	12	36	39	34	4	FXR505GØ4.98+4MT0A-HP613	30584964
4,99	6	75	12	36	39	34	4	FXR505GØ4.99+4MT0A-HP613	30584965
5,01	6	75	12	36	39	34	4	FXR505GØ5.01+4MT0A-HP613	30584966
5,02	6	75	12	36	39	34	4	FXR505GØ5.02+4MT0A-HP613	30584967
5,03	6	75	12	36	39	34	4	FXR505GØ5.03+4MT0A-HP613	30584968
5,97	6	75	12	36	39	34	4	FXR505GØ5.97+4MT0A-HP613	30584969
5,98	6	75	12	36	39	34	4	FXR505GØ5.98+4MT0A-HP613	30584970
5,99	6	75	12	36	39	34	4	FXR505GØ5.99+4MT0A-HP613	30584971
6,01	6	75	12	36	39	34	4	FXR505GØ6.01+4MT0A-HP613	30584972
6,02	6	75	12	36	39	34	4	FXR505GØ6.02+4MT0A-HP613	30584973
6,03	6	75	12	36	39	34	4	FXR505GØ6.03+4MT0A-HP613	30584974
7,97	8	100	16	36	64	58	6	FXR505GØ7.97+4MT0A-HP613	30584975
7,98	8	100	16	36	64	58	6	FXR505GØ7.98+4MT0A-HP613	30584976
7,99	8	100	16	36	64	58	6	FXR505GØ7.99+4MT0A-HP613	30584977
8,01	8	100	16	36	64	58	6	FXR505GØ8.01+4MT0A-HP613	30584978
8,02	8	100	16	36	64	58	6	FXR505GØ8.02+4MT0A-HP613	30584979
8,03	8	100	16	36	64	58	6	FXR505GØ8.03+4MT0A-HP613	30584980
9,97	10	120	20	40	80	74	6	FXR505GØ9.97+4MT0A-HP613	30584981
9,98	10	120	20	40	80	74	6	FXR505GØ9.98+4MT0A-HP613	30584982
9,99	10	120	20	40	80	74	6	FXR505GØ9.99+4MT0A-HP613	30584983
10,01	10	120	20	40	80	74	6	FXR505GØ10.01+4MT0A-HP613	30584984
10,02	10	120	20	40	80	74	6	FXR505GØ10.02+4MT0A-HP613	30584985
10,03	10	120	20	40	80	74	6	FXR505GØ10.03+4MT0A-HP613	30584986
11,97	12	120	20	45	75	68	6	FXR505GØ11.97+4MT0A-HP613	30584987
11,98	12	120	20	45	75	68	6	FXR505GØ11.98+4MT0A-HP613	30584988
11,99	12	120	20	45	75	68	6	FXR505GØ11.99+4MT0A-HP613	30584989
12,01	12	120	20	45	75	68	6	FXR505GØ12.01+4MT0A-HP613	30584990
12,02	12	120	20	45	75	68	6	FXR505GØ12.02+4MT0A-HP613	30584991
12,03	12	120	20	45	75	68	6	FXR505GØ12.03+4MT0A-HP613	30584992

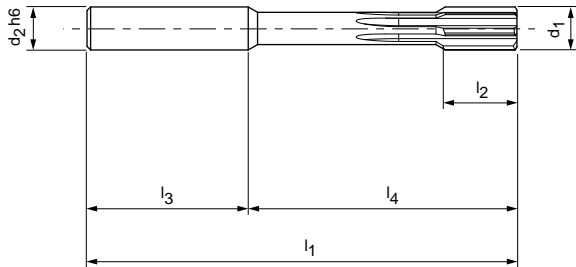
Dimensions in mm.

Cutting data recommendation from page 436.

Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "High-performance reamers FixReam".

FixReam FXR505

Design: Solid carbide
Reamer diameter: 4.00 - 20.00 mm
Lead: MV0A
Cutting material: HP622



Dimensions							z	Specification	Order No.
d_1	$d_2 h6$	l_1	l_2	l_3	l_4	l_5			
4,00	6	75	12	36	39	34	4	FXR505Ø4H7MV0A-HP622	30570897
4,50	6	75	12	36	39	34	4	FXR505Ø4.5H7MV0A-HP622	30570898
5,00	6	75	12	36	39	34	4	FXR505Ø5H7MV0A-HP622	30570899
5,50	6	75	12	36	39	34	4	FXR505Ø5.5H7MV0A-HP622	30570900
6,00	6	75	12	36	39	34	4	FXR505Ø6H7MV0A-HP622	30570901
6,50	8	100	16	36	64	58	6	FXR505Ø6.5H7MV0A-HP622	30570902
7,00	8	100	16	36	64	58	6	FXR505Ø7H7MV0A-HP622	30570903
7,50	8	100	16	36	64	58	6	FXR505Ø7.5H7MV0A-HP622	30570904
8,00	8	100	16	36	64	58	6	FXR505Ø8H7MV0A-HP622	30570905
8,50	10	100	20	40	60	54	6	FXR505Ø8.5H7MV0A-HP622	30570906
9,00	10	100	20	40	60	54	6	FXR505Ø9H7MV0A-HP622	30570907
9,50	10	120	20	40	80	74	6	FXR505Ø9.5H7MV0A-HP622	30570908
10,00	10	120	20	40	80	74	6	FXR505Ø10H7MV0A-HP622	30570909
10,50	12	120	20	45	75	68	6	FXR505Ø10.5H7MV0A-HP622	30570910
11,00	12	120	20	45	75	68	6	FXR505Ø11H7MV0A-HP622	30570911
11,50	12	120	20	45	75	68	6	FXR505Ø11.5H7MV0A-HP622	30570912
12,00	12	120	20	45	75	68	6	FXR505Ø12H7MV0A-HP622	30570913
13,00	14	130	22	45	85	78	6	FXR505Ø13H7MV0A-HP622	30570914
14,00	14	130	22	45	85	78	6	FXR505Ø14H7MV0A-HP622	30570915
15,00	16	130	22	48	82	75	6	FXR505Ø15H7MV0A-HP622	30570916
16,00	16	150	25	48	102	95	6	FXR505Ø16H7MV0A-HP622	30570917
17,00	18	150	25	48	102	95	6	FXR505Ø17H7MV0A-HP622	30570918
18,00	18	150	25	48	102	95	6	FXR505Ø18H7MV0A-HP622	30570919
19,00	20	150	25	50	100	92	6	FXR505Ø19H7MV0A-HP622	30570920
20,00	20	150	25	50	100	92	6	FXR505Ø20H7MV0A-HP622	30570921

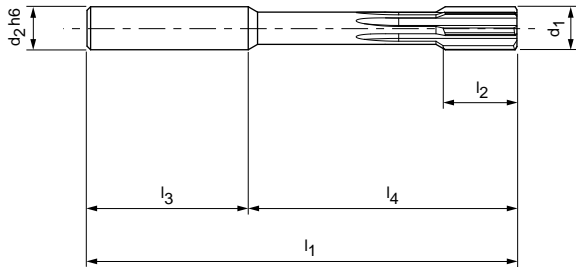
Dimensions in mm.

Cutting data recommendation from page 436.

Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "High-performance reamers FixReam".

FixReam FXR505

Design: Solid carbide
Reamer diameter: 4.00 - 20.00 mm
Lead: MV0A
Cutting material: HC614



N	1.1	1.2	1.3	1.4	2.1	2.2	2.3	3.1	4.1	4.2	4.3	C	1.1	1.2	1.3	2.1	3.1	4.1	4.2	4.3	4.4	5.1	5.2
---	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	---	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----



Dimensions							z	Specification	Order No.
d_1	$d_2\ h6$	l_1	l_2	l_3	l_4	l_5			
4,00	6	75	12	36	39	34	4	FXR50504H7MV0A-HC614	30570947
4,50	6	75	12	36	39	34	4	FXR50504.5H7MV0A-HC614	30570948
5,00	6	75	12	36	39	34	4	FXR50505H7MV0A-HC614	30570949
5,50	6	75	12	36	39	34	4	FXR50505.5H7MV0A-HC614	30570950
6,00	6	75	12	36	39	34	4	FXR50506H7MV0A-HC614	30570951
6,50	8	100	16	36	64	58	6	FXR50506.5H7MV0A-HC614	30570952
7,00	8	100	16	36	64	58	6	FXR50507H7MV0A-HC614	30570953
7,50	8	100	16	36	64	58	6	FXR50507.5H7MV0A-HC614	30570954
8,00	8	100	16	36	64	58	6	FXR50508H7MV0A-HC614	30570955
8,50	10	100	20	40	60	54	6	FXR50508.5H7MV0A-HC614	30570956
9,00	10	100	20	40	60	54	6	FXR50509H7MV0A-HC614	30570957
9,50	10	120	20	40	80	74	6	FXR50509.5H7MV0A-HC614	30570958
10,00	10	120	20	40	80	74	6	FXR505010H7MV0A-HC614	30570959
10,50	12	120	20	45	75	68	6	FXR505010.5H7MV0A-HC614	30570960
11,00	12	120	20	45	75	68	6	FXR505011H7MV0A-HC614	30570961
11,50	12	120	20	45	75	68	6	FXR505011.5H7MV0A-HC614	30570962
12,00	12	120	20	45	75	68	6	FXR505012H7MV0A-HC614	30570963
13,00	14	130	22	45	85	78	6	FXR505013H7MV0A-HC614	30570964
14,00	14	130	22	45	85	78	6	FXR505014H7MV0A-HC614	30570965
15,00	16	130	22	48	82	75	6	FXR505015H7MV0A-HC614	30570966
16,00	16	150	25	48	102	95	6	FXR505016H7MV0A-HC614	30570967
17,00	18	150	25	48	102	95	6	FXR505017H7MV0A-HC614	30570968
18,00	18	150	25	48	102	95	6	FXR505018H7MV0A-HC614	30570969
19,00	20	150	25	50	100	92	6	FXR505019H7MV0A-HC614	30570970
20,00	20	150	25	50	100	92	6	FXR505020H7MV0A-HC614	30570971

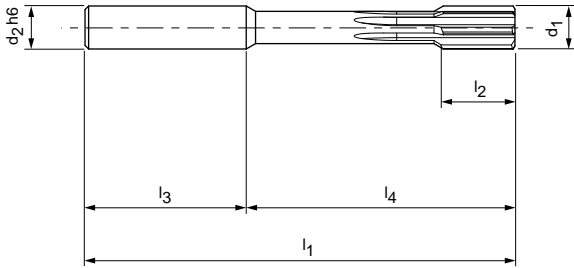
Dimensions in mm.

Cutting data recommendation from page 436.

Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "High-performance reamers FixReam".

FixReam FXR505

Design: HSS
Reamer diameter: 6.00 - 40.00 mm
Lead: MV0A
Cutting material: SP346



Dimensions							z	Specification	Order No.
d_1	$d_2 h6$	l_1	l_2	l_3	l_4	l_5			
6,00	8	100	16	36	64	39	6	FXR505Ø6H7MV0A-SP346	30817528
6,50	8	100	16	36	64	39	6	FXR505Ø6.5H7MV0A-SP346	30817532
7,00	8	100	16	36	64	42	6	FXR505Ø7H7MV0A-SP346	30817533
7,50	8	100	16	36	64	44	6	FXR505Ø7.5H7MV0A-SP346	30817534
8,00	8	100	16	36	64	46	6	FXR505Ø8H7MV0A-SP346	30817538
8,50	10	100	20	40	60	38	6	FXR505Ø8.5H7MV0A-SP346	30817542
9,00	10	100	20	40	60	40	6	FXR505Ø9H7MV0A-SP346	30817543
9,50	10	120	20	40	80	60	6	FXR505Ø9.5H7MV0A-SP346	30817544
10,00	10	120	20	40	80	60	6	FXR505Ø10H7MV0A-SP346	30817548
10,50	12	120	20	45	75	51	6	FXR505Ø10.5H7MV0A-SP346	30817552
11,00	12	120	20	45	75	52	6	FXR505Ø11H7MV0A-SP346	30817553
11,50	12	120	20	45	75	53	6	FXR505Ø11.5H7MV0A-SP346	30817554
12,00	12	120	20	45	75	54	6	FXR505Ø12H7MV0A-SP346	30817558
13,00	14	130	22	45	85	59	6	FXR505Ø13H7MV0A-SP346	30817562
14,00	14	130	22	45	85	63	6	FXR505Ø14H7MV0A-SP346	30817563
15,00	16	130	22	48	82	58	6	FXR505Ø15H7MV0A-SP346	30817564
16,00	16	150	25	48	102	78	6	FXR505Ø16H7MV0A-SP346	30817565
17,00	18	150	25	48	102	78	6	FXR505Ø17H7MV0A-SP346	30817566
18,00	18	150	25	48	102	80	6	FXR505Ø18H7MV0A-SP346	30817567
19,00	20	150	25	50	100	80	6	FXR505Ø19H7MV0A-SP346	30817568
20,00	20	150	25	50	100	82	6	FXR505Ø20H7MV0A-SP346	30817569
21,00	20	160	25	50	110	93	8	FXR505Ø21H7MV0A-SP346	30817570
22,00	20	160	25	50	110	95	8	FXR505Ø22H7MV0A-SP346	30817571
23,00	20	180	25	50	130	115	8	FXR505Ø23H7MV0A-SP346	30817572
24,00	20	180	25	50	130	115	8	FXR505Ø24H7MV0A-SP346	30817573
25,00	20	180	25	50	130	125	8	FXR505Ø25H7MV0A-SP346	30817574
26,00	20	180	25	50	130	125	8	FXR505Ø26H7MV0A-SP346	30817575
27,00	20	180	25	50	130	125	8	FXR505Ø27H7MV0A-SP346	30817576
28,00	25	180	25	56	124	119	8	FXR505Ø28H7MV0A-SP346	30817577
29,00	25	180	25	56	124	119	8	FXR505Ø29H7MV0A-SP346	30817578
30,00	25	200	25	56	144	139	8	FXR505Ø30H7MV0A-SP346	30817579
31,00	25	200	25	56	144	139	8	FXR505Ø31H7MV0A-SP346	30817580
32,00	25	200	25	56	144	139	8	FXR505Ø32H7MV0A-SP346	30817581
33,00	25	200	25	56	144	139	8	FXR505Ø33H7MV0A-SP346	30817582
34,00	25	200	25	56	144	139	8	FXR505Ø34H7MV0A-SP346	30817583
35,00	25	200	25	56	144	139	8	FXR505Ø35H7MV0A-SP346	30817584
36,00	25	200	25	56	144	139	8	FXR505Ø36H7MV0A-SP346	30817585
37,00	25	200	25	56	144	139	8	FXR505Ø37H7MV0A-SP346	30817586
38,00	25	200	25	56	144	139	8	FXR505Ø38H7MV0A-SP346	30817587

FixReam FXR505

Dimensions							z	Specification	Order No.
d ₁	d ₂ h6	l ₁	l ₂	l ₃	l ₄	l ₅			
39,00	25	200	25	56	144	139	8	FXR505Ø39H7MV0A-SP346	30817588
40,00	25	200	25	56	144	139	8	FXR505Ø40H7MV0A-SP346	30817589

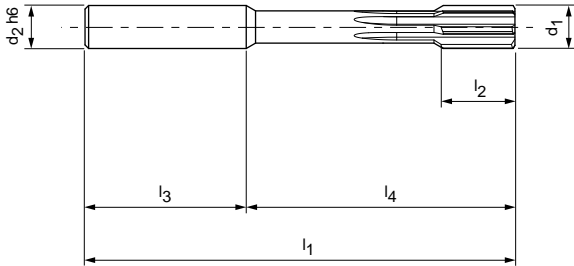
Dimensions in mm.

Cutting data recommendation from page 436.

Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "High-performance reamers FixReam".

FixReam FXR505G

Design: HSS
Reamer diameter: 6.01 - 12.03 mm
Lead: MV0A
Cutting material: SP346



Dimensions							z	Specification	Order No.
d_1	$d_2\ h6$	l_1	l_2	l_3	l_4	l_5			
6,01	8	100	16	36	64	39	6	FXR505GØ6.01+5MV0A-SP346	30817529
6,02	8	100	16	36	64	39	6	FXR505GØ6.02+5MV0A-SP346	30817530
6,03	8	100	16	36	64	39	6	FXR505GØ6.03+5MV0A-SP346	30817531
7,97	8	100	16	36	64	46	6	FXR505GØ7.97+5MV0A-SP346	30817535
7,98	8	100	16	36	64	46	6	FXR505GØ7.98+5MV0A-SP346	30817536
7,99	8	100	16	36	64	46	6	FXR505GØ7.99+5MV0A-SP346	30817537
8,01	8	100	16	36	64	46	6	FXR505GØ8.01+5MV0A-SP346	30817539
8,02	8	100	16	36	64	46	6	FXR505GØ8.02+5MV0A-SP346	30817540
8,03	8	100	16	36	64	46	6	FXR505GØ8.03+5MV0A-SP346	30817541
9,97	10	120	20	40	80	60	6	FXR505GØ9.97+5MV0A-SP346	30817545
9,98	10	120	20	40	80	60	6	FXR505GØ9.98+5MV0A-SP346	30817546
9,99	10	120	20	40	80	60	6	FXR505GØ9.99+5MV0A-SP346	30817547
10,01	10	120	20	40	80	60	6	FXR505GØ10.01+5MV0A-SP346	30817549
10,02	10	120	20	40	80	60	6	FXR505GØ10.02+5MV0A-SP346	30817550
10,03	10	120	20	40	80	60	6	FXR505GØ10.03+5MV0A-SP346	30817551
11,97	12	120	20	45	75	54	6	FXR505GØ11.97+5MV0A-SP346	30817555
11,98	12	120	20	45	75	54	6	FXR505GØ11.98+5MV0A-SP346	30817556
11,99	12	120	20	45	75	54	6	FXR505GØ11.99+5MV0A-SP346	30817557
12,01	12	120	20	45	75	54	6	FXR505GØ12.01+5MV0A-SP346	30817559
12,02	12	120	20	45	75	54	6	FXR505GØ12.02+5MV0A-SP346	30817560
12,03	12	120	20	45	75	54	6	FXR505GØ12.03+5MV0A-SP346	30817561

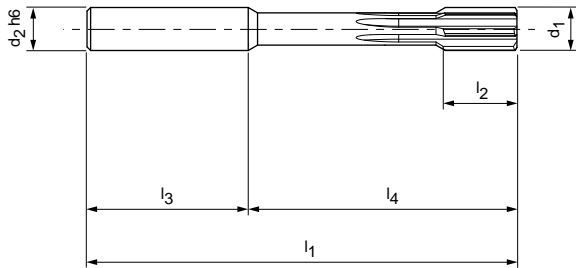
Dimensions in mm.

Cutting data recommendation from page 436.

Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "High-performance reamers FixReam".

FixReam FXR505 PcBN

Design: PcBN head
Reamer diameter: 3.00 - 10.00 mm
Lead: MI3F
Cutting material: FU840



P
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K
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2
3
N
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2
3
4
S
1
2
3
4
5
H
1.1
1.2

Dimensions						z	Specification	Order No.
d ₁	d ₂ h6	l ₁	l ₂	l ₃	l ₄			
3,00	4	65	12	28	37	6	FXR505Ø3H7MI3F-FU840	30571037
3,50	4	65	12	28	37	6	FXR505Ø3.5H7MI3F-FU840	30571038
4,00	6	75	12	36	39	6	FXR505Ø4H7MI3F-FU840	30571039
4,50	6	75	12	36	39	6	FXR505Ø4.5H7MI3F-FU840	30571040
5,00	6	75	12	36	39	6	FXR505Ø5H7MI3F-FU840	30571041
5,50	6	75	12	36	39	6	FXR505Ø5.5H7MI3F-FU840	30571042
6,00	6	75	12	36	39	8	FXR505Ø6H7MI3F-FU840	30571043
6,50	8	100	16	36	64	8	FXR505Ø6.5H7MI3F-FU840	30571044
7,00	8	100	16	36	64	8	FXR505Ø7H7MI3F-FU840	30571045
7,50	8	100	16	36	64	8	FXR505Ø7.5H7MI3F-FU840	30571046
8,00	8	100	16	36	64	10	FXR505Ø8H7MI3F-FU840	30571047
8,50	10	100	16	40	60	10	FXR505Ø8.5H7MI3F-FU840	30571048
9,00	10	100	16	40	60	10	FXR505Ø9H7MI3F-FU840	30571049
9,50	10	120	20	40	80	10	FXR505Ø9.5H7MI3F-FU840	30571050
10,00	10	120	20	40	80	10	FXR505Ø10H7MI3F-FU840	30571051

Dimensions in mm.

Cutting data recommendation from page 436.

Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "High-performance reamers FixReam".

FixReam FXR503 short

Particularly suitable for machining on automated lathes, for short bores

Design:

Reamer diameter:

Lead:

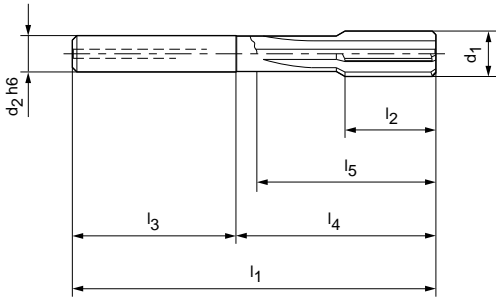
Cutting material:

Solid carbide

3.00 - 20.00 mm

MC1F

HP145



Dimensions							z	Specification	Order No.
d_1	$d_2 h6$	l_1	l_2	l_3	l_4	l_5			
3,00	4	56	12	28	28	24	4	FXR503Ø3H7MC1F-HP145	30570972
3,20	4	56	12	28	28	24	4	FXR503Ø3.2H7MC1F-HP145	30570973
3,50	4	56	12	28	28	24	4	FXR503Ø3.5H7MC1F-HP145	30570974
4,00	4	56	12	28	28	24	4	FXR503Ø4H7MC1F-HP145	30570975
4,50	6	64	12	36	28	23	4	FXR503Ø4.5H7MC1F-HP145	30570976
5,00	6	64	12	36	28	23	4	FXR503Ø5H7MC1F-HP145	30570977
5,50	6	64	12	36	28	24	4	FXR503Ø5.5H7MC1F-HP145	30570978
6,00	6	64	12	36	28	25	4	FXR503Ø6H7MC1F-HP145	30570979
6,50	8	75	16	36	39	32	6	FXR503Ø6.5H7MC1F-HP145	30570980
7,00	8	75	16	36	39	34	6	FXR503Ø7H7MC1F-HP145	30570981
7,50	8	75	16	36	39	35	6	FXR503Ø7.5H7MC1F-HP145	30570982
8,00	8	75	16	36	39	35	6	FXR503Ø8H7MC1F-HP145	30570983
8,50	8	75	20	36	39	35	6	FXR503Ø8.5H7MC1F-HP145	30570984
9,00	8	75	20	36	39	35	6	FXR503Ø9H7MC1F-HP145	30570985
9,50	8	75	20	36	39	35	6	FXR503Ø9.5H7MC1F-HP145	30570986
10,00	8	75	20	36	39	35	6	FXR503Ø10H7MC1F-HP145	30570987
10,50	10	80	20	40	40	35	6	FXR503Ø10.5H7MC1F-HP145	30570988
11,00	10	80	20	40	40	35	6	FXR503Ø11H7MC1F-HP145	30570989
11,50	10	80	20	40	40	35	6	FXR503Ø11.5H7MC1F-HP145	30570990
12,00	12	90	22	45	45	40	6	FXR503Ø12H7MC1F-HP145	30570991
13,00	12	90	22	45	45	40	6	FXR503Ø13H7MC1F-HP145	30570992
14,00	14	90	22	45	45	40	6	FXR503Ø14H7MC1F-HP145	30570993
15,00	14	90	22	45	45	40	6	FXR503Ø15H7MC1F-HP145	30570994
16,00	16	100	25	48	52	47	8	FXR503Ø16H7MC1F-HP145	30570995
17,00	16	100	25	48	52	47	8	FXR503Ø17H7MC1F-HP145	30570996
18,00	16	100	25	48	52	47	8	FXR503Ø18H7MC1F-HP145	30570997
19,00	18	100	25	48	52	47	8	FXR503Ø19H7MC1F-HP145	30570998
20,00	18	100	25	48	52	47	8	FXR503Ø20H7MC1F-HP145	30570999

Dimensions in mm.

Cutting data recommendation from page 436.

Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "High-performance reamers FixReam".



Customised special solutions for multi-stepped machining and order-specific equipping with guide pads possible.



MonoReam - MOR

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Preferred series 700 H7

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Preferred series 800 H7

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PRODUCT OVERVIEW

MonoReam

The multi-bladed reamers in the MonoReam series 600, 700 and 800 offer a new, simple, high performance, standardised reaming system. The reamers in the MonoReam series are available as fixed, expanding and finely adjustable versions. Depending on the area of application and material, they can be ordered as left-hand spiral fluted or straight fluted versions for through bores and blind bores

as well as with different leads and cutting materials. The three series are compatible with each other. It is therefore possible to change to the optimum system reamer for the specific case if general conditions change in production, for example different quantities or bore tolerances.



MonoReam 600 700 800	MonoReam 610 710 810	MonoReam 605 705 805
<p>Straight fluted design for machining through bores in non-ferrous metals with uncoated carbide cutting edges (PCD cutting edges on request).</p> <p>Ø range: 8.00 - 40.00 mm*</p> <p>600 700 800</p> <p>Basic Performance Expert</p> <p>H7</p> <p>N</p>	<p>Left-hand spiral fluted design for machining through bores with uncoated or coated carbide or cermet cutting edges.</p> <p>Ø range: 8.00 - 40.00 mm*</p> <p>610 710 810</p> <p>Basic Performance Expert</p> <p>H7</p> <p>P K</p>	<p>Straight fluted design for machining blind bores with uncoated or coated carbide or cermet cutting edges.</p> <p>Ø range: 8.00 - 40.00 mm*</p> <p>605 705 805</p> <p>Basic Performance Expert</p> <p>H7</p> <p>P K N</p>
<p>Pages 145/154/161</p>	<p>Pages 142/150/158</p>	<p>Pages 146/152/154</p>

* The diameter range can vary, depending on the series.



System explanation series 600



The reamers in the MonoReam 600 series are fixed reamers with brazed cutting edges that cannot be adjusted. They are the simplest of the MonoReam reamers and are the most economical variant to procure.



System explanation series 700



The MonoReam reamers in the 700 series are used as fixed tools, however this series is optimised for re-grinding. The reamer is expanded in diameter using a one-piece expansion screw. The expansion system is therefore only suitable for compensation prior to re-grinding and not for setting or re-adjusting the diameter. Due to the expansion of the diameter it is possible to re-grind all functional surfaces, both on the lead, and also on the tool diameter.



System explanation series 800









Setting to the μ can be realised with the reamers in the MonoReam series 800. Due to the setting system, which is also used on the MAPAL HPR replaceable head reamers, the cutting edges can be finely adjusted. The special three-piece design with screw, pushing ring and adjusting sleeve makes it possible to compensate for coaxial errors and the radial run-out accuracy of the cutting edges after adjustment is within 3 μ m. Very tight bore tolerances can be achieved reliably using the exactly set MonoReam 800 reamers and cutting materials used optimally.



Selection overview MonoReam | ordering example

1. Series

Type of bore	Material	Coolant supply	Flute helix angle	FIXED Simplest, economical design	EXPANDABLE Fixed tool with expansion screw	FINELY ADJUSTABLE Three-piece design with screw, pushing ring and adjusting sleeve
	P K N	 ✓		MOR605	MOR705	MOR805
	N	✓		MOR600	MOR700	MOR800
	P K	✓		MOR610	MOR710	MOR810

2. Tool dimensions

ød ₁	ød ₂	l ₁	l ₂	l ₃	l ₄	z
7,70 - 9,70	12	120	45	75	8	4
9,71 - 11,70	12	120	45	75	8	6
11,71 - 17,20	16	140	48	92	8	6
17,21 - 22,20	20	160	50	110	12	6
22,21 - 27,20	20	180	50	130	12	6
27,21 - 29,20	25	200	56	144	12	6
29,21 - 40,20	25	200	56	144	12	8

3. Lead and cutting material

MOR600 MOR700 MOR800	Lead
	Cutting material
	Preferred series H7 600
MOR610 MOR710 MOR810	Preferred series H7 700
	Preferred series H7 800
	Lead
MOR605 MOR705 MOR805	Cutting material
	Preferred series H7 610
	Preferred series H7 710
MOR600 MOR700 MOR800	Preferred series H7 810
	Lead
	Cutting material
MOR610 MOR710 MOR810	Preferred series H7 610
	Preferred series H7 710
	Preferred series H7 810
MOR605 MOR705 MOR805	Lead
	Cutting material
	Preferred series H7 605
MOR600 MOR700 MOR800	Preferred series H7 705
	Preferred series H7 805
	Lead
MOR610 MOR710 MOR810	Cutting material
	Preferred series H7 605
	Preferred series H7 705
MOR605 MOR705 MOR805	Preferred series H7 805
	Lead
	Cutting material
MOR600 MOR700 MOR800	Preferred series H7 605
	Preferred series H7 705
	Preferred series H7 805

Ordering example:

1. Series

M O R

MonoReam

Designs:

- 6 = Fixed reamer
- 7 = Expandable reamer
- 8 = Finely adjustable reamer

2. Diameter

6 0 0

Type of bore:
0 = Through bore
5 = Blind bore

Flute helix angle on the cutting edges:

- 0 = Straight fluted
- 1 = Left-hand spiral fluted

ø 2 0

Bore diameter

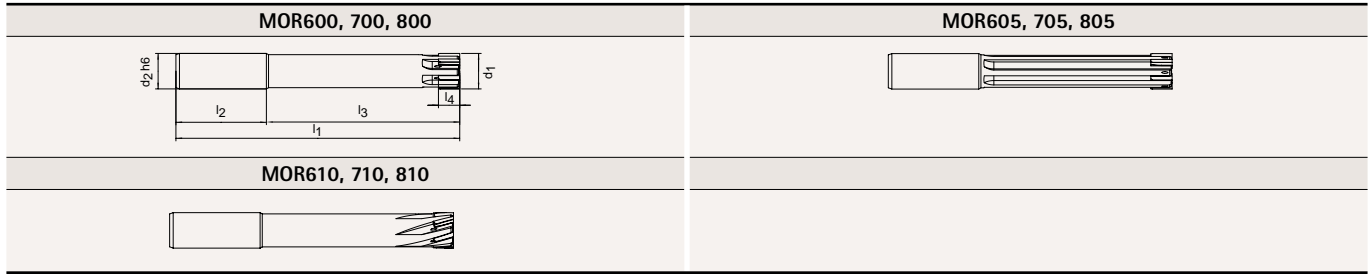
. 0 0 0

Tolerance

H 7

IT or allowance in µm
(example: +30+10)

Tool dimensions *

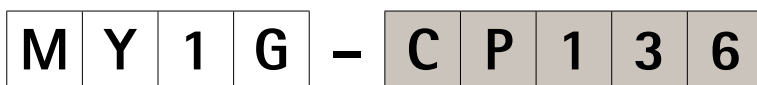


* The dimensions stated are identical for all MonoReam series.

	P				K						N	
	P1 - P3		P4 - P5		K1		K2		K3		N1 - N2	
												MY1G
												HU612
												P. 145
												P. 153
												P. 161
	MY1G	MY1G			MY1G	MY1G		MY1G				
	HP421	HP421			HP421	HP421		HP421				
	P. 142	P. 142			P. 142	P. 142		P. 142				
	P. 150	P. 150			P. 150	P. 150		P. 150				
	P. 158	P. 158			P. 158	P. 158		P. 158				
	MY1G				MY1G	MY1G						
	CU130				CU130	CU130						
	P. 143				P. 143	P. 143						
	P. 151				P. 151	P. 151						
	P. 159				P. 159	P. 159						
	MY1G				MY1G	MY1G		MY1G				
	CP136				CP136	CP136		CP136				
	P. 144				P. 144	P. 144		P. 144				
	P. 152				P. 152	P. 152		P. 152				
	P. 160				P. 160	P. 160		P. 160				
	MU2A	MU2A			MU2A	MU2A		MU2A			MU2A	
	HP421	HP421			HP421	HP421		HP421			HU612	
	P. 147	P. 147			P. 147	P. 147		P. 147			P. 146	
	P. 155	P. 155			P. 155	P. 155		P. 155			P. 154	
	P. 163	P. 163			P. 163	P. 163		P. 163			P. 162	
	MU2A				MU2A	MU2A						
	CU130				CU130	CU130						
	P. 148				P. 148	P. 148						
	P. 156				P. 156	P. 156						
	P. 164				P. 163	P. 164						
	MU2A				MU2A	MU2A		MU2A				
	CP136				CP136	CP136		CP136				
	P. 149				P. 149	P. 149		P. 149				
	P. 157				P. 157	P. 157		P. 157				
	P. 165				P. 165	P. 165		P. 165				

3. Lead

Cutting material



Lead geometry and rake angle:

MY1G
MU2A

For an explanation of the lead geometry see pages 432/433.

Cutting material:

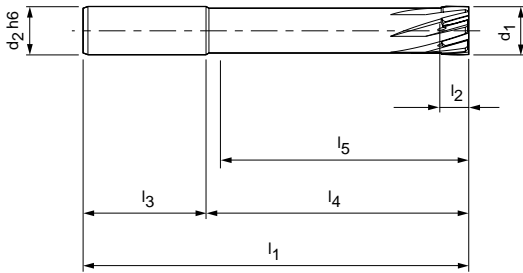
HP421
HU612
CP136
CU130
PCD and PcBN on request

MonoReam MOR610

Fixed design

Design:

Reamer diameter: 8.00 - 40.00 mm
 Lead: MY1G
 Cutting material: HP421



Dimensions							z	Specification	Order No.
d ₁	d ₂ h6	l ₁	l ₂	l ₃	l ₄	l ₅			
8,00	12	120	8	45	75	70	4	MOR61008H7MY1G-HP421	30473864
8,50	12	120	8	45	75	70	4	MOR61008.5H7MY1G-HP421	30473865
9,00	12	120	8	45	75	70	4	MOR61009H7MY1G-HP421	30473866
9,50	12	120	8	45	75	70	4	MOR61009.5H7MY1G-HP421	30473867
10,00	12	120	8	45	75	70	6	MOR610010H7MY1G-HP421	30315448
10,50	12	120	8	45	75	70	6	MOR610010.5H7MY1G-HP421	30473868
11,00	12	120	8	45	75	70	6	MOR610011H7MY1G-HP421	30473869
11,50	12	120	8	45	75	70	6	MOR610011.5H7MY1G-HP421	30473870
12,00	16	140	8	48	92	87	6	MOR610012H7MY1G-HP421	30473871
12,50	16	140	8	48	92	87	6	MOR610012.5H7MY1G-HP421	30473872
13,00	16	140	8	48	92	87	6	MOR610013H7MY1G-HP421	30473873
14,00	16	140	8	48	92	87	6	MOR610014H7MY1G-HP421	30473874
15,00	16	140	8	48	92	87	6	MOR610015H7MY1G-HP421	30473875
16,00	16	140	8	48	92	87	6	MOR610016H7MY1G-HP421	30473876
17,00	16	140	8	48	92	87	6	MOR610017H7MY1G-HP421	30473877
18,00	20	160	12	50	110	105	6	MOR610018H7MY1G-HP421	30473878
19,00	20	160	12	50	110	105	6	MOR610019H7MY1G-HP421	30473879
20,00	20	160	12	50	110	105	6	MOR610020H7MY1G-HP421	30315449
21,00	20	160	12	50	110	105	6	MOR610021H7MY1G-HP421	30473880
22,00	20	160	12	50	110	105	6	MOR610022H7MY1G-HP421	30473881
23,00	20	180	12	50	130	125	6	MOR610023H7MY1G-HP421	30473882
24,00	20	180	12	50	130	125	6	MOR610024H7MY1G-HP421	30473883
25,00	20	180	12	50	130	125	6	MOR610025H7MY1G-HP421	30473884
26,00	20	180	12	50	130	125	6	MOR610026H7MY1G-HP421	30420392
27,00	20	180	12	50	130	125	6	MOR610027H7MY1G-HP421	30473885
28,00	25	200	12	56	144	139	6	MOR610028H7MY1G-HP421	30420393
29,00	25	200	12	56	144	139	6	MOR610029H7MY1G-HP421	30473886
30,00	25	200	12	56	144	139	8	MOR610030H7MY1G-HP421	30473887
31,00	25	200	12	56	144	139	8	MOR610031H7MY1G-HP421	30473888
32,00	25	200	12	56	144	139	8	MOR610032H7MY1G-HP421	30473889
33,00	25	200	12	56	144	139	8	MOR610033H7MY1G-HP421	30473890
34,00	25	200	12	56	144	139	8	MOR610034H7MY1G-HP421	30473891
35,00	25	200	12	56	144	139	8	MOR610035H7MY1G-HP421	30315450
36,00	25	200	12	56	144	139	8	MOR610036H7MY1G-HP421	30473892
37,00	25	200	12	56	144	139	8	MOR610037H7MY1G-HP421	30473893
38,00	25	200	12	56	144	139	8	MOR610038H7MY1G-HP421	30473894
39,00	25	200	12	56	144	139	8	MOR610039H7MY1G-HP421	30473895
40,00	25	200	12	56	144	139	8	MOR610040H7MY1G-HP421	30473896

Dimensions in mm.

Cutting data recommendation from page 436.

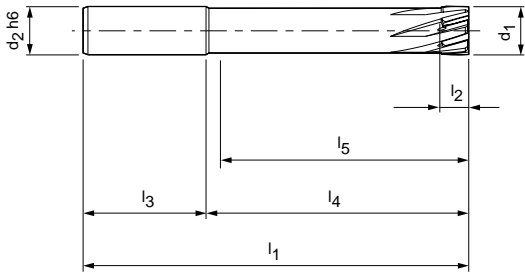
Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "MonoReam".

MonoReam MOR610

Fixed design

Design:

Reamer diameter: 8.00 - 40.00 mm
 Lead: MY1G
 Cutting material: CU130



Dimensions							z	Specification	Order No.
d_1	$d_2 h_6$	l_1	l_2	l_3	l_4	l_5			
8,00	12	120	8	45	75	70	4	MOR610Ø8H7MY1G-CU130	30473827
8,50	12	120	8	45	75	70	4	MOR610Ø8.5H7MY1G-CU130	30473828
9,00	12	120	8	45	75	70	4	MOR610Ø9H7MY1G-CU130	30473829
9,50	12	120	8	45	75	70	4	MOR610Ø9.5H7MY1G-CU130	30473830
10,00	12	120	8	45	75	70	6	MOR610Ø10H7MY1G-CU130	30473831
10,50	12	120	8	45	75	70	6	MOR610Ø10.5H7MY1G-CU130	30473832
11,00	12	120	8	45	75	70	6	MOR610Ø11H7MY1G-CU130	30473833
11,50	12	120	8	45	75	70	6	MOR610Ø11.5H7MY1G-CU130	30473834
12,00	16	140	8	48	92	87	6	MOR610Ø12H7MY1G-CU130	30473835
12,50	16	140	8	48	92	87	6	MOR610Ø12.5H7MY1G-CU130	30473836
13,00	16	140	8	48	92	87	6	MOR610Ø13H7MY1G-CU130	30473837
14,00	16	140	8	48	92	87	6	MOR610Ø14H7MY1G-CU130	30473838
15,00	16	140	8	48	92	87	6	MOR610Ø15H7MY1G-CU130	30473839
16,00	16	140	8	48	92	87	6	MOR610Ø16H7MY1G-CU130	30473840
17,00	16	140	8	48	92	87	6	MOR610Ø17H7MY1G-CU130	30473841
18,00	20	160	12	50	110	105	6	MOR610Ø18H7MY1G-CU130	30473842
19,00	20	160	12	50	110	105	6	MOR610Ø19H7MY1G-CU130	30473843
20,00	20	160	12	50	110	105	6	MOR610Ø20H7MY1G-CU130	30306110
21,00	20	160	12	50	110	105	6	MOR610Ø21H7MY1G-CU130	30473844
22,00	20	160	12	50	110	105	6	MOR610Ø22H7MY1G-CU130	30473845
23,00	20	180	12	50	130	125	6	MOR610Ø23H7MY1G-CU130	30473846
24,00	20	180	12	50	130	125	6	MOR610Ø24H7MY1G-CU130	30473847
25,00	20	180	12	50	130	125	6	MOR610Ø25H7MY1G-CU130	30473848
26,00	20	180	12	50	130	125	6	MOR610Ø26H7MY1G-CU130	30473849
27,00	20	180	12	50	130	125	6	MOR610Ø27H7MY1G-CU130	30473850
28,00	25	200	12	56	144	139	6	MOR610Ø28H7MY1G-CU130	30473851
29,00	25	200	12	56	144	139	6	MOR610Ø29H7MY1G-CU130	30473852
30,00	25	200	12	56	144	139	8	MOR610Ø30H7MY1G-CU130	30473853
31,00	25	200	12	56	144	139	8	MOR610Ø31H7MY1G-CU130	30473854
32,00	25	200	12	56	144	139	8	MOR610Ø32H7MY1G-CU130	30473855
33,00	25	200	12	56	144	139	8	MOR610Ø33H7MY1G-CU130	30473856
34,00	25	200	12	56	144	139	8	MOR610Ø34H7MY1G-CU130	30473857
35,00	25	200	12	56	144	139	8	MOR610Ø35H7MY1G-CU130	30473858
36,00	25	200	12	56	144	139	8	MOR610Ø36H7MY1G-CU130	30473859
37,00	25	200	12	56	144	139	8	MOR610Ø37H7MY1G-CU130	30473860
38,00	25	200	12	56	144	139	8	MOR610Ø38H7MY1G-CU130	30473861
39,00	25	200	12	56	144	139	8	MOR610Ø39H7MY1G-CU130	30473862
40,00	25	200	12	56	144	139	8	MOR610Ø40H7MY1G-CU130	30473863

Dimensions in mm.

Cutting data recommendation from page 436.

Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "MonoReam".

MonoReam MOR610

Fixed design

Design:

Reamer diameter:

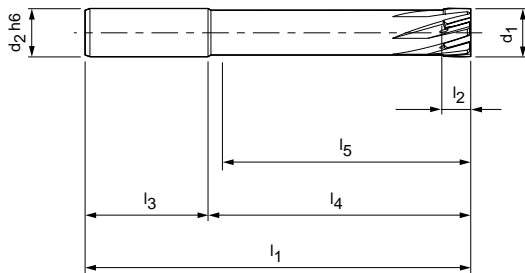
8.00 - 40.00 mm

Lead:

MY1G

Cutting material:

CP136



Dimensions							z	Specification	Order No.
d_1	$d_2 h_6$	l_1	l_2	l_3	l_4	l_5			
8,00	12	120	8	45	75	70	4	MOR61008H7MY1G-CP136	30473897
8,50	12	120	8	45	75	70	4	MOR61008.5H7MY1G-CP136	30473898
9,00	12	120	8	45	75	70	4	MOR61009H7MY1G-CP136	30473899
9,50	12	120	8	45	75	70	4	MOR61009.5H7MY1G-CP136	30473900
10,00	12	120	8	45	75	70	6	MOR610010H7MY1G-CP136	30473901
10,50	12	120	8	45	75	70	6	MOR610010.5H7MY1G-CP136	30473902
11,00	12	120	8	45	75	70	6	MOR610011H7MY1G-CP136	30473903
11,50	12	120	8	45	75	70	6	MOR610011.5H7MY1G-CP136	30473904
12,00	16	140	8	48	92	87	6	MOR610012H7MY1G-CP136	30473905
12,50	16	140	8	48	92	87	6	MOR610012.5H7MY1G-CP136	30473906
13,00	16	140	8	48	92	87	6	MOR610013H7MY1G-CP136	30473907
14,00	16	140	8	48	92	87	6	MOR610014H7MY1G-CP136	30473908
15,00	16	140	8	48	92	87	6	MOR610015H7MY1G-CP136	30473909
16,00	16	140	8	48	92	87	6	MOR610016H7MY1G-CP136	30473910
17,00	16	140	8	48	92	87	6	MOR610017H7MY1G-CP136	30473911
18,00	20	160	12	50	110	105	6	MOR610018H7MY1G-CP136	30473912
19,00	20	160	12	50	110	105	6	MOR610019H7MY1G-CP136	30473913
20,00	20	160	12	50	110	105	6	MOR610020H7MY1G-CP136	30473914
21,00	20	160	12	50	110	105	6	MOR610021H7MY1G-CP136	30473915
22,00	20	160	12	50	110	105	6	MOR610022H7MY1G-CP136	30473916
23,00	20	180	12	50	130	125	6	MOR610023H7MY1G-CP136	30473917
24,00	20	180	12	50	130	125	6	MOR610024H7MY1G-CP136	30473918
25,00	20	180	12	50	130	125	6	MOR610025H7MY1G-CP136	30473919
26,00	20	180	12	50	130	125	6	MOR610026H7MY1G-CP136	30473920
27,00	20	180	12	50	130	125	6	MOR610027H7MY1G-CP136	30473921
28,00	25	200	12	56	144	139	6	MOR610028H7MY1G-CP136	30473922
29,00	25	200	12	56	144	139	6	MOR610029H7MY1G-CP136	30473923
30,00	25	200	12	56	144	139	8	MOR610030H7MY1G-CP136	30473924
31,00	25	200	12	56	144	139	8	MOR610031H7MY1G-CP136	30473925
32,00	25	200	12	56	144	139	8	MOR610032H7MY1G-CP136	30473926
33,00	25	200	12	56	144	139	8	MOR610033H7MY1G-CP136	30473927
34,00	25	200	12	56	144	139	8	MOR610034H7MY1G-CP136	30473928
35,00	25	200	12	56	144	139	8	MOR610035H7MY1G-CP136	30473929
36,00	25	200	12	56	144	139	8	MOR610036H7MY1G-CP136	30473930
37,00	25	200	12	56	144	139	8	MOR610037H7MY1G-CP136	30473931
38,00	25	200	12	56	144	139	8	MOR610038H7MY1G-CP136	30473932
39,00	25	200	12	56	144	139	8	MOR610039H7MY1G-CP136	30473933
40,00	25	200	12	56	144	139	8	MOR610040H7MY1G-CP136	30473934

Dimensions in mm.

Cutting data recommendation from page 436.

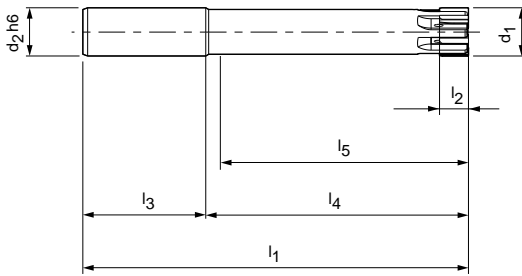
Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "MonoReam".

MonoReam MOR600

Fixed design

Design:

Reamer diameter: 8.00 - 40.00 mm
 Lead: MY1G
 Cutting material: HU612



Dimensions							z	Specification	Order No.
d_1	$d_2 h6$	l_1	l_2	l_3	l_4	l_5			
8,00	12	120	8	45	75	70	4	MOR600Ø8H7MY1G-HU612	30474552
8,50	12	120	8	45	75	70	4	MOR600Ø8.5H7MY1G-HU612	30474553
9,00	12	120	8	45	75	70	4	MOR600Ø9H7MY1G-HU612	30474554
9,50	12	120	8	45	75	70	4	MOR600Ø9.5H7MY1G-HU612	30474555
10,00	12	120	8	45	75	70	6	MOR600Ø10H7MY1G-HU612	30315442
10,50	12	120	8	45	75	70	6	MOR600Ø10.5H7MY1G-HU612	30474556
11,00	12	120	8	45	75	70	6	MOR600Ø11H7MY1G-HU612	30474557
11,50	12	120	8	45	75	70	6	MOR600Ø11.5H7MY1G-HU612	30474558
12,00	16	140	8	48	92	87	6	MOR600Ø12H7MY1G-HU612	30474559
12,50	16	140	8	48	92	87	6	MOR600Ø12.5H7MY1G-HU612	30474560
13,00	16	140	8	48	92	87	6	MOR600Ø13H7MY1G-HU612	30474561
14,00	16	140	8	48	92	87	6	MOR600Ø14H7MY1G-HU612	30474562
15,00	16	140	8	48	92	87	6	MOR600Ø15H7MY1G-HU612	30474563
16,00	16	140	8	48	92	87	6	MOR600Ø16H7MY1G-HU612	30474564
17,00	16	140	8	48	92	87	6	MOR600Ø17H7MY1G-HU612	30438940
18,00	20	160	12	50	110	105	6	MOR600Ø18H7MY1G-HU612	30474565
19,00	20	160	12	50	110	105	6	MOR600Ø19H7MY1G-HU612	30474566
20,00	20	160	12	50	110	105	6	MOR600Ø20H7MY1G-HU612	30315443
21,00	20	160	12	50	110	105	6	MOR600Ø21H7MY1G-HU612	30474567
22,00	20	160	12	50	110	105	6	MOR600Ø22H7MY1G-HU612	30474568
23,00	20	180	12	50	130	125	6	MOR600Ø23H7MY1G-HU612	30474569
24,00	20	180	12	50	130	125	6	MOR600Ø24H7MY1G-HU612	30474570
25,00	20	180	12	50	130	125	6	MOR600Ø25H7MY1G-HU612	30474571
26,00	20	180	12	50	130	125	6	MOR600Ø26H7MY1G-HU612	30474572
27,00	20	180	12	50	130	125	6	MOR600Ø27H7MY1G-HU612	30474573
28,00	25	200	12	56	144	139	6	MOR600Ø28H7MY1G-HU612	30474574
29,00	25	200	12	56	144	139	6	MOR600Ø29H7MY1G-HU612	30474575
30,00	25	200	12	56	144	139	8	MOR600Ø30H7MY1G-HU612	30474576
31,00	25	200	12	56	144	139	8	MOR600Ø31H7MY1G-HU612	30474577
32,00	25	200	12	56	144	139	8	MOR600Ø32H7MY1G-HU612	30474578
33,00	25	200	12	56	144	139	8	MOR600Ø33H7MY1G-HU612	30474579
34,00	25	200	12	56	144	139	8	MOR600Ø34H7MY1G-HU612	30474580
35,00	25	200	12	56	144	139	8	MOR600Ø35H7MY1G-HU612	30315444
36,00	25	200	12	56	144	139	8	MOR600Ø36H7MY1G-HU612	30474581
37,00	25	200	12	56	144	139	8	MOR600Ø37H7MY1G-HU612	30474582
38,00	25	200	12	56	144	139	8	MOR600Ø38H7MY1G-HU612	30474583
39,00	25	200	12	56	144	139	8	MOR600Ø39H7MY1G-HU612	30474584
40,00	25	200	12	56	144	139	8	MOR600Ø40H7MY1G-HU612	30474585

Dimensions in mm.

Cutting data recommendation from page 436.

Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "MonoReam".

MonoReam MOR605

Fixed design

Design:

Reamer diameter:

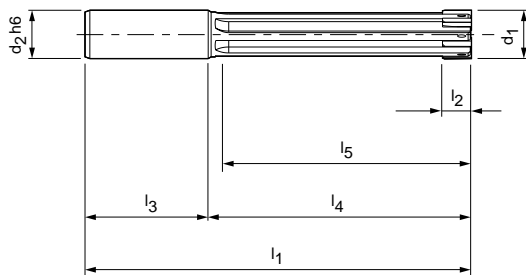
8.00 - 40.00 mm

Lead:

MU2A

Cutting material:

HU612



Dimensions							z	Specification	Order No.
d_1	$d_2 h_6$	l_1	l_2	l_3	l_4	l_5			
8,00	12	120	8	45	75	64	4	MOR605Ø8H7MU2A-HU612	30474758
8,50	12	120	8	45	75	64	4	MOR605Ø8.5H7MU2A-HU612	30474759
9,00	12	120	8	45	75	64	4	MOR605Ø9H7MU2A-HU612	30474760
9,50	12	120	8	45	75	65	4	MOR605Ø9.5H7MU2A-HU612	30474761
10,00	12	120	8	45	75	65	6	MOR605Ø10H7MU2A-HU612	30315445
10,50	12	120	8	45	75	65	6	MOR605Ø10.5H7MU2A-HU612	30474762
11,00	12	120	8	45	75	65	6	MOR605Ø11H7MU2A-HU612	30474763
11,50	12	120	8	45	75	65	6	MOR605Ø11.5H7MU2A-HU612	30474764
12,00	16	140	8	48	92	65	6	MOR605Ø12H7MU2A-HU612	30474765
12,50	16	140	8	48	92	80	6	MOR605Ø12.5H7MU2A-HU612	30474766
13,00	16	140	8	48	92	80	6	MOR605Ø13H7MU2A-HU612	30474767
14,00	16	140	8	48	92	80	6	MOR605Ø14H7MU2A-HU612	30474768
15,00	16	140	8	48	92	80	6	MOR605Ø15H7MU2A-HU612	30474769
16,00	16	140	8	48	92	80	6	MOR605Ø16H7MU2A-HU612	30474770
17,00	16	140	8	48	92	80	6	MOR605Ø17H7MU2A-HU612	30474771
18,00	20	160	12	50	110	98	6	MOR605Ø18H7MU2A-HU612	30474772
19,00	20	160	12	50	110	99	6	MOR605Ø19H7MU2A-HU612	30474773
20,00	20	160	12	50	110	100	6	MOR605Ø20H7MU2A-HU612	30315446
21,00	20	160	12	50	110	100	6	MOR605Ø21H7MU2A-HU612	30474774
22,00	20	160	12	50	110	100	6	MOR605Ø22H7MU2A-HU612	30474775
23,00	20	180	12	50	130	120	6	MOR605Ø23H7MU2A-HU612	30474776
24,00	20	180	12	50	130	120	6	MOR605Ø24H7MU2A-HU612	30474777
25,00	20	180	12	50	130	120	6	MOR605Ø25H7MU2A-HU612	30474778
26,00	20	180	12	50	130	120	6	MOR605Ø26H7MU2A-HU612	30474779
27,00	20	180	12	50	130	120	6	MOR605Ø27H7MU2A-HU612	30474780
28,00	25	200	12	56	144	130	6	MOR605Ø28H7MU2A-HU612	30474781
29,00	25	200	12	56	144	130	6	MOR605Ø29H7MU2A-HU612	30474782
30,00	25	200	12	56	144	130	8	MOR605Ø30H7MU2A-HU612	30474783
31,00	25	200	12	56	144	130	8	MOR605Ø31H7MU2A-HU612	30474784
32,00	25	200	12	56	144	130	8	MOR605Ø32H7MU2A-HU612	30474785
33,00	25	200	12	56	144	130	8	MOR605Ø33H7MU2A-HU612	30474786
34,00	25	200	12	56	144	130	8	MOR605Ø34H7MU2A-HU612	30438801
35,00	25	200	12	56	144	130	8	MOR605Ø35H7MU2A-HU612	30315447
36,00	25	200	12	56	144	130	8	MOR605Ø36H7MU2A-HU612	30474787
37,00	25	200	12	56	144	130	8	MOR605Ø37H7MU2A-HU612	30474788
38,00	25	200	12	56	144	130	8	MOR605Ø38H7MU2A-HU612	30474789
39,00	25	200	12	56	144	130	8	MOR605Ø39H7MU2A-HU612	30474790
40,00	25	200	12	56	144	130	8	MOR605Ø40H7MU2A-HU612	30474791

Dimensions in mm.

Cutting data recommendation from page 436.

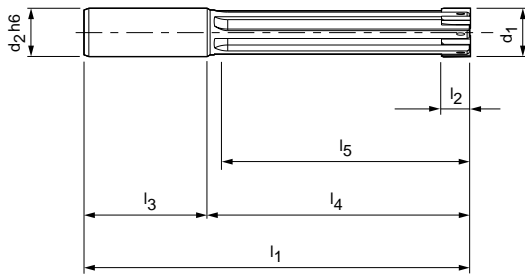
Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "MonoReam".

MonoReam MOR605

Fixed design

Design:

Reamer diameter: 8.00 - 40.00 mm
 Lead: MU2A
 Cutting material: HP421



Dimensions							z	Specification	Order No.
d_1	$d_2 h6$	l_1	l_2	l_3	l_4	l_5			
8,00	12	120	8	45	75	64	4	MOR605Ø8H7MU2A-HP421	30474792
8,50	12	120	8	45	75	64	4	MOR605Ø8.5H7MU2A-HP421	30474793
9,00	12	120	8	45	75	64	4	MOR605Ø9H7MU2A-HP421	30474794
9,50	12	120	8	45	75	65	4	MOR605Ø9.5H7MU2A-HP421	30474795
10,00	12	120	8	45	75	65	6	MOR605Ø10H7MU2A-HP421	30474796
10,50	12	120	8	45	75	65	6	MOR605Ø10.5H7MU2A-HP421	30474797
11,00	12	120	8	45	75	65	6	MOR605Ø11H7MU2A-HP421	30474798
11,50	12	120	8	45	75	65	6	MOR605Ø11.5H7MU2A-HP421	30474799
12,00	16	140	8	48	92	65	6	MOR605Ø12H7MU2A-HP421	30313451
12,50	16	140	8	48	92	80	6	MOR605Ø12.5H7MU2A-HP421	30474800
13,00	16	140	8	48	92	80	6	MOR605Ø13H7MU2A-HP421	30474801
14,00	16	140	8	48	92	80	6	MOR605Ø14H7MU2A-HP421	30474802
15,00	16	140	8	48	92	80	6	MOR605Ø15H7MU2A-HP421	30474803
16,00	16	140	8	48	92	80	6	MOR605Ø16H7MU2A-HP421	30474804
17,00	16	140	8	48	92	80	6	MOR605Ø17H7MU2A-HP421	30474805
18,00	20	160	12	50	110	98	6	MOR605Ø18H7MU2A-HP421	30474806
19,00	20	160	12	50	110	99	6	MOR605Ø19H7MU2A-HP421	30474807
20,00	20	160	12	50	110	100	6	MOR605Ø20H7MU2A-HP421	30474808
21,00	20	160	12	50	110	100	6	MOR605Ø21H7MU2A-HP421	30474809
22,00	20	160	12	50	110	100	6	MOR605Ø22H7MU2A-HP421	30357239
23,00	20	180	12	50	130	120	6	MOR605Ø23H7MU2A-HP421	30474810
24,00	20	180	12	50	130	120	6	MOR605Ø24H7MU2A-HP421	30474811
25,00	20	180	12	50	130	120	6	MOR605Ø25H7MU2A-HP421	30474812
26,00	20	180	12	50	130	120	6	MOR605Ø26H7MU2A-HP421	30474813
27,00	20	180	12	50	130	120	6	MOR605Ø27H7MU2A-HP421	30474814
28,00	25	200	12	56	144	130	6	MOR605Ø28H7MU2A-HP421	30474815
29,00	25	200	12	56	144	130	6	MOR605Ø29H7MU2A-HP421	30474816
30,00	25	200	12	56	144	130	8	MOR605Ø30H7MU2A-HP421	30372240
31,00	25	200	12	56	144	130	8	MOR605Ø31H7MU2A-HP421	30474817
32,00	25	200	12	56	144	130	8	MOR605Ø32H7MU2A-HP421	30474818
33,00	25	200	12	56	144	130	8	MOR605Ø33H7MU2A-HP421	30474819
34,00	25	200	12	56	144	130	8	MOR605Ø34H7MU2A-HP421	30474820
35,00	25	200	12	56	144	130	8	MOR605Ø35H7MU2A-HP421	30474821
36,00	25	200	12	56	144	130	8	MOR605Ø36H7MU2A-HP421	30474822
37,00	25	200	12	56	144	130	8	MOR605Ø37H7MU2A-HP421	30474823
38,00	25	200	12	56	144	130	8	MOR605Ø38H7MU2A-HP421	30474824
39,00	25	200	12	56	144	130	8	MOR605Ø39H7MU2A-HP421	30474825
40,00	25	200	12	56	144	130	8	MOR605Ø40H7MU2A-HP421	30474826

Dimensions in mm.

Cutting data recommendation from page 436.

Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "MonoReam".

MonoReam MOR605

Fixed design

Design:

Reamer diameter:

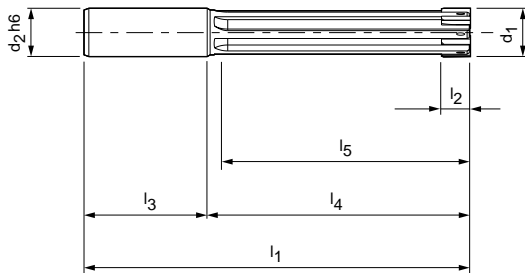
8.00 - 40.00 mm

Lead:

MU2A

Cutting material:

CU130



Dimensions							z	Specification	Order No.
d_1	$d_2 h_6$	l_1	l_2	l_3	l_4	l_5			
8,00	12	120	8	45	75	64	4	MOR605Ø8H7MU2A-CU130	30474827
8,50	12	120	8	45	75	64	4	MOR605Ø8.5H7MU2A-CU130	30474828
9,00	12	120	8	45	75	64	4	MOR605Ø9H7MU2A-CU130	30474829
9,50	12	120	8	45	75	65	4	MOR605Ø9.5H7MU2A-CU130	30474830
10,00	12	120	8	45	75	65	6	MOR605Ø10H7MU2A-CU130	30474831
10,50	12	120	8	45	75	65	6	MOR605Ø10.5H7MU2A-CU130	30474832
11,00	12	120	8	45	75	65	6	MOR605Ø11H7MU2A-CU130	30474833
11,50	12	120	8	45	75	65	6	MOR605Ø11.5H7MU2A-CU130	30474834
12,00	16	140	8	48	92	65	6	MOR605Ø12H7MU2A-CU130	30313450
12,50	16	140	8	48	92	80	6	MOR605Ø12.5H7MU2A-CU130	30474835
13,00	16	140	8	48	92	80	6	MOR605Ø13H7MU2A-CU130	30474836
14,00	16	140	8	48	92	80	6	MOR605Ø14H7MU2A-CU130	30474837
15,00	16	140	8	48	92	80	6	MOR605Ø15H7MU2A-CU130	30474838
16,00	16	140	8	48	92	80	6	MOR605Ø16H7MU2A-CU130	30474839
17,00	16	140	8	48	92	80	6	MOR605Ø17H7MU2A-CU130	30474840
18,00	20	160	12	50	110	98	6	MOR605Ø18H7MU2A-CU130	30474841
19,00	20	160	12	50	110	99	6	MOR605Ø19H7MU2A-CU130	30474842
20,00	20	160	12	50	110	100	6	MOR605Ø20H7MU2A-CU130	30306108
21,00	20	160	12	50	110	100	6	MOR605Ø21H7MU2A-CU130	30474843
22,00	20	160	12	50	110	100	6	MOR605Ø22H7MU2A-CU130	30474844
23,00	20	180	12	50	130	120	6	MOR605Ø23H7MU2A-CU130	30474845
24,00	20	180	12	50	130	120	6	MOR605Ø24H7MU2A-CU130	30474846
25,00	20	180	12	50	130	120	6	MOR605Ø25H7MU2A-CU130	30474847
26,00	20	180	12	50	130	120	6	MOR605Ø26H7MU2A-CU130	30474848
27,00	20	180	12	50	130	120	6	MOR605Ø27H7MU2A-CU130	30474849
28,00	25	200	12	56	144	130	6	MOR605Ø28H7MU2A-CU130	30474850
29,00	25	200	12	56	144	130	6	MOR605Ø29H7MU2A-CU130	30474851
30,00	25	200	12	56	144	130	8	MOR605Ø30H7MU2A-CU130	30474852
31,00	25	200	12	56	144	130	8	MOR605Ø31H7MU2A-CU130	30474853
32,00	25	200	12	56	144	130	8	MOR605Ø32H7MU2A-CU130	30474854
33,00	25	200	12	56	144	130	8	MOR605Ø33H7MU2A-CU130	30474855
34,00	25	200	12	56	144	130	8	MOR605Ø34H7MU2A-CU130	30474856
35,00	25	200	12	56	144	130	8	MOR605Ø35H7MU2A-CU130	30474857
36,00	25	200	12	56	144	130	8	MOR605Ø36H7MU2A-CU130	30474858
37,00	25	200	12	56	144	130	8	MOR605Ø37H7MU2A-CU130	30474859
38,00	25	200	12	56	144	130	8	MOR605Ø38H7MU2A-CU130	30474860
39,00	25	200	12	56	144	130	8	MOR605Ø39H7MU2A-CU130	30474861
40,00	25	200	12	56	144	130	8	MOR605Ø40H7MU2A-CU130	30474862

Dimensions in mm.

Cutting data recommendation from page 436.

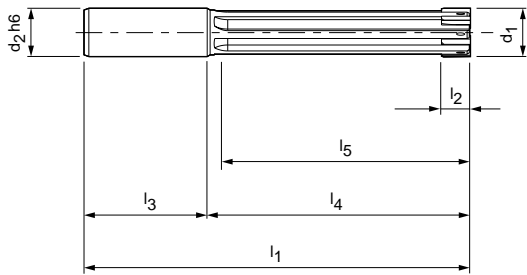
Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "MonoReam".

MonoReam MOR605

Fixed design

Design:

Reamer diameter: 8.00 - 40.00 mm
 Lead: MU2A
 Cutting material: CP136



Dimensions							z	Specification	Order No.
d_1	$d_2 h6$	l_1	l_2	l_3	l_4	l_5			
8,00	12	120	8	45	75	64	4	MOR605Ø8H7MU2A-CP136	30474863
8,50	12	120	8	45	75	64	4	MOR605Ø8.5H7MU2A-CP136	30474864
9,00	12	120	8	45	75	64	4	MOR605Ø9H7MU2A-CP136	30474865
9,50	12	120	8	45	75	65	4	MOR605Ø9.5H7MU2A-CP136	30474866
10,00	12	120	8	45	75	65	6	MOR605Ø10H7MU2A-CP136	30474867
10,50	12	120	8	45	75	65	6	MOR605Ø10.5H7MU2A-CP136	30474868
11,00	12	120	8	45	75	65	6	MOR605Ø11H7MU2A-CP136	30474869
11,50	12	120	8	45	75	65	6	MOR605Ø11.5H7MU2A-CP136	30474870
12,00	16	140	8	48	92	65	6	MOR605Ø12H7MU2A-CP136	30474871
12,50	16	140	8	48	92	80	6	MOR605Ø12.5H7MU2A-CP136	30474872
13,00	16	140	8	48	92	80	6	MOR605Ø13H7MU2A-CP136	30474873
14,00	16	140	8	48	92	80	6	MOR605Ø14H7MU2A-CP136	30474874
15,00	16	140	8	48	92	80	6	MOR605Ø15H7MU2A-CP136	30474875
16,00	16	140	8	48	92	80	6	MOR605Ø16H7MU2A-CP136	30474876
17,00	16	140	8	48	92	80	6	MOR605Ø17H7MU2A-CP136	30474877
18,00	20	160	12	50	110	98	6	MOR605Ø18H7MU2A-CP136	30474878
19,00	20	160	12	50	110	99	6	MOR605Ø19H7MU2A-CP136	30474879
20,00	20	160	12	50	110	100	6	MOR605Ø20H7MU2A-CP136	30474880
21,00	20	160	12	50	110	100	6	MOR605Ø21H7MU2A-CP136	30474881
22,00	20	160	12	50	110	100	6	MOR605Ø22H7MU2A-CP136	30474882
23,00	20	180	12	50	130	120	6	MOR605Ø23H7MU2A-CP136	30407543
24,00	20	180	12	50	130	120	6	MOR605Ø24H7MU2A-CP136	30474883
25,00	20	180	12	50	130	120	6	MOR605Ø25H7MU2A-CP136	30474884
26,00	20	180	12	50	130	120	6	MOR605Ø26H7MU2A-CP136	30474885
27,00	20	180	12	50	130	120	6	MOR605Ø27H7MU2A-CP136	30474886
28,00	25	200	12	56	144	130	6	MOR605Ø28H7MU2A-CP136	30474887
29,00	25	200	12	56	144	130	6	MOR605Ø29H7MU2A-CP136	30474888
30,00	25	200	12	56	144	130	8	MOR605Ø30H7MU2A-CP136	30474889
31,00	25	200	12	56	144	130	8	MOR605Ø31H7MU2A-CP136	30474890
32,00	25	200	12	56	144	130	8	MOR605Ø32H7MU2A-CP136	30474891
33,00	25	200	12	56	144	130	8	MOR605Ø33H7MU2A-CP136	30474892
34,00	25	200	12	56	144	130	8	MOR605Ø34H7MU2A-CP136	30474893
35,00	25	200	12	56	144	130	8	MOR605Ø35H7MU2A-CP136	30357797
36,00	25	200	12	56	144	130	8	MOR605Ø36H7MU2A-CP136	30474894
37,00	25	200	12	56	144	130	8	MOR605Ø37H7MU2A-CP136	30474895
38,00	25	200	12	56	144	130	8	MOR605Ø38H7MU2A-CP136	30474896
39,00	25	200	12	56	144	130	8	MOR605Ø39H7MU2A-CP136	30474897
40,00	25	200	12	56	144	130	8	MOR605Ø40H7MU2A-CP136	30474898

Dimensions in mm.

Cutting data recommendation from page 436.

Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "MonoReam".

MonoReam MOR710

Expanding design

Design:

Reamer diameter:

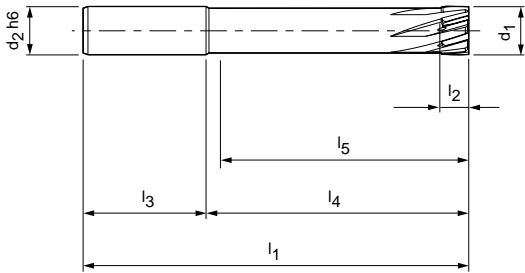
8.00 - 40.00 mm

Lead:

MY1G

Cutting material:

HP421



Dimensions							z	Specification	Order No.
d_1	$d_2 h6$	l_1	l_2	l_3	l_4	l_5			
8,00	12	120	8	45	75	70	4	MOR71008H7MY1G-HP421	30475022
8,50	12	120	8	45	75	70	4	MOR71008.5H7MY1G-HP421	30475023
9,00	12	120	8	45	75	70	4	MOR71009H7MY1G-HP421	30475024
9,50	12	120	8	45	75	70	4	MOR71009.5H7MY1G-HP421	30475025
10,00	12	120	8	45	75	70	6	MOR710010H7MY1G-HP421	30475026
10,50	12	120	8	45	75	70	6	MOR710010.5H7MY1G-HP421	30475027
11,00	12	120	8	45	75	70	6	MOR710011H7MY1G-HP421	30475028
11,50	12	120	8	45	75	70	6	MOR710011.5H7MY1G-HP421	30475029
12,00	16	140	8	48	92	87	6	MOR710012H7MY1G-HP421	30475030
12,50	16	140	8	48	92	87	6	MOR710012.5H7MY1G-HP421	30475031
13,00	16	140	8	48	92	87	6	MOR710013H7MY1G-HP421	30475032
14,00	16	140	8	48	92	87	6	MOR710014H7MY1G-HP421	30475033
15,00	16	140	8	48	92	87	6	MOR710015H7MY1G-HP421	30475034
16,00	16	140	8	48	92	87	6	MOR710016H7MY1G-HP421	30475035
17,00	16	140	8	48	92	87	6	MOR710017H7MY1G-HP421	30475036
18,00	20	160	12	50	110	105	6	MOR710018H7MY1G-HP421	30475037
19,00	20	160	12	50	110	105	6	MOR710019H7MY1G-HP421	30475038
20,00	20	160	12	50	110	105	6	MOR710020H7MY1G-HP421	30436229
21,00	20	160	12	50	110	105	6	MOR710021H7MY1G-HP421	30475039
22,00	20	160	12	50	110	105	6	MOR710022H7MY1G-HP421	30475040
23,00	20	180	12	50	130	125	6	MOR710023H7MY1G-HP421	30475041
24,00	20	180	12	50	130	125	6	MOR710024H7MY1G-HP421	30475042
25,00	20	180	12	50	130	125	6	MOR710025H7MY1G-HP421	30475043
26,00	20	180	12	50	130	125	6	MOR710026H7MY1G-HP421	30475044
27,00	20	180	12	50	130	125	6	MOR710027H7MY1G-HP421	30475045
28,00	25	200	12	56	144	139	6	MOR710028H7MY1G-HP421	30384825
29,00	25	200	12	56	144	139	6	MOR710029H7MY1G-HP421	30475046
30,00	25	200	12	56	144	139	8	MOR710030H7MY1G-HP421	30475047
31,00	25	200	12	56	144	139	8	MOR710031H7MY1G-HP421	30475048
32,00	25	200	12	56	144	139	8	MOR710032H7MY1G-HP421	30475049
33,00	25	200	12	56	144	139	8	MOR710033H7MY1G-HP421	30475050
34,00	25	200	12	56	144	139	8	MOR710034H7MY1G-HP421	30475051
35,00	25	200	12	56	144	139	8	MOR710035H7MY1G-HP421	30475052
36,00	25	200	12	56	144	139	8	MOR710036H7MY1G-HP421	30475053
37,00	25	200	12	56	144	139	8	MOR710037H7MY1G-HP421	30475054
38,00	25	200	12	56	144	139	8	MOR710038H7MY1G-HP421	30475055
39,00	25	200	12	56	144	139	8	MOR710039H7MY1G-HP421	30475056
40,00	25	200	12	56	144	139	8	MOR710040H7MY1G-HP421	30475057

Dimensions in mm.

Cutting data recommendation from page 436.

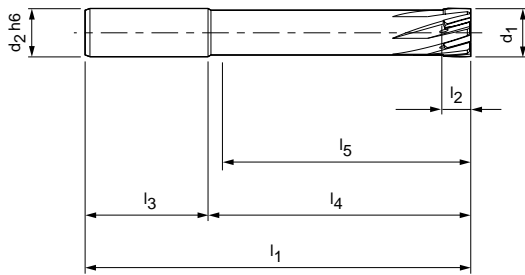
Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "MonoReam".

MonoReam MOR710

Expanding design

Design:

Reamer diameter: 8.00 - 40.00 mm
 Lead: MY1G
 Cutting material: CU130



Dimensions							z	Specification	Order No.
d_1	$d_2 h_6$	l_1	l_2	l_3	l_4	l_5			
8,00	12	120	8	45	75	70	4	MOR71008H7MY1G-CU130	30475058
8,50	12	120	8	45	75	70	4	MOR71008.5H7MY1G-CU130	30475059
9,00	12	120	8	45	75	70	4	MOR71009H7MY1G-CU130	30475060
9,50	12	120	8	45	75	70	4	MOR71009.5H7MY1G-CU130	30475061
10,00	12	120	8	45	75	70	6	MOR710010H7MY1G-CU130	30475062
10,50	12	120	8	45	75	70	6	MOR710010.5H7MY1G-CU130	30475063
11,00	12	120	8	45	75	70	6	MOR710011H7MY1G-CU130	30475064
11,50	12	120	8	45	75	70	6	MOR710011.5H7MY1G-CU130	30475065
12,00	16	140	8	48	92	87	6	MOR710012H7MY1G-CU130	30475066
12,50	16	140	8	48	92	87	6	MOR710012.5H7MY1G-CU130	30475067
13,00	16	140	8	48	92	87	6	MOR710013H7MY1G-CU130	30475068
14,00	16	140	8	48	92	87	6	MOR710014H7MY1G-CU130	30475069
15,00	16	140	8	48	92	87	6	MOR710015H7MY1G-CU130	30475070
16,00	16	140	8	48	92	87	6	MOR710016H7MY1G-CU130	30475071
17,00	16	140	8	48	92	87	6	MOR710017H7MY1G-CU130	30475072
18,00	20	160	12	50	110	105	6	MOR710018H7MY1G-CU130	30475073
19,00	20	160	12	50	110	105	6	MOR710019H7MY1G-CU130	30475074
20,00	20	160	12	50	110	105	6	MOR710020H7MY1G-CU130	30475075
21,00	20	160	12	50	110	105	6	MOR710021H7MY1G-CU130	30475076
22,00	20	160	12	50	110	105	6	MOR710022H7MY1G-CU130	30475077
23,00	20	180	12	50	130	125	6	MOR710023H7MY1G-CU130	30475078
24,00	20	180	12	50	130	125	6	MOR710024H7MY1G-CU130	30475079
25,00	20	180	12	50	130	125	6	MOR710025H7MY1G-CU130	30475080
26,00	20	180	12	50	130	125	6	MOR710026H7MY1G-CU130	30475081
27,00	20	180	12	50	130	125	6	MOR710027H7MY1G-CU130	30475082
28,00	25	200	12	56	144	139	6	MOR710028H7MY1G-CU130	30475083
29,00	25	200	12	56	144	139	6	MOR710029H7MY1G-CU130	30475084
30,00	25	200	12	56	144	139	8	MOR710030H7MY1G-CU130	30475085
31,00	25	200	12	56	144	139	8	MOR710031H7MY1G-CU130	30475086
32,00	25	200	12	56	144	139	8	MOR710032H7MY1G-CU130	30475087
33,00	25	200	12	56	144	139	8	MOR710033H7MY1G-CU130	30475088
34,00	25	200	12	56	144	139	8	MOR710034H7MY1G-CU130	30475089
35,00	25	200	12	56	144	139	8	MOR710035H7MY1G-CU130	30475090
36,00	25	200	12	56	144	139	8	MOR710036H7MY1G-CU130	30475091
37,00	25	200	12	56	144	139	8	MOR710037H7MY1G-CU130	30475092
38,00	25	200	12	56	144	139	8	MOR710038H7MY1G-CU130	30475093
39,00	25	200	12	56	144	139	8	MOR710039H7MY1G-CU130	30475094
40,00	25	200	12	56	144	139	8	MOR710040H7MY1G-CU130	30475095

Dimensions in mm.

Cutting data recommendation from page 436.

Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "MonoReam".

MonoReam MOR710

Expanding design

Design:

Reamer diameter:

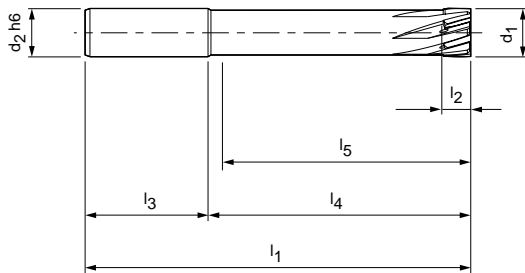
8.00 - 40.00 mm

Lead:

MY1G

Cutting material:

CP136



Dimensions							z	Specification	Order No.
d_1	$d_2 h_6$	l_1	l_2	l_3	l_4	l_5			
8,00	12	120	8	45	75	70	4	MOR71008H7MY1G-CP136	30355052
8,50	12	120	8	45	75	70	4	MOR71008.5H7MY1G-CP136	30475096
9,00	12	120	8	45	75	70	4	MOR71009H7MY1G-CP136	30475097
9,50	12	120	8	45	75	70	4	MOR71009.5H7MY1G-CP136	30475098
10,00	12	120	8	45	75	70	6	MOR710010H7MY1G-CP136	30355053
10,50	12	120	8	45	75	70	6	MOR710010.5H7MY1G-CP136	30475099
11,00	12	120	8	45	75	70	6	MOR710011H7MY1G-CP136	30475100
11,50	12	120	8	45	75	70	6	MOR710011.5H7MY1G-CP136	30475101
12,00	16	140	8	48	92	87	6	MOR710012H7MY1G-CP136	30355055
12,50	16	140	8	48	92	87	6	MOR710012.5H7MY1G-CP136	30475102
13,00	16	140	8	48	92	87	6	MOR710013H7MY1G-CP136	30475103
14,00	16	140	8	48	92	87	6	MOR710014H7MY1G-CP136	30355056
15,00	16	140	8	48	92	87	6	MOR710015H7MY1G-CP136	30475104
16,00	16	140	8	48	92	87	6	MOR710016H7MY1G-CP136	30355057
17,00	16	140	8	48	92	87	6	MOR710017H7MY1G-CP136	30475105
18,00	20	160	12	50	110	105	6	MOR710018H7MY1G-CP136	30475106
19,00	20	160	12	50	110	105	6	MOR710019H7MY1G-CP136	30475107
20,00	20	160	12	50	110	105	6	MOR710020H7MY1G-CP136	30475108
21,00	20	160	12	50	110	105	6	MOR710021H7MY1G-CP136	30475109
22,00	20	160	12	50	110	105	6	MOR710022H7MY1G-CP136	30475110
23,00	20	180	12	50	130	125	6	MOR710023H7MY1G-CP136	30475111
24,00	20	180	12	50	130	125	6	MOR710024H7MY1G-CP136	30475112
25,00	20	180	12	50	130	125	6	MOR710025H7MY1G-CP136	30475113
26,00	20	180	12	50	130	125	6	MOR710026H7MY1G-CP136	30475114
27,00	20	180	12	50	130	125	6	MOR710027H7MY1G-CP136	30475115
28,00	25	200	12	56	144	139	6	MOR710028H7MY1G-CP136	30475116
29,00	25	200	12	56	144	139	6	MOR710029H7MY1G-CP136	30475117
30,00	25	200	12	56	144	139	8	MOR710030H7MY1G-CP136	30475118
31,00	25	200	12	56	144	139	8	MOR710031H7MY1G-CP136	30475119
32,00	25	200	12	56	144	139	8	MOR710032H7MY1G-CP136	30475120
33,00	25	200	12	56	144	139	8	MOR710033H7MY1G-CP136	30475121
34,00	25	200	12	56	144	139	8	MOR710034H7MY1G-CP136	30475122
35,00	25	200	12	56	144	139	8	MOR710035H7MY1G-CP136	30475123
36,00	25	200	12	56	144	139	8	MOR710036H7MY1G-CP136	30475124
37,00	25	200	12	56	144	139	8	MOR710037H7MY1G-CP136	30475125
38,00	25	200	12	56	144	139	8	MOR710038H7MY1G-CP136	30475126
39,00	25	200	12	56	144	139	8	MOR710039H7MY1G-CP136	30475127
40,00	25	200	12	56	144	139	8	MOR710040H7MY1G-CP136	30475128

Dimensions in mm.

Cutting data recommendation from page 436.

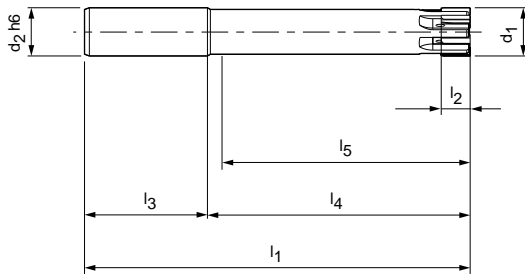
Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "MonoReam".

MonoReam MOR700

Expanding design

Design:

Reamer diameter: 8.00 - 40.00 mm
 Lead: MY1G
 Cutting material: HU612



Dimensions							z	Specification	Order No.
d_1	$d_2\ h6$	l_1	l_2	l_3	l_4	l_5			
8,00	12	120	8	45	75	70	4	MOR70008H7MY1G-HU612	30475185
8,50	12	120	8	45	75	70	4	MOR70008.5H7MY1G-HU612	30475186
9,00	12	120	8	45	75	70	4	MOR70009H7MY1G-HU612	30475187
9,50	12	120	8	45	75	70	4	MOR70009.5H7MY1G-HU612	30475188
10,00	12	120	8	45	75	70	6	MOR700010H7MY1G-HU612	30315451
10,50	12	120	8	45	75	70	6	MOR700010.5H7MY1G-HU612	30475189
11,00	12	120	8	45	75	70	6	MOR700011H7MY1G-HU612	30475190
11,50	12	120	8	45	75	70	6	MOR700011.5H7MY1G-HU612	30475191
12,00	16	140	8	48	92	87	6	MOR700012H7MY1G-HU612	30475192
12,50	16	140	8	48	92	87	6	MOR700012.5H7MY1G-HU612	30475193
13,00	16	140	8	48	92	87	6	MOR700013H7MY1G-HU612	30475194
14,00	16	140	8	48	92	87	6	MOR700014H7MY1G-HU612	30475195
15,00	16	140	8	48	92	87	6	MOR700015H7MY1G-HU612	30475196
16,00	16	140	8	48	92	87	6	MOR700016H7MY1G-HU612	30475197
17,00	16	140	8	48	92	87	6	MOR700017H7MY1G-HU612	30475198
18,00	20	160	12	50	110	105	6	MOR700018H7MY1G-HU612	30475199
19,00	20	160	12	50	110	105	6	MOR700019H7MY1G-HU612	30475200
20,00	20	160	12	50	110	105	6	MOR700020H7MY1G-HU612	30315452
21,00	20	160	12	50	110	105	6	MOR700021H7MY1G-HU612	30475201
22,00	20	160	12	50	110	105	6	MOR700022H7MY1G-HU612	30475202
23,00	20	180	12	50	130	125	6	MOR700023H7MY1G-HU612	30475203
24,00	20	180	12	50	130	125	6	MOR700024H7MY1G-HU612	30475204
25,00	20	180	12	50	130	125	6	MOR700025H7MY1G-HU612	30475205
26,00	20	180	12	50	130	125	6	MOR700026H7MY1G-HU612	30475206
27,00	20	180	12	50	130	125	6	MOR700027H7MY1G-HU612	30475207
28,00	25	200	12	56	144	139	6	MOR700028H7MY1G-HU612	30475208
29,00	25	200	12	56	144	139	6	MOR700029H7MY1G-HU612	30475209
30,00	25	200	12	56	144	139	8	MOR700030H7MY1G-HU612	30475210
31,00	25	200	12	56	144	139	8	MOR700031H7MY1G-HU612	30475211
32,00	25	200	12	56	144	139	8	MOR700032H7MY1G-HU612	30475212
33,00	25	200	12	56	144	139	8	MOR700033H7MY1G-HU612	30475213
34,00	25	200	12	56	144	139	8	MOR700034H7MY1G-HU612	30475214
35,00	25	200	12	56	144	139	8	MOR700035H7MY1G-HU612	30315453
36,00	25	200	12	56	144	139	8	MOR700036H7MY1G-HU612	30475215
37,00	25	200	12	56	144	139	8	MOR700037H7MY1G-HU612	30475216
38,00	25	200	12	56	144	139	8	MOR700038H7MY1G-HU612	30475217
39,00	25	200	12	56	144	139	8	MOR700039H7MY1G-HU612	30475218
40,00	25	200	12	56	144	139	8	MOR700040H7MY1G-HU612	30475219

Dimensions in mm.

Cutting data recommendation from page 436.

Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "MonoReam".

MonoReam MOR705

Expanding design

Design:

Reamer diameter:

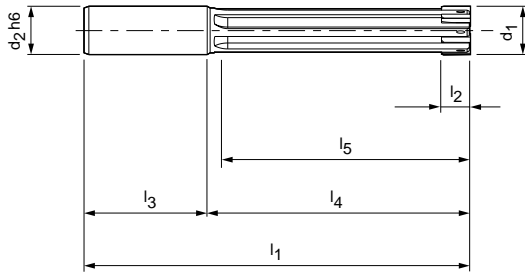
8.00 - 40.00 mm

Lead:

MU2A

Cutting material:

HU612



Dimensions							z	Specification	Order No.
d_1	$d_2 h6$	l_1	l_2	l_3	l_4	l_5			
8,00	12	120	8	45	75	64	4	MOR70508H7MU2A-HU612	30475298
8,50	12	120	8	45	75	64	4	MOR70508.5H7MU2A-HU612	30475299
9,00	12	120	8	45	75	64	4	MOR70509H7MU2A-HU612	30475300
9,50	12	120	8	45	75	65	4	MOR70509.5H7MU2A-HU612	30475301
10,00	12	120	8	45	75	65	6	MOR705010H7MU2A-HU612	30339172
10,50	12	120	8	45	75	65	6	MOR705010.5H7MU2A-HU612	30475302
11,00	12	120	8	45	75	65	6	MOR705011H7MU2A-HU612	30475303
11,50	12	120	8	45	75	65	6	MOR705011.5H7MU2A-HU612	30475304
12,00	16	140	8	48	92	65	6	MOR705012H7MU2A-HU612	30475305
12,50	16	140	8	48	92	80	6	MOR705012.5H7MU2A-HU612	30475306
13,00	16	140	8	48	92	80	6	MOR705013H7MU2A-HU612	30475307
14,00	16	140	8	48	92	80	6	MOR705014H7MU2A-HU612	30475308
15,00	16	140	8	48	92	80	6	MOR705015H7MU2A-HU612	30475309
16,00	16	140	8	48	92	80	6	MOR705016H7MU2A-HU612	30475310
17,00	16	140	8	48	92	80	6	MOR705017H7MU2A-HU612	30438939
18,00	20	160	12	50	110	98	6	MOR705018H7MU2A-HU612	30475311
19,00	20	160	12	50	110	99	6	MOR705019H7MU2A-HU612	30475312
20,00	20	160	12	50	110	100	6	MOR705020H7MU2A-HU612	30475313
21,00	20	160	12	50	110	100	6	MOR705021H7MU2A-HU612	30475314
22,00	20	160	12	50	110	100	6	MOR705022H7MU2A-HU612	30475315
23,00	20	180	12	50	130	120	6	MOR705023H7MU2A-HU612	30475316
24,00	20	180	12	50	130	120	6	MOR705024H7MU2A-HU612	30475317
25,00	20	180	12	50	130	120	6	MOR705025H7MU2A-HU612	30475318
26,00	20	180	12	50	130	120	6	MOR705026H7MU2A-HU612	30475319
27,00	20	180	12	50	130	120	6	MOR705027H7MU2A-HU612	30475320
28,00	25	200	12	56	144	130	6	MOR705028H7MU2A-HU612	30475321
29,00	25	200	12	56	144	130	6	MOR705029H7MU2A-HU612	30475322
30,00	25	200	12	56	144	130	8	MOR705030H7MU2A-HU612	30475323
31,00	25	200	12	56	144	130	8	MOR705031H7MU2A-HU612	30475324
32,00	25	200	12	56	144	130	8	MOR705032H7MU2A-HU612	30475325
33,00	25	200	12	56	144	130	8	MOR705033H7MU2A-HU612	30475326
34,00	25	200	12	56	144	130	8	MOR705034H7MU2A-HU612	30475327
35,00	25	200	12	56	144	130	8	MOR705035H7MU2A-HU612	30475328
36,00	25	200	12	56	144	130	8	MOR705036H7MU2A-HU612	30475329
37,00	25	200	12	56	144	130	8	MOR705037H7MU2A-HU612	30475330
38,00	25	200	12	56	144	130	8	MOR705038H7MU2A-HU612	30475331
39,00	25	200	12	56	144	130	8	MOR705039H7MU2A-HU612	30475332
40,00	25	200	12	56	144	130	8	MOR705040H7MU2A-HU612	30475333

Dimensions in mm.

Cutting data recommendation from page 436.

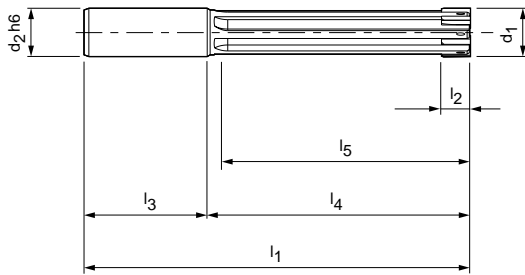
Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "MonoReam".

MonoReam MOR705

Expanding design

Design:

Reamer diameter: 8.00 - 40.00 mm
 Lead: MU2A
 Cutting material: HP421



Dimensions							z	Specification	Order No.
d_1	$d_2 h_6$	l_1	l_2	l_3	l_4	l_5			
8,00	12	120	8	45	75	64	4	MOR705Ø8H7MU2A-HP421	30475334
8,50	12	120	8	45	75	64	4	MOR705Ø8.5H7MU2A-HP421	30475335
9,00	12	120	8	45	75	64	4	MOR705Ø9H7MU2A-HP421	30475336
9,50	12	120	8	45	75	65	4	MOR705Ø9.5H7MU2A-HP421	30475337
10,00	12	120	8	45	75	65	6	MOR705Ø10H7MU2A-HP421	30315454
10,50	12	120	8	45	75	65	6	MOR705Ø10.5H7MU2A-HP421	30475338
11,00	12	120	8	45	75	65	6	MOR705Ø11H7MU2A-HP421	30475339
11,50	12	120	8	45	75	65	6	MOR705Ø11.5H7MU2A-HP421	30475340
12,00	16	140	8	48	92	65	6	MOR705Ø12H7MU2A-HP421	30475341
12,50	16	140	8	48	92	80	6	MOR705Ø12.5H7MU2A-HP421	30475342
13,00	16	140	8	48	92	80	6	MOR705Ø13H7MU2A-HP421	30475343
14,00	16	140	8	48	92	80	6	MOR705Ø14H7MU2A-HP421	30475344
15,00	16	140	8	48	92	80	6	MOR705Ø15H7MU2A-HP421	30475345
16,00	16	140	8	48	92	80	6	MOR705Ø16H7MU2A-HP421	30475346
17,00	16	140	8	48	92	80	6	MOR705Ø17H7MU2A-HP421	30475347
18,00	20	160	12	50	110	98	6	MOR705Ø18H7MU2A-HP421	30475348
19,00	20	160	12	50	110	99	6	MOR705Ø19H7MU2A-HP421	30475349
20,00	20	160	12	50	110	100	6	MOR705Ø20H7MU2A-HP421	30315455
21,00	20	160	12	50	110	100	6	MOR705Ø21H7MU2A-HP421	30475350
22,00	20	160	12	50	110	100	6	MOR705Ø22H7MU2A-HP421	30475351
23,00	20	180	12	50	130	120	6	MOR705Ø23H7MU2A-HP421	30475352
24,00	20	180	12	50	130	120	6	MOR705Ø24H7MU2A-HP421	30475353
25,00	20	180	12	50	130	120	6	MOR705Ø25H7MU2A-HP421	30475354
26,00	20	180	12	50	130	120	6	MOR705Ø26H7MU2A-HP421	30475355
27,00	20	180	12	50	130	120	6	MOR705Ø27H7MU2A-HP421	30475356
28,00	25	200	12	56	144	130	6	MOR705Ø28H7MU2A-HP421	30475357
29,00	25	200	12	56	144	130	6	MOR705Ø29H7MU2A-HP421	30475358
30,00	25	200	12	56	144	130	8	MOR705Ø30H7MU2A-HP421	30458547
31,00	25	200	12	56	144	130	8	MOR705Ø31H7MU2A-HP421	30475359
32,00	25	200	12	56	144	130	8	MOR705Ø32H7MU2A-HP421	30475360
33,00	25	200	12	56	144	130	8	MOR705Ø33H7MU2A-HP421	30475361
34,00	25	200	12	56	144	130	8	MOR705Ø34H7MU2A-HP421	30475362
35,00	25	200	12	56	144	130	8	MOR705Ø35H7MU2A-HP421	30315456
36,00	25	200	12	56	144	130	8	MOR705Ø36H7MU2A-HP421	30475363
37,00	25	200	12	56	144	130	8	MOR705Ø37H7MU2A-HP421	30475364
38,00	25	200	12	56	144	130	8	MOR705Ø38H7MU2A-HP421	30475365
39,00	25	200	12	56	144	130	8	MOR705Ø39H7MU2A-HP421	30475366
40,00	25	200	12	56	144	130	8	MOR705Ø40H7MU2A-HP421	30475367

Dimensions in mm.

Cutting data recommendation from page 436.

Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "MonoReam".

MonoReam MOR705

Expanding design

Design:

Reamer diameter:

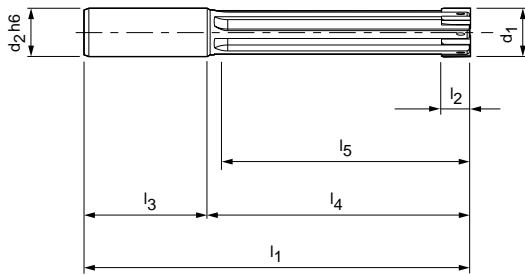
8.00 - 40.00 mm

Lead:

MU2A

Cutting material:

CU130



Dimensions							z	Specification	Order No.
d_1	$d_2 h6$	l_1	l_2	l_3	l_4	l_5			
8,00	12	120	8	45	75	64	4	MOR70508H7MU2A-CU130	30475368
8,50	12	120	8	45	75	64	4	MOR70508.5H7MU2A-CU130	30475369
9,00	12	120	8	45	75	64	4	MOR70509H7MU2A-CU130	30475370
9,50	12	120	8	45	75	65	4	MOR70509.5H7MU2A-CU130	30475371
10,00	12	120	8	45	75	65	6	MOR705010H7MU2A-CU130	30475372
10,50	12	120	8	45	75	65	6	MOR705010.5H7MU2A-CU130	30475373
11,00	12	120	8	45	75	65	6	MOR705011H7MU2A-CU130	30475374
11,50	12	120	8	45	75	65	6	MOR705011.5H7MU2A-CU130	30475375
12,00	16	140	8	48	92	65	6	MOR705012H7MU2A-CU130	30475376
12,50	16	140	8	48	92	80	6	MOR705012.5H7MU2A-CU130	30475377
13,00	16	140	8	48	92	80	6	MOR705013H7MU2A-CU130	30475378
14,00	16	140	8	48	92	80	6	MOR705014H7MU2A-CU130	30475379
15,00	16	140	8	48	92	80	6	MOR705015H7MU2A-CU130	30475380
16,00	16	140	8	48	92	80	6	MOR705016H7MU2A-CU130	30475381
17,00	16	140	8	48	92	80	6	MOR705017H7MU2A-CU130	30475382
18,00	20	160	12	50	110	98	6	MOR705018H7MU2A-CU130	30475383
19,00	20	160	12	50	110	99	6	MOR705019H7MU2A-CU130	30475384
20,00	20	160	12	50	110	100	6	MOR705020H7MU2A-CU130	30306112
21,00	20	160	12	50	110	100	6	MOR705021H7MU2A-CU130	30475385
22,00	20	160	12	50	110	100	6	MOR705022H7MU2A-CU130	30475386
23,00	20	180	12	50	130	120	6	MOR705023H7MU2A-CU130	30475387
24,00	20	180	12	50	130	120	6	MOR705024H7MU2A-CU130	30475388
25,00	20	180	12	50	130	120	6	MOR705025H7MU2A-CU130	30475389
26,00	20	180	12	50	130	120	6	MOR705026H7MU2A-CU130	30475390
27,00	20	180	12	50	130	120	6	MOR705027H7MU2A-CU130	30475391
28,00	25	200	12	56	144	130	6	MOR705028H7MU2A-CU130	30475392
29,00	25	200	12	56	144	130	6	MOR705029H7MU2A-CU130	30475393
30,00	25	200	12	56	144	130	8	MOR705030H7MU2A-CU130	30475394
31,00	25	200	12	56	144	130	8	MOR705031H7MU2A-CU130	30475395
32,00	25	200	12	56	144	130	8	MOR705032H7MU2A-CU130	30475396
33,00	25	200	12	56	144	130	8	MOR705033H7MU2A-CU130	30475397
34,00	25	200	12	56	144	130	8	MOR705034H7MU2A-CU130	30475398
35,00	25	200	12	56	144	130	8	MOR705035H7MU2A-CU130	30475399
36,00	25	200	12	56	144	130	8	MOR705036H7MU2A-CU130	30475400
37,00	25	200	12	56	144	130	8	MOR705037H7MU2A-CU130	30475401
38,00	25	200	12	56	144	130	8	MOR705038H7MU2A-CU130	30475402
39,00	25	200	12	56	144	130	8	MOR705039H7MU2A-CU130	30475403
40,00	25	200	12	56	144	130	8	MOR705040H7MU2A-CU130	30475404

Dimensions in mm.

Cutting data recommendation from page 436.

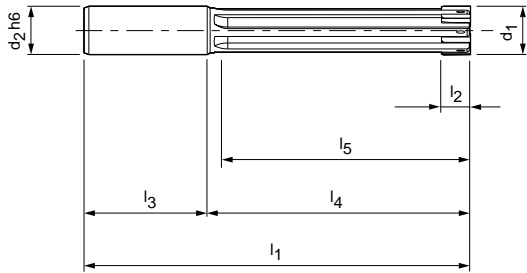
Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "MonoReam".

MonoReam MOR705

Expanding design

Design:

Reamer diameter: 8.00 - 40.00 mm
 Lead: MU2A
 Cutting material: CP136



Dimensions							z	Specification	Order No.
d_1	$d_2 h6$	l_1	l_2	l_3	l_4	l_5			
8,00	12	120	8	45	75	64	4	MOR705Ø8H7MU2A-CP136	30475405
8,50	12	120	8	45	75	64	4	MOR705Ø8.5H7MU2A-CP136	30475406
9,00	12	120	8	45	75	64	4	MOR705Ø9H7MU2A-CP136	30475407
9,50	12	120	8	45	75	65	4	MOR705Ø9.5H7MU2A-CP136	30475408
10,00	12	120	8	45	75	65	6	MOR705Ø10H7MU2A-CP136	30435220
10,50	12	120	8	45	75	65	6	MOR705Ø10.5H7MU2A-CP136	30475409
11,00	12	120	8	45	75	65	6	MOR705Ø11H7MU2A-CP136	30475410
11,50	12	120	8	45	75	65	6	MOR705Ø11.5H7MU2A-CP136	30475411
12,00	16	140	8	48	92	65	6	MOR705Ø12H7MU2A-CP136	30475412
12,50	16	140	8	48	92	80	6	MOR705Ø12.5H7MU2A-CP136	30475413
13,00	16	140	8	48	92	80	6	MOR705Ø13H7MU2A-CP136	30475414
14,00	16	140	8	48	92	80	6	MOR705Ø14H7MU2A-CP136	30475415
15,00	16	140	8	48	92	80	6	MOR705Ø15H7MU2A-CP136	30475416
16,00	16	140	8	48	92	80	6	MOR705Ø16H7MU2A-CP136	30475417
17,00	16	140	8	48	92	80	6	MOR705Ø17H7MU2A-CP136	30475418
18,00	20	160	12	50	110	98	6	MOR705Ø18H7MU2A-CP136	30304637
19,00	20	160	12	50	110	99	6	MOR705Ø19H7MU2A-CP136	30475419
20,00	20	160	12	50	110	100	6	MOR705Ø20H7MU2A-CP136	30475420
21,00	20	160	12	50	110	100	6	MOR705Ø21H7MU2A-CP136	30475421
22,00	20	160	12	50	110	100	6	MOR705Ø22H7MU2A-CP136	30475422
23,00	20	180	12	50	130	120	6	MOR705Ø23H7MU2A-CP136	30475423
24,00	20	180	12	50	130	120	6	MOR705Ø24H7MU2A-CP136	30475424
25,00	20	180	12	50	130	120	6	MOR705Ø25H7MU2A-CP136	30475425
26,00	20	180	12	50	130	120	6	MOR705Ø26H7MU2A-CP136	30475426
27,00	20	180	12	50	130	120	6	MOR705Ø27H7MU2A-CP136	30475427
28,00	25	200	12	56	144	130	6	MOR705Ø28H7MU2A-CP136	30475428
29,00	25	200	12	56	144	130	6	MOR705Ø29H7MU2A-CP136	30475429
30,00	25	200	12	56	144	130	8	MOR705Ø30H7MU2A-CP136	30475430
31,00	25	200	12	56	144	130	8	MOR705Ø31H7MU2A-CP136	30475431
32,00	25	200	12	56	144	130	8	MOR705Ø32H7MU2A-CP136	30475432
33,00	25	200	12	56	144	130	8	MOR705Ø33H7MU2A-CP136	30475433
34,00	25	200	12	56	144	130	8	MOR705Ø34H7MU2A-CP136	30475434
35,00	25	200	12	56	144	130	8	MOR705Ø35H7MU2A-CP136	30475435
36,00	25	200	12	56	144	130	8	MOR705Ø36H7MU2A-CP136	30475436
37,00	25	200	12	56	144	130	8	MOR705Ø37H7MU2A-CP136	30475437
38,00	25	200	12	56	144	130	8	MOR705Ø38H7MU2A-CP136	30475438
39,00	25	200	12	56	144	130	8	MOR705Ø39H7MU2A-CP136	30475439
40,00	25	200	12	56	144	130	8	MOR705Ø40H7MU2A-CP136	30475440

Dimensions in mm.

Cutting data recommendation from page 436.

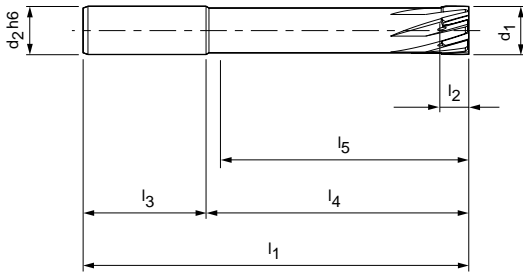
Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "MonoReam".

MonoReam MOR810

Finely adjustable design

Design:

Reamer diameter: 8.00 - 40.00 mm
 Lead: MY1G
 Cutting material: HP421



Dimensions							z	Specification	Order No.
d_1	$d_2 h6$	l_1	l_2	l_3	l_4	l_5			
8,00	12	120	8	45	75	70	4	MOR81008H7MY1G-HP421	30475534
8,50	12	120	8	45	75	70	4	MOR81008.5H7MY1G-HP421	30475535
9,00	12	120	8	45	75	70	4	MOR81009H7MY1G-HP421	30475536
9,50	12	120	8	45	75	70	4	MOR81009.5H7MY1G-HP421	30475537
10,00	12	120	8	45	75	70	6	MOR810010H7MY1G-HP421	30475538
10,50	12	120	8	45	75	70	6	MOR810010.5H7MY1G-HP421	30475539
11,00	12	120	8	45	75	70	6	MOR810011H7MY1G-HP421	30475540
11,50	12	120	8	45	75	70	6	MOR810011.5H7MY1G-HP421	30475541
12,00	16	140	8	48	92	87	6	MOR810012H7MY1G-HP421	30344794
12,50	16	140	8	48	92	87	6	MOR810012.5H7MY1G-HP421	30475542
13,00	16	140	8	48	92	87	6	MOR810013H7MY1G-HP421	30475543
14,00	16	140	8	48	92	87	6	MOR810014H7MY1G-HP421	30475544
15,00	16	140	8	48	92	87	6	MOR810015H7MY1G-HP421	30475545
16,00	16	140	8	48	92	87	6	MOR810016H7MY1G-HP421	30462991
17,00	16	140	8	48	92	87	6	MOR810017H7MY1G-HP421	30475546
18,00	20	160	12	50	110	105	6	MOR810018H7MY1G-HP421	30475547
19,00	20	160	12	50	110	105	6	MOR810019H7MY1G-HP421	30475548
20,00	20	160	12	50	110	105	6	MOR810020H7MY1G-HP421	30475549
21,00	20	160	12	50	110	105	6	MOR810021H7MY1G-HP421	30475550
22,00	20	160	12	50	110	105	6	MOR810022H7MY1G-HP421	30475551
23,00	20	180	12	50	130	125	6	MOR810023H7MY1G-HP421	30475552
24,00	20	180	12	50	130	125	6	MOR810024H7MY1G-HP421	30475553
25,00	20	180	12	50	130	125	6	MOR810025H7MY1G-HP421	30475554
26,00	20	180	12	50	130	125	6	MOR810026H7MY1G-HP421	30475555
27,00	20	180	12	50	130	125	6	MOR810027H7MY1G-HP421	30475556
28,00	25	200	12	56	144	139	6	MOR810028H7MY1G-HP421	30475557
29,00	25	200	12	56	144	139	6	MOR810029H7MY1G-HP421	30475558
30,00	25	200	12	56	144	139	8	MOR810030H7MY1G-HP421	30475559
31,00	25	200	12	56	144	139	8	MOR810031H7MY1G-HP421	30475560
32,00	25	200	12	56	144	139	8	MOR810032H7MY1G-HP421	30475561
33,00	25	200	12	56	144	139	8	MOR810033H7MY1G-HP421	30475562
34,00	25	200	12	56	144	139	8	MOR810034H7MY1G-HP421	30475563
35,00	25	200	12	56	144	139	8	MOR810035H7MY1G-HP421	30475564
36,00	25	200	12	56	144	139	8	MOR810036H7MY1G-HP421	30475565
37,00	25	200	12	56	144	139	8	MOR810037H7MY1G-HP421	30475566
38,00	25	200	12	56	144	139	8	MOR810038H7MY1G-HP421	30475567
39,00	25	200	12	56	144	139	8	MOR810039H7MY1G-HP421	30475568
40,00	25	200	12	56	144	139	8	MOR810040H7MY1G-HP421	30475569

Dimensions in mm.

Cutting data recommendation from page 436.

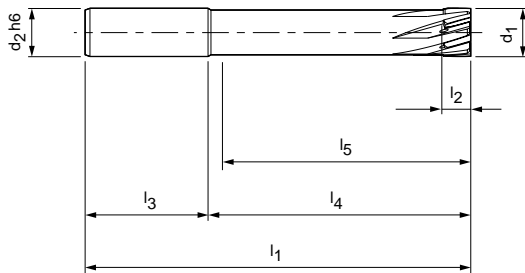
Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "MonoReam".

MonoReam MOR810

Finely adjustable design

Design:

Reamer diameter: 8.00 - 40.00 mm
 Lead: MY1G
 Cutting material: CU130



Dimensions							z	Specification	Order No.
d_1	$d_2 h6$	l_1	l_2	l_3	l_4	l_5			
8,00	12	120	8	45	75	70	4	MOR810Ø8H7MY1G-CU130	30305297
8,50	12	120	8	45	75	70	4	MOR810Ø8.5H7MY1G-CU130	30305298
9,00	12	120	8	45	75	70	4	MOR810Ø9H7MY1G-CU130	30305299
9,50	12	120	8	45	75	70	4	MOR810Ø9.5H7MY1G-CU130	30305300
10,00	12	120	8	45	75	70	6	MOR810Ø10H7MY1G-CU130	30305301
10,50	12	120	8	45	75	70	6	MOR810Ø10.5H7MY1G-CU130	30305302
11,00	12	120	8	45	75	70	6	MOR810Ø11H7MY1G-CU130	30305303
11,50	12	120	8	45	75	70	6	MOR810Ø11.5H7MY1G-CU130	30305304
12,00	16	140	8	48	92	87	6	MOR810Ø12H7MY1G-CU130	30305305
12,50	16	140	8	48	92	87	6	MOR810Ø12.5H7MY1G-CU130	30305306
13,00	16	140	8	48	92	87	6	MOR810Ø13H7MY1G-CU130	30305307
14,00	16	140	8	48	92	87	6	MOR810Ø14H7MY1G-CU130	30305308
15,00	16	140	8	48	92	87	6	MOR810Ø15H7MY1G-CU130	30305309
16,00	16	140	8	48	92	87	6	MOR810Ø16H7MY1G-CU130	30305310
17,00	16	140	8	48	92	87	6	MOR810Ø17H7MY1G-CU130	30305311
18,00	20	160	12	50	110	105	6	MOR810Ø18H7MY1G-CU130	30305312
19,00	20	160	12	50	110	105	6	MOR810Ø19H7MY1G-CU130	30305313
20,00	20	160	12	50	110	105	6	MOR810Ø20H7MY1G-CU130	30305314
21,00	20	160	12	50	110	105	6	MOR810Ø21H7MY1G-CU130	30305315
22,00	20	160	12	50	110	105	6	MOR810Ø22H7MY1G-CU130	30305316
23,00	20	180	12	50	130	125	6	MOR810Ø23H7MY1G-CU130	30305317
24,00	20	180	12	50	130	125	6	MOR810Ø24H7MY1G-CU130	30305318
25,00	20	180	12	50	130	125	6	MOR810Ø25H7MY1G-CU130	30305319
26,00	20	180	12	50	130	125	6	MOR810Ø26H7MY1G-CU130	30305320
27,00	20	180	12	50	130	125	6	MOR810Ø27H7MY1G-CU130	30305321
28,00	25	200	12	56	144	139	6	MOR810Ø28H7MY1G-CU130	30305323
29,00	25	200	12	56	144	139	6	MOR810Ø29H7MY1G-CU130	30305324
30,00	25	200	12	56	144	139	8	MOR810Ø30H7MY1G-CU130	30305325
31,00	25	200	12	56	144	139	8	MOR810Ø31H7MY1G-CU130	30305326
32,00	25	200	12	56	144	139	8	MOR810Ø32H7MY1G-CU130	30305327
33,00	25	200	12	56	144	139	8	MOR810Ø33H7MY1G-CU130	30305328
34,00	25	200	12	56	144	139	8	MOR810Ø34H7MY1G-CU130	30305329
35,00	25	200	12	56	144	139	8	MOR810Ø35H7MY1G-CU130	30305330
36,00	25	200	12	56	144	139	8	MOR810Ø36H7MY1G-CU130	30305331
37,00	25	200	12	56	144	139	8	MOR810Ø37H7MY1G-CU130	30305332
38,00	25	200	12	56	144	139	8	MOR810Ø38H7MY1G-CU130	30305333
39,00	25	200	12	56	144	139	8	MOR810Ø39H7MY1G-CU130	30305334
40,00	25	200	12	56	144	139	8	MOR810Ø40H7MY1G-CU130	30305335

Dimensions in mm.

Cutting data recommendation from page 436.

Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "MonoReam".

MonoReam MOR810

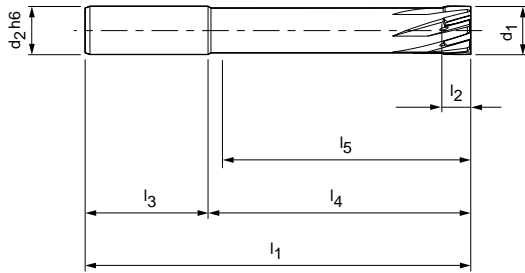
Finely adjustable design

Design:

Reamer diameter: 8.00 - 40.00 mm

Lead: MY1G

Cutting material: CP136



Dimensions							z	Specification	Order No.
d_1	$d_2 h_6$	l_1	l_2	l_3	l_4	l_5			
8,00	12	120	8	45	75	70	4	MOR81008H7MY1G-CP136	30475570
8,50	12	120	8	45	75	70	4	MOR81008.5H7MY1G-CP136	30475572
9,00	12	120	8	45	75	70	4	MOR81009H7MY1G-CP136	30475573
9,50	12	120	8	45	75	70	4	MOR81009.5H7MY1G-CP136	30475574
10,00	12	120	8	45	75	70	6	MOR810010H7MY1G-CP136	30475575
10,50	12	120	8	45	75	70	6	MOR810010.5H7MY1G-CP136	30333548
11,00	12	120	8	45	75	70	6	MOR810011H7MY1G-CP136	30475576
11,50	12	120	8	45	75	70	6	MOR810011.5H7MY1G-CP136	30475577
12,00	16	140	8	48	92	87	6	MOR810012H7MY1G-CP136	30309465
12,50	16	140	8	48	92	87	6	MOR810012.5H7MY1G-CP136	30475578
13,00	16	140	8	48	92	87	6	MOR810013H7MY1G-CP136	30475579
14,00	16	140	8	48	92	87	6	MOR810014H7MY1G-CP136	30475580
15,00	16	140	8	48	92	87	6	MOR810015H7MY1G-CP136	30475581
16,00	16	140	8	48	92	87	6	MOR810016H7MY1G-CP136	30475582
17,00	16	140	8	48	92	87	6	MOR810017H7MY1G-CP136	30475583
18,00	20	160	12	50	110	105	6	MOR810018H7MY1G-CP136	30475584
19,00	20	160	12	50	110	105	6	MOR810019H7MY1G-CP136	30475585
20,00	20	160	12	50	110	105	6	MOR810020H7MY1G-CP136	30475586
21,00	20	160	12	50	110	105	6	MOR810021H7MY1G-CP136	30475587
22,00	20	160	12	50	110	105	6	MOR810022H7MY1G-CP136	30475588
23,00	20	180	12	50	130	125	6	MOR810023H7MY1G-CP136	30475589
24,00	20	180	12	50	130	125	6	MOR810024H7MY1G-CP136	30475590
25,00	20	180	12	50	130	125	6	MOR810025H7MY1G-CP136	30475591
26,00	20	180	12	50	130	125	6	MOR810026H7MY1G-CP136	30475592
27,00	20	180	12	50	130	125	6	MOR810027H7MY1G-CP136	30475593
28,00	25	200	12	56	144	139	6	MOR810028H7MY1G-CP136	30475594
29,00	25	200	12	56	144	139	6	MOR810029H7MY1G-CP136	30475595
30,00	25	200	12	56	144	139	8	MOR810030H7MY1G-CP136	30475596
31,00	25	200	12	56	144	139	8	MOR810031H7MY1G-CP136	30475597
32,00	25	200	12	56	144	139	8	MOR810032H7MY1G-CP136	30475598
33,00	25	200	12	56	144	139	8	MOR810033H7MY1G-CP136	30475599
34,00	25	200	12	56	144	139	8	MOR810034H7MY1G-CP136	30475600
35,00	25	200	12	56	144	139	8	MOR810035H7MY1G-CP136	30475601
36,00	25	200	12	56	144	139	8	MOR810036H7MY1G-CP136	30475602
37,00	25	200	12	56	144	139	8	MOR810037H7MY1G-CP136	30475603
38,00	25	200	12	56	144	139	8	MOR810038H7MY1G-CP136	30475604
39,00	25	200	12	56	144	139	8	MOR810039H7MY1G-CP136	30475605
40,00	25	200	12	56	144	139	8	MOR810040H7MY1G-CP136	30475606

Dimensions in mm.

Cutting data recommendation from page 436.

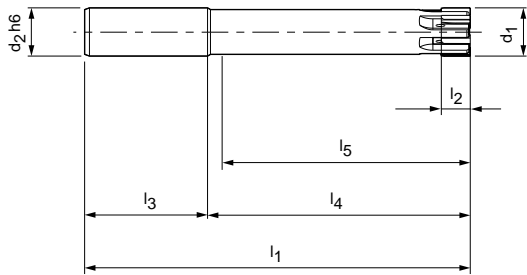
Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "MonoReam".

MonoReam MOR800

Finely adjustable design

Design:

Reamer diameter: 8.00 - 40.00 mm
 Lead: MY1G
 Cutting material: HU612



Dimensions							z	Specification	Order No.
d_1	$d_2 h6$	l_1	l_2	l_3	l_4	l_5			
8,00	12	120	8	45	75	64	4	MOR800Ø8H7MY1G-HU612	30475817
8,50	12	120	8	45	75	64	4	MOR800Ø8.5H7MY1G-HU612	30475818
9,00	12	120	8	45	75	64	4	MOR800Ø9H7MY1G-HU612	30475819
9,50	12	120	8	45	75	65	4	MOR800Ø9.5H7MY1G-HU612	30475820
10,00	12	120	8	45	75	65	6	MOR800Ø10H7MY1G-HU612	30475821
10,50	12	120	8	45	75	65	6	MOR800Ø10.5H7MY1G-HU612	30475822
11,00	12	120	8	45	75	65	6	MOR800Ø11H7MY1G-HU612	30475823
11,50	12	120	8	45	75	65	6	MOR800Ø11.5H7MY1G-HU612	30475824
12,00	16	140	8	48	92	65	6	MOR800Ø12H7MY1G-HU612	30475825
12,50	16	140	8	48	92	80	6	MOR800Ø12.5H7MY1G-HU612	30475826
13,00	16	140	8	48	92	80	6	MOR800Ø13H7MY1G-HU612	30475827
14,00	16	140	8	48	92	80	6	MOR800Ø14H7MY1G-HU612	30475828
15,00	16	140	8	48	92	80	6	MOR800Ø15H7MY1G-HU612	30368530
16,00	16	140	8	48	92	80	6	MOR800Ø16H7MY1G-HU612	30475829
17,00	16	140	8	48	92	80	6	MOR800Ø17H7MY1G-HU612	30475830
18,00	20	160	12	50	110	98	6	MOR800Ø18H7MY1G-HU612	30475831
19,00	20	160	12	50	110	99	6	MOR800Ø19H7MY1G-HU612	30475832
20,00	20	160	12	50	110	100	6	MOR800Ø20H7MY1G-HU612	30475833
21,00	20	160	12	50	110	100	6	MOR800Ø21H7MY1G-HU612	30475834
22,00	20	160	12	50	110	100	6	MOR800Ø22H7MY1G-HU612	30475835
23,00	20	180	12	50	130	120	6	MOR800Ø23H7MY1G-HU612	30475836
24,00	20	180	12	50	130	120	6	MOR800Ø24H7MY1G-HU612	30475837
25,00	20	180	12	50	130	120	6	MOR800Ø25H7MY1G-HU612	30475838
26,00	20	180	12	50	130	120	6	MOR800Ø26H7MY1G-HU612	30475839
27,00	20	180	12	50	130	120	6	MOR800Ø27H7MY1G-HU612	30475840
28,00	25	200	12	56	144	130	6	MOR800Ø28H7MY1G-HU612	30475841
29,00	25	200	12	56	144	130	6	MOR800Ø29H7MY1G-HU612	30475842
30,00	25	200	12	56	144	130	8	MOR800Ø30H7MY1G-HU612	30475843
31,00	25	200	12	56	144	130	8	MOR800Ø31H7MY1G-HU612	30475844
32,00	25	200	12	56	144	130	8	MOR800Ø32H7MY1G-HU612	30475845
33,00	25	200	12	56	144	130	8	MOR800Ø33H7MY1G-HU612	30475846
34,00	25	200	12	56	144	130	8	MOR800Ø34H7MY1G-HU612	30475847
35,00	56	200	25	12	144	130	8	MOR800Ø35H7MY1G-HU612	30475848
36,00	25	200	12	56	144	130	8	MOR800Ø36H7MY1G-HU612	30475849
37,00	25	200	12	56	144	130	8	MOR800Ø37H7MY1G-HU612	30475850
38,00	25	200	12	56	144	130	8	MOR800Ø38H7MY1G-HU612	30475851
39,00	25	200	12	56	144	130	8	MOR800Ø39H7MY1G-HU612	30475852
40,00	25	200	12	56	144	130	8	MOR800Ø40H7MY1G-HU612	30475853

Dimensions in mm.

Cutting data recommendation from page 436.

Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "MonoReam".

MonoReam MOR805

Finely adjustable design

Design:

Reamer diameter:

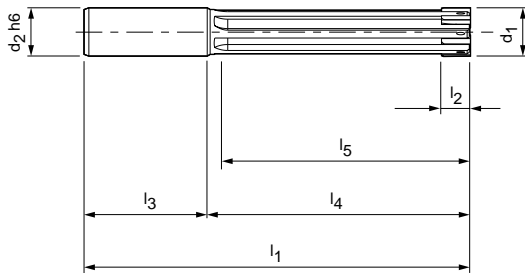
8.00 - 40.00 mm

Lead:

MU2A

Cutting material:

HU612



Dimensions							z	Specification	Order No.
d_1	$d_2 h6$	l_1	l_2	l_3	l_4	l_5			
8,00	12	120	8	45	75	64	4	MOR805Ø8H7MU2A-HU612	30475984
8,50	12	120	8	45	75	64	4	MOR805Ø8.5H7MU2A-HU612	30475985
9,00	12	120	8	45	75	64	4	MOR805Ø9H7MU2A-HU612	30475986
9,50	12	120	8	45	75	65	4	MOR805Ø9.5H7MU2A-HU612	30475987
10,00	12	120	8	45	75	65	6	MOR805Ø10H7MU2A-HU612	30315463
10,50	12	120	8	45	75	65	6	MOR805Ø10.5H7MU2A-HU612	30475988
11,00	12	120	8	45	75	65	6	MOR805Ø11H7MU2A-HU612	30475989
11,50	12	120	8	45	75	65	6	MOR805Ø11.5H7MU2A-HU612	30475990
12,00	16	140	8	48	92	80	6	MOR805Ø12H7MU2A-HU612	30475991
12,50	16	140	8	48	92	80	6	MOR805Ø12.5H7MU2A-HU612	30475992
13,00	16	140	8	48	92	80	6	MOR805Ø13H7MU2A-HU612	30475993
14,00	16	140	8	48	92	80	6	MOR805Ø14H7MU2A-HU612	30475994
15,00	16	140	8	48	92	80	6	MOR805Ø15H7MU2A-HU612	30475995
16,00	16	140	8	48	92	80	6	MOR805Ø16H7MU2A-HU612	30475996
17,00	16	140	8	48	92	80	6	MOR805Ø17H7MU2A-HU612	30475997
18,00	20	160	12	50	110	98	6	MOR805Ø18H7MU2A-HU612	30475998
19,00	20	160	12	50	110	99	6	MOR805Ø19H7MU2A-HU612	30475999
20,00	20	160	12	50	110	100	6	MOR805Ø20H7MU2A-HU612	30315464
21,00	20	160	12	50	110	100	6	MOR805Ø21H7MU2A-HU612	30476000
22,00	20	160	12	50	110	100	6	MOR805Ø22H7MU2A-HU612	30476001
23,00	20	180	12	50	130	120	6	MOR805Ø23H7MU2A-HU612	30476002
24,00	20	180	12	50	130	120	6	MOR805Ø24H7MU2A-HU612	30476003
25,00	20	180	12	50	130	120	6	MOR805Ø25H7MU2A-HU612	30476004
26,00	20	180	12	50	130	120	6	MOR805Ø26H7MU2A-HU612	30476005
27,00	20	180	12	50	130	120	6	MOR805Ø27H7MU2A-HU612	30476006
28,00	25	200	12	56	144	130	6	MOR805Ø28H7MU2A-HU612	30476007
29,00	25	200	12	56	144	130	6	MOR805Ø29H7MU2A-HU612	30476008
30,00	25	200	12	56	144	130	8	MOR805Ø30H7MU2A-HU612	30476009
31,00	25	200	12	56	144	130	8	MOR805Ø31H7MU2A-HU612	30476010
32,00	25	200	12	56	144	130	8	MOR805Ø32H7MU2A-HU612	30476011
33,00	25	200	12	56	144	130	8	MOR805Ø33H7MU2A-HU612	30476012
34,00	25	200	12	56	144	130	8	MOR805Ø34H7MU2A-HU612	30476013
35,00	25	200	12	56	144	130	8	MOR805Ø35H7MU2A-HU612	30315465
36,00	25	200	12	56	144	130	8	MOR805Ø36H7MU2A-HU612	30476014
37,00	25	200	12	56	144	130	8	MOR805Ø37H7MU2A-HU612	30476015
38,00	25	200	12	56	144	130	8	MOR805Ø38H7MU2A-HU612	30476016
39,00	25	200	12	56	144	130	8	MOR805Ø39H7MU2A-HU612	30476017
40,00	25	200	12	56	144	130	8	MOR805Ø40H7MU2A-HU612	30476018

Dimensions in mm.

Cutting data recommendation from page 436.

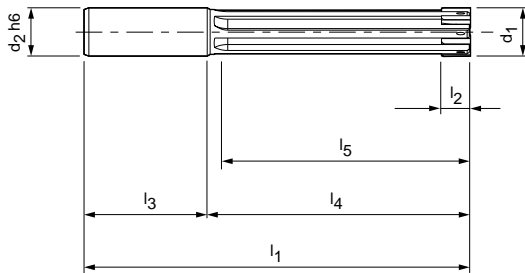
Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "MonoReam".

MonoReam MOR805

Finely adjustable design

Design:

Reamer diameter: 8.00 - 40.00 mm
 Lead: MU2A
 Cutting material: HP421



Dimensions							z	Specification	Order No.
d_1	$d_2 h6$	l_1	l_2	l_3	l_4	l_5			
8,00	12	120	8	45	75	64	4	MOR805Ø8H7MU2A-HP421	30476019
8,50	12	120	8	45	75	64	4	MOR805Ø8.5H7MU2A-HP421	30476020
9,00	12	120	8	45	75	64	4	MOR805Ø9H7MU2A-HP421	30476021
9,50	12	120	8	45	75	65	4	MOR805Ø9.5H7MU2A-HP421	30476022
10,00	12	120	8	45	75	65	6	MOR805Ø10H7MU2A-HP421	30476023
10,50	12	120	8	45	75	65	6	MOR805Ø10.5H7MU2A-HP421	30476024
11,00	12	120	8	45	75	65	6	MOR805Ø11H7MU2A-HP421	30476025
11,50	12	120	8	45	75	65	6	MOR805Ø11.5H7MU2A-HP421	30476026
12,00	16	140	8	48	92	80	6	MOR805Ø12H7MU2A-HP421	30476027
12,50	16	140	8	48	92	80	6	MOR805Ø12.5H7MU2A-HP421	30476028
13,00	16	140	8	48	92	80	6	MOR805Ø13H7MU2A-HP421	30476029
14,00	16	140	8	48	92	80	6	MOR805Ø14H7MU2A-HP421	30476030
15,00	16	140	8	48	92	80	6	MOR805Ø15H7MU2A-HP421	30476031
16,00	16	140	8	48	92	80	6	MOR805Ø16H7MU2A-HP421	30333429
17,00	16	140	8	48	92	80	6	MOR805Ø17H7MU2A-HP421	30476032
18,00	20	160	12	50	110	98	6	MOR805Ø18H7MU2A-HP421	30476033
19,00	20	160	12	50	110	99	6	MOR805Ø19H7MU2A-HP421	30476034
20,00	20	160	12	50	110	100	6	MOR805Ø20H7MU2A-HP421	30476035
21,00	20	160	12	50	110	100	6	MOR805Ø21H7MU2A-HP421	30476036
22,00	20	160	12	50	110	100	6	MOR805Ø22H7MU2A-HP421	30476037
23,00	20	180	12	50	130	120	6	MOR805Ø23H7MU2A-HP421	30476038
24,00	20	180	12	50	130	120	6	MOR805Ø24H7MU2A-HP421	30476039
25,00	20	180	12	50	130	120	6	MOR805Ø25H7MU2A-HP421	30476040
26,00	20	180	12	50	130	120	6	MOR805Ø26H7MU2A-HP421	30476041
27,00	20	180	12	50	130	120	6	MOR805Ø27H7MU2A-HP421	30476042
28,00	25	200	12	56	144	130	6	MOR805Ø28H7MU2A-HP421	30476043
29,00	25	200	12	56	144	130	6	MOR805Ø29H7MU2A-HP421	30476044
30,00	25	200	12	56	144	130	8	MOR805Ø30H7MU2A-HP421	30476045
31,00	25	200	12	56	144	130	8	MOR805Ø31H7MU2A-HP421	30476046
32,00	25	200	12	56	144	130	8	MOR805Ø32H7MU2A-HP421	30476047
33,00	25	200	12	56	144	130	8	MOR805Ø33H7MU2A-HP421	30476048
34,00	25	200	12	56	144	130	8	MOR805Ø34H7MU2A-HP421	30476049
35,00	25	200	12	56	144	130	8	MOR805Ø35H7MU2A-HP421	30476050
36,00	25	200	12	56	144	130	8	MOR805Ø36H7MU2A-HP421	30476051
37,00	25	200	12	56	144	130	8	MOR805Ø37H7MU2A-HP421	30476052
38,00	25	200	12	56	144	130	8	MOR805Ø38H7MU2A-HP421	30476053
39,00	25	200	12	56	144	130	8	MOR805Ø39H7MU2A-HP421	30476054
40,00	25	200	12	56	144	130	8	MOR805Ø40H7MU2A-HP421	30476055

Dimensions in mm.

Cutting data recommendation from page 436.

Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "MonoReam".

MonoReam MOR805

Finely adjustable design

Design:

Reamer diameter:

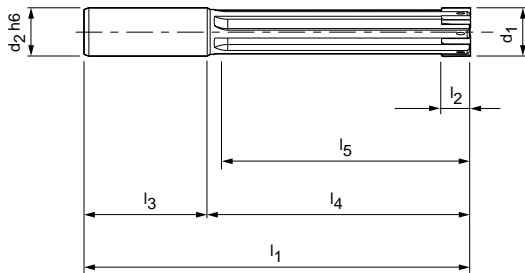
8.00 - 40.00 mm

Lead:

MU2A

Cutting material:

CU130



Dimensions							z	Specification	Order No.
d_1	$d_2 h6$	l_1	l_2	l_3	l_4	l_5			
8,00	12	120	8	45	75	64	4	MOR805Ø8H7MU2A-CU130	30476056
8,50	12	120	8	45	75	64	4	MOR805Ø8.5H7MU2A-CU130	30476057
9,00	12	120	8	45	75	64	4	MOR805Ø9H7MU2A-CU130	30476058
9,50	12	120	8	45	75	65	4	MOR805Ø9.5H7MU2A-CU130	30476059
10,00	12	120	8	45	75	65	6	MOR805Ø10H7MU2A-CU130	30377734
10,50	12	120	8	45	75	65	6	MOR805Ø10.5H7MU2A-CU130	30476060
11,00	12	120	8	45	75	65	6	MOR805Ø11H7MU2A-CU130	30476061
11,50	12	120	8	45	75	65	6	MOR805Ø11.5H7MU2A-CU130	30476062
12,00	16	140	8	48	92	80	6	MOR805Ø12H7MU2A-CU130	30476063
12,50	16	140	8	48	92	80	6	MOR805Ø12.5H7MU2A-CU130	30476064
13,00	16	140	8	48	92	80	6	MOR805Ø13H7MU2A-CU130	30476065
14,00	16	140	8	48	92	80	6	MOR805Ø14H7MU2A-CU130	30476066
15,00	16	140	8	48	92	80	6	MOR805Ø15H7MU2A-CU130	30476067
16,00	16	140	8	48	92	80	6	MOR805Ø16H7MU2A-CU130	30476068
17,00	16	140	8	48	92	80	6	MOR805Ø17H7MU2A-CU130	30476069
18,00	20	160	12	50	110	98	6	MOR805Ø18H7MU2A-CU130	30476070
19,00	20	160	12	50	110	99	6	MOR805Ø19H7MU2A-CU130	30476071
20,00	20	160	12	50	110	100	6	MOR805Ø20H7MU2A-CU130	30306102
21,00	20	160	12	50	110	100	6	MOR805Ø21H7MU2A-CU130	30476072
22,00	20	160	12	50	110	100	6	MOR805Ø22H7MU2A-CU130	30476073
23,00	20	180	12	50	130	120	6	MOR805Ø23H7MU2A-CU130	30476074
24,00	20	180	12	50	130	120	6	MOR805Ø24H7MU2A-CU130	30476075
25,00	20	180	12	50	130	120	6	MOR805Ø25H7MU2A-CU130	30476076
26,00	20	180	12	50	130	120	6	MOR805Ø26H7MU2A-CU130	30476077
27,00	20	180	12	50	130	120	6	MOR805Ø27H7MU2A-CU130	30476078
28,00	25	200	12	56	144	130	6	MOR805Ø28H7MU2A-CU130	30476079
29,00	25	200	12	56	144	130	6	MOR805Ø29H7MU2A-CU130	30476080
30,00	25	200	12	56	144	130	8	MOR805Ø30H7MU2A-CU130	30476081
31,00	25	200	12	56	144	130	8	MOR805Ø31H7MU2A-CU130	30476082
32,00	25	200	12	56	144	130	8	MOR805Ø32H7MU2A-CU130	30476083
33,00	25	200	12	56	144	130	8	MOR805Ø33H7MU2A-CU130	30476084
34,00	25	200	12	56	144	130	8	MOR805Ø34H7MU2A-CU130	30476085
35,00	25	200	12	56	144	130	8	MOR805Ø35H7MU2A-CU130	30476086
36,00	25	200	12	56	144	130	8	MOR805Ø36H7MU2A-CU130	30476087
37,00	25	200	12	56	144	130	8	MOR805Ø37H7MU2A-CU130	30476088
38,00	25	200	12	56	144	130	8	MOR805Ø38H7MU2A-CU130	30476089
39,00	25	200	12	56	144	130	8	MOR805Ø39H7MU2A-CU130	30476090
40,00	25	200	12	56	144	130	8	MOR805Ø40H7MU2A-CU130	30476091

Dimensions in mm.

Cutting data recommendation from page 436.

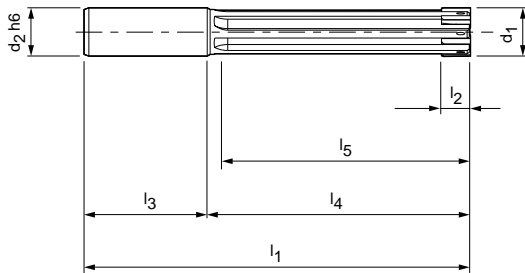
Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "MonoReam".

MonoReam MOR805

Finely adjustable design

Design:

Reamer diameter: 8.00 - 40.00 mm
 Lead: MU2A
 Cutting material: CP136



Dimensions							z	Specification	Order No.
d_1	$d_2 h6$	l_1	l_2	l_3	l_4	l_5			
8,00	12	120	8	45	75	64	4	MOR805Ø8H7MU2A-CP136	30476092
8,50	12	120	8	45	75	64	4	MOR805Ø8.5H7MU2A-CP136	30476093
9,00	12	120	8	45	75	64	4	MOR805Ø9H7MU2A-CP136	30476094
9,50	12	120	8	45	75	65	4	MOR805Ø9.5H7MU2A-CP136	30476095
10,00	12	120	8	45	75	65	6	MOR805Ø10H7MU2A-CP136	30476096
10,50	12	120	8	45	75	65	6	MOR805Ø10.5H7MU2A-CP136	30476097
11,00	12	120	8	45	75	65	6	MOR805Ø11H7MU2A-CP136	30476098
11,50	12	120	8	45	75	65	6	MOR805Ø11.5H7MU2A-CP136	30476099
12,00	16	140	8	48	92	80	6	MOR805Ø12H7MU2A-CP136	30476100
12,50	16	140	8	48	92	80	6	MOR805Ø12.5H7MU2A-CP136	30476101
13,00	16	140	8	48	92	80	6	MOR805Ø13H7MU2A-CP136	30476102
14,00	16	140	8	48	92	80	6	MOR805Ø14H7MU2A-CP136	30476103
15,00	16	140	8	48	92	80	6	MOR805Ø15H7MU2A-CP136	30476104
16,00	16	140	8	48	92	80	6	MOR805Ø16H7MU2A-CP136	30476105
17,00	16	140	8	48	92	80	6	MOR805Ø17H7MU2A-CP136	30476106
18,00	20	160	12	50	110	98	6	MOR805Ø18H7MU2A-CP136	30476107
19,00	20	160	12	50	110	99	6	MOR805Ø19H7MU2A-CP136	30476108
20,00	20	160	12	50	110	100	6	MOR805Ø20H7MU2A-CP136	30476109
21,00	20	160	12	50	110	100	6	MOR805Ø21H7MU2A-CP136	30476110
22,00	20	160	12	50	110	100	6	MOR805Ø22H7MU2A-CP136	30476111
23,00	20	180	12	50	130	120	6	MOR805Ø23H7MU2A-CP136	30476112
24,00	20	180	12	50	130	120	6	MOR805Ø24H7MU2A-CP136	30476113
25,00	20	180	12	50	130	120	6	MOR805Ø25H7MU2A-CP136	30476114
26,00	20	180	12	50	130	120	6	MOR805Ø26H7MU2A-CP136	30476115
27,00	20	180	12	50	130	120	6	MOR805Ø27H7MU2A-CP136	30476116
28,00	25	200	12	56	144	130	6	MOR805Ø28H7MU2A-CP136	30476117
29,00	25	200	12	56	144	130	6	MOR805Ø29H7MU2A-CP136	30476118
30,00	25	200	12	56	144	130	8	MOR805Ø30H7MU2A-CP136	30476119
31,00	25	200	12	56	144	130	8	MOR805Ø31H7MU2A-CP136	30476120
32,00	25	200	12	56	144	130	8	MOR805Ø32H7MU2A-CP136	30476121
33,00	25	200	12	56	144	130	8	MOR805Ø33H7MU2A-CP136	30476122
34,00	25	200	12	56	144	130	8	MOR805Ø34H7MU2A-CP136	30476123
35,00	25	200	12	56	144	130	8	MOR805Ø35H7MU2A-CP136	30476124
36,00	25	200	12	56	144	130	8	MOR805Ø36H7MU2A-CP136	30476125
37,00	25	200	12	56	144	130	8	MOR805Ø37H7MU2A-CP136	30476126
38,00	25	200	12	56	144	130	8	MOR805Ø38H7MU2A-CP136	30476127
39,00	25	200	12	56	144	130	8	MOR805Ø39H7MU2A-CP136	30476128
40,00	25	200	12	56	144	130	8	MOR805Ø40H7MU2A-CP136	30476129

Dimensions in mm.

Cutting data recommendation from page 436.

Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "MonoReam".



MonoReam Plus - MRP

Introduction

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Preferred series

MRP510 _____	172
MRP610 _____	173
MRP505 _____	174
MRP605 _____	175
MRP710 _____	176

PRODUCT OVERVIEW


MonoReam Plus

The MonoReam Plus series is specially designed for machining cast iron and steel. It has a patented coolant supply. A sleeve ensures the optimal supply of coolant to the HPC cutting edges.

The programme comprises of reamers with solid cermet head in the diameter range 3.85 to 20.20 mm (series 500). From a diameter range of 20.21 mm the tools are available in

a cermet-tipped design (series 600). A further addition to the range is the expandable variant (MRP710) for machining through bores. It combines the advantages of a solid tool with those of adjustability. The expansion system is suitable for expanding the diameter prior to re-grinding. The re-ground tools also have the same performance as the original, the tool costs are reduced.



MonoReam Plus MRP510 Solid cermet head	MonoReam Plus MRP610 Cermet-tipped	MonoReam Plus MRP710 Cermet-tipped, expanding design
		
<p>High-performance reamer with solid cermet head, left-hand spiral fluted, special coolant supply.</p> <p>Ø range: 4.00 – 20.00 mm*</p>   	<p>Cermet-tipped high-performance reamer with cermet cutting edges, left-hand spiral fluted, special coolant supply.</p> <p>Ø range: 21.00 – 40.00 mm*</p>   	<p>Cermet-tipped high-performance reamer with expansion system, left-hand spiral fluted, special coolant supply.</p> <p>Ø range: 8.00 – 40.00 mm*</p>   
<p>Page 172</p>	<p>Page 173</p>	<p>Page 176</p>

* The diameter range can vary, depending on the series.



MonoReam Plus | MRP505
Solid cermet head



High-performance reamer with solid cermet head, straight fluted, special coolant supply.

Ø range: 4.00 – 20.00 mm*



MonoReam Plus | MRP605
Cermet-tipped








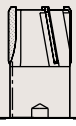
Cermet-tipped high-performance reamer with cermet cutting edges, straight fluted, special coolant supply.

Ø range: 21.00 – 40.00 mm*



Selection overview MonoReam Plus | Ordering example

1. Series

Type of bore	Material	Coolant supply	Flute helix angle	FIXED Solid cermet head	FEST Cermet cutting edges	EXPANDING Cermet cutting edges
	P K			505	605	-
	P K			510	610	710

2. Tool dimensions

MRP510 | MRP610 | MRP505

	ød ₁	ød ₂	l ₁	l ₂	l ₃	l ₄	z
MRP510	3,85 - 4,90	10	80	40	40	14	4
	4,91 - 6,20	12	85	45	40	14	4
	6,21 - 6,70	12	105	45	60	14	6
	6,71 - 8,20	12	110	45	65	18	6
	8,21 - 8,70	12	120	45	75	18	6
	8,71 - 12,20	12	120	45	75	22	6
	12,21 - 13,20	16	130	48	82	22	6
	13,21 - 15,20	16	130	48	82	23	6
	15,21 - 16,20	16	130	48	82	26	6
16,21 - 20,20	16	160	48	112	26	8	
MRP610	20,21 - 21,20	16	160	48	112	19	6
	21,21 - 22,20	16	160	48	112	22	6
	22,21 - 26,20	20	180	50	130	22	6
	26,21 - 27,20	20	180	50	130	25	6
	27,21 - 29,20	25	180	56	124	25	6
	29,21 - 40,20	25	200	56	144	25	8
MRP505	3,85 - 4,90	10	80	40	40	12	4
	4,91 - 6,20	12	85	45	40	12	4
	6,21 - 6,70	12	105	45	60	12	6
	6,71 - 8,20	12	110	45	65	16	6
	8,21 - 12,20	12	120	45	75	19	6
	12,21 - 16,20	16	130	48	82	19	6
	16,21 - 20,20	16	160	48	112	22	6

MRP605 | MRP710

	ød ₁	ød ₂	l ₁	l ₂	l ₃	l ₄	z
MRP605	20,21 - 21,20	16	160	48	112	19	6
	21,21 - 22,20	16	160	48	112	22	6
	22,21 - 26,20	20	180	50	130	22	6
	26,21 - 27,20	20	180	50	130	25	6
	27,21 - 29,20	25	180	56	124	25	6
	29,21 - 34,20	25	200	56	144	25	6
	34,21 - 40,20	25	200	56	144	25	8
	MRP710	7,70 - 8,70	6	110	36	74	12
8,71 - 9,20		6	110	36	74	12	6
9,21 - 11,70		8	120	36	84	12	6
11,71 - 13,20		10	140	40	100	12	6
13,21 - 15,20		12	140	45	95	16	6
15,21 - 17,20		14	160	45	115	19	6
17,21 - 21,20		16	160	48	112	19	6
21,21 - 22,20		16	160	48	112	22	6
22,21 - 26,20		20	180	50	130	22	6
26,21 - 27,20		20	180	50	130	25	6
27,21 - 29,20	25	180	56	124	25	6	
29,21 - 33,20	25	200	56	144	25	6	
33,21 - 40,20	25	200	56	144	25	8	

Ordering example:

1. Series

M R P

MonoReam Plus

2. Diameter

6 1 0

Flute helix angle on the cutting edges:
0 = Straight fluted
1 = Left-hand spiral fluted

Ø 2 0

Type of bore:
0 = Through bore
5 = Blind bore

. 0 0 0

Bore diameter

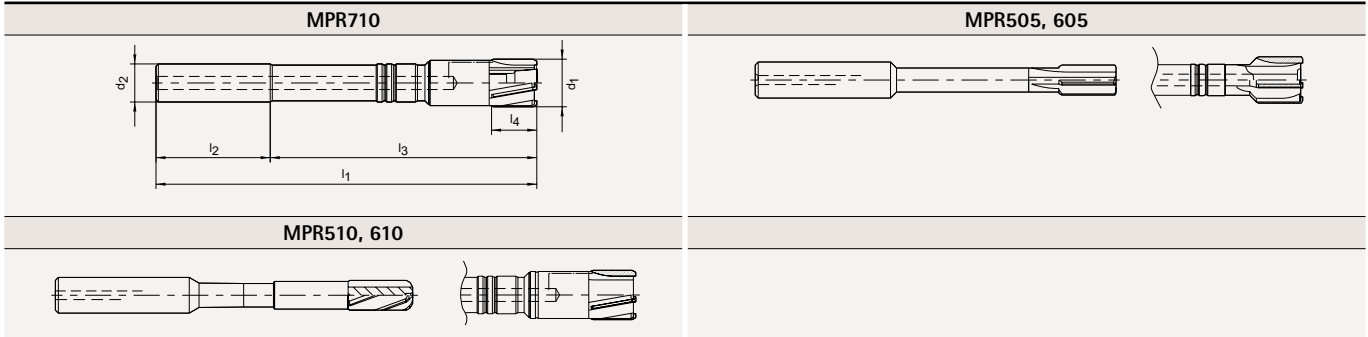
Tolerance

H 7





IT or allowance in µm
(example: +30+10)

Designs:
5 = Fixed reamer, solid cermet head
6 = Fixed reamer, cermet cutting edges
7 = Expanding reamer, cermet cutting edges

Tool dimensions



3. Lead and cutting material

		P		K	
		P1 - P3 P5		K2 - K3	
					
510 505	Lead	MV3C	MG1M	MV3C	MG1M
	Cutting material	CU178	CU178	CU178	CU178
	Preferred series H7	P. 174	P. 172	P. 174	P. 172
610 605	Lead	MV3C	MG1L	MV3C	MG1L
	Cutting material	CU130	CU130	CU130	CU130
	Preferred series H7	P. 175	P. 173	P. 175	P. 173
710	Lead		MG1F		MG1F
	Cutting material		CU130		CU130
	Preferred series H7		P. 176		P. 176

3. Lead

Cutting material



Lead geometry and rake angle:

- MG1M
- MG1L
- MV3C
- MG1F

For an explanation of the lead geometry see pages 432/433.

Cutting material:

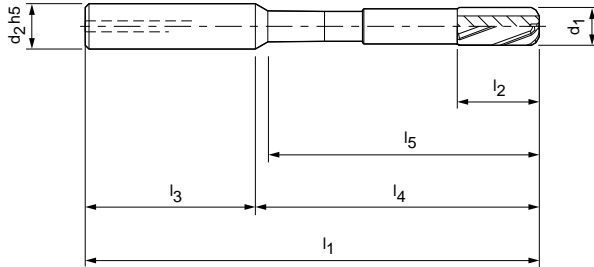
- CU178
- CU130

MonoReam Plus MRP510

Fixed design, solid cermet head

Design:

Reamer diameter: 4.00 - 20.00 mm
 Lead: MG1M
 Cutting material: CU178



Dimensions							z	Specification	Order No.
d_1	$d_2 h_5$	l_1	l_2	l_3	l_4	l_5			
4,00	10	80	14	40	40	33	4	MRP51004H7MG1M-CU178	30570517
4,50	10	80	14	40	40	33	4	MRP51004.5H7MG1M-CU178	30570518
5,00	12	85	14	45	40	33	4	MRP51005H7MG1M-CU178	30570519
5,50	12	85	14	45	40	33	4	MRP51005.5H7MG1M-CU178	30570520
6,00	12	85	14	45	40	33	4	MRP51006H7MG1M-CU178	30570521
6,50	12	105	14	45	60	52	6	MRP51006.5H7MG1M-CU178	30570522
7,00	12	110	18	45	65	57	6	MRP51007H7MG1M-CU178	30570523
7,50	12	110	18	45	65	57	6	MRP51007.5H7MG1M-CU178	30570524
8,00	12	110	18	45	65	57	6	MRP51008H7MG1M-CU178	30570525
8,50	12	120	18	45	75	67	6	MRP51008.5H7MG1M-CU178	30570526
9,00	12	120	22	45	75	67	6	MRP51009H7MG1M-CU178	30570527
9,50	12	120	22	45	75	67	6	MRP51009.5H7MG1M-CU178	30570528
10,00	12	120	22	45	75	68	6	MRP510010H7MG1M-CU178	30570529
10,50	12	120	22	45	75	68	6	MRP510010.5H7MG1M-CU178	30570530
11,00	12	120	22	45	75	68	6	MRP510011H7MG1M-CU178	30570531
11,50	12	120	22	45	75	68	6	MRP510011.5H7MG1M-CU178	30570532
12,00	12	120	22	45	75	68	6	MRP510012H7MG1M-CU178	30570533
13,00	16	130	22	48	82	74	6	MRP510013H7MG1M-CU178	30570534
14,00	16	130	23	48	82	74	6	MRP510014H7MG1M-CU178	30570535
15,00	16	130	23	48	82	74	6	MRP510015H7MG1M-CU178	30570536
16,00	16	130	26	48	82	74	6	MRP510016H7MG1M-CU178	30570537
17,00	16	160	26	48	112	105	8	MRP510017H7MG1M-CU178	30570538
18,00	16	160	26	48	112	105	8	MRP510018H7MG1M-CU178	30570539
19,00	16	160	26	48	112	105	8	MRP510019H7MG1M-CU178	30570540
20,00	16	160	26	48	112	105	8	MRP510020H7MG1M-CU178	30570541

Dimensions in mm.

Cutting data recommendation from page 436.

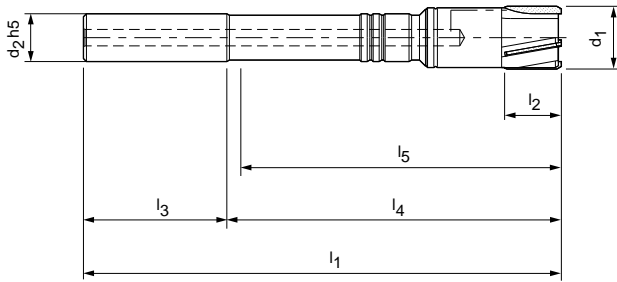
Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "High-performance reamers MonoReam Plus".

MonoReam Plus MRP610

Fixed design, cermet cutting edges

Design:

Reamer diameter: 21.00 - 40.00 mm
 Lead: MG1L
 Cutting material: CU130



Dimensions							z	Specification	Order No.
d_1	$d_2 h5$	l_1	l_2	l_3	l_4	l_5			
21,00	16	160	19	48	112	105	6	MRP610021H7MG1L-CU130	30570542
22,00	16	160	22	48	112	105	6	MRP610022H7MG1L-CU130	30570543
23,00	20	180	22	50	130	122	6	MRP610023H7MG1L-CU130	30570544
24,00	20	180	22	50	130	122	6	MRP610024H7MG1L-CU130	30570545
25,00	20	180	22	50	130	122	6	MRP610025H7MG1L-CU130	30570546
26,00	20	180	22	50	130	122	6	MRP610026H7MG1L-CU130	30570547
27,00	20	180	25	50	130	122	6	MRP610027H7MG1L-CU130	30570548
28,00	25	180	25	56	124	116	6	MRP610028H7MG1L-CU130	30570549
29,00	25	180	25	56	124	116	6	MRP610029H7MG1L-CU130	30570550
30,00	25	200	25	56	144	136	8	MRP610030H7MG1L-CU130	30570551
31,00	25	200	25	56	144	136	8	MRP610031H7MG1L-CU130	30570552
32,00	25	200	25	56	144	136	8	MRP610032H7MG1L-CU130	30570553
33,00	25	200	25	56	144	136	8	MRP610033H7MG1L-CU130	30570554
34,00	25	200	25	56	144	136	8	MRP610034H7MG1L-CU130	30570555
35,00	25	200	25	56	144	136	8	MRP610035H7MG1L-CU130	30570556
36,00	25	200	25	56	144	136	8	MRP610036H7MG1L-CU130	30570557
37,00	25	200	25	56	144	136	8	MRP610037H7MG1L-CU130	30570558
38,00	25	200	25	56	144	136	8	MRP610038H7MG1L-CU130	30570559
39,00	25	200	25	56	144	136	8	MRP610039H7MG1L-CU130	30570560
40,00	25	200	25	56	144	136	8	MRP610040H7MG1L-CU130	30570561

Dimensions in mm.

Cutting data recommendation from page 436.

Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "High-performance reamers MonoReam Plus".

MonoReam Plus MRP505

Fixed design, solid cermet head

Design:

Reamer diameter:

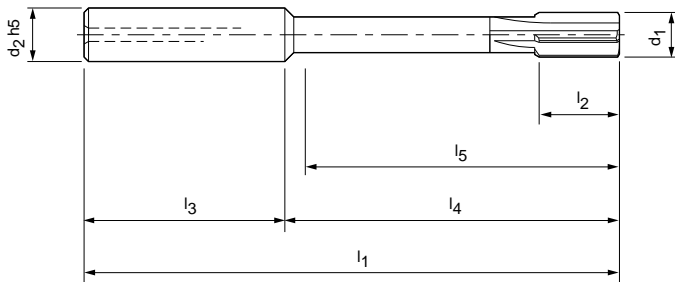
4.00 - 20.00 mm

Lead:

MV3C

Cutting material:

CU178



Dimensions							z	Specification	Order No.
d_1	$d_2 h_5$	l_1	l_2	l_3	l_4	l_5			
4,00	10	80	12	40	40	33	4	MRP505Ø4H7MV3C-CU178	30570562
4,50	10	80	12	40	40	33	4	MRP505Ø4.5H7MV3C-CU178	30570563
5,00	12	85	12	45	40	33	4	MRP505Ø5H7MV3C-CU178	30570564
5,50	12	85	12	45	40	33	4	MRP505Ø5.5H7MV3C-CU178	30570565
6,00	12	85	12	45	40	33	4	MRP505Ø6H7MV3C-CU178	30570566
6,50	12	105	12	45	60	53	6	MRP505Ø6.5H7MV3C-CU178	30570567
7,00	12	110	16	45	65	58	6	MRP505Ø7H7MV3C-CU178	30570568
7,50	12	110	16	45	65	58	6	MRP505Ø7.5H7MV3C-CU178	30570569
8,00	12	110	16	45	65	58	6	MRP505Ø8H7MV3C-CU178	30570570
8,50	12	120	19	45	75	68	6	MRP505Ø8.5H7MV3C-CU178	30570571
9,00	12	120	19	45	75	68	6	MRP505Ø9H7MV3C-CU178	30570572
9,50	12	120	19	45	75	68	6	MRP505Ø9.5H7MV3C-CU178	30570573
10,00	12	120	19	45	75	68	6	MRP505Ø10H7MV3C-CU178	30570574
10,50	12	120	19	45	75	68	6	MRP505Ø10.5H7MV3C-CU178	30570575
11,00	12	120	19	45	75	68	6	MRP505Ø11H7MV3C-CU178	30570576
11,50	12	120	19	45	75	68	6	MRP505Ø11.5H7MV3C-CU178	30570577
12,00	12	120	19	45	75	68	6	MRP505Ø12H7MV3C-CU178	30570578
13,00	16	130	19	48	82	75	6	MRP505Ø13H7MV3C-CU178	30570579
14,00	16	130	19	48	82	75	6	MRP505Ø14H7MV3C-CU178	30570580
15,00	16	130	19	48	82	75	6	MRP505Ø15H7MV3C-CU178	30570581
16,00	16	130	19	48	82	75	6	MRP505Ø16H7MV3C-CU178	30570582
17,00	16	160	22	48	112	105	6	MRP505Ø17H7MV3C-CU178	30570583
18,00	16	160	22	48	112	105	6	MRP505Ø18H7MV3C-CU178	30570584
19,00	16	160	22	48	112	105	6	MRP505Ø19H7MV3C-CU178	30570585
20,00	16	160	22	48	112	105	6	MRP505Ø20H7MV3C-CU178	30570586

Dimensions in mm.

Cutting data recommendation from page 436.

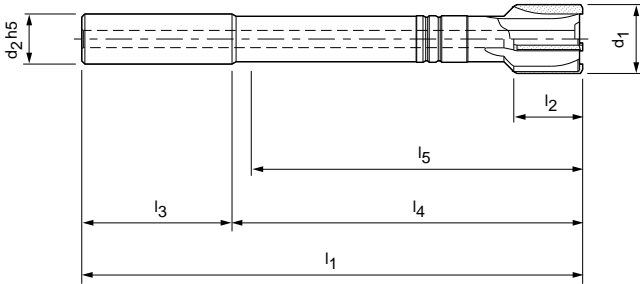
Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "High-performance reamers MonoReam Plus".

MonoReam Plus MRP605

Fixed design, cermet cutting edges

Design:

Reamer diameter: 21.00 - 40.00 mm
 Lead: MV3C
 Cutting material: CU130



Dimensions							z	Specification	Order No.
d_1	$d_2 h_5$	l_1	l_2	l_3	l_4	l_5			
21,00	16	160	19	48	112	102	6	MRP605021H7MV3C-CU130	30570587
22,00	16	160	22	48	112	102	6	MRP605022H7MV3C-CU130	30570588
23,00	20	180	22	50	130	120	6	MRP605023H7MV3C-CU130	30570589
24,00	20	180	22	50	130	120	6	MRP605024H7MV3C-CU130	30570590
25,00	20	180	22	50	130	120	6	MRP605025H7MV3C-CU130	30570591
26,00	20	180	22	50	130	120	6	MRP605026H7MV3C-CU130	30570592
27,00	20	180	25	50	130	120	6	MRP605027H7MV3C-CU130	30570593
28,00	25	180	25	56	124	114	6	MRP605028H7MV3C-CU130	30570594
29,00	25	180	25	56	124	114	6	MRP605029H7MV3C-CU130	30570595
30,00	25	200	25	56	144	134	6	MRP605030H7MV3C-CU130	30570596
31,00	25	200	25	56	144	134	6	MRP605031H7MV3C-CU130	30570597
32,00	25	200	25	56	144	134	6	MRP605032H7MV3C-CU130	30570598
33,00	25	200	25	56	144	134	6	MRP605033H7MV3C-CU130	30570599
34,00	25	200	25	56	144	134	6	MRP605034H7MV3C-CU130	30570600
35,00	25	200	25	56	144	134	8	MRP605035H7MV3C-CU130	30570601
36,00	25	200	25	56	144	134	8	MRP605036H7MV3C-CU130	30570602
37,00	25	200	25	56	144	134	8	MRP605037H7MV3C-CU130	30570603
38,00	25	200	25	56	144	134	8	MRP605038H7MV3C-CU130	30570604
39,00	25	200	25	56	144	134	8	MRP605039H7MV3C-CU130	30570605
40,00	25	200	25	56	144	134	8	MRP605040H7MV3C-CU130	30570606

Dimensions in mm.

Cutting data recommendation from page 436.

Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "High-performance reamers MonoReam Plus".

MonoReam Plus MRP710

Expanding design, cermet cutting edges

Design:

Reamer diameter:

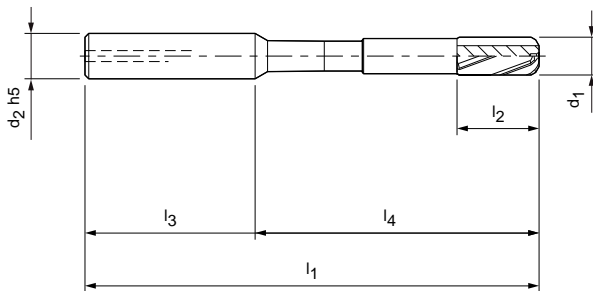
8.00 – 40.00 mm

Lead:

MG1F

Cutting material:

CU130



Dimensions						z	Specification	Order No.
d_1	$d_2 h5$	l_1	l_2	l_3	l_4			
8,00	6	110	36	74	12	4	MRP710Ø8H7MG1F-CU130	30570607
8,50	6	110	36	74	12	4	MRP710Ø8.5H7MG1F-CU130	30570608
9,00	6	110	36	74	12	6	MRP710Ø9H7MG1F-CU130	30570609
9,50	8	120	36	84	12	6	MRP710Ø9.5H7MG1F-CU130	30570610
10,00	8	120	36	84	12	6	MRP710Ø10H7MG1F-CU130	30570611
10,50	8	120	36	84	12	6	MRP710Ø10.5H7MG1F-CU130	30570612
11,00	8	120	36	84	12	6	MRP710Ø11H7MG1F-CU130	30570613
11,50	8	120	36	84	12	6	MRP710Ø11.5H7MG1F-CU130	30570614
12,00	10	140	40	100	12	6	MRP710Ø12H7MG1F-CU130	30570615
12,50	10	140	40	100	12	6	MRP710Ø12.5H7MG1F-CU130	30570616
13,00	10	140	40	100	12	6	MRP710Ø13H7MG1F-CU130	30570617
14,00	12	140	45	95	16	6	MRP710Ø14H7MG1F-CU130	30570618
15,00	12	140	45	95	16	6	MRP710Ø15H7MG1F-CU130	30570619
16,00	14	160	45	115	19	6	MRP710Ø16H7MG1F-CU130	30570620
17,00	14	160	45	115	19	6	MRP710Ø17H7MG1F-CU130	30570621
18,00	16	160	48	112	19	6	MRP710Ø18H7MG1F-CU130	30570622
19,00	16	160	48	112	19	6	MRP710Ø19H7MG1F-CU130	30570623
20,00	16	160	48	112	19	6	MRP710Ø20H7MG1F-CU130	30570624
21,00	16	160	48	112	19	6	MRP710Ø21H7MG1F-CU130	30570625
22,00	16	160	48	112	22	6	MRP710Ø22H7MG1F-CU130	30570626
23,00	20	180	50	130	22	6	MRP710Ø23H7MG1F-CU130	30570627
24,00	20	180	50	130	22	6	MRP710Ø24H7MG1F-CU130	30570628
25,00	20	180	50	130	22	6	MRP710Ø25H7MG1F-CU130	30570629
26,00	20	180	50	130	22	6	MRP710Ø26H7MG1F-CU130	30570630
27,00	20	180	50	130	25	6	MRP710Ø27H7MG1F-CU130	30570631
28,00	25	180	56	124	25	6	MRP710Ø28H7MG1F-CU130	30570632
29,00	25	180	56	124	25	6	MRP710Ø29H7MG1F-CU130	30570633
30,00	25	200	56	144	25	6	MRP710Ø30H7MG1F-CU130	30570634
31,00	25	200	56	144	25	6	MRP710Ø31H7MG1F-CU130	30570635
32,00	25	200	56	144	25	6	MRP710Ø32H7MG1F-CU130	30570636
33,00	25	200	56	144	25	6	MRP710Ø33H7MG1F-CU130	30570637
34,00	25	200	56	144	25	8	MRP710Ø34H7MG1F-CU130	30570638
35,00	25	200	56	144	25	8	MRP710Ø35H7MG1F-CU130	30570639
36,00	25	200	56	144	25	8	MRP710Ø36H7MG1F-CU130	30570640
37,00	25	200	56	144	25	8	MRP710Ø37H7MG1F-CU130	30570641
38,00	25	200	56	144	25	8	MRP710Ø38H7MG1F-CU130	30570642
39,00	25	200	56	144	25	8	MRP710Ø39H7MG1F-CU130	30570643
40,00	25	200	56	144	25	8	MRP710Ø40H7MG1F-CU130	30570644

Dimensions in mm.

Cutting data recommendation from page 436.

Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "High-performance reamers MonoReam Plus".





FeedPlus - FPR

Introduction

Product overview	180
Selection overview Configuration	182

Preferred series

FPR500	184
FPR610	185

PRODUCT OVERVIEW

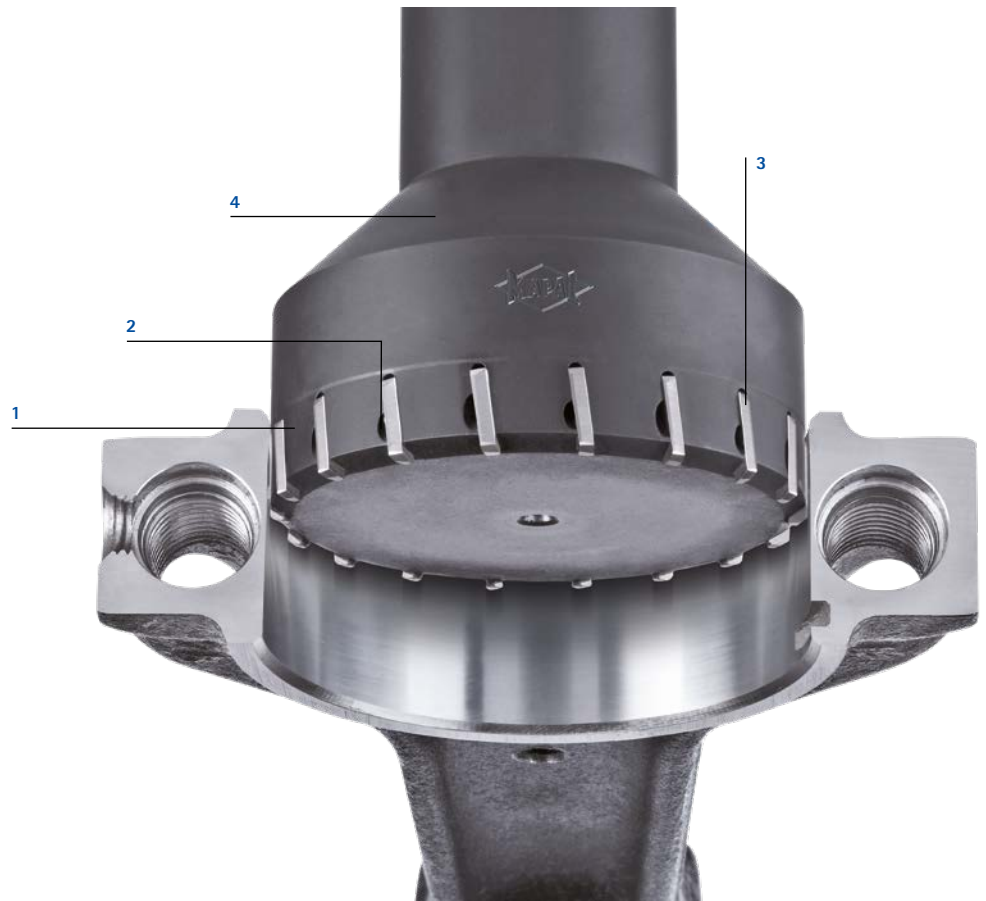
FeedPlus

The most important feature for the performance of multi-bladed reamers is the number of cutting edges. This is limited by the diameter of the tool and by the space required for the chip flutes. Whereas to date, for example, there was only space for eight cutting edges on a diameter of 40 mm, the FeedPlus now has 16 cutting edges on the same sized tool. Depending on the machining tasks and the

material, different cutting materials are used. The number of cutting edges and the right choice of cutting material enable machining speeds to be achieved that were previously impossible during reaming. In addition, due to their support on the bore walls, the large number of cutting edges ensures an outstanding circularity of the reamed bore.



Tool features in detail



1 No chip flutes

Maximum number of cutting edges

2 Internal coolant supply

Exit directly at the cutting edge

3 High strength embedded cutting edges

Maximum performance

4 Wear-resistant tool body

Cost-effective re-tipping



FeedPlus | FPR500
Solid carbide design



Straight fluted solid carbide multi-tooth high performance reamer.

Ø range: 6.00 – 12.00 mm



FeedPlus | FPR610
Tipped design









Multi-tooth high-performance reamer with brazed cutting edges left-hand spiral fluted.

Ø range: 10.00 – 40.00 mm



Selection overview FeedPlus | Ordering example

1. Series

Type of bore	Material	Coolant supply	Flute helix angle	FIXED Solid carbide design	FIXED Fixed tool with brazed cutting edges
	P			500	-
	P N1 K H			-	610

2. Tool dimensions

FPR500 | FPR610

	ød ₁	ød ₂	l ₁	l ₂	l ₃	l ₄	z
FPR500	5,71 - 6,20	6	75	36	39	-	6
	6,21 - 8,20	8	100	36	64	-	8
	8,21 - 9,20	10	100	40	60	-	8
	9,21 - 10,20	10	120	40	80	-	8
	10,21 - 12,20	12	120	45	75	-	10
FPR610	9,76 - 11,75	12	120	45	75	9	6
	11,76 - 12,25	12	120	45	75	9	8
	12,26 - 13,75	16	130	48	82	9	8
	13,76 - 16,25	16	130	48	82	9	10
	16,26 - 17,75	20	160	50	110	9	10
	17,76 - 21,75	20	160	50	110	9	12
	21,76 - 22,25	20	160	50	110	9	14
	22,26 - 24,75	20	180	50	130	9	14
	24,76 - 27,75	20	180	50	130	9	16
	27,76 - 29,25	25	180	56	124	9	16
	29,26 - 31,75	25	200	56	144	9	16
	31,76 - 35,75	25	200	56	144	9	18
	35,76 - 40,25	32	200	60	140	9	18

Ordering example:

1. Series

F P R

FeedPlus

Designs:
5 = Solid carbide, fixed
6 = Brazed cutting edge, fixed

2. Diameter

6 1 0

Type of bore:
0 = Through bore
5 = Blind bore

Flute helix angle on the cutting edges:
0 = Straight fluted
1 = Left-hand spiral fluted

∅ 2 0

Bore diameter

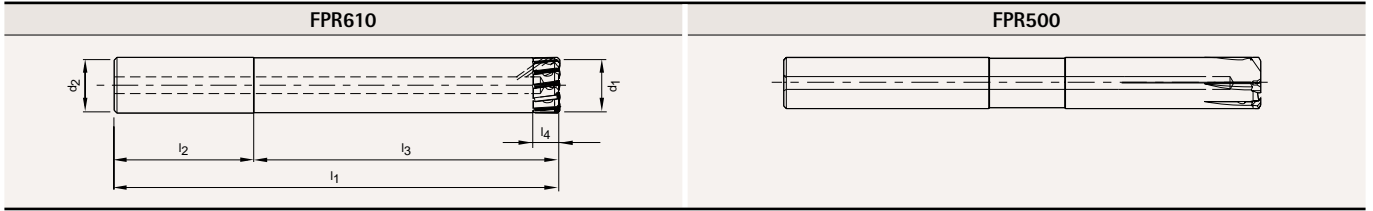
. 0 0 0

Tolerance

H 7

IT or allowance in µm
(example: +30+10)

Tool dimensions



3. Lead and cutting material

		P		K			N			H	
		P1 - P4	P5	K1	K2	K3	N1	N2	N3 - N4	H1	H2
500	Lead	MV0A									
	Cutting material	HP145									
	Preferred series H7	P. 184									
610	Lead	MJ1E	MJ1E		MJ1E		MV1E				MQ3Z
	Cutting material	HP145	HP145		HP145		HU612				FU801
	Preferred series H7	P. 187	P. 187		P. 187		P. 185				P. 191
	Lead	MM1E	MM1E		MM1E		MV1E				
	Cutting material	CU178	CU178		CU178		PU620				
	Preferred series H7	P. 189	P. 189		P. 189		P. 195				
	Lead				MV3L						
	Cutting material				FU861						
	Preferred series H7				P. 193						

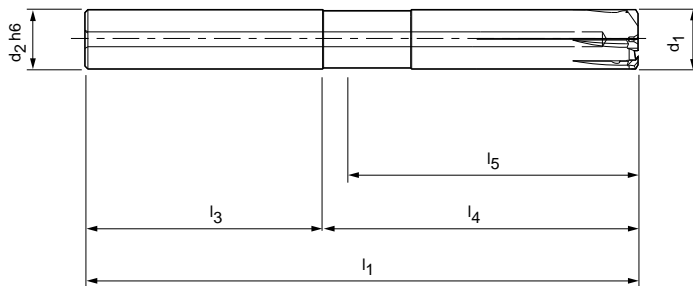
3. Lead

Cutting material

M	H	1	E	-	H	P	1	4	5
<p>Lead geometry and rake angle:</p> <ul style="list-style-type: none"> MV1E MM1E MJ1E MV0A MV3L MQ3Z 					<p>Cutting material:</p> <ul style="list-style-type: none"> HP145 CU178 HU612 PU620 FU801 FU861 				
<p>For an explanation of the lead geometry see pages 432/433.</p>									

FeedPlus FPR500

Design: Solid carbide
 Reamer diameter: 6.00 - 12.00 mm
 Lead: MV0A
 Cutting material: HP145



Dimensions						z	Specification	Order No.
d_1	d_2 h6	l_1	l_3	l_4	l_5			
6,00	6	75	36	39	31	6	FPR500Ø6H7MV0A-HP145	30570163
6,50	8	100	36	64	56	8	FPR500Ø6.5H7MV0A-HP145	30570164
7,00	8	100	36	64	56	8	FPR500Ø7H7MV0A-HP145	30570165
7,50	8	100	36	64	56	8	FPR500Ø7.5H7MV0A-HP145	30570166
8,00	8	100	36	64	56	8	FPR500Ø8H7MV0A-HP145	30570167
8,50	10	100	40	60	52	8	FPR500Ø8.5H7MV0A-HP145	30570168
9,00	10	100	40	60	52	8	FPR500Ø9H7MV0A-HP145	30570169
9,50	10	120	40	80	72	8	FPR500Ø9.5H7MV0A-HP145	30570170
10,00	10	120	40	80	72	8	FPR500Ø10H7MV0A-HP145	30570171
10,50	12	120	45	75	67	10	FPR500Ø10.5H7MV0A-HP145	30570172
11,00	12	120	45	75	67	10	FPR500Ø11H7MV0A-HP145	30570173
11,50	12	120	45	75	67	10	FPR500Ø11.5H7MV0A-HP145	30570174
12,00	12	120	45	75	67	10	FPR500Ø12H7MV0A-HP145	30570175

Dimensions in mm.

Cutting data recommendation from page 436.

Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "High-performance reamers FeedPlus".

FeedPlus FPR610

Design:

With brazed cutting edges

Reamer diameter:

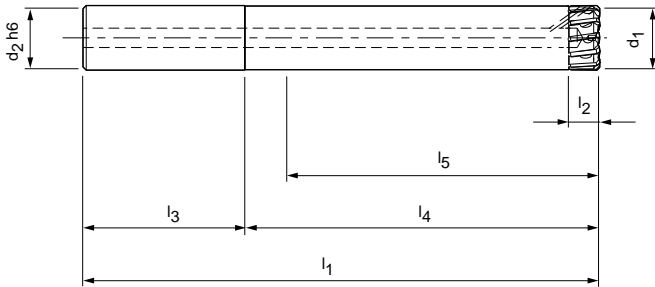
10.00 – 40.00 mm

Lead:

MV1E

Cutting material:

HU612



Dimensions							z	Specification	Order No.
d_1	$d_2 h6$	l_1	l_2	l_3	l_4	l_5			
10,00	12	120	9	45	75	67	6	FPR610Ø10H7MV1E-HU612	30570176
10,50	12	120	9	45	75	67	6	FPR610Ø10.5H7MV1E-HU612	30570177
11,00	12	120	9	45	75	67	6	FPR610Ø11H7MV1E-HU612	30570178
11,50	12	120	9	45	75	67	6	FPR610Ø11.5H7MV1E-HU612	30570179
12,00	12	120	9	45	75	67	8	FPR610Ø12H7MV1E-HU612	30570180
12,50	16	130	9	48	82	74	8	FPR610Ø12.5H7MV1E-HU612	30570181
13,00	16	130	9	48	82	74	8	FPR610Ø13H7MV1E-HU612	30570182
13,50	16	130	9	48	82	74	8	FPR610Ø13.5H7MV1E-HU612	30570183
14,00	16	130	9	48	82	74	10	FPR610Ø14H7MV1E-HU612	30570184
14,50	16	130	9	48	82	74	10	FPR610Ø14.5H7MV1E-HU612	30570185
15,00	16	130	9	48	82	74	10	FPR610Ø15H7MV1E-HU612	30570186
15,50	16	130	9	48	82	74	10	FPR610Ø15.5H7MV1E-HU612	30570187
16,00	16	130	9	48	82	74	10	FPR610Ø16H7MV1E-HU612	30570188
16,50	20	160	9	50	110	102	10	FPR610Ø16.5H7MV1E-HU612	30570189
17,00	20	160	9	50	110	102	10	FPR610Ø17H7MV1E-HU612	30570190
17,50	20	160	9	50	110	102	10	FPR610Ø17.5H7MV1E-HU612	30570191
18,00	20	160	9	50	110	102	12	FPR610Ø18H7MV1E-HU612	30570192
18,50	20	160	9	50	110	102	12	FPR610Ø18.5H7MV1E-HU612	30570193
19,00	20	160	9	50	110	102	12	FPR610Ø19H7MV1E-HU612	30570194
19,50	20	160	9	50	110	102	12	FPR610Ø19.5H7MV1E-HU612	30570195
20,00	20	160	9	50	110	102	12	FPR610Ø20H7MV1E-HU612	30570196
20,50	20	160	9	50	110	102	12	FPR610Ø20.5H7MV1E-HU612	30570197
21,00	20	160	9	50	110	102	12	FPR610Ø21H7MV1E-HU612	30570198
21,50	20	160	9	50	110	102	12	FPR610Ø21.5H7MV1E-HU612	30570199
22,00	20	160	9	50	110	102	14	FPR610Ø22H7MV1E-HU612	30570200
22,50	20	180	9	50	130	122	14	FPR610Ø22.5H7MV1E-HU612	30570201
23,00	20	180	9	50	130	122	14	FPR610Ø23H7MV1E-HU612	30570202
23,50	20	180	9	50	130	122	14	FPR610Ø23.5H7MV1E-HU612	30570203
24,00	20	180	9	50	130	122	14	FPR610Ø24H7MV1E-HU612	30570204
24,50	20	180	9	50	130	122	14	FPR610Ø24.5H7MV1E-HU612	30570205
25,00	20	180	9	50	130	122	16	FPR610Ø25H7MV1E-HU612	30570206
25,50	20	180	9	50	130	122	16	FPR610Ø25.5H7MV1E-HU612	30570207
26,00	20	180	9	50	130	122	16	FPR610Ø26H7MV1E-HU612	30570208
26,50	20	180	9	50	130	122	16	FPR610Ø26.5H7MV1E-HU612	30570209
27,00	20	180	9	50	130	122	16	FPR610Ø27H7MV1E-HU612	30570210
27,50	20	180	9	50	130	122	16	FPR610Ø27.5H7MV1E-HU612	30570211
28,00	25	180	9	56	124	116	16	FPR610Ø28H7MV1E-HU612	30570212
28,50	25	180	9	56	124	116	16	FPR610Ø28.5H7MV1E-HU612	30570213
29,00	25	180	9	56	124	116	16	FPR610Ø29H7MV1E-HU612	30570214

FeedPlus FPR610

Dimensions							z	Specification	Order No.
d ₁	d ₂ h6	l ₁	l ₂	l ₃	l ₄	l ₅			
29,50	25	200	9	56	144	136	16	FPR610Ø29.5H7MV1E-HU612	30570215
30,00	25	200	9	56	144	136	16	FPR610Ø30H7MV1E-HU612	30570216
30,50	25	200	9	56	144	136	16	FPR610Ø30.5H7MV1E-HU612	30570217
31,00	25	200	9	56	144	136	16	FPR610Ø31H7MV1E-HU612	30570218
31,50	25	200	9	56	144	136	16	FPR610Ø31.5H7MV1E-HU612	30570219
32,00	25	200	9	56	144	136	18	FPR610Ø32H7MV1E-HU612	30570220
32,50	25	200	9	56	144	136	18	FPR610Ø32.5H7MV1E-HU612	30570221
33,00	25	200	9	56	144	136	18	FPR610Ø33H7MV1E-HU612	30570222
33,50	25	200	9	56	144	136	18	FPR610Ø33.5H7MV1E-HU612	30570223
34,00	25	200	9	56	144	136	18	FPR610Ø34H7MV1E-HU612	30570224
34,50	25	200	9	56	144	136	18	FPR610Ø34.5H7MV1E-HU612	30570225
35,00	25	200	9	56	144	136	18	FPR610Ø35H7MV1E-HU612	30570226
35,50	25	200	9	56	144	136	18	FPR610Ø35.5H7MV1E-HU612	30570227
36,00	32	200	9	60	140	132	18	FPR610Ø36H7MV1E-HU612	30570228
36,50	32	200	9	60	140	132	18	FPR610Ø36.5H7MV1E-HU612	30570229
37,00	32	200	9	60	140	132	18	FPR610Ø37H7MV1E-HU612	30570230
37,50	32	200	9	60	140	132	18	FPR610Ø37.5H7MV1E-HU612	30570231
38,00	32	200	9	60	140	132	18	FPR610Ø38H7MV1E-HU612	30570232
38,50	32	200	9	60	140	132	18	FPR610Ø38.5H7MV1E-HU612	30570233
39,00	32	200	9	60	140	132	18	FPR610Ø39H7MV1E-HU612	30570234
39,50	32	200	9	60	140	132	18	FPR610Ø39.5H7MV1E-HU612	30570235
40,00	32	200	9	60	140	132	18	FPR610Ø40H7MV1E-HU612	30570236

Dimensions in mm.

Cutting data recommendation from page 436.

Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "High-performance reamers FeedPlus".

FeedPlus FPR610

Design:

With brazed cutting edges

Reamer diameter:

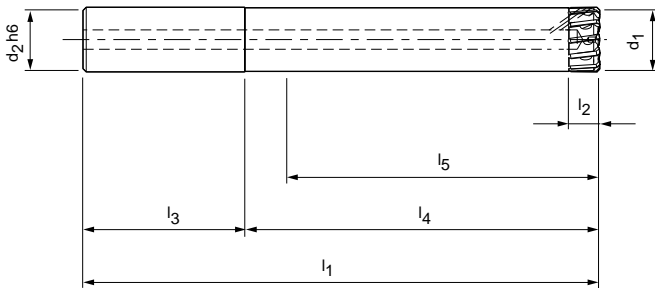
10.00 – 40.00 mm

Lead:

MJ1E

Cutting material:

HP145



Dimensions							z	Specification	Order No.
d ₁	d ₂ h6	l ₁	l ₂	l ₃	l ₄	l ₅			
10,00	12	120	9	45	75	67	6	FPR610Ø10H7MJ1E-HP145	30570237
10,50	12	120	9	45	75	67	6	FPR610Ø10.5H7MJ1E-HP145	30570238
11,00	12	120	9	45	75	67	6	FPR610Ø11H7MJ1E-HP145	30570239
11,50	12	120	9	45	75	67	6	FPR610Ø11.5H7MJ1E-HP145	30570240
12,00	12	120	9	45	75	67	8	FPR610Ø12H7MJ1E-HP145	30570241
12,50	16	130	9	48	82	74	8	FPR610Ø12.5H7MJ1E-HP145	30570242
13,00	16	130	9	48	82	74	8	FPR610Ø13H7MJ1E-HP145	30570243
13,50	16	130	9	48	82	74	8	FPR610Ø13.5H7MJ1E-HP145	30570244
14,00	16	130	9	48	82	74	10	FPR610Ø14H7MJ1E-HP145	30570245
14,50	16	130	9	48	82	74	10	FPR610Ø14.5H7MJ1E-HP145	30570246
15,00	16	130	9	48	82	74	10	FPR610Ø15H7MJ1E-HP145	30570247
15,50	16	130	9	48	82	74	10	FPR610Ø15.5H7MJ1E-HP145	30570248
16,00	16	130	9	48	82	74	10	FPR610Ø16H7MJ1E-HP145	30570249
16,50	20	160	9	50	110	102	10	FPR610Ø16.5H7MJ1E-HP145	30570250
17,00	20	160	9	50	110	102	10	FPR610Ø17H7MJ1E-HP145	30570251
17,50	20	160	9	50	110	102	10	FPR610Ø17.5H7MJ1E-HP145	30570252
18,00	20	160	9	50	110	102	12	FPR610Ø18H7MJ1E-HP145	30570253
18,50	20	160	9	50	110	102	12	FPR610Ø18.5H7MJ1E-HP145	30570254
19,00	20	160	9	50	110	102	12	FPR610Ø19H7MJ1E-HP145	30570255
19,50	20	160	9	50	110	102	12	FPR610Ø19.5H7MJ1E-HP145	30570256
20,00	20	160	9	50	110	102	12	FPR610Ø20H7MJ1E-HP145	30570257
20,50	20	160	9	50	110	102	12	FPR610Ø20.5H7MJ1E-HP145	30570258
21,00	20	160	9	50	110	102	12	FPR610Ø21H7MJ1E-HP145	30570259
21,50	20	160	9	50	110	102	12	FPR610Ø21.5H7MJ1E-HP145	30570260
22,00	20	160	9	50	110	102	14	FPR610Ø22H7MJ1E-HP145	30570261
22,50	20	180	9	50	130	122	14	FPR610Ø22.5H7MJ1E-HP145	30570262
23,00	20	180	9	50	130	122	14	FPR610Ø23H7MJ1E-HP145	30570263
23,50	20	180	9	50	130	122	14	FPR610Ø23.5H7MJ1E-HP145	30570264
24,00	20	180	9	50	130	122	14	FPR610Ø24H7MJ1E-HP145	30570265
24,50	20	180	9	50	130	122	14	FPR610Ø24.5H7MJ1E-HP145	30570266
25,00	20	180	9	50	130	122	16	FPR610Ø25H7MJ1E-HP145	30570267
25,50	20	180	9	50	130	122	16	FPR610Ø25.5H7MJ1E-HP145	30570268
26,00	20	180	9	50	130	122	16	FPR610Ø26H7MJ1E-HP145	30570269
26,50	20	180	9	50	130	122	16	FPR610Ø26.5H7MJ1E-HP145	30570270
27,00	20	180	9	50	130	122	16	FPR610Ø27H7MJ1E-HP145	30570271
27,50	20	180	9	50	130	122	16	FPR610Ø27.5H7MJ1E-HP145	30570272
28,00	25	180	9	56	124	116	16	FPR610Ø28H7MJ1E-HP145	30570273
28,50	25	180	9	56	124	116	16	FPR610Ø28.5H7MJ1E-HP145	30570274
29,00	25	180	9	56	124	116	16	FPR610Ø29H7MJ1E-HP145	30570275

FeedPlus FPR610

Dimensions							z	Specification	Order No.
d ₁	d ₂ h6	l ₁	l ₂	l ₃	l ₄	l ₅			
29,50	25	200	9	56	144	136	16	FPR610Ø29.5H7MJ1E-HP145	30570276
30,00	25	200	9	56	144	136	16	FPR610Ø30H7MJ1E-HP145	30570277
30,50	25	200	9	56	144	136	16	FPR610Ø30.5H7MJ1E-HP145	30570278
31,00	25	200	9	56	144	136	16	FPR610Ø31H7MJ1E-HP145	30570279
31,50	25	200	9	56	144	136	16	FPR610Ø31.5H7MJ1E-HP145	30570280
32,00	25	200	9	56	144	136	18	FPR610Ø32H7MJ1E-HP145	30570281
32,50	25	200	9	56	144	136	18	FPR610Ø32.5H7MJ1E-HP145	30570282
33,00	25	200	9	56	144	136	18	FPR610Ø33H7MJ1E-HP145	30570283
33,50	25	200	9	56	144	136	18	FPR610Ø33.5H7MJ1E-HP145	30570284
34,00	25	200	9	56	144	136	18	FPR610Ø34H7MJ1E-HP145	30570285
34,50	25	200	9	56	144	136	18	FPR610Ø34.5H7MJ1E-HP145	30570286
35,00	25	200	9	56	144	136	18	FPR610Ø35H7MJ1E-HP145	30570287
35,50	25	200	9	56	144	136	18	FPR610Ø35.5H7MJ1E-HP145	30570288
36,00	32	200	9	60	140	132	18	FPR610Ø36H7MJ1E-HP145	30570289
36,50	32	200	9	60	140	132	18	FPR610Ø36.5H7MJ1E-HP145	30570290
37,00	32	200	9	60	140	132	18	FPR610Ø37H7MJ1E-HP145	30570291
37,50	32	200	9	60	140	132	18	FPR610Ø37.5H7MJ1E-HP145	30570292
38,00	32	200	9	60	140	132	18	FPR610Ø38H7MJ1E-HP145	30570293
38,50	32	200	9	60	140	132	18	FPR610Ø38.5H7MJ1E-HP145	30570294
39,00	32	200	9	60	140	132	18	FPR610Ø39H7MJ1E-HP145	30570295
39,50	32	200	9	60	140	132	18	FPR610Ø39.5H7MJ1E-HP145	30570296
40,00	32	200	9	60	140	132	18	FPR610Ø40H7MJ1E-HP145	30570297

Dimensions in mm.

Cutting data recommendation from page 436.

Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "High-performance reamers FeedPlus".

FeedPlus FPR610

Design:

With brazed cutting edges

Reamer diameter:

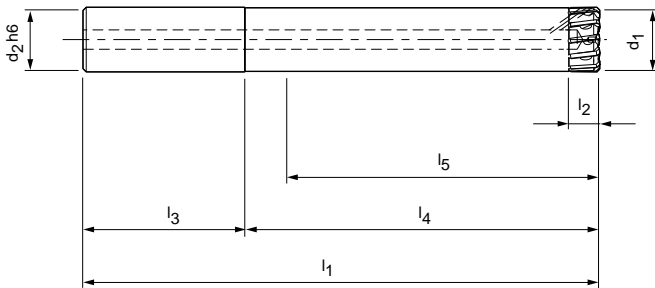
10.00 - 40.00 mm

Lead:

MM1E

Cutting material:

CU178



Dimensions							z	Specification	Order No.
d ₁	d ₂ h6	l ₁	l ₂	l ₃	l ₄	l ₅			
10,00	12	120	9	45	75	67	6	FPR610Ø10H7MM1E-CU178	30570298
10,50	12	120	9	45	75	67	6	FPR610Ø10.5H7MM1E-CU178	30570299
11,00	12	120	9	45	75	67	6	FPR610Ø11H7MM1E-CU178	30570300
11,50	12	120	9	45	75	67	6	FPR610Ø11.5H7MM1E-CU178	30570301
12,00	12	120	9	45	75	67	8	FPR610Ø12H7MM1E-CU178	30570302
12,50	16	130	9	48	82	74	8	FPR610Ø12.5H7MM1E-CU178	30570303
13,00	16	130	9	48	82	74	8	FPR610Ø13H7MM1E-CU178	30570304
13,50	16	130	9	48	82	74	8	FPR610Ø13.5H7MM1E-CU178	30570305
14,00	16	130	9	48	82	74	10	FPR610Ø14H7MM1E-CU178	30570306
14,50	16	130	9	48	82	74	10	FPR610Ø14.5H7MM1E-CU178	30570307
15,00	16	130	9	48	82	74	10	FPR610Ø15H7MM1E-CU178	30570308
15,50	16	130	9	48	82	74	10	FPR610Ø15.5H7MM1E-CU178	30570309
16,00	16	130	9	48	82	74	10	FPR610Ø16H7MM1E-CU178	30570310
16,50	20	160	9	50	110	102	10	FPR610Ø16.5H7MM1E-CU178	30570311
17,00	20	160	9	50	110	102	10	FPR610Ø17H7MM1E-CU178	30570312
17,50	20	160	9	50	110	102	10	FPR610Ø17.5H7MM1E-CU178	30570313
18,00	20	160	9	50	110	102	12	FPR610Ø18H7MM1E-CU178	30570314
18,50	20	160	9	50	110	102	12	FPR610Ø18.5H7MM1E-CU178	30570315
19,00	20	160	9	50	110	102	12	FPR610Ø19H7MM1E-CU178	30570316
19,50	20	160	9	50	110	102	12	FPR610Ø19.5H7MM1E-CU178	30570317
20,00	20	160	9	50	110	102	12	FPR610Ø20H7MM1E-CU178	30570318
20,50	20	160	9	50	110	102	12	FPR610Ø20.5H7MM1E-CU178	30570319
21,00	20	160	9	50	110	102	12	FPR610Ø21H7MM1E-CU178	30570320
21,50	20	160	9	50	110	102	12	FPR610Ø21.5H7MM1E-CU178	30570321
22,00	20	160	9	50	110	102	14	FPR610Ø22H7MM1E-CU178	30570322
22,50	20	180	9	50	130	122	14	FPR610Ø22.5H7MM1E-CU178	30570323
23,00	20	180	9	50	130	122	14	FPR610Ø23H7MM1E-CU178	30570324
23,50	20	180	9	50	130	122	14	FPR610Ø23.5H7MM1E-CU178	30570325
24,00	20	180	9	50	130	122	14	FPR610Ø24H7MM1E-CU178	30570326
24,50	20	180	9	50	130	122	14	FPR610Ø24.5H7MM1E-CU178	30570327
25,00	20	180	9	50	130	122	16	FPR610Ø25H7MM1E-CU178	30570328
25,50	20	180	9	50	130	122	16	FPR610Ø25.5H7MM1E-CU178	30570329
26,00	20	180	9	50	130	122	16	FPR610Ø26H7MM1E-CU178	30570330
26,50	20	180	9	50	130	122	16	FPR610Ø26.5H7MM1E-CU178	30570331
27,00	20	180	9	50	130	122	16	FPR610Ø27H7MM1E-CU178	30570332
27,50	20	180	9	50	130	122	16	FPR610Ø27.5H7MM1E-CU178	30570333
28,00	25	180	9	56	124	116	16	FPR610Ø28H7MM1E-CU178	30570334
28,50	25	180	9	56	124	116	16	FPR610Ø28.5H7MM1E-CU178	30570335
29,00	25	180	9	56	124	116	16	FPR610Ø29H7MM1E-CU178	30570336

FeedPlus FPR610

Dimensions							z	Specification	Order No.
d ₁	d ₂ h6	l ₁	l ₂	l ₃	l ₄	l ₅			
29,50	25	200	9	56	144	136	16	FPR610029.5H7MM1E-CU178	30570337
30,00	25	200	9	56	144	136	16	FPR610030H7MM1E-CU178	30570338
30,50	25	200	9	56	144	136	16	FPR610030.5H7MM1E-CU178	30570339
31,00	25	200	9	56	144	136	16	FPR610031H7MM1E-CU178	30570340
31,50	25	200	9	56	144	136	16	FPR610031.5H7MM1E-CU178	30570341
32,00	25	200	9	56	144	136	18	FPR610032H7MM1E-CU178	30570342
32,50	25	200	9	56	144	136	18	FPR610032.5H7MM1E-CU178	30570343
33,00	25	200	9	56	144	136	18	FPR610033H7MM1E-CU178	30570344
33,50	25	200	9	56	144	136	18	FPR610033.5H7MM1E-CU178	30570345
34,00	25	200	9	56	144	136	18	FPR610034H7MM1E-CU178	30570346
34,50	25	200	9	56	144	136	18	FPR610034.5H7MM1E-CU178	30570347
35,00	25	200	9	56	144	136	18	FPR610035H7MM1E-CU178	30570348
35,50	25	200	9	56	144	136	18	FPR610035.5H7MM1E-CU178	30570349
36,00	32	200	9	60	140	132	18	FPR610036H7MM1E-CU178	30570350
36,50	32	200	9	60	140	132	18	FPR610036.5H7MM1E-CU178	30570351
37,00	32	200	9	60	140	132	18	FPR610037H7MM1E-CU178	30570352
37,50	32	200	9	60	140	132	18	FPR610037.5H7MM1E-CU178	30570353
38,00	32	200	9	60	140	132	18	FPR610038H7MM1E-CU178	30570354
38,50	32	200	9	60	140	132	18	FPR610038.5H7MM1E-CU178	30570355
39,00	32	200	9	60	140	132	18	FPR610039H7MM1E-CU178	30570356
39,50	32	200	9	60	140	132	18	FPR610039.5H7MM1E-CU178	30570357
40,00	32	200	9	60	140	132	18	FPR610040H7MM1E-CU178	30570358

Dimensions in mm.

Cutting data recommendation from page 436.

Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "High-performance reamers FeedPlus".

FeedPlus FPR610

Design:

With brazed cutting edges

Reamer diameter:

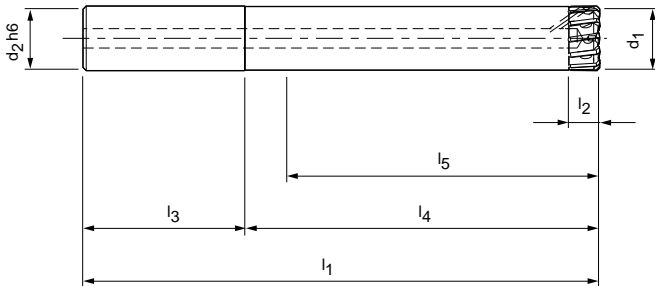
10.00 - 40.00 mm

Lead:

MQ3Z

Cutting material:

FU801



Dimensions							z	Specification	Order No.
d_1	$d_2 h6$	l_1	l_2	l_3	l_4	l_5			
10,00	12	120	9	45	75	67	6	FPR610Ø10H7MQ3Z-FU801	30570420
10,50	12	120	9	45	75	67	6	FPR610Ø10.5H7MQ3Z-FU801	30570421
11,00	12	120	9	45	75	67	6	FPR610Ø11H7MQ3Z-FU801	30570422
11,50	12	120	9	45	75	67	6	FPR610Ø11.5H7MQ3Z-FU801	30570423
12,00	12	120	9	45	75	67	8	FPR610Ø12H7MQ3Z-FU801	30570424
12,50	16	130	9	48	82	74	8	FPR610Ø12.5H7MQ3Z-FU801	30570425
13,00	16	130	9	48	82	74	8	FPR610Ø13H7MQ3Z-FU801	30570426
13,50	16	130	9	48	82	74	8	FPR610Ø13.5H7MQ3Z-FU801	30570427
14,00	16	130	9	48	82	74	10	FPR610Ø14H7MQ3Z-FU801	30570428
14,50	16	130	9	48	82	74	10	FPR610Ø14.5H7MQ3Z-FU801	30570429
15,00	16	130	9	48	82	74	10	FPR610Ø15H7MQ3Z-FU801	30570430
15,50	16	130	9	48	82	74	10	FPR610Ø15.5H7MQ3Z-FU801	30570431
16,00	16	130	9	48	82	74	10	FPR610Ø16H7MQ3Z-FU801	30570432
16,50	20	160	9	50	110	102	10	FPR610Ø16.5H7MQ3Z-FU801	30570433
17,00	20	160	9	50	110	102	10	FPR610Ø17H7MQ3Z-FU801	30570434
17,50	20	160	9	50	110	102	10	FPR610Ø17.5H7MQ3Z-FU801	30570435
18,00	20	160	9	50	110	102	12	FPR610Ø18H7MQ3Z-FU801	30570436
18,50	20	160	9	50	110	102	12	FPR610Ø18.5H7MQ3Z-FU801	30570437
19,00	20	160	9	50	110	102	12	FPR610Ø19H7MQ3Z-FU801	30570438
19,50	20	160	9	50	110	102	12	FPR610Ø19.5H7MQ3Z-FU801	30570439
20,00	20	160	9	50	110	102	12	FPR610Ø20H7MQ3Z-FU801	30570440
20,50	20	160	9	50	110	102	12	FPR610Ø20.5H7MQ3Z-FU801	30570441
21,00	20	160	9	50	110	102	12	FPR610Ø21H7MQ3Z-FU801	30570442
21,50	20	160	9	50	110	102	12	FPR610Ø21.5H7MQ3Z-FU801	30570443
22,00	20	160	9	50	110	102	14	FPR610Ø22H7MQ3Z-FU801	30570444
22,50	20	180	9	50	130	122	14	FPR610Ø22.5H7MQ3Z-FU801	30570445
23,00	20	180	9	50	130	122	14	FPR610Ø23H7MQ3Z-FU801	30570446
23,50	20	180	9	50	130	122	14	FPR610Ø23.5H7MQ3Z-FU801	30570447
24,00	20	180	9	50	130	122	14	FPR610Ø24H7MQ3Z-FU801	30570448
24,50	20	180	9	50	130	122	14	FPR610Ø24.5H7MQ3Z-FU801	30570449
25,00	20	180	9	50	130	122	16	FPR610Ø25H7MQ3Z-FU801	30570450
25,50	20	180	9	50	130	122	16	FPR610Ø25.5H7MQ3Z-FU801	30570451
26,00	20	180	9	50	130	122	16	FPR610Ø26H7MQ3Z-FU801	30570452
26,50	20	180	9	50	130	122	16	FPR610Ø26.5H7MQ3Z-FU801	30570453
27,00	20	180	9	50	130	122	16	FPR610Ø27H7MQ3Z-FU801	30570454
27,50	20	180	9	50	130	122	16	FPR610Ø27.5H7MQ3Z-FU801	30570455
28,00	25	180	9	56	124	116	16	FPR610Ø28H7MQ3Z-FU801	30570456
28,50	25	180	9	56	124	116	16	FPR610Ø28.5H7MQ3Z-FU801	30570457
29,00	25	180	9	56	124	116	16	FPR610Ø29H7MQ3Z-FU801	30570458

FeedPlus FPR610

Dimensions							z	Specification	Order No.
d ₁	d ₂ h6	l ₁	l ₂	l ₃	l ₄	l ₅			
29,50	25	200	9	56	144	136	16	FPR610Ø29.5H7MQ3Z-FU801	30570459
30,00	25	200	9	56	144	136	16	FPR610Ø30H7MQ3Z-FU801	30570460
30,50	25	200	9	56	144	136	16	FPR610Ø30.5H7MQ3Z-FU801	30570461
31,00	25	200	9	56	144	136	16	FPR610Ø31H7MQ3Z-FU801	30570462
31,50	25	200	9	56	144	136	16	FPR610Ø31.5H7MQ3Z-FU801	30570463
32,00	25	200	9	56	144	136	18	FPR610Ø32H7MQ3Z-FU801	30570464
32,50	25	200	9	56	144	136	18	FPR610Ø32.5H7MQ3Z-FU801	30570465
33,00	25	200	9	56	144	136	18	FPR610Ø33H7MQ3Z-FU801	30570466
33,50	25	200	9	56	144	136	18	FPR610Ø33.5H7MQ3Z-FU801	30570467
34,00	25	200	9	56	144	136	18	FPR610Ø34H7MQ3Z-FU801	30570468
34,50	25	200	9	56	144	136	18	FPR610Ø34.5H7MQ3Z-FU801	30570469
35,00	25	200	9	56	144	136	18	FPR610Ø35H7MQ3Z-FU801	30570470
35,50	25	200	9	56	144	136	18	FPR610Ø35.5H7MQ3Z-FU801	30570471
36,00	32	200	9	60	140	132	18	FPR610Ø36H7MQ3Z-FU801	30570472
36,50	32	200	9	60	140	132	18	FPR610Ø36.5H7MQ3Z-FU801	30570473
37,00	32	200	9	60	140	132	18	FPR610Ø37H7MQ3Z-FU801	30570474
37,50	32	200	9	60	140	132	18	FPR610Ø37.5H7MQ3Z-FU801	30570475
38,00	32	200	9	60	140	132	18	FPR610Ø38H7MQ3Z-FU801	30570476
38,50	32	200	9	60	140	132	18	FPR610Ø38.5H7MQ3Z-FU801	30570477
39,00	32	200	9	60	140	132	18	FPR610Ø39H7MQ3Z-FU801	30570478
39,50	32	200	9	60	140	132	18	FPR610Ø39.5H7MQ3Z-FU801	30570479
40,00	32	200	9	60	140	132	18	FPR610Ø40H7MQ3Z-FU801	30570480

Dimensions in mm.

Cutting data recommendation from page 436.

Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "High-performance reamers FeedPlus".

FeedPlus FPR610

Design:

With brazed cutting edges

Reamer diameter:

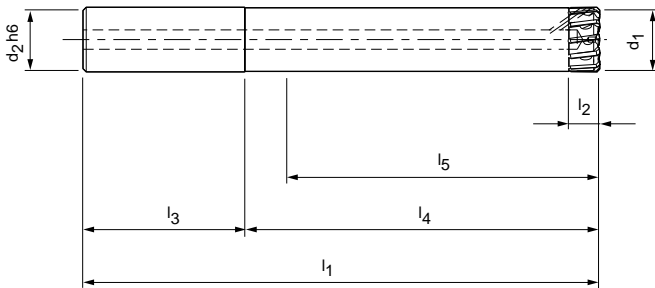
10.00 – 40.00 mm

Lead:

MV3L

Cutting material:

FU861



Dimensions							z	Specification	Order No.
d ₁	d ₂ h6	l ₁	l ₂	l ₃	l ₄	l ₅			
10,00	12	120	9	45	75	67	6	FPR610Ø10H7MV3L-FU861	30570359
10,50	12	120	9	45	75	67	6	FPR610Ø10.5H7MV3L-FU861	30570360
11,00	12	120	9	45	75	67	6	FPR610Ø11H7MV3L-FU861	30570361
11,50	12	120	9	45	75	67	6	FPR610Ø11.5H7MV3L-FU861	30570362
12,00	12	120	9	45	75	67	8	FPR610Ø12H7MV3L-FU861	30570363
12,50	16	130	9	48	82	74	8	FPR610Ø12.5H7MV3L-FU861	30570364
13,00	16	130	9	48	82	74	8	FPR610Ø13H7MV3L-FU861	30570365
13,50	16	130	9	48	82	74	8	FPR610Ø13.5H7MV3L-FU861	30570366
14,00	16	130	9	48	82	74	10	FPR610Ø14H7MV3L-FU861	30570367
14,50	16	130	9	48	82	74	10	FPR610Ø14.5H7MV3L-FU861	30570368
15,00	16	130	9	48	82	74	10	FPR610Ø15H7MV3L-FU861	30570369
15,50	16	130	9	48	82	74	10	FPR610Ø15.5H7MV3L-FU861	30570370
16,00	16	130	9	48	82	74	10	FPR610Ø16H7MV3L-FU861	30570371
16,50	20	160	9	50	110	102	10	FPR610Ø16.5H7MV3L-FU861	30570372
17,00	20	160	9	50	110	102	10	FPR610Ø17H7MV3L-FU861	30570373
17,50	20	160	9	50	110	102	10	FPR610Ø17.5H7MV3L-FU861	30570374
18,00	20	160	9	50	110	102	12	FPR610Ø18H7MV3L-FU861	30570375
18,50	20	160	9	50	110	102	12	FPR610Ø18.5H7MV3L-FU861	30570376
19,00	20	160	9	50	110	102	12	FPR610Ø19H7MV3L-FU861	30570377
19,50	20	160	9	50	110	102	12	FPR610Ø19.5H7MV3L-FU861	30570378
20,00	20	160	9	50	110	102	12	FPR610Ø20H7MV3L-FU861	30570379
20,50	20	160	9	50	110	102	12	FPR610Ø20.5H7MV3L-FU861	30570380
21,00	20	160	9	50	110	102	12	FPR610Ø21H7MV3L-FU861	30570381
21,50	20	160	9	50	110	102	12	FPR610Ø21.5H7MV3L-FU861	30570382
22,00	20	160	9	50	110	102	14	FPR610Ø22H7MV3L-FU861	30570383
22,50	20	180	9	50	130	122	14	FPR610Ø22.5H7MV3L-FU861	30570384
23,00	20	180	9	50	130	122	14	FPR610Ø23H7MV3L-FU861	30570385
23,50	20	180	9	50	130	122	14	FPR610Ø23.5H7MV3L-FU861	30570386
24,00	20	180	9	50	130	122	14	FPR610Ø24H7MV3L-FU861	30570387
24,50	20	180	9	50	130	122	14	FPR610Ø24.5H7MV3L-FU861	30570388
25,00	20	180	9	50	130	122	16	FPR610Ø25H7MV3L-FU861	30570389
25,50	20	180	9	50	130	122	16	FPR610Ø25.5H7MV3L-FU861	30570390
26,00	20	180	9	50	130	122	16	FPR610Ø26H7MV3L-FU861	30570391
26,50	20	180	9	50	130	122	16	FPR610Ø26.5H7MV3L-FU861	30570392
27,00	20	180	9	50	130	122	16	FPR610Ø27H7MV3L-FU861	30570393
27,50	20	180	9	50	130	122	16	FPR610Ø27.5H7MV3L-FU861	30570394
28,00	25	180	9	56	124	116	16	FPR610Ø28H7MV3L-FU861	30570395
28,50	25	180	9	56	124	116	16	FPR610Ø28.5H7MV3L-FU861	30570396
29,00	25	180	9	56	124	116	16	FPR610Ø29H7MV3L-FU861	30570397

FeedPlus FPR610

Dimensions							z	Specification	Order No.
d ₁	d ₂ h6	l ₁	l ₂	l ₃	l ₄	l ₅			
29,50	25	200	9	56	144	136	16	FPR610Ø29.5H7MV3L-FU861	30570398
30,00	25	200	9	56	144	136	16	FPR610Ø30H7MV3L-FU861	30570399
30,50	25	200	9	56	144	136	16	FPR610Ø30.5H7MV3L-FU861	30570400
31,00	25	200	9	56	144	136	16	FPR610Ø31H7MV3L-FU861	30570401
31,50	25	200	9	56	144	136	16	FPR610Ø31.5H7MV3L-FU861	30570402
32,00	25	200	9	56	144	136	18	FPR610Ø32H7MV3L-FU861	30570403
32,50	25	200	9	56	144	136	18	FPR610Ø32.5H7MV3L-FU861	30570404
33,00	25	200	9	56	144	136	18	FPR610Ø33H7MV3L-FU861	30570405
33,50	25	200	9	56	144	136	18	FPR610Ø33.5H7MV3L-FU861	30570406
34,00	25	200	9	56	144	136	18	FPR610Ø34H7MV3L-FU861	30570407
34,50	25	200	9	56	144	136	18	FPR610Ø34.5H7MV3L-FU861	30570408
35,00	25	200	9	56	144	136	18	FPR610Ø35H7MV3L-FU861	30570409
35,50	25	200	9	56	144	136	18	FPR610Ø35.5H7MV3L-FU861	30570410
36,00	32	200	9	60	140	132	18	FPR610Ø36H7MV3L-FU861	30570411
36,50	32	200	9	60	140	132	18	FPR610Ø36.5H7MV3L-FU861	30570412
37,00	32	200	9	60	140	132	18	FPR610Ø37H7MV3L-FU861	30570413
37,50	32	200	9	60	140	132	18	FPR610Ø37.5H7MV3L-FU861	30570414
38,00	32	200	9	60	140	132	18	FPR610Ø38H7MV3L-FU861	30570415
38,50	32	200	9	60	140	132	18	FPR610Ø38.5H7MV3L-FU861	30570416
39,00	32	200	9	60	140	132	18	FPR610Ø39H7MV3L-FU861	30570417
39,50	32	200	9	60	140	132	18	FPR610Ø39.5H7MV3L-FU861	30570418
40,00	32	200	9	60	140	132	18	FPR610Ø40H7MV3L-FU861	30570419

Dimensions in mm.

Cutting data recommendation from page 436.

Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "High-performance reamers FeedPlus".

FeedPlus FPR610

Design:

With brazed cutting edges

Reamer diameter:

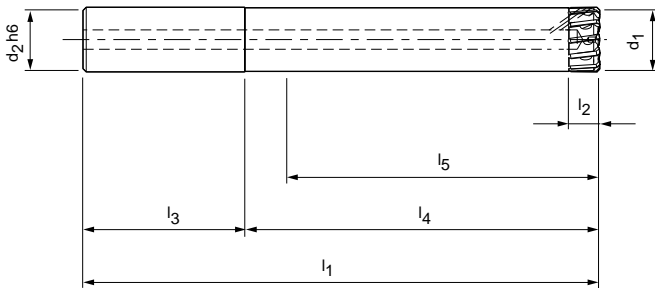
10.00 – 40.00 mm

Lead:

MV1E

Cutting material:

PU620



Dimensions							z	Specification	Order No.
d_1	$d_2 h6$	l_1	l_2	l_3	l_4	l_5			
10,00	12	120	9	45	75	67	6	FPR610Ø10H7MV1E-PU620	30570481
10,50	12	120	9	45	75	67	6	FPR610Ø10.5H7MV1E-PU620	30570482
11,00	12	120	9	45	75	67	6	FPR610Ø11H7MV1E-PU620	30570483
11,50	12	120	9	45	75	67	6	FPR610Ø11.5H7MV1E-PU620	30570484
12,00	12	120	9	45	75	67	8	FPR610Ø12H7MV1E-PU620	30570485
12,50	16	130	9	48	82	74	8	FPR610Ø12.5H7MV1E-PU620	30570486
13,00	16	130	9	48	82	74	8	FPR610Ø13H7MV1E-PU620	30570487
13,50	16	130	9	48	82	74	8	FPR610Ø13.5H7MV1E-PU620	30570488
14,00	16	130	9	48	82	74	10	FPR610Ø14H7MV1E-PU620	30570489
14,50	16	130	9	48	82	74	10	FPR610Ø14.5H7MV1E-PU620	30570490
15,00	16	130	9	48	82	74	10	FPR610Ø15H7MV1E-PU620	30570491
15,50	16	130	9	48	82	74	10	FPR610Ø15.5H7MV1E-PU620	30570492
16,00	16	130	9	48	82	74	10	FPR610Ø16H7MV1E-PU620	30570493
16,50	20	160	9	50	110	102	10	FPR610Ø16.5H7MV1E-PU620	30570494
17,00	20	160	9	50	110	102	10	FPR610Ø17H7MV1E-PU620	30570495
17,50	20	160	9	50	110	102	10	FPR610Ø17.5H7MV1E-PU620	30570496
18,00	20	160	9	50	110	102	12	FPR610Ø18H7MV1E-PU620	30570497
18,50	20	160	9	50	110	102	12	FPR610Ø18.5H7MV1E-PU620	30570498
19,00	20	160	9	50	110	102	12	FPR610Ø19H7MV1E-PU620	30570499
19,50	20	160	9	50	110	102	12	FPR610Ø19.5H7MV1E-PU620	30570500
20,00	20	160	9	50	110	102	12	FPR610Ø20H7MV1E-PU620	30570501
20,50	20	160	9	50	110	102	12	FPR610Ø20.5H7MV1E-PU620	30570502
21,00	20	160	9	50	110	102	12	FPR610Ø21H7MV1E-PU620	30570503
21,50	20	160	9	50	110	102	12	FPR610Ø21.5H7MV1E-PU620	30570504
22,00	20	160	9	50	110	102	14	FPR610Ø22H7MV1E-PU620	30570505
22,50	20	180	9	50	130	122	14	FPR610Ø22.5H7MV1E-PU620	30570506
23,00	20	180	9	50	130	122	14	FPR610Ø23H7MV1E-PU620	30570507
23,50	20	180	9	50	130	122	14	FPR610Ø23.5H7MV1E-PU620	30570508
24,00	20	180	9	50	130	122	14	FPR610Ø24H7MV1E-PU620	30570509
24,50	20	180	9	50	130	122	14	FPR610Ø24.5H7MV1E-PU620	30570510
25,00	20	180	9	50	130	122	16	FPR610Ø25H7MV1E-PU620	30570511
25,50	20	180	9	50	130	122	16	FPR610Ø25.5H7MV1E-PU620	30570512
26,00	20	180	9	50	130	122	16	FPR610Ø26H7MV1E-PU620	30570513
26,50	20	180	9	50	130	122	16	FPR610Ø26.5H7MV1E-PU620	30570514
27,00	20	180	9	50	130	122	16	FPR610Ø27H7MV1E-PU620	30570515
27,50	20	180	9	50	130	122	16	FPR610Ø27.5H7MV1E-PU620	30570516
28,00	25	180	9	56	124	116	16	FPR610Ø28H7MV1E-PU620	30572053
28,50	25	180	9	56	124	116	16	FPR610Ø28.5H7MV1E-PU620	30572054
29,00	25	180	9	56	124	116	16	FPR610Ø29H7MV1E-PU620	30572055

FeedPlus FPR610

Dimensions							z	Specification	Order No.
d ₁	d ₂ h6	l ₁	l ₂	l ₃	l ₄	l ₅			
29,50	25	200	9	56	144	136	16	FPR610Ø29.5H7MV1E-PU620	30572056
30,00	25	200	9	56	144	136	16	FPR610Ø30H7MV1E-PU620	30572057
30,50	25	200	9	56	144	136	16	FPR610Ø30.5H7MV1E-PU620	30572058
31,00	25	200	9	56	144	136	16	FPR610Ø31H7MV1E-PU620	30572059
31,50	25	200	9	56	144	136	16	FPR610Ø31.5H7MV1E-PU620	30572060
32,00	25	200	9	56	144	136	18	FPR610Ø32H7MV1E-PU620	30572061
32,50	25	200	9	56	144	136	18	FPR610Ø32.5H7MV1E-PU620	30572062
33,00	25	200	9	56	144	136	18	FPR610Ø33H7MV1E-PU620	30572063
33,50	25	200	9	56	144	136	18	FPR610Ø33.5H7MV1E-PU620	30572064
34,00	25	200	9	56	144	136	18	FPR610Ø34H7MV1E-PU620	30572065
34,50	25	200	9	56	144	136	18	FPR610Ø34.5H7MV1E-PU620	30572066
35,00	25	200	9	56	144	136	18	FPR610Ø35H7MV1E-PU620	30572067
35,50	25	200	9	56	144	136	18	FPR610Ø35.5H7MV1E-PU620	30572068
36,00	32	200	9	60	140	132	18	FPR610Ø36H7MV1E-PU620	30572069
36,50	32	200	9	60	140	132	18	FPR610Ø36.5H7MV1E-PU620	30572070
37,00	32	200	9	60	140	132	18	FPR610Ø37H7MV1E-PU620	30572071
37,50	32	200	9	60	140	132	18	FPR610Ø37.5H7MV1E-PU620	30572072
38,00	32	200	9	60	140	132	18	FPR610Ø38H7MV1E-PU620	30572073
38,50	32	200	9	60	140	132	18	FPR610Ø38.5H7MV1E-PU620	30572074
39,00	32	200	9	60	140	132	18	FPR610Ø39H7MV1E-PU620	30572075
39,50	32	200	9	60	140	132	18	FPR610Ø39.5H7MV1E-PU620	30572076
40,00	32	200	9	60	140	132	18	FPR610Ø40H7MV1E-PU620	30572077

Dimensions in mm.

Cutting data recommendation from page 436.

Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "High-performance reamers FeedPlus".



Customised special solutions for multi-stepped machining and order-specific equipping with guide pads possible.





REPLACEABLE HEAD REAMERS

Introduction

Programme overview 200

Replaceable head reamers

HPR replaceable head reamers 202

CPR replaceable head reamers 326

PROGRAMME OVERVIEW

Replaceable head reamers

MAPAL offers replaceable head reamers with two different head systems that impress with exact radial run-out and changeover accuracy, and with safe and simple handling. It is possible to replace the tool head directly on the machine.

The strength and accuracy of tools with HFS and CFS connection are no worse than monolithic tools. Due to the high precision of the connections, the tools are actually even stiffer. The replaceable head tools achieve the tool lives of monolithic tools with reduced process costs.



Basic Line:

Universal tools, broad application area, low procurement costs



Performance Line:

High-performance tools, broad application area, high productivity in series production manufacturing



Expert Line:

Specialist tools for selected applications, maximum precision and productivity

HPR replaceable head reamers with HFS connection



The HPR replaceable head reamers from MAPAL are based on the HFS® replaceable head system.

The HFS principle from MAPAL impresses with exact radial run-out and a changeover accuracy of 3 µm, along with safe and simple handling, particularly during assembly and disassembly of the tool head.

The coolant is supplied internally, directly to the face surface on the HFS, making it possible for the coolant to be supplied directly at the cutting edges where it is required. As such the HPR reamers are also suitable for minimum quantity lubrication. Consistent high precision and a long tool life are therefore ensured. Due to the even grinding quality and the stable clamping of the complete system, it is also possible to grind new types of geometry, for example for chip breakers. The standard programme of HPR reamers includes, along with the tool heads from 7 mm diameter and series for through and blind bores, also the HFS holder range with axial and radial clamping system in varying lengths.



CPR replaceable head reamers with CFS connection



The CFS connection for the Complete-Performance-Reamer CPR is designed such that the highest possible stability and rigidity is achieved by a taper and a face connection. The special design and manufacture to the μ of the thread and taper-face section guarantee the highly precise radial run-out accuracy of $5 \mu\text{m}$. Thanks to the simple and safe handling, the reaming heads can be replaced in the machine tool quickly and easily. The range of CPR replaceable head reamers includes heads made of solid carbide and heads with brazed cutting edges.





HPR REPLACEABLE HEAD REAMERS

Introduction

Product overview	200
Selection overview Configuration	202
HPR with configurable parameters	204

HPR replaceable head reamers

Fixed design series 100	206
Finely adjustable design series 200	258

HFS replaceable head holder

Designation key	308
Holder range	310

PRODUCT OVERVIEW

HPR replaceable head reamer

The HPR range of replaceable head reamers includes series for through and blind bores from a diameter of 8.00 mm. The replaceable head reamers are available either of fixed design (series 100) or of finely adjustable design (series 200) and can be tipped with different cutting materials such as carbide, cermet, PcBN or PCD. The reamers can be configured in the diameter range from 8.00 to 65.00 mm in steps of 0.10 mm; the tolerance range can also be configured. A broad range of H7 dimensions is available as a preferred series.

The related holders with the HFS (Head Fitting System) feature exact radial run-out and changeover accuracy, along with safe and simple handling, particularly during assembly and dismantling of the tool head. HFS guarantees high precision and power transmission, here changeover and radial run-out accuracies less than 3 μm can be achieved reliably. Due to the simple construction with direct coolant supply to the cutting edge, the system is suitable for minimum quantity lubrication (MQL).

HPR series 100 130 | 131 | 100 | 110 | 180 | 150



Fixed design with brazed cutting edges.

Ø range: 7.00 – 65.00 mm*

Perfor
mance
LINE



P M K N S

Page 206

HPR series 200 230 | 231 | 200 | 210 | 280 | 250



Can be adjusted to the μ through the adjusting system.

Ø range: 7.00 – 65.00 mm*

Expert
LINE



P M K N S

Page 258

* The diameter range can vary, depending on the series.

Tool features in detail



HFS axial clamping system



- 1 Different holder variants**
e.g. cylindrical shank, HSK-A
- 2 Taper for easy, highly accurate centring**
- 3 Face connection for rigidity and stability**
- 4 Internal coolant supply**
Exit directly at the cutting edge
- 5 Sturdy, precision clamping screw with differential thread**



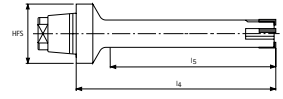
HFS radial clamping system

Head replacement quickly, easily and generally in the machine



- 6 Eccentric pin**
For rapid clamping and release with high clamping force
- 7 Taper for easy, highly accurate centring**
- 8 Face connection for rigidity and stability**
- 9 Internal coolant supply**
Exit directly at the cutting edge
- 10 Precision pull stud**
- 11 Different holder variants**
e.g. cylindrical shank, HSK-A

Article overview HPR | Ordering example



HPR130 | 230

1. Series

Type of bore	Material	Coolant supply	Flute helix angle	FIXED Straight-forward, advantageous design	FINELY ADJUSTABLE Three-piece design with screw, pushing ring and adjusting sleeve
	K N			HPR130 HPR100	HPR230 HPR200
	P K M S			HPR131 HPR110	HPR231 HPR210
	P K N S			HPR180 HPR150	HPR280 HPR250

2. Tool dimensions

	ød ₁	l ₄	l ₅	HFS size	z
HPR130 131	7,00 - 9,59	60	45	12	4
HPR230 231	9,60 - 18,59	60	45	12	6
HPR180	7,00 - 14,59	60	40	12	4
HPR280	14,60 - 21,29	60	40	12	6
HPR100 HPR110	15,60 - 18,59	14	-	10	6
	18,60 - 21,29	14,5	-	12	6
	21,30 - 23,99	15,5	-	14	6
	24,00 - 29,99	16	-	16	6
	30,00 - 39,99	17	-	20	8
HPR150	40,00 - 50,70	19	-	24	8
	50,71 - 65,00	25	-	24	8
	16,60 - 21,29	14	-	10	6
	21,30 - 24,99	15,5	-	12	6
	25,00 - 28,99	15,5	-	14	6
HPR250	29,00 - 36,99	17	-	16	6
	37,00 - 44,99	17	-	20	8
	45,00 - 50,70	19	-	24	8
	50,71 - 65,00	25	-	24	8

	ød ₁	l ₄	l ₅	HFS size	z
HPR200 HPR210	18,60 - 20,39	25	-	12	6
	20,40 - 21,29	27	-	12	6
	21,30 - 23,99	27	-	14	6
	24,00 - 29,99	35	-	16	6
	30,00 - 39,99	41	-	20	8
HPR250	40,00 - 65,00	47	-	24	8
	16,60 - 21,29	25	-	10	6
	21,30 - 24,99	27	-	12	6
	25,00 - 28,59	35	-	14	6
	29,00 - 32,29	35	-	16	6
	32,30 - 36,99	41	-	16	6
	37,00 - 41,19	41	-	20	8
41,20 - 44,90	47	-	20	8	
45,00 - 65,00	47	-	24	8	

3. Lead and cutting material

130 230	Lead
	Cutting material
	Preferred series H7
131 231	Lead
	Cutting material
	Preferred series H7
180 280	Lead
	Cutting material
	Preferred series H7
100 200	Lead
	Cutting material
	Preferred series H7
110 210	Lead
	Cutting material
	Preferred series H7
150 250	Lead
	Cutting material
	Preferred series H7

Ordering example:

1. Series

H P R

HPR replaceable head reamer

Designs:
1 = Fixed reamer
2 = Finely adjustable reamer

2. Diameter

1 0 0 C **ø 2 0 . 0 0 0**

Bore or tool diameter

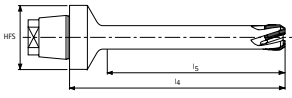
C = Configurable variant:
Length deviates from the standard or through the required grinding tolerance
G = Tool diameter information
Digit is only used for C and G variants

Tolerance

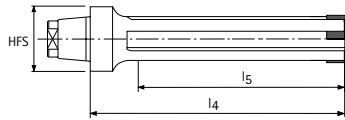
H 7

IT or allowance in µm (example: +30+10)

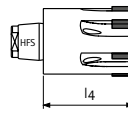
Flute helix angle on the cutting edges:
0 = Straight fluted up to ø 65.00 mm
1 = Left-hand spiral fluted up to ø 65.00 mm
3 = Left-hand spiral up to ø 18.59 mm
5 = Blind bore up to ø 65.00 mm
8 = Blind bore up to ø 21.29 mm



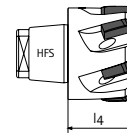
HPR131 | 231



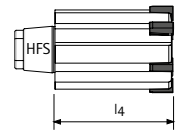
HPR180 | 280



HPR100 | 200



HPR110 | 210

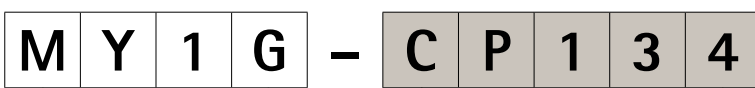


HPR150 | 250

	P		M	K			N	S	
	P1 - P5		P6	M1 - M3	K1	K2	K3	N1 - N4	S1 - S5
	U	U	U	U	U	U	U	U	
					MC1G HP421	MC1G HP421	MC1G HP421	MA0A PU620	
				P. 212/262	P. 212/262	P. 212/262	P. 215/264		
				MC1G HC412					
				P. 213					
				MC1G CP134	MC1G CP134	MC1G CP134			
				P. 214/263	P. 214/263	P. 214/263			
	ME1G CU134	MF1G HP421	MF1G HP421	ME1G HP421	ME1G HP421	ME1G HP421		MF1G HP612	
	P. 219/268	P. 218/266	P. 218/266	P. 217/265	P. 217/265	P. 217/265		P. 216/267	
	ME1G HP421								
	P. 217/265								
	ME1G CP134			ME1G CP134	ME1G CP134				
	P. 220/269			P. 220/269	P. 220/269				
ML2G CU134				MC1G HP421	MC1G HP421	MC1G HP421		M02G HP612	
P. 224/2713				P. 222/270	P. 222/270	P. 222/270		P. 223/272	
ML2G HP421									
P. 221/273									
ML2G CP134				MC1G CP134	MC1G CP134	MC1G CP134	MA0A PU620		
P. 226/275				P. 225/274	P. 225/274	P. 225/274	P. 227/276		
				MC1G HP421	MC1G HP421	MC1G HP421	MA0A PU620		
				P. 228/277	P. 228/277	P. 228/277	P. 234/281		
				MC1G HC412					
				P. 230					
				MC1G CP134	MC1G CP134	MC1G CP134			
				P. 232/279	P. 232/279	P. 232/279			
	ME1G CU134	MF1G HP421	MF1G HP421	ME1G HP421	ME1G HP421	ME1G HP421			
P. 242/289	P. 238/285	P. 238/285	P. 238/285	P. 236/283	P. 236/283	P. 236/283			
ME1G HP421				ME1G CP134	ME1G CP134	ME1G CP134		MF1G HP612	
P. 236/283				P. 244/291	P. 244/291			P. 240/287	
ME1G CP134									
P. 244/291									
ML2G CU134				MC1G HP421	MC1G HP421	MC1G HP421	MA0A PU620	M02G HP612	
P. 252/299				P. 246/293	P. 246/293	P. 246/293	P. 258/305	P. 250/297	
ML2G HP421				MC1G CP134	MC1G CP134	MC1G CP134			
P. 248/295				P. 254/301	P. 254/301	P. 254/301			
ML2G CP134									
P. 256/303									

3. Lead

Cutting material



Lead geometry and rake angle:

MC1G ME1G
MA0A ML2G
M02G MF1G

For an explanation of the lead geometry see pages 432/433.

Cutting material:

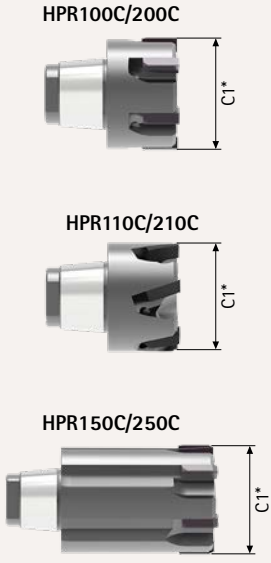
HP421 HC412
CP134 HP612
CU134 PU620

HPR replaceable head reamers with configurable parameters

The standardised designs of the HPR replaceable head reamers can be specifically adapted via configurable parameters. These individually adapted tools are always based on a standardised design; one or more parameters is/are configured. The model for the configured variant

is based on the model for the initial design and is supplemented with the letter "C" (configurable).

1. Configurable parameters for replaceable heads HPR100C, 110C, 150C and 200C, 210C, 250C



HPR100C/200C

HPR110C/210C

HPR150C/250C

– Cutting edge diameter or grinding dimension configurable (C1)

For the designs HPR100C, HPR200C, HPR110C, HPR210C, HPR150C and HPR250C, the ground cutting edge diameter or the grinding dimension of the replaceable head reamers can be stated individually.

Here the largest dimension for the cutting edge diameter is defined.

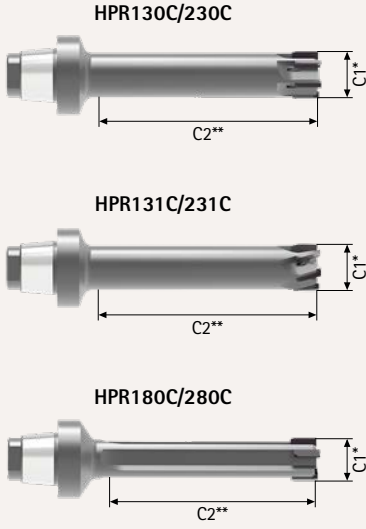
A fit surcharge is not charged for this non-standard design.

Ordering example for replaceable head reamer HPR110C

- Bore diameter: $\varnothing 20^{H7 (+21 \mu m)}$
- For application in steel
- Design for mid-tolerance

Ordering information:
HPR110C $\varnothing 20H7ME1G-CU134$

2. Configurable parameters for replaceable heads HPR130C, 131C, 180C, 230C, 231C, 280C



HPR130C/230C

HPR131C/231C

HPR180C/280C

– Cutting edge diameter or grinding dimension configurable (C1)

– Useable length configurable (C2)

– From diameter 7 - 15 mm the working length l_5 increases by the maximum factor $10 \times d_1$

– From diameter 15 mm the working length l_5 remains constant at maximum 150 mm

For the designs HPR130C, HPR131C, HPR180C, HPR230C, HPR231C and HPR280C, the ground cutting edge diameter or the grinding dimension of the replaceable head reamers can also be stated individually. Here the largest dimension for the cutting edge diameter is defined.

A fit surcharge is not charged for this non-standard design.

The useable length can also be configured for these designs; the solid carbide designs HC412/HC413 are excluded here. A quantity-dependent surcharge is charged for replaceable heads with modified useable length.

Ordering example for replaceable head reamer HPR131C

- Bore diameter: $\varnothing 16^{H7}$
- For application in steel
- Configured useful length 50 mm (standard 45 mm)

Ordering information:
HPR131C $\varnothing 16H7ME1G-CU134$

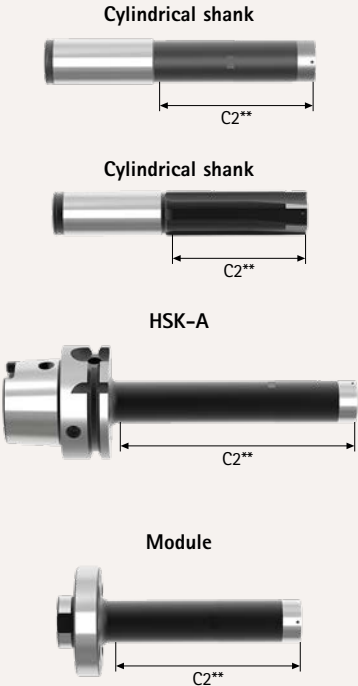
** Length C2 corresponds to length l_5 from the tables on pages 212 - 306.

HFS replaceable head holders with configurable parameters

The standardised designs of the HFS replaceable head holders can also be specifically adapted via configurable parameters. These individually adapted tools are always based on a standardised holder design; the useable length is configured. The model for the configured variant

is based on the model for the initial design and is supplemented with the letter "C" (configurable).

Configurable parameters for HFS replaceable head holders



Cylindrical shank

Cylindrical shank

HSK-A

Module

– Useable length configurable (C2)

The useful length (l_5 or l_3 for cylindrical shank holders) stated in the individual tables for the HFS replaceable head holders can be configured for all designs.

A surcharge is charged for these length changes.

Ordering example for HFS replaceable head holder HFS101RC with radial tool clamping with HSK-A 63 shank and HFS size 12

- Configured useable length 85 mm (standard 75 mm)
- Design for mid-tolerance

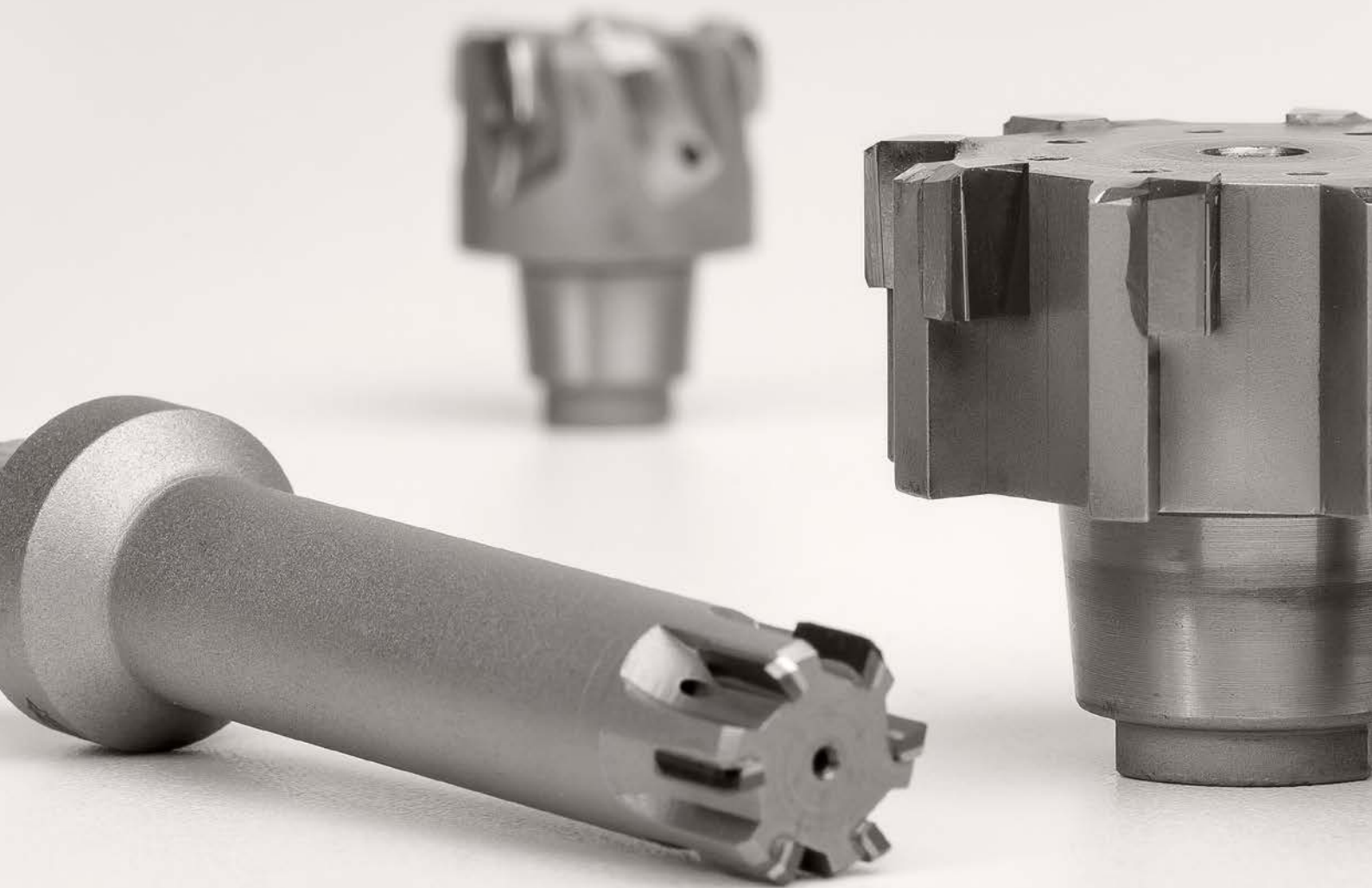
Ordering information:
HFS101RC-12-124-HSK-A063-S
 Useable length: 85 mm

** Length C2 corresponds to length l_3 from the tables on pages 312 - 325.



ADVANTAGES

- Simple adaptation of the tool diameter to the μm in difficult machining conditions due to thin-walled parts, difficult materials, effects of part geometry or clamping system.
- Drawing-specific custom tools are not required for the adaptation of the useable length for replaceable heads (only HPR130, HPR131, HPR180, HPR230, HPR231, HPR250 and HPR280) or for HFS replaceable head holders.
- By means of the straightforward configuration via parameters, if necessary a tool optimally adapted to the machining task comprising of HPR replaceable head reamer and HFS replaceable head holder is obtained.



HPR - FIXED DESIGN

HPR replaceable head reamers

HPR130	212
HPR131	216
HPR180	221
HPR100	228
HPR110	236
HPR150	246



HPR130

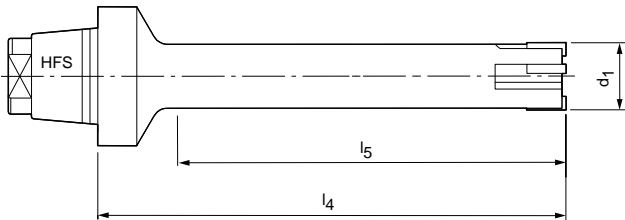
Fixed design

Design:

Reamer diameter: 7.00 - 18.00 mm

Lead: MC1G

Cutting material: HP421



Dimensions				z	Specification	Order No.
d_1	HFS size	l_4	l_5			
7,00	12	60	45	4	HPR130Ø7H7MC1G-HP421	30032677
8,00	12	60	45	4	HPR130Ø8H7MC1G-HP421	30032739
9,00	12	60	45	4	HPR130Ø9H7MC1G-HP421	30401405
10,00	12	60	45	6	HPR130Ø10H7MC1G-HP421	30058428
11,00	12	60	45	6	HPR130Ø11H7MC1G-HP421	30710144
12,00	12	60	45	6	HPR130Ø12H7MC1G-HP421	30201261
13,00	12	60	45	6	HPR130Ø13H7MC1G-HP421	30710145
14,00	12	60	45	6	HPR130Ø14H7MC1G-HP421	30710146
15,00	12	60	45	6	HPR130Ø15H7MC1G-HP421	30710147
16,00	12	60	45	6	HPR130Ø16H7MC1G-HP421	30710148
17,00	12	60	45	6	HPR130Ø17H7MC1G-HP421	30710149
18,00	12	60	45	6	HPR130Ø18H7MC1G-HP421	30156684

Dimensions in mm.

Cutting data recommendation from page 436.

For related HFS replaceable head holders see page 308.

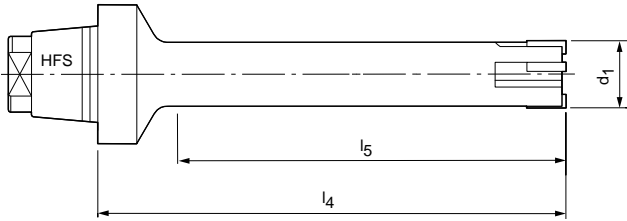
Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "HPR replaceable head reamers".

HPR130

Fixed design

Design:

Reamer diameter: 7.00 - 18.00 mm
 Lead: MC1G
 Cutting material: HC412



Dimensions				z	Specification	Order No.
d_1	HFS size	l_4	l_5			
7,00	12	60	45	4	HPR130Ø7H7MC1G-HC412	30795858
8,00	12	60	45	4	HPR130Ø8H7MC1G-HC412	30795859
9,00	12	60	45	4	HPR130Ø9H7MC1G-HC412	30795860
10,00	12	60	45	6	HPR130Ø10H7MC1G-HC412	30795861
11,00	12	60	45	6	HPR130Ø11H7MC1G-HC412	30795862
12,00	12	60	45	6	HPR130Ø12H7MC1G-HC412	30795863
13,00	12	60	45	6	HPR130Ø13H7MC1G-HC412	30795864
14,00	12	60	45	6	HPR130Ø14H7MC1G-HC412	30795865
15,00	12	60	45	6	HPR130Ø15H7MC1G-HC412	30379625
16,00	12	60	45	6	HPR130Ø16H7MC1G-HC412	30795866
17,00	12	60	45	6	HPR130Ø17H7MC1G-HC412	30795867
18,00	12	60	45	6	HPR130Ø18H7MC1G-HC412	30795868

Dimensions in mm.

Cutting data recommendation from page 436.

For related HFS replaceable head holders see page 308.

Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "HPR replaceable head reamers".

HPR130

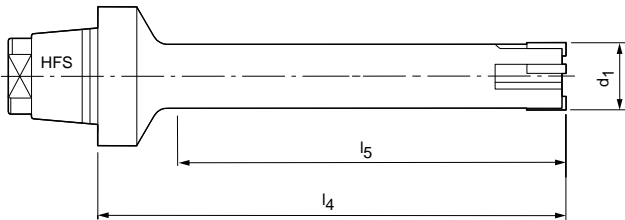
Fixed design

Design:

Reamer diameter: 7.00 - 18.00 mm

Lead: MC1G

Cutting material: CP134



Dimensions				z	Specification	Order No.
d_1	HFS size	l_4	l_5			
7,00	12	60	45	4	HPR130Ø7H7MC1G-CP134	30828308
8,00	12	60	45	4	HPR130Ø8H7MC1G-CP134	30829943
9,00	12	60	45	4	HPR130Ø9H7MC1G-CP134	30828309
10,00	12	60	45	6	HPR130Ø10H7MC1G-CP134	30829944
11,00	12	60	45	6	HPR130Ø11H7MC1G-CP134	30829946
12,00	12	60	45	6	HPR130Ø12H7MC1G-CP134	30196279
13,00	12	60	45	6	HPR130Ø13H7MC1G-CP134	30828310
14,00	12	60	45	6	HPR130Ø14H7MC1G-CP134	30828313
15,00	12	60	45	6	HPR130Ø15H7MC1G-CP134	30572821
16,00	12	60	45	6	HPR130Ø16H7MC1G-CP134	30828314
17,00	12	60	45	6	HPR130Ø17H7MC1G-CP134	30828315
18,00	12	60	45	6	HPR130Ø18H7MC1G-CP134	30829947

Dimensions in mm.

Cutting data recommendation from page 436.

For related HFS replaceable head holders see page 308.

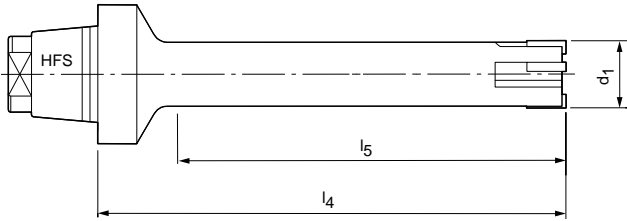
Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "HPR replaceable head reamers".

HPR130

Fixed design

Design:

Reamer diameter: 7.00 - 18.00 mm
 Lead: MA0A
 Cutting material: PU620



Dimensions				z	Specification	Order No.
d_1	HFS size	l_4	l_5			
7,00	12	60	45	4	HPR130Ø7H7MA0A-PU620	30710150
8,00	12	60	45	4	HPR130Ø8H7MA0A-PU620	30202021
9,00	12	60	45	4	HPR130Ø9H7MA0A-PU620	30710151
10,00	12	60	45	6	HPR130Ø10H7MA0A-PU620	30048933
11,00	12	60	45	6	HPR130Ø11H7MA0A-PU620	30710152
12,00	12	60	45	6	HPR130Ø12H7MA0A-PU620	30095380
13,00	12	60	45	6	HPR130Ø13H7MA0A-PU620	30710153
14,00	12	60	45	6	HPR130Ø14H7MA0A-PU620	30228254
15,00	12	60	45	6	HPR130Ø15H7MA0A-PU620	30710154
16,00	12	60	45	6	HPR130Ø16H7MA0A-PU620	30710155
17,00	12	60	45	6	HPR130Ø17H7MA0A-PU620	30710156
18,00	12	60	45	6	HPR130Ø18H7MA0A-PU620	30710157

Dimensions in mm.

Cutting data recommendation from page 436.

For related HFS replaceable head holders see page 308.

Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "HPR replaceable head reamers".

HPR131

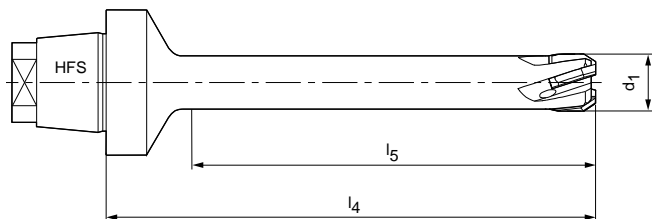
Fixed design

Design:

Reamer diameter: 7.00 - 18.00 mm

Lead: MF1G

Cutting material: HP612



Dimensions				z	Specification	Order No.
d_1	HFS size	l_4	l_5			
7,00	12	60	45	4	HPR131Ø7H7MF1G-HP612	30817342
8,00	12	60	45	4	HPR131Ø8H7MF1G-HP612	30817343
9,00	12	60	45	4	HPR131Ø9H7MF1G-HP612	30817344
10,00	12	60	45	6	HPR131Ø10H7MF1G-HP612	30817345
11,00	12	60	45	6	HPR131Ø11H7MF1G-HP612	30817346
12,00	12	60	45	6	HPR131Ø12H7MF1G-HP612	30817347
13,00	12	60	45	6	HPR131Ø13H7MF1G-HP612	30817348
14,00	12	60	45	6	HPR131Ø14H7MF1G-HP612	30817349
15,00	12	60	45	6	HPR131Ø15H7MF1G-HP612	30817350
16,00	12	60	45	6	HPR131Ø16H7MF1G-HP612	30817351
17,00	12	60	45	6	HPR131Ø17H7MF1G-HP612	30817352
18,00	12	60	45	6	HPR131Ø18H7MF1G-HP612	30817353

Dimensions in mm.

Cutting data recommendation from page 436.

For related HFS replaceable head holders see page 308.

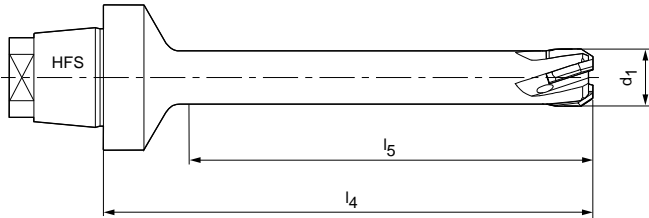
Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "HPR replaceable head reamers".

HPR131

Fixed design

Design:

Reamer diameter: 7.00 - 18.00 mm
 Lead: ME1G
 Cutting material: HP421



Dimensions				z	Specification	Order No.
d_1	HFS size	l_4	l_5			
7,00	12	60	45	4	HPR131Ø7H7ME1G-HP421	30710169
8,00	12	60	45	4	HPR131Ø8H7ME1G-HP421	30140576
9,00	12	60	45	4	HPR131Ø9H7ME1G-HP421	30710170
10,00	12	60	45	6	HPR131Ø10H7ME1G-HP421	30040402
11,00	12	60	45	6	HPR131Ø11H7ME1G-HP421	30710171
12,00	12	60	45	6	HPR131Ø12H7ME1G-HP421	30088226
13,00	12	60	45	6	HPR131Ø13H7ME1G-HP421	30631557
14,00	12	60	45	6	HPR131Ø14H7ME1G-HP421	30099835
15,00	12	60	45	6	HPR131Ø15H7ME1G-HP421	30710172
16,00	12	60	45	6	HPR131Ø16H7ME1G-HP421	30097917
17,00	12	60	45	6	HPR131Ø17H7ME1G-HP421	30710173
18,00	12	60	45	6	HPR131Ø18H7ME1G-HP421	30202190

Dimensions in mm.

Cutting data recommendation from page 436.

For related HFS replaceable head holders see page 308.

Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "HPR replaceable head reamers".

HPR131

Fixed design

Design:

Reamer diameter:

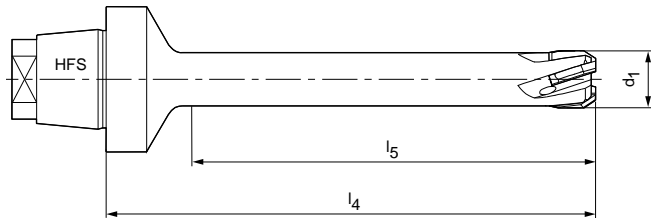
7.00 - 18.00 mm

Lead:

MF1G

Cutting material:

HP421



Dimensions				z	Specification	Order No.
d_1	HFS size	l_4	l_5			
7,00	12	60	45	4	HPR131Ø7H7MF1G-HP421	30710158
8,00	12	60	45	4	HPR131Ø8H7MF1G-HP421	30537763
9,00	12	60	45	4	HPR131Ø9H7MF1G-HP421	30710159
10,00	12	60	45	6	HPR131Ø10H7MF1G-HP421	30710160
11,00	12	60	45	6	HPR131Ø11H7MF1G-HP421	30710161
12,00	12	60	45	6	HPR131Ø12H7MF1G-HP421	30710162
13,00	12	60	45	6	HPR131Ø13H7MF1G-HP421	30710163
14,00	12	60	45	6	HPR131Ø14H7MF1G-HP421	30710164
15,00	12	60	45	6	HPR131Ø15H7MF1G-HP421	30710165
16,00	12	60	45	6	HPR131Ø16H7MF1G-HP421	30710166
17,00	12	60	45	6	HPR131Ø17H7MF1G-HP421	30710167
18,00	12	60	45	6	HPR131Ø18H7MF1G-HP421	30710168

Dimensions in mm.

Cutting data recommendation from page 436.

For related HFS replaceable head holders see page 308.

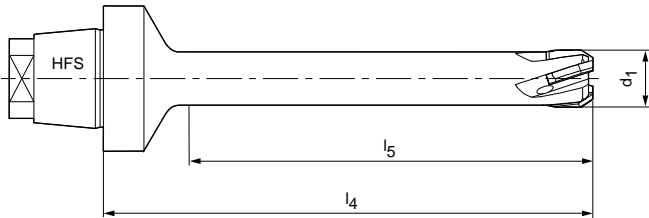
Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "HPR replaceable head reamers".

HPR131

Fixed design

Design:

Reamer diameter: 7.00 - 18.00 mm
 Lead: ME1G
 Cutting material: CU134



Dimensions				z	Specification	Order No.
d_1	HFS size	l_4	l_5			
7,00	12	60	45	4	HPR131Ø7H7ME1G-CU134	30118919
8,00	12	60	45	4	HPR131Ø8H7ME1G-CU134	30090851
9,00	12	60	45	4	HPR131Ø9H7ME1G-CU134	30167993
10,00	12	60	45	6	HPR131Ø10H7ME1G-CU134	30043741
11,00	12	60	45	6	HPR131Ø11H7ME1G-CU134	30087260
12,00	12	60	45	6	HPR131Ø12H7ME1G-CU134	30041656
13,00	12	60	45	6	HPR131Ø13H7ME1G-CU134	30057835
14,00	12	60	45	6	HPR131Ø14H7ME1G-CU134	30082580
15,00	12	60	45	6	HPR131Ø15H7ME1G-CU134	30039950
16,00	12	60	45	6	HPR131Ø16H7ME1G-CU134	30047996
17,00	12	60	45	6	HPR131Ø17H7ME1G-CU134	30087261
18,00	12	60	45	6	HPR131Ø18H7ME1G-CU134	30048997

Dimensions in mm.

Cutting data recommendation from page 436.

For related HFS replaceable head holders see page 308.

Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "HPR replaceable head reamers".

HPR131

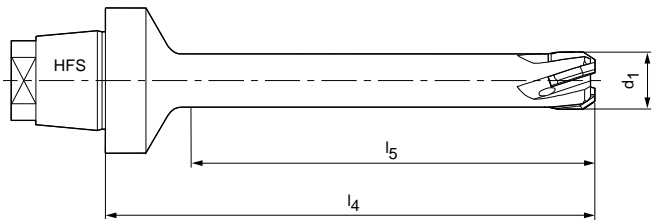
Fixed design

Design:

Reamer diameter: 7.00 - 18.00 mm

Lead: ME1G

Cutting material: CP134



Dimensions				z	Specification	Order No.
d_1	HFS size	l_4	l_5			
7,00	12	60	45	4	HPR131Ø7H7ME1G-CP134	30710174
8,00	12	60	45	4	HPR131Ø8H7ME1G-CP134	30710175
9,00	12	60	45	4	HPR131Ø9H7ME1G-CP134	30710176
10,00	12	60	45	6	HPR131Ø10H7ME1G-CP134	30710177
11,00	12	60	45	6	HPR131Ø11H7ME1G-CP134	30710178
12,00	12	60	45	6	HPR131Ø12H7ME1G-CP134	30078108
13,00	12	60	45	6	HPR131Ø13H7ME1G-CP134	30710179
14,00	12	60	45	6	HPR131Ø14H7ME1G-CP134	30710180
15,00	12	60	45	6	HPR131Ø15H7ME1G-CP134	30710181
16,00	12	60	45	6	HPR131Ø16H7ME1G-CP134	30407713
17,00	12	60	45	6	HPR131Ø17H7ME1G-CP134	30710182
18,00	12	60	45	6	HPR131Ø18H7ME1G-CP134	30173342

Dimensions in mm.

Cutting data recommendation from page 436.

For related HFS replaceable head holders see page 308.

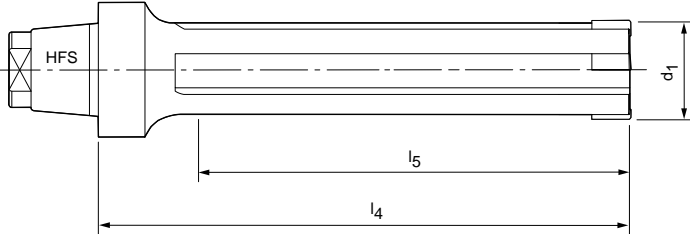
Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "HPR replaceable head reamers".

HPR180

Fixed design

Design:

Reamer diameter: 7.00 - 21.00 mm
 Lead: ML2G
 Cutting material: HP421



Dimensions				z	Specification	Order No.
d_1	HFS size	l_4	l_5			
7,00	12	60	40	4	HPR180Ø7H7ML2G-HP421	30710206
8,00	12	60	40	4	HPR180Ø8H7ML2G-HP421	30193287
9,00	12	60	40	4	HPR180Ø9H7ML2G-HP421	30710207
10,00	12	60	40	4	HPR180Ø10H7ML2G-HP421	30710208
11,00	12	60	40	4	HPR180Ø11H7ML2G-HP421	30710209
12,00	12	60	40	4	HPR180Ø12H7ML2G-HP421	30710210
13,00	12	60	40	4	HPR180Ø13H7ML2G-HP421	30710211
14,00	12	60	40	4	HPR180Ø14H7ML2G-HP421	30710212
15,00	12	60	40	6	HPR180Ø15H7ML2G-HP421	30710213
16,00	12	60	40	6	HPR180Ø16H7ML2G-HP421	30710214
17,00	12	60	40	6	HPR180Ø17H7ML2G-HP421	30710215
18,00	12	60	40	6	HPR180Ø18H7ML2G-HP421	30710216
19,00	12	60	40	6	HPR180Ø19H7ML2G-HP421	30710217
20,00	12	60	40	6	HPR180Ø20H7ML2G-HP421	30710218
21,00	12	60	40	6	HPR180Ø21H7ML2G-HP421	30710219

Dimensions in mm.

Cutting data recommendation from page 436.

For related HFS replaceable head holders see page 308.

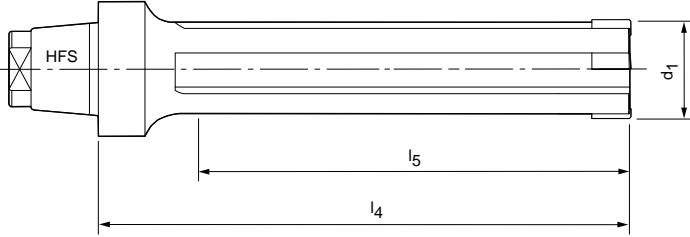
Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "HPR replaceable head reamers".

HPR180

Fixed design

Design:

Reamer diameter: 7.00 - 21.00 mm
 Lead: MC1G
 Cutting material: HP421



Dimensions				z	Specification	Order No.
d_1	HFS size	l_4	l_5			
7,00	12	60	40	4	HPR180Ø7H7MC1G-HP421	30817354
8,00	12	60	40	4	HPR180Ø8H7MC1G-HP421	30817355
9,00	12	60	40	4	HPR180Ø9H7MC1G-HP421	30817356
10,00	12	60	40	4	HPR180Ø10H7MC1G-HP421	30817357
11,00	12	60	40	4	HPR180Ø11H7MC1G-HP421	30817358
12,00	12	60	40	4	HPR180Ø12H7MC1G-HP421	30057945
13,00	12	60	40	4	HPR180Ø13H7MC1G-HP421	30817359
14,00	12	60	40	4	HPR180Ø14H7MC1G-HP421	30817360
15,00	12	60	40	6	HPR180Ø15H7MC1G-HP421	30817361
16,00	12	60	40	6	HPR180Ø16H7MC1G-HP421	30212138
17,00	12	60	40	6	HPR180Ø17H7MC1G-HP421	30817362
18,00	12	60	40	6	HPR180Ø18H7MC1G-HP421	30057294
19,00	12	60	40	6	HPR180Ø19H7MC1G-HP421	30817363
20,00	12	60	40	6	HPR180Ø20H7MC1G-HP421	30368311
21,00	12	60	40	6	HPR180Ø21H7MC1G-HP421	30817364

Dimensions in mm.

Cutting data recommendation from page 436.

For related HFS replaceable head holders see page 308.

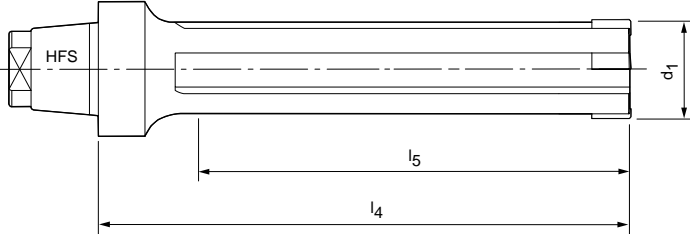
Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "HPR replaceable head reamers".

HPR180

Fixed design

Design:

Reamer diameter: 7.00 - 21.00 mm
 Lead: M02G
 Cutting material: HP612



Dimensions				z	Specification	Order No.
d_1	HFS size	l_4	l_5			
7,00	12	60	40	4	HPR180Ø7H7M02G-HP612	30817379
8,00	12	60	40	4	HPR180Ø8H7M02G-HP612	30817380
9,00	12	60	40	4	HPR180Ø9H7M02G-HP612	30817381
10,00	12	60	40	4	HPR180Ø10H7M02G-HP612	30817382
11,00	12	60	40	4	HPR180Ø11H7M02G-HP612	30817383
12,00	12	60	40	4	HPR180Ø12H7M02G-HP612	30817384
13,00	12	60	40	4	HPR180Ø13H7M02G-HP612	30817385
14,00	12	60	40	4	HPR180Ø14H7M02G-HP612	30817386
15,00	12	60	40	6	HPR180Ø15H7M02G-HP612	30817387
16,00	12	60	40	6	HPR180Ø16H7M02G-HP612	30817388
17,00	12	60	40	6	HPR180Ø17H7M02G-HP612	30817389
18,00	12	60	40	6	HPR180Ø18H7M02G-HP612	30817390
19,00	12	60	40	6	HPR180Ø19H7M02G-HP612	30817391
20,00	12	60	40	6	HPR180Ø20H7M02G-HP612	30817392
21,00	12	60	40	6	HPR180Ø21H7M02G-HP612	30817393

Dimensions in mm.

Cutting data recommendation from page 436.

For related HFS replaceable head holders see page 308.

Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "HPR replaceable head reamers".

HPR180

Fixed design

Design:

Reamer diameter:

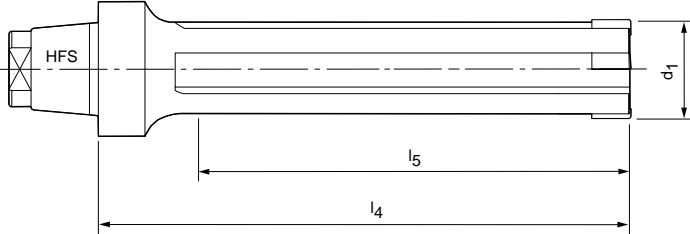
7.00 - 21.00 mm

Lead:

ML2G

Cutting material:

CU134



Dimensions				z	Specification	Order No.
d_1	HFS size	l_4	l_5			
7,00	12	60	40	4	HPR180Ø7H7ML2G-CU134	30710183
8,00	12	60	40	4	HPR180Ø8H7ML2G-CU134	30557357
9,00	12	60	40	4	HPR180Ø9H7ML2G-CU134	30710184
10,00	12	60	40	4	HPR180Ø10H7ML2G-CU134	30710185
11,00	12	60	40	4	HPR180Ø11H7ML2G-CU134	30710186
12,00	12	60	40	4	HPR180Ø12H7ML2G-CU134	30232276
13,00	12	60	40	4	HPR180Ø13H7ML2G-CU134	30117795
14,00	12	60	40	4	HPR180Ø14H7ML2G-CU134	30078857
15,00	12	60	40	6	HPR180Ø15H7ML2G-CU134	30078850
16,00	12	60	40	6	HPR180Ø16H7ML2G-CU134	30710187
17,00	12	60	40	6	HPR180Ø17H7ML2G-CU134	30078853
18,00	12	60	40	6	HPR180Ø18H7ML2G-CU134	30077117
19,00	12	60	40	6	HPR180Ø19H7ML2G-CU134	30710188
20,00	12	60	40	6	HPR180Ø20H7ML2G-CU134	30710189
21,00	12	60	40	6	HPR180Ø21H7ML2G-CU134	30710190

Dimensions in mm.

Cutting data recommendation from page 436.

For related HFS replaceable head holders see page 308.

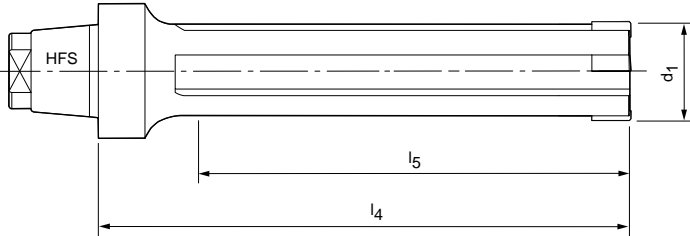
Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "HPR replaceable head reamers".

HPR180

Fixed design

Design:

Reamer diameter: 7.00 - 21.00 mm
 Lead: MC1G
 Cutting material: CP134



Dimensions				z	Specification	Order No.
d_1	HFS size	l_4	l_5			
7,00	12	60	40	4	HPR180Ø7H7MC1G-CP134	30829725
8,00	12	60	40	4	HPR180Ø8H7MC1G-CP134	30829726
9,00	12	60	40	4	HPR180Ø9H7MC1G-CP134	30829727
10,00	12	60	40	4	HPR180Ø10H7MC1G-CP134	30829728
11,00	12	60	40	4	HPR180Ø11H7MC1G-CP134	30829729
12,00	12	60	40	4	HPR180Ø12H7MC1G-CP134	30829730
13,00	12	60	40	4	HPR180Ø13H7MC1G-CP134	30829731
14,00	12	60	40	4	HPR180Ø14H7MC1G-CP134	30829732
15,00	12	60	40	6	HPR180Ø15H7MC1G-CP134	30829733
16,00	12	60	40	6	HPR180Ø16H7MC1G-CP134	30156469
17,00	12	60	40	6	HPR180Ø17H7MC1G-CP134	30829734
18,00	12	60	40	6	HPR180Ø18H7MC1G-CP134	30808787
19,00	12	60	40	6	HPR180Ø19H7MC1G-CP134	30829735
20,00	12	60	40	6	HPR180Ø20H7MC1G-CP134	30829736
21,00	12	60	40	6	HPR180Ø21H7MC1G-CP134	30829737

Dimensions in mm.

Cutting data recommendation from page 436.

For related HFS replaceable head holders see page 308.

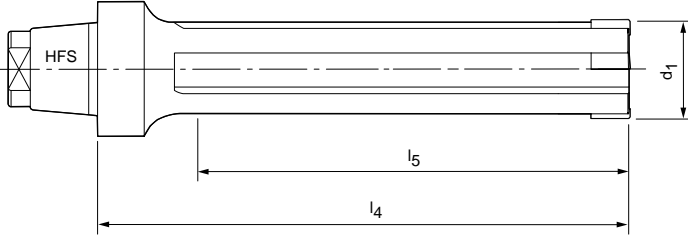
Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "HPR replaceable head reamers".

HPR180

Fixed design

Design:

Reamer diameter: 7.00 - 21.00 mm
 Lead: ML2G
 Cutting material: CP134



Dimensions				z	Specification	Order No.
d_1	HFS size	l_4	l_5			
7,00	12	60	40	4	HPR180Ø7H7ML2G-CP134	30710191
8,00	12	60	40	4	HPR180Ø8H7ML2G-CP134	30710192
9,00	12	60	40	4	HPR180Ø9H7ML2G-CP134	30710193
10,00	12	60	40	4	HPR180Ø10H7ML2G-CP134	30710194
11,00	12	60	40	4	HPR180Ø11H7ML2G-CP134	30710195
12,00	12	60	40	4	HPR180Ø12H7ML2G-CP134	30710196
13,00	12	60	40	4	HPR180Ø13H7ML2G-CP134	30710197
14,00	12	60	40	4	HPR180Ø14H7ML2G-CP134	30710198
15,00	12	60	40	6	HPR180Ø15H7ML2G-CP134	30710199
16,00	12	60	40	6	HPR180Ø16H7ML2G-CP134	30710200
17,00	12	60	40	6	HPR180Ø17H7ML2G-CP134	30710201
18,00	12	60	40	6	HPR180Ø18H7ML2G-CP134	30710202
19,00	12	60	40	6	HPR180Ø19H7ML2G-CP134	30710203
20,00	12	60	40	6	HPR180Ø20H7ML2G-CP134	30710204
21,00	12	60	40	6	HPR180Ø21H7ML2G-CP134	30710205

Dimensions in mm.

Cutting data recommendation from page 436.

For related HFS replaceable head holders see page 308.

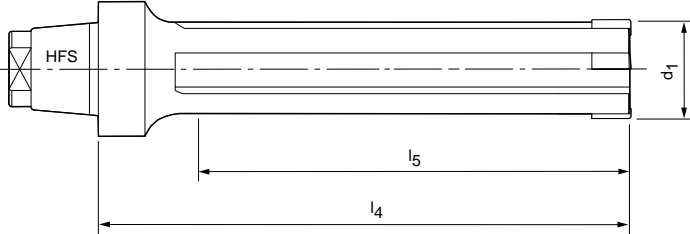
Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "HPR replaceable head reamers".

HPR180

Fixed design

Design:

Reamer diameter: 7.00 - 21.00 mm
 Lead: MA0A
 Cutting material: PU620



Dimensions				z	Specification	Order No.
d_1	HFS size	l_4	l_5			
7,00	12	60	40	4	HPR180Ø7H7MA0A-PU620	30710220
8,00	12	60	40	4	HPR180Ø8H7MA0A-PU620	30207760
9,00	12	60	40	4	HPR180Ø9H7MA0A-PU620	30710221
10,00	12	60	40	4	HPR180Ø10H7MA0A-PU620	30710222
11,00	12	60	40	4	HPR180Ø11H7MA0A-PU620	30710223
12,00	12	60	40	4	HPR180Ø12H7MA0A-PU620	30656726
13,00	12	60	40	4	HPR180Ø13H7MA0A-PU620	30710224
14,00	12	60	40	4	HPR180Ø14H7MA0A-PU620	30095381
15,00	12	60	40	6	HPR180Ø15H7MA0A-PU620	30710225
16,00	12	60	40	6	HPR180Ø16H7MA0A-PU620	30710226
17,00	12	60	40	6	HPR180Ø17H7MA0A-PU620	30710227
18,00	12	60	40	6	HPR180Ø18H7MA0A-PU620	30710228
19,00	12	60	40	6	HPR180Ø19H7MA0A-PU620	30710229
20,00	12	60	40	6	HPR180Ø20H7MA0A-PU620	30710230
21,00	12	60	40	6	HPR180Ø21H7MA0A-PU620	30710231

Dimensions in mm.

Cutting data recommendation from page 436.

For related HFS replaceable head holders see page 308.

Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "HPR replaceable head reamers".

HPR100

Fixed design

Design:

Reamer diameter:

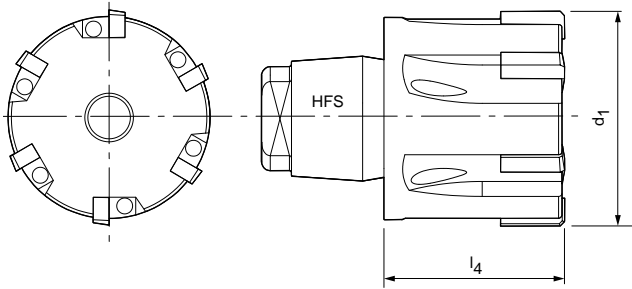
16.00 - 65.00 mm

Lead:

MC1G

Cutting material:

HP421



Dimensions			z	Specification	Order No.
d ₁	HFS size	l ₄			
16,00	10	14	6	HPR100Ø16H7MC1G-HP421	30310964
17,00	10	14	6	HPR100Ø17H7MC1G-HP421	30710232
18,00	10	14	6	HPR100Ø18H7MC1G-HP421	30031346
19,00	12	14,5	6	HPR100Ø19H7MC1G-HP421	30037777
20,00	12	14,5	6	HPR100Ø20H7MC1G-HP421	30191340
21,00	12	14,5	6	HPR100Ø21H7MC1G-HP421	30117030
22,00	14	15,5	6	HPR100Ø22H7MC1G-HP421	30368857
23,00	14	15,5	6	HPR100Ø23H7MC1G-HP421	30710233
24,00	16	16	6	HPR100Ø24H7MC1G-HP421	30181729
25,00	16	16	6	HPR100Ø25H7MC1G-HP421	30537929
26,00	16	16	6	HPR100Ø26H7MC1G-HP421	30076945
27,00	16	16	6	HPR100Ø27H7MC1G-HP421	30541466
28,00	16	16	6	HPR100Ø28H7MC1G-HP421	30025212
29,00	16	16	6	HPR100Ø29H7MC1G-HP421	30408971
30,00	20	17	8	HPR100Ø30H7MC1G-HP421	30031345
31,00	20	17	8	HPR100Ø31H7MC1G-HP421	30346195
32,00	20	17	8	HPR100Ø32H7MC1G-HP421	30438453
33,00	20	17	8	HPR100Ø33H7MC1G-HP421	30710234
34,00	20	17	8	HPR100Ø34H7MC1G-HP421	30710235
35,00	20	17	8	HPR100Ø35H7MC1G-HP421	30537930
36,00	20	17	8	HPR100Ø36H7MC1G-HP421	30223112
37,00	20	17	8	HPR100Ø37H7MC1G-HP421	30710236
38,00	20	17	8	HPR100Ø38H7MC1G-HP421	30710237
39,00	20	17	8	HPR100Ø39H7MC1G-HP421	30159499
40,00	24	19	8	HPR100Ø40H7MC1G-HP421	30083953
41,00	24	19	8	HPR100Ø41H7MC1G-HP421	30682104
42,00	24	19	8	HPR100Ø42H7MC1G-HP421	30710238
43,00	24	19	8	HPR100Ø43H7MC1G-HP421	30710239
44,00	24	19	8	HPR100Ø44H7MC1G-HP421	30710240
45,00	24	19	8	HPR100Ø45H7MC1G-HP421	30537931
46,00	24	19	8	HPR100Ø46H7MC1G-HP421	30710241
47,00	24	19	8	HPR100Ø47H7MC1G-HP421	30710242
48,00	24	19	8	HPR100Ø48H7MC1G-HP421	30710243
49,00	24	19	8	HPR100Ø49H7MC1G-HP421	30710244
50,00	24	19	8	HPR100Ø50H7MC1G-HP421	30710245
51,00	24	25	8	HPR100Ø51H7MC1G-HP421	30710246
52,00	24	25	8	HPR100Ø52H7MC1G-HP421	30710247
53,00	24	25	8	HPR100Ø53H7MC1G-HP421	30710248
54,00	24	25	8	HPR100Ø54H7MC1G-HP421	30710249

HPR100 | Fixed design

Dimensions			z	Specification	Order No.
d ₁	HFS size	l ₄			
55,00	24	25	8	HPR100Ø55H7MC1G-HP421	30419154
56,00	24	25	8	HPR100Ø56H7MC1G-HP421	30710250
57,00	24	25	8	HPR100Ø57H7MC1G-HP421	30710251
58,00	24	25	8	HPR100Ø58H7MC1G-HP421	30710252
59,00	24	25	8	HPR100Ø59H7MC1G-HP421	30710253
60,00	24	25	8	HPR100Ø60H7MC1G-HP421	30350208
61,00	24	25	8	HPR100Ø61H7MC1G-HP421	30710254
62,00	24	25	8	HPR100Ø62H7MC1G-HP421	30710255
63,00	24	25	8	HPR100Ø63H7MC1G-HP421	30710256
64,00	24	25	8	HPR100Ø64H7MC1G-HP421	30710257
65,00	24	25	8	HPR100Ø65H7MC1G-HP421	30272888

Dimensions in mm.

Cutting data recommendation from page 436.

For related HFS replaceable head holders see page 308.

Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "HPR replaceable head reamers".

HPR100

Fixed design

Design:

Reamer diameter:

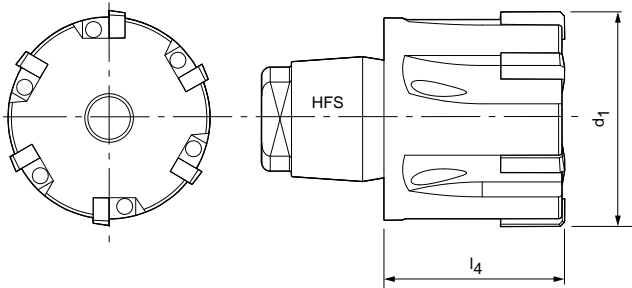
16.00 - 65.00 mm

Lead:

MC1G

Cutting material:

HC412



Dimensions			z	Specification	Order No.
d ₁	HFS size	l ₄			
16,00	10	14	6	HPR100Ø16H7MC1G-HC412	30169954
17,00	10	14	6	HPR100Ø17H7MC1G-HC412	30795906
18,00	10	14	6	HPR100Ø18H7MC1G-HC412	30795907
19,00	12	14,5	6	HPR100Ø19H7MC1G-HC412	30795908
20,00	12	14,5	6	HPR100Ø20H7MC1G-HC412	30077114
21,00	12	14,5	6	HPR100Ø21H7MC1G-HC412	30756826
22,00	14	15,5	6	HPR100Ø22H7MC1G-HC412	30293354
23,00	14	15,5	6	HPR100Ø23H7MC1G-HC412	30192412
24,00	16	16	6	HPR100Ø24H7MC1G-HC412	30795909
25,00	16	16	6	HPR100Ø25H7MC1G-HC412	30500789
26,00	16	16	6	HPR100Ø26H7MC1G-HC412	30717536
27,00	16	16	6	HPR100Ø27H7MC1G-HC412	30140941
28,00	16	16	6	HPR100Ø28H7MC1G-HC412	30190153
29,00	16	16	6	HPR100Ø29H7MC1G-HC412	30652479
30,00	20	17	8	HPR100Ø30H7MC1G-HC412	30509929
31,00	20	17	8	HPR100Ø31H7MC1G-HC412	30795910
32,00	20	17	8	HPR100Ø32H7MC1G-HC412	30795911
33,00	20	17	8	HPR100Ø33H7MC1G-HC412	30795912
34,00	20	17	8	HPR100Ø34H7MC1G-HC412	30164228
35,00	20	17	8	HPR100Ø35H7MC1G-HC412	30795913
36,00	20	17	8	HPR100Ø36H7MC1G-HC412	30795914
37,00	20	17	8	HPR100Ø37H7MC1G-HC412	30795915
38,00	20	17	8	HPR100Ø38H7MC1G-HC412	30795916
39,00	20	17	8	HPR100Ø39H7MC1G-HC412	30795917
40,00	24	19	8	HPR100Ø40H7MC1G-HC412	30509932
41,00	24	19	8	HPR100Ø41H7MC1G-HC412	30795918
42,00	24	19	8	HPR100Ø42H7MC1G-HC412	30795919
43,00	24	19	8	HPR100Ø43H7MC1G-HC412	30795920
44,00	24	19	8	HPR100Ø44H7MC1G-HC412	30356345
45,00	24	19	8	HPR100Ø45H7MC1G-HC412	30795921
46,00	24	19	8	HPR100Ø46H7MC1G-HC412	30171060
47,00	24	19	8	HPR100Ø47H7MC1G-HC412	30795922
48,00	24	19	8	HPR100Ø48H7MC1G-HC412	30795923
49,00	24	19	8	HPR100Ø49H7MC1G-HC412	30795924
50,00	24	19	8	HPR100Ø50H7MC1G-HC412	30756827
51,00	24	25	8	HPR100Ø51H7MC1G-HC412	30795925
52,00	24	25	8	HPR100Ø52H7MC1G-HC412	30795926
53,00	24	25	8	HPR100Ø53H7MC1G-HC412	30795927
54,00	24	25	8	HPR100Ø54H7MC1G-HC412	30595369

HPR100 | Fixed design

Dimensions			z	Specification	Order No.
d ₁	HFS size	l ₄			
55,00	24	25	8	HPR100Ø55H7MC1G-HC412	30795928
56,00	24	25	8	HPR100Ø56H7MC1G-HC412	30795929
57,00	24	25	8	HPR100Ø57H7MC1G-HC412	30795930
58,00	24	25	8	HPR100Ø58H7MC1G-HC412	30795931
59,00	24	25	8	HPR100Ø59H7MC1G-HC412	30795932
60,00	24	25	8	HPR100Ø60H7MC1G-HC412	30795933
61,00	24	25	8	HPR100Ø61H7MC1G-HC412	30795934
62,00	24	25	8	HPR100Ø62H7MC1G-HC412	30795935
63,00	24	25	8	HPR100Ø63H7MC1G-HC412	30795936
64,00	24	25	8	HPR100Ø64H7MC1G-HC412	30795937
65,00	24	25	8	HPR100Ø65H7MC1G-HC412	30795938

Dimensions in mm.

Cutting data recommendation from page 436.

For related HFS replaceable head holders see page 308.

Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "HPR replaceable head reamers".

HPR100

Fixed design

Design:

Reamer diameter:

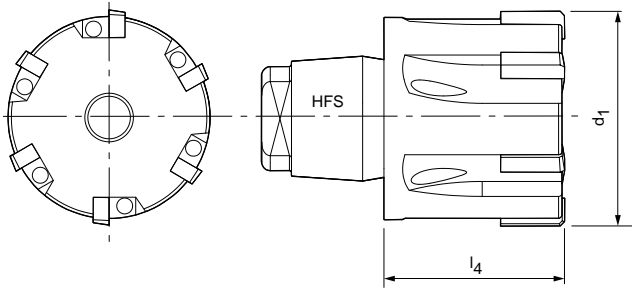
16.00 - 65.00 mm

Lead:

MC1G

Cutting material:

CP134



Dimensions			z	Specification	Order No.
d ₁	HFS size	l ₄			
16,00	10	14	6	HPR100Ø16H7MC1G-CP134	30091454
17,00	10	14	6	HPR100Ø17H7MC1G-CP134	30706077
18,00	10	14	6	HPR100Ø18H7MC1G-CP134	30077112
19,00	12	14,5	6	HPR100Ø19H7MC1G-CP134	30817394
20,00	12	14,5	6	HPR100Ø20H7MC1G-CP134	30817395
21,00	12	14,5	6	HPR100Ø21H7MC1G-CP134	30817396
22,00	14	15,5	6	HPR100Ø22H7MC1G-CP134	30817397
23,00	14	15,5	6	HPR100Ø23H7MC1G-CP134	30817398
24,00	16	16	6	HPR100Ø24H7MC1G-CP134	30817399
25,00	16	16	6	HPR100Ø25H7MC1G-CP134	30817400
26,00	16	16	6	HPR100Ø26H7MC1G-CP134	30261542
27,00	16	16	6	HPR100Ø27H7MC1G-CP134	30100101
28,00	16	16	6	HPR100Ø28H7MC1G-CP134	30203019
29,00	16	16	6	HPR100Ø29H7MC1G-CP134	30817401
30,00	20	17	8	HPR100Ø30H7MC1G-CP134	30099739
31,00	20	17	8	HPR100Ø31H7MC1G-CP134	30541573
32,00	20	17	8	HPR100Ø32H7MC1G-CP134	30095920
33,00	20	17	8	HPR100Ø33H7MC1G-CP134	30817402
34,00	20	17	8	HPR100Ø34H7MC1G-CP134	30817403
35,00	20	17	8	HPR100Ø35H7MC1G-CP134	30229796
36,00	20	17	8	HPR100Ø36H7MC1G-CP134	30099692
37,00	20	17	8	HPR100Ø37H7MC1G-CP134	30817404
38,00	20	17	8	HPR100Ø38H7MC1G-CP134	30469339
39,00	20	17	8	HPR100Ø39H7MC1G-CP134	30817405
40,00	24	19	8	HPR100Ø40H7MC1G-CP134	30165125
41,00	24	19	8	HPR100Ø41H7MC1G-CP134	30817406
42,00	24	19	8	HPR100Ø42H7MC1G-CP134	30327499
43,00	24	19	8	HPR100Ø43H7MC1G-CP134	30817407
44,00	24	19	8	HPR100Ø44H7MC1G-CP134	30201274
45,00	24	19	8	HPR100Ø45H7MC1G-CP134	30435784
46,00	24	19	8	HPR100Ø46H7MC1G-CP134	30817408
47,00	24	19	8	HPR100Ø47H7MC1G-CP134	30817409
48,00	24	19	8	HPR100Ø48H7MC1G-CP134	30817410
49,00	24	19	8	HPR100Ø49H7MC1G-CP134	30817411
50,00	24	19	8	HPR100Ø50H7MC1G-CP134	30499334
51,00	24	25	8	HPR100Ø51H7MC1G-CP134	30817412
52,00	24	25	8	HPR100Ø52H7MC1G-CP134	30817413
53,00	24	25	8	HPR100Ø53H7MC1G-CP134	30817414
54,00	24	25	8	HPR100Ø54H7MC1G-CP134	30817415

HPR100 | Fixed design

Dimensions			z	Specification	Order No.
d ₁	HFS size	l ₄			
55,00	24	25	8	HPR100Ø55H7MC1G-CP134	30817416
56,00	24	25	8	HPR100Ø56H7MC1G-CP134	30327500
57,00	24	25	8	HPR100Ø57H7MC1G-CP134	30817417
58,00	24	25	8	HPR100Ø58H7MC1G-CP134	30817418
59,00	24	25	8	HPR100Ø59H7MC1G-CP134	30817420
60,00	24	25	8	HPR100Ø60H7MC1G-CP134	30433429
61,00	24	25	8	HPR100Ø61H7MC1G-CP134	30817421
62,00	24	25	8	HPR100Ø62H7MC1G-CP134	30817422
63,00	24	25	8	HPR100Ø63H7MC1G-CP134	30817423
64,00	24	25	8	HPR100Ø64H7MC1G-CP134	30817424
65,00	24	25	8	HPR100Ø65H7MC1G-CP134	30240576

Dimensions in mm.

Cutting data recommendation from page 436.

For related HFS replaceable head holders see page 308.

Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "HPR replaceable head reamers".

HPR100

Fixed design

Design:

Reamer diameter:

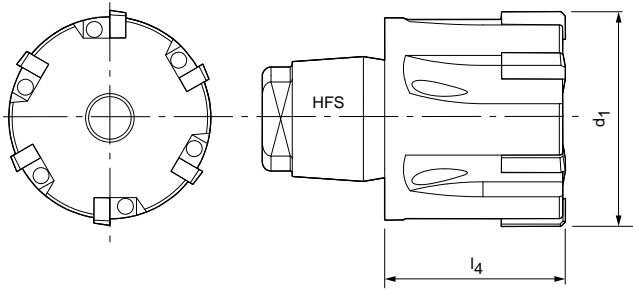
16.00 - 65.00 mm

Lead:

MA0A

Cutting material:

PU620



Dimensions			z	Specification	Order No.
d ₁	HFS size	l ₄			
16,00	10	14	6	HPR100Ø16H7MA0A-PU620	30795869
17,00	10	14	6	HPR100Ø17H7MA0A-PU620	30795870
18,00	10	14	6	HPR100Ø18H7MA0A-PU620	30036957
19,00	12	14,5	6	HPR100Ø19H7MA0A-PU620	30226308
20,00	12	14,5	6	HPR100Ø20H7MA0A-PU620	30795871
21,00	12	14,5	6	HPR100Ø21H7MA0A-PU620	30043060
22,00	14	15,5	6	HPR100Ø22H7MA0A-PU620	30161072
23,00	14	15,5	6	HPR100Ø23H7MA0A-PU620	30795872
24,00	16	16	6	HPR100Ø24H7MA0A-PU620	30507398
25,00	16	16	6	HPR100Ø25H7MA0A-PU620	30292106
26,00	16	16	6	HPR100Ø26H7MA0A-PU620	30795873
27,00	16	16	6	HPR100Ø27H7MA0A-PU620	30795874
28,00	16	16	6	HPR100Ø28H7MA0A-PU620	30020902
29,00	16	16	6	HPR100Ø29H7MA0A-PU620	30795875
30,00	20	17	8	HPR100Ø30H7MA0A-PU620	30094963
31,00	20	17	8	HPR100Ø31H7MA0A-PU620	30795876
32,00	20	17	8	HPR100Ø32H7MA0A-PU620	30278205
33,00	20	17	8	HPR100Ø33H7MA0A-PU620	30795877
34,00	20	17	8	HPR100Ø34H7MA0A-PU620	30795878
35,00	20	17	8	HPR100Ø35H7MA0A-PU620	30087320
36,00	20	17	8	HPR100Ø36H7MA0A-PU620	30795879
37,00	20	17	8	HPR100Ø37H7MA0A-PU620	30118602
38,00	20	17	8	HPR100Ø38H7MA0A-PU620	30795880
39,00	20	17	8	HPR100Ø39H7MA0A-PU620	30795881
40,00	24	19	8	HPR100Ø40H7MA0A-PU620	30638155
41,00	24	19	8	HPR100Ø41H7MA0A-PU620	30795882
42,00	24	19	8	HPR100Ø42H7MA0A-PU620	30795883
43,00	24	19	8	HPR100Ø43H7MA0A-PU620	30795884
44,00	24	19	8	HPR100Ø44H7MA0A-PU620	30795885
45,00	24	19	8	HPR100Ø45H7MA0A-PU620	30795886
46,00	24	19	8	HPR100Ø46H7MA0A-PU620	30677465
47,00	24	19	8	HPR100Ø47H7MA0A-PU620	30795887
48,00	24	19	8	HPR100Ø48H7MA0A-PU620	30795888
49,00	24	19	8	HPR100Ø49H7MA0A-PU620	30795889
50,00	24	19	8	HPR100Ø50H7MA0A-PU620	30795890
51,00	24	25	8	HPR100Ø51H7MA0A-PU620	30795891
52,00	24	25	8	HPR100Ø52H7MA0A-PU620	30795892
53,00	24	25	8	HPR100Ø53H7MA0A-PU620	30795893
54,00	24	25	8	HPR100Ø54H7MA0A-PU620	30795894

HPR100 | Fixed design

Dimensions			z	Specification	Order No.
d ₁	HFS size	l ₄			
55,00	24	25	8	HPR100Ø55H7MA0A-PU620	30795895
56,00	24	25	8	HPR100Ø56H7MA0A-PU620	30795896
57,00	24	25	8	HPR100Ø57H7MA0A-PU620	30795897
58,00	24	25	8	HPR100Ø58H7MA0A-PU620	30795898
59,00	24	25	8	HPR100Ø59H7MA0A-PU620	30795899
60,00	24	25	8	HPR100Ø60H7MA0A-PU620	30795900
61,00	24	25	8	HPR100Ø61H7MA0A-PU620	30795901
62,00	24	25	8	HPR100Ø62H7MA0A-PU620	30795902
63,00	24	25	8	HPR100Ø63H7MA0A-PU620	30795903
64,00	24	25	8	HPR100Ø64H7MA0A-PU620	30795904
65,00	24	25	8	HPR100Ø65H7MA0A-PU620	30795905

Dimensions in mm.

Cutting data recommendation from page 436.

For related HFS replaceable head holders see page 308.

Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "HPR replaceable head reamers".

HPR110

Fixed design

Design:

Reamer diameter:

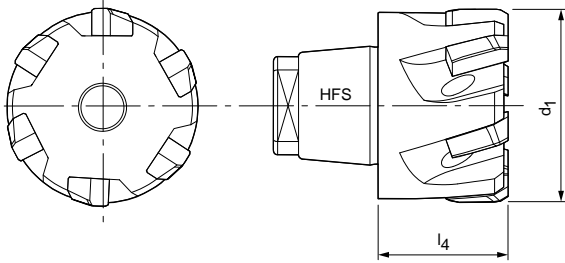
16.00 - 65.00 mm

Lead:

ME1G

Cutting material:

HP421



Dimensions			z	Specification	Order No.
d ₁	HFS size	l ₄			
16,00	10	14	6	HPR110Ø16H7ME1G-HP421	30546553
17,00	10	14	6	HPR110Ø17H7ME1G-HP421	30605950
18,00	10	14	6	HPR110Ø18H7ME1G-HP421	30166211
19,00	12	14,5	6	HPR110Ø19H7ME1G-HP421	30099836
20,00	12	14,5	6	HPR110Ø20H7ME1G-HP421	30046086
21,00	12	14,5	6	HPR110Ø21H7ME1G-HP421	30099837
22,00	14	15,5	6	HPR110Ø22H7ME1G-HP421	30086991
23,00	14	15,5	6	HPR110Ø23H7ME1G-HP421	30133376
24,00	16	16	6	HPR110Ø24H7ME1G-HP421	30099839
25,00	16	16	6	HPR110Ø25H7ME1G-HP421	30115731
26,00	16	16	6	HPR110Ø26H7ME1G-HP421	30250463
27,00	16	16	6	HPR110Ø27H7ME1G-HP421	30099510
28,00	16	16	6	HPR110Ø28H7ME1G-HP421	30136595
29,00	16	16	6	HPR110Ø29H7ME1G-HP421	30381740
30,00	20	17	8	HPR110Ø30H7ME1G-HP421	30098231
31,00	20	17	8	HPR110Ø31H7ME1G-HP421	30710333
32,00	20	17	8	HPR110Ø32H7ME1G-HP421	30136596
33,00	20	17	8	HPR110Ø33H7ME1G-HP421	30710334
34,00	20	17	8	HPR110Ø34H7ME1G-HP421	30100038
35,00	20	17	8	HPR110Ø35H7ME1G-HP421	30078882
36,00	20	17	8	HPR110Ø36H7ME1G-HP421	30136597
37,00	20	17	8	HPR110Ø37H7ME1G-HP421	30488900
38,00	20	17	8	HPR110Ø38H7ME1G-HP421	30096144
39,00	20	17	8	HPR110Ø39H7ME1G-HP421	30215537
40,00	24	19	8	HPR110Ø40H7ME1G-HP421	30057536
41,00	24	19	8	HPR110Ø41H7ME1G-HP421	30710335
42,00	24	19	8	HPR110Ø42H7ME1G-HP421	30090325
43,00	24	19	8	HPR110Ø43H7ME1G-HP421	30404253
44,00	24	19	8	HPR110Ø44H7ME1G-HP421	30488903
45,00	24	19	8	HPR110Ø45H7ME1G-HP421	30057537
46,00	24	19	8	HPR110Ø46H7ME1G-HP421	30583437
47,00	24	19	8	HPR110Ø47H7ME1G-HP421	30710336
48,00	24	19	8	HPR110Ø48H7ME1G-HP421	30671984
49,00	24	19	8	HPR110Ø49H7ME1G-HP421	30710337
50,00	24	19	8	HPR110Ø50H7ME1G-HP421	30240142
51,00	24	25	8	HPR110Ø51H7ME1G-HP421	30710338
52,00	24	25	8	HPR110Ø52H7ME1G-HP421	30488905
53,00	24	25	8	HPR110Ø53H7ME1G-HP421	30710339
54,00	24	25	8	HPR110Ø54H7ME1G-HP421	30488906

HPR110 | Fixed design

Dimensions			z	Specification	Order No.
d ₁	HFS size	l ₄			
55,00	24	25	8	HPR110Ø55H7ME1G-HP421	30710340
56,00	24	25	8	HPR110Ø56H7ME1G-HP421	30710341
57,00	24	25	8	HPR110Ø57H7ME1G-HP421	30710342
58,00	24	25	8	HPR110Ø58H7ME1G-HP421	30710343
59,00	24	25	8	HPR110Ø59H7ME1G-HP421	30710344
60,00	24	25	8	HPR110Ø60H7ME1G-HP421	30301138
61,00	24	25	8	HPR110Ø61H7ME1G-HP421	30710345
62,00	24	25	8	HPR110Ø62H7ME1G-HP421	30710346
63,00	24	25	8	HPR110Ø63H7ME1G-HP421	30710347
64,00	24	25	8	HPR110Ø64H7ME1G-HP421	30710348
65,00	24	25	8	HPR110Ø65H7ME1G-HP421	30710349

Dimensions in mm.

Cutting data recommendation from page 436.

For related HFS replaceable head holders see page 308.

Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "HPR replaceable head reamers".

HPR110

Fixed design

Design:

Reamer diameter:

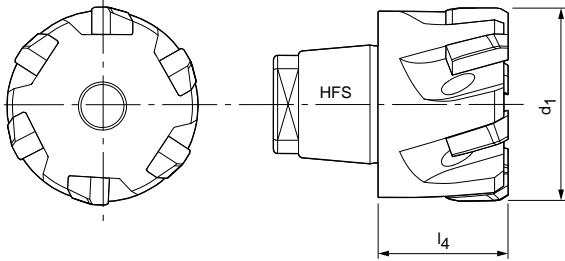
16.00 - 65.00 mm

Lead:

MF1G

Cutting material:

HP421



Dimensions			z	Specification	Order No.
d ₁	HFS size	l ₄			
16,00	10	14	6	HPR110Ø16H7MF1G-HP421	30710288
17,00	10	14	6	HPR110Ø17H7MF1G-HP421	30710289
18,00	10	14	6	HPR110Ø18H7MF1G-HP421	30710290
19,00	12	14,5	6	HPR110Ø19H7MF1G-HP421	30710291
20,00	12	14,5	6	HPR110Ø20H7MF1G-HP421	30401369
21,00	12	14,5	6	HPR110Ø21H7MF1G-HP421	30710292
22,00	14	15,5	6	HPR110Ø22H7MF1G-HP421	30710293
23,00	14	15,5	6	HPR110Ø23H7MF1G-HP421	30710294
24,00	16	16	6	HPR110Ø24H7MF1G-HP421	30710295
25,00	16	16	6	HPR110Ø25H7MF1G-HP421	30318503
26,00	16	16	6	HPR110Ø26H7MF1G-HP421	30710296
27,00	16	16	6	HPR110Ø27H7MF1G-HP421	30710297
28,00	16	16	6	HPR110Ø28H7MF1G-HP421	30710298
29,00	16	16	6	HPR110Ø29H7MF1G-HP421	30710299
30,00	20	17	8	HPR110Ø30H7MF1G-HP421	30576508
31,00	20	17	8	HPR110Ø31H7MF1G-HP421	30710300
32,00	20	17	8	HPR110Ø32H7MF1G-HP421	30671985
33,00	20	17	8	HPR110Ø33H7MF1G-HP421	30710301
34,00	20	17	8	HPR110Ø34H7MF1G-HP421	30710302
35,00	20	17	8	HPR110Ø35H7MF1G-HP421	30710303
36,00	20	17	8	HPR110Ø36H7MF1G-HP421	30710304
37,00	20	17	8	HPR110Ø37H7MF1G-HP421	30710305
38,00	20	17	8	HPR110Ø38H7MF1G-HP421	30710306
39,00	20	17	8	HPR110Ø39H7MF1G-HP421	30710307
40,00	24	19	8	HPR110Ø40H7MF1G-HP421	30498368
41,00	24	19	8	HPR110Ø41H7MF1G-HP421	30710308
42,00	24	19	8	HPR110Ø42H7MF1G-HP421	30710309
43,00	24	19	8	HPR110Ø43H7MF1G-HP421	30710310
44,00	24	19	8	HPR110Ø44H7MF1G-HP421	30710311
45,00	24	19	8	HPR110Ø45H7MF1G-HP421	30710312
46,00	24	19	8	HPR110Ø46H7MF1G-HP421	30710313
47,00	24	19	8	HPR110Ø47H7MF1G-HP421	30710314
48,00	24	19	8	HPR110Ø48H7MF1G-HP421	30710315
49,00	24	19	8	HPR110Ø49H7MF1G-HP421	30710316
50,00	24	19	8	HPR110Ø50H7MF1G-HP421	30710317
51,00	24	25	8	HPR110Ø51H7MF1G-HP421	30710318
52,00	24	25	8	HPR110Ø52H7MF1G-HP421	30710319
53,00	24	25	8	HPR110Ø53H7MF1G-HP421	30710320
54,00	24	25	8	HPR110Ø54H7MF1G-HP421	30710321

HPR110 | Fixed design

Dimensions			z	Specification	Order No.
d ₁	HFS size	l ₄			
55,00	24	25	8	HPR110Ø55H7MF1G-HP421	30710322
56,00	24	25	8	HPR110Ø56H7MF1G-HP421	30710323
57,00	24	25	8	HPR110Ø57H7MF1G-HP421	30710324
58,00	24	25	8	HPR110Ø58H7MF1G-HP421	30710325
59,00	24	25	8	HPR110Ø59H7MF1G-HP421	30710326
60,00	24	25	8	HPR110Ø60H7MF1G-HP421	30710327
61,00	24	25	8	HPR110Ø61H7MF1G-HP421	30710328
62,00	24	25	8	HPR110Ø62H7MF1G-HP421	30710329
63,00	24	25	8	HPR110Ø63H7MF1G-HP421	30710330
64,00	24	25	8	HPR110Ø64H7MF1G-HP421	30710331
65,00	24	25	8	HPR110Ø65H7MF1G-HP421	30710332

Dimensions in mm.

Cutting data recommendation from page 436.

For related HFS replaceable head holders see page 308.

Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "HPR replaceable head reamers".

HPR110

Fixed design

Design:

Reamer diameter:

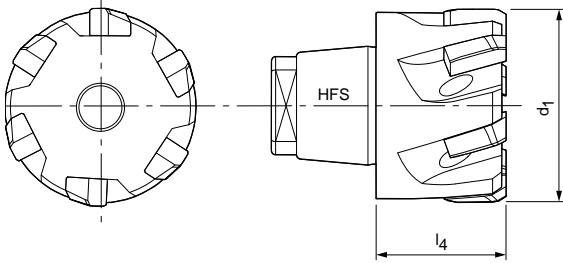
16.00 - 65.00 mm

Lead:

MF1G

Cutting material:

HP612



Dimensions			z	Specification	Order No.
d ₁	HFS size	l ₄			
16,00	10	14	6	HPR110Ø16H7MF1G-HP612	30795960
17,00	10	14	6	HPR110Ø17H7MF1G-HP612	30795961
18,00	10	14	6	HPR110Ø18H7MF1G-HP612	30795962
19,00	12	14,5	6	HPR110Ø19H7MF1G-HP612	30795963
20,00	12	14,5	6	HPR110Ø20H7MF1G-HP612	30795964
21,00	12	14,5	6	HPR110Ø21H7MF1G-HP612	30795965
22,00	14	15,5	6	HPR110Ø22H7MF1G-HP612	30795966
23,00	14	15,5	6	HPR110Ø23H7MF1G-HP612	30795967
24,00	16	16	6	HPR110Ø24H7MF1G-HP612	30795968
25,00	16	16	6	HPR110Ø25H7MF1G-HP612	30774479
26,00	16	16	6	HPR110Ø26H7MF1G-HP612	30795969
27,00	16	16	6	HPR110Ø27H7MF1G-HP612	30781145
28,00	16	16	6	HPR110Ø28H7MF1G-HP612	30781172
29,00	16	16	6	HPR110Ø29H7MF1G-HP612	30795970
30,00	20	17	8	HPR110Ø30H7MF1G-HP612	30795971
31,00	20	17	8	HPR110Ø31H7MF1G-HP612	30795972
32,00	20	17	8	HPR110Ø32H7MF1G-HP612	30795973
33,00	20	17	8	HPR110Ø33H7MF1G-HP612	30781144
34,00	20	17	8	HPR110Ø34H7MF1G-HP612	30795974
35,00	20	17	8	HPR110Ø35H7MF1G-HP612	30795975
36,00	20	17	8	HPR110Ø36H7MF1G-HP612	30795976
37,00	20	17	8	HPR110Ø37H7MF1G-HP612	30795977
38,00	20	17	8	HPR110Ø38H7MF1G-HP612	30795978
39,00	20	17	8	HPR110Ø39H7MF1G-HP612	30795979
40,00	24	19	8	HPR110Ø40H7MF1G-HP612	30795980
41,00	24	19	8	HPR110Ø41H7MF1G-HP612	30795981
42,00	24	19	8	HPR110Ø42H7MF1G-HP612	30795982
43,00	24	19	8	HPR110Ø43H7MF1G-HP612	30795983
44,00	24	19	8	HPR110Ø44H7MF1G-HP612	30795984
45,00	24	19	8	HPR110Ø45H7MF1G-HP612	30795985
46,00	24	19	8	HPR110Ø46H7MF1G-HP612	30774477
47,00	24	19	8	HPR110Ø47H7MF1G-HP612	30795986
48,00	24	19	8	HPR110Ø48H7MF1G-HP612	30795987
49,00	24	19	8	HPR110Ø49H7MF1G-HP612	30795988
50,00	24	19	8	HPR110Ø50H7MF1G-HP612	30795989
51,00	24	25	8	HPR110Ø51H7MF1G-HP612	30774478
52,00	24	25	8	HPR110Ø52H7MF1G-HP612	30795990
53,00	24	25	8	HPR110Ø53H7MF1G-HP612	30795991
54,00	24	25	8	HPR110Ø54H7MF1G-HP612	30795992

HPR110 | Fixed design

Dimensions			z	Specification	Order No.
d ₁	HFS size	l ₄			
55,00	24	25	8	HPR110Ø55H7MF1G-HP612	30795993
56,00	24	25	8	HPR110Ø56H7MF1G-HP612	30795994
57,00	24	25	8	HPR110Ø57H7MF1G-HP612	30795995
58,00	24	25	8	HPR110Ø58H7MF1G-HP612	30795996
59,00	24	25	8	HPR110Ø59H7MF1G-HP612	30795997
60,00	24	25	8	HPR110Ø60H7MF1G-HP612	30795998
61,00	24	25	8	HPR110Ø61H7MF1G-HP612	30795999
62,00	24	25	8	HPR110Ø62H7MF1G-HP612	30796000
63,00	24	25	8	HPR110Ø63H7MF1G-HP612	30796001
64,00	24	25	8	HPR110Ø64H7MF1G-HP612	30796002
65,00	24	25	8	HPR110Ø65H7MF1G-HP612	30796003

Dimensions in mm.

Cutting data recommendation from page 436.

For related HFS replaceable head holders see page 308.

Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "HPR replaceable head reamers".

HPR110

Fixed design

Design:

Reamer diameter:

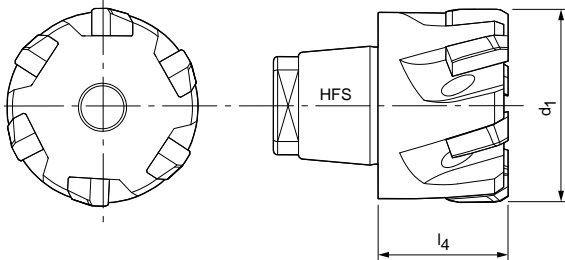
16.00 - 65.00 mm

Lead:

ME1G

Cutting material:

CU134



Dimensions			z	Specification	Order No.
d ₁	HFS size	l ₄			
16,00	10	14	6	HPR110Ø16H7ME1G-CU134	30470347
17,00	10	14	6	HPR110Ø17H7ME1G-CU134	30138021
18,00	10	14	6	HPR110Ø18H7ME1G-CU134	30077243
19,00	12	14,5	6	HPR110Ø19H7ME1G-CU134	30077358
20,00	12	14,5	6	HPR110Ø20H7ME1G-CU134	30040404
21,00	12	14,5	6	HPR110Ø21H7ME1G-CU134	30039919
22,00	14	15,5	6	HPR110Ø22H7ME1G-CU134	30081546
23,00	14	15,5	6	HPR110Ø23H7ME1G-CU134	30085368
24,00	16	16	6	HPR110Ø24H7ME1G-CU134	30080958
25,00	16	16	6	HPR110Ø25H7ME1G-CU134	30076110
26,00	16	16	6	HPR110Ø26H7ME1G-CU134	30045730
27,00	16	16	6	HPR110Ø27H7ME1G-CU134	30087257
28,00	16	16	6	HPR110Ø28H7ME1G-CU134	30046121
29,00	16	16	6	HPR110Ø29H7ME1G-CU134	30087258
30,00	20	17	8	HPR110Ø30H7ME1G-CU134	30045095
31,00	20	17	8	HPR110Ø31H7ME1G-CU134	30192960
32,00	20	17	8	HPR110Ø32H7ME1G-CU134	30084530
33,00	20	17	8	HPR110Ø33H7ME1G-CU134	30162282
34,00	20	17	8	HPR110Ø34H7ME1G-CU134	30043743
35,00	20	17	8	HPR110Ø35H7ME1G-CU134	30084885
36,00	20	17	8	HPR110Ø36H7ME1G-CU134	30119836
37,00	20	17	8	HPR110Ø37H7ME1G-CU134	30154321
38,00	20	17	8	HPR110Ø38H7ME1G-CU134	30169593
39,00	20	17	8	HPR110Ø39H7ME1G-CU134	30088042
40,00	24	19	8	HPR110Ø40H7ME1G-CU134	30045097
41,00	24	19	8	HPR110Ø41H7ME1G-CU134	30192962
42,00	24	19	8	HPR110Ø42H7ME1G-CU134	30080437
43,00	24	19	8	HPR110Ø43H7ME1G-CU134	30192963
44,00	24	19	8	HPR110Ø44H7ME1G-CU134	30097178
45,00	24	19	8	HPR110Ø45H7ME1G-CU134	30049313
46,00	24	19	8	HPR110Ø46H7ME1G-CU134	30087827
47,00	24	19	8	HPR110Ø47H7ME1G-CU134	30154322
48,00	24	19	8	HPR110Ø48H7ME1G-CU134	30171074
49,00	24	19	8	HPR110Ø49H7ME1G-CU134	30189230
50,00	24	19	8	HPR110Ø50H7ME1G-CU134	30219386
51,00	24	25	8	HPR110Ø51H7ME1G-CU134	30250123
52,00	24	25	8	HPR110Ø52H7ME1G-CU134	30250124
53,00	24	25	8	HPR110Ø53H7ME1G-CU134	30225133
54,00	24	25	8	HPR110Ø54H7ME1G-CU134	30204271

HPR110 | Fixed design

Dimensions			z	Specification	Order No.
d ₁	HFS size	l ₄			
55,00	24	25	8	HPR110Ø55H7ME1G-CU134	30196567
56,00	24	25	8	HPR110Ø56H7ME1G-CU134	30250125
57,00	24	25	8	HPR110Ø57H7ME1G-CU134	30250126
58,00	24	25	8	HPR110Ø58H7ME1G-CU134	30197411
59,00	24	25	8	HPR110Ø59H7ME1G-CU134	30250127
60,00	24	25	8	HPR110Ø60H7ME1G-CU134	30242416
61,00	24	25	8	HPR110Ø61H7ME1G-CU134	30250128
62,00	24	25	8	HPR110Ø62H7ME1G-CU134	30459043
63,00	24	25	8	HPR110Ø63H7ME1G-CU134	30250130
64,00	24	25	8	HPR110Ø64H7ME1G-CU134	30216671
65,00	24	25	8	HPR110Ø65H7ME1G-CU134	30236537

Dimensions in mm.

Cutting data recommendation from page 436.

For related HFS replaceable head holders see page 308.

Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "HPR replaceable head reamers".

HPR110

Fixed design

Design:

Reamer diameter:

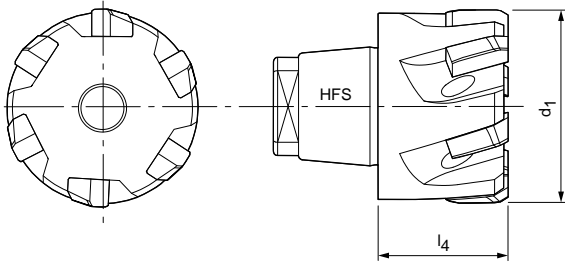
16.00 - 65.00 mm

Lead:

ME1G

Cutting material:

CP134



Dimensions			z	Specification	Order No.
d ₁	HFS size	l ₄			
16,00	10	14	6	HPR110Ø16H7ME1G-CP134	30624670
17,00	10	14	6	HPR110Ø17H7ME1G-CP134	30795939
18,00	10	14	6	HPR110Ø18H7ME1G-CP134	30118711
19,00	12	14,5	6	HPR110Ø19H7ME1G-CP134	30158383
20,00	12	14,5	6	HPR110Ø20H7ME1G-CP134	30115211
21,00	12	14,5	6	HPR110Ø21H7ME1G-CP134	30078109
22,00	14	15,5	6	HPR110Ø22H7ME1G-CP134	30118126
23,00	14	15,5	6	HPR110Ø23H7ME1G-CP134	30795940
24,00	16	16	6	HPR110Ø24H7ME1G-CP134	30165822
25,00	16	16	6	HPR110Ø25H7ME1G-CP134	30165823
26,00	16	16	6	HPR110Ø26H7ME1G-CP134	30795941
27,00	16	16	6	HPR110Ø27H7ME1G-CP134	30076161
28,00	16	16	6	HPR110Ø28H7ME1G-CP134	30236257
29,00	16	16	6	HPR110Ø29H7ME1G-CP134	30502601
30,00	20	17	8	HPR110Ø30H7ME1G-CP134	30469104
31,00	20	17	8	HPR110Ø31H7ME1G-CP134	30795942
32,00	20	17	8	HPR110Ø32H7ME1G-CP134	30310514
33,00	20	17	8	HPR110Ø33H7ME1G-CP134	30795943
34,00	20	17	8	HPR110Ø34H7ME1G-CP134	30290796
35,00	20	17	8	HPR110Ø35H7ME1G-CP134	30795944
36,00	20	17	8	HPR110Ø36H7ME1G-CP134	30493572
37,00	20	17	8	HPR110Ø37H7ME1G-CP134	30672522
38,00	20	17	8	HPR110Ø38H7ME1G-CP134	30250529
39,00	20	17	8	HPR110Ø39H7ME1G-CP134	30211186
40,00	24	19	8	HPR110Ø40H7ME1G-CP134	30379394
41,00	24	19	8	HPR110Ø41H7ME1G-CP134	30795945
42,00	24	19	8	HPR110Ø42H7ME1G-CP134	30425953
43,00	24	19	8	HPR110Ø43H7ME1G-CP134	30795946
44,00	24	19	8	HPR110Ø44H7ME1G-CP134	30623276
45,00	24	19	8	HPR110Ø45H7ME1G-CP134	30226182
46,00	24	19	8	HPR110Ø46H7ME1G-CP134	30264412
47,00	24	19	8	HPR110Ø47H7ME1G-CP134	30795947
48,00	24	19	8	HPR110Ø48H7ME1G-CP134	30795948
49,00	24	19	8	HPR110Ø49H7ME1G-CP134	30226183
50,00	24	19	8	HPR110Ø50H7ME1G-CP134	30221370
51,00	24	25	8	HPR110Ø51H7ME1G-CP134	30795949
52,00	24	25	8	HPR110Ø52H7ME1G-CP134	30795950
53,00	24	25	8	HPR110Ø53H7ME1G-CP134	30288807
54,00	24	25	8	HPR110Ø54H7ME1G-CP134	30795951

HPR110 | Fixed design

Dimensions			z	Specification	Order No.
d ₁	HFS size	l ₄			
55,00	24	25	8	HPR110Ø55H7ME1G-CP134	30485103
56,00	24	25	8	HPR110Ø56H7ME1G-CP134	30342758
57,00	24	25	8	HPR110Ø57H7ME1G-CP134	30795952
58,00	24	25	8	HPR110Ø58H7ME1G-CP134	30795953
59,00	24	25	8	HPR110Ø59H7ME1G-CP134	30795954
60,00	24	25	8	HPR110Ø60H7ME1G-CP134	30226184
61,00	24	25	8	HPR110Ø61H7ME1G-CP134	30795955
62,00	24	25	8	HPR110Ø62H7ME1G-CP134	30795956
63,00	24	25	8	HPR110Ø63H7ME1G-CP134	30795957
64,00	24	25	8	HPR110Ø64H7ME1G-CP134	30795958
65,00	24	25	8	HPR110Ø65H7ME1G-CP134	30795959

Dimensions in mm.

Cutting data recommendation from page 436.

For related HFS replaceable head holders see page 308.

Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "HPR replaceable head reamers".

HPR150

Fixed design

Design:

Reamer diameter:

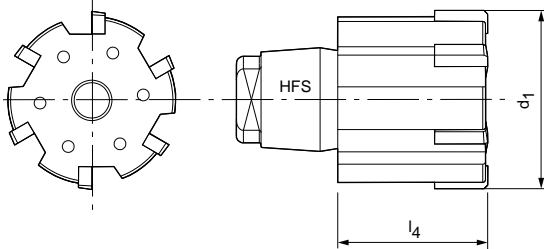
17.00 - 65.00 mm

Lead:

MC1G

Cutting material:

HP421



Dimensions			z	Specification	Order No.
d ₁	HFS size	l ₄			
17,00	10	14	6	HPR150Ø17H7MC1G-HP421	30796138
18,00	10	14	6	HPR150Ø18H7MC1G-HP421	30270022
19,00	10	14	6	HPR150Ø19H7MC1G-HP421	30545403
20,00	10	14	6	HPR150Ø20H7MC1G-HP421	30154961
21,00	10	14	6	HPR150Ø21H7MC1G-HP421	30796139
22,00	12	15,5	6	HPR150Ø22H7MC1G-HP421	30796140
23,00	12	15,5	6	HPR150Ø23H7MC1G-HP421	30796141
24,00	12	15,5	6	HPR150Ø24H7MC1G-HP421	30796142
25,00	14	15,5	6	HPR150Ø25H7MC1G-HP421	30093533
26,00	14	15,5	6	HPR150Ø26H7MC1G-HP421	30796143
27,00	14	15,5	6	HPR150Ø27H7MC1G-HP421	30796144
28,00	14	15,5	6	HPR150Ø28H7MC1G-HP421	30796145
29,00	16	17	6	HPR150Ø29H7MC1G-HP421	30796146
30,00	16	17	6	HPR150Ø30H7MC1G-HP421	30082585
31,00	16	17	6	HPR150Ø31H7MC1G-HP421	30796147
32,00	16	17	6	HPR150Ø32H7MC1G-HP421	30796148
33,00	16	17	6	HPR150Ø33H7MC1G-HP421	30796149
34,00	16	17	6	HPR150Ø34H7MC1G-HP421	30796150
35,00	16	17	6	HPR150Ø35H7MC1G-HP421	30796151
36,00	16	17	6	HPR150Ø36H7MC1G-HP421	30796152
37,00	20	17	8	HPR150Ø37H7MC1G-HP421	30796153
38,00	20	17	8	HPR150Ø38H7MC1G-HP421	30796154
39,00	20	17	8	HPR150Ø39H7MC1G-HP421	30796155
40,00	20	17	8	HPR150Ø40H7MC1G-HP421	30086805
41,00	20	17	8	HPR150Ø41H7MC1G-HP421	30796156
42,00	20	17	8	HPR150Ø42H7MC1G-HP421	30796157
43,00	20	17	8	HPR150Ø43H7MC1G-HP421	30796158
44,00	20	17	8	HPR150Ø44H7MC1G-HP421	30796159
45,00	24	19	8	HPR150Ø45H7MC1G-HP421	30796499
46,00	24	19	8	HPR150Ø46H7MC1G-HP421	30796160
47,00	24	19	8	HPR150Ø47H7MC1G-HP421	30796161
48,00	24	19	8	HPR150Ø48H7MC1G-HP421	30796162
49,00	24	19	8	HPR150Ø49H7MC1G-HP421	30796163
50,00	24	19	8	HPR150Ø50H7MC1G-HP421	30796164
51,00	24	25	8	HPR150Ø51H7MC1G-HP421	30083346
52,00	24	25	8	HPR150Ø52H7MC1G-HP421	30796165
53,00	24	25	8	HPR150Ø53H7MC1G-HP421	30796166
54,00	24	25	8	HPR150Ø54H7MC1G-HP421	30796167
55,00	24	25	8	HPR150Ø55H7MC1G-HP421	30083347

HPR150 | Fixed design

Dimensions			z	Specification	Order No.
d ₁	HFS size	l ₄			
56,00	24	25	8	HPR150Ø56H7MC1G-HP421	30796168
57,00	24	25	8	HPR150Ø57H7MC1G-HP421	30796169
58,00	24	25	8	HPR150Ø58H7MC1G-HP421	30796170
59,00	24	25	8	HPR150Ø59H7MC1G-HP421	30796171
60,00	24	25	8	HPR150Ø60H7MC1G-HP421	30473610
61,00	24	25	8	HPR150Ø61H7MC1G-HP421	30796172
62,00	24	25	8	HPR150Ø62H7MC1G-HP421	30796173
63,00	24	25	8	HPR150Ø63H7MC1G-HP421	30796174
64,00	24	25	8	HPR150Ø64H7MC1G-HP421	30796175
65,00	24	25	8	HPR150Ø65H7MC1G-HP421	30796176

Dimensions in mm.

Cutting data recommendation from page 436.

For related HFS replaceable head holders see page 308.

Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "HPR replaceable head reamers".

HPR150

Fixed design

Design:

Reamer diameter:

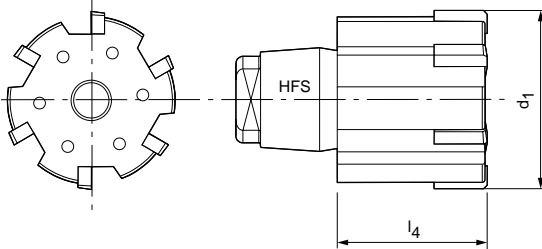
17.00 - 65.00 mm

Lead:

ML2G

Cutting material:

HP421



Dimensions			z	Specification	Order No.
d ₁	HFS size	l ₄			
17,00	10	14	6	HPR150Ø17H7ML2G-HP421	30710385
18,00	10	14	6	HPR150Ø18H7ML2G-HP421	30710386
19,00	10	14	6	HPR150Ø19H7ML2G-HP421	30710387
20,00	10	14	6	HPR150Ø20H7ML2G-HP421	30044822
21,00	10	14	6	HPR150Ø21H7ML2G-HP421	30710388
22,00	12	15,5	6	HPR150Ø22H7ML2G-HP421	30098915
23,00	12	15,5	6	HPR150Ø23H7ML2G-HP421	30710389
24,00	12	15,5	6	HPR150Ø24H7ML2G-HP421	30329443
25,00	14	15,5	6	HPR150Ø25H7ML2G-HP421	30710390
26,00	14	15,5	6	HPR150Ø26H7ML2G-HP421	30044823
27,00	14	15,5	6	HPR150Ø27H7ML2G-HP421	30462440
28,00	14	15,5	6	HPR150Ø28H7ML2G-HP421	30710391
29,00	16	17	6	HPR150Ø29H7ML2G-HP421	30710392
30,00	16	17	6	HPR150Ø30H7ML2G-HP421	30710393
31,00	16	17	6	HPR150Ø31H7ML2G-HP421	30710394
32,00	16	17	6	HPR150Ø32H7ML2G-HP421	30462441
33,00	16	17	6	HPR150Ø33H7ML2G-HP421	30710395
34,00	16	17	6	HPR150Ø34H7ML2G-HP421	30710396
35,00	16	17	6	HPR150Ø35H7ML2G-HP421	30710397
36,00	16	17	6	HPR150Ø36H7ML2G-HP421	30710398
37,00	20	17	8	HPR150Ø37H7ML2G-HP421	30710399
38,00	20	17	8	HPR150Ø38H7ML2G-HP421	30710400
39,00	20	17	8	HPR150Ø39H7ML2G-HP421	30710401
40,00	20	17	8	HPR150Ø40H7ML2G-HP421	30586834
41,00	20	17	8	HPR150Ø41H7ML2G-HP421	30710402
42,00	20	17	8	HPR150Ø42H7ML2G-HP421	30710403
43,00	20	17	8	HPR150Ø43H7ML2G-HP421	30710404
44,00	20	17	8	HPR150Ø44H7ML2G-HP421	30710405
45,00	24	19	8	HPR150Ø45H7ML2G-HP421	30710406
46,00	24	19	8	HPR150Ø46H7ML2G-HP421	30710407
47,00	24	19	8	HPR150Ø47H7ML2G-HP421	30710408
48,00	24	19	8	HPR150Ø48H7ML2G-HP421	30710409
49,00	24	19	8	HPR150Ø49H7ML2G-HP421	30710410
50,00	24	19	8	HPR150Ø50H7ML2G-HP421	30609726
51,00	24	25	8	HPR150Ø51H7ML2G-HP421	30710411
52,00	24	25	8	HPR150Ø52H7ML2G-HP421	30710412
53,00	24	25	8	HPR150Ø53H7ML2G-HP421	30710413
54,00	24	25	8	HPR150Ø54H7ML2G-HP421	30710414
55,00	24	25	8	HPR150Ø55H7ML2G-HP421	30710415

HPR150 | Fixed design

Dimensions			z	Specification	Order No.
d ₁	HFS size	l ₄			
56,00	24	25	8	HPR150Ø56H7ML2G-HP421	30710416
57,00	24	25	8	HPR150Ø57H7ML2G-HP421	30710417
58,00	24	25	8	HPR150Ø58H7ML2G-HP421	30710418
59,00	24	25	8	HPR150Ø59H7ML2G-HP421	30710419
60,00	24	25	8	HPR150Ø60H7ML2G-HP421	30710420
61,00	24	25	8	HPR150Ø61H7ML2G-HP421	30710421
62,00	24	25	8	HPR150Ø62H7ML2G-HP421	30710422
63,00	24	25	8	HPR150Ø63H7ML2G-HP421	30710423
64,00	24	25	8	HPR150Ø64H7ML2G-HP421	30710424
65,00	24	25	8	HPR150Ø65H7ML2G-HP421	30710425

Dimensions in mm.

Cutting data recommendation from page 436.

For related HFS replaceable head holders see page 308.

Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "HPR replaceable head reamers".

HPR150

Fixed design

Design:

Reamer diameter:

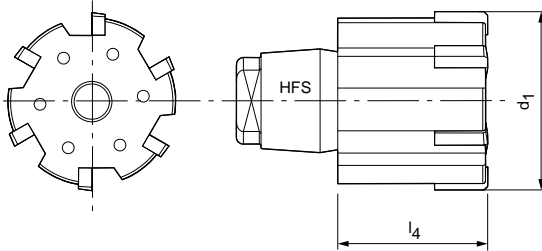
17.00 - 65.00 mm

Lead:

MO2G

Cutting material:

HP612



Dimensions			z	Specification	Order No.
d ₁	HFS size	l ₄			
17,00	10	14	6	HPR150Ø17H7M02G-HP612	30796089
18,00	10	14	6	HPR150Ø18H7M02G-HP612	30796090
19,00	10	14	6	HPR150Ø19H7M02G-HP612	30796091
20,00	10	14	6	HPR150Ø20H7M02G-HP612	30796092
21,00	10	14	6	HPR150Ø21H7M02G-HP612	30796093
22,00	12	15,5	6	HPR150Ø22H7M02G-HP612	30796094
23,00	12	15,5	6	HPR150Ø23H7M02G-HP612	30796095
24,00	12	15,5	6	HPR150Ø24H7M02G-HP612	30796096
25,00	14	15,5	6	HPR150Ø25H7M02G-HP612	30796097
26,00	14	15,5	6	HPR150Ø26H7M02G-HP612	30796098
27,00	14	15,5	6	HPR150Ø27H7M02G-HP612	30796099
28,00	14	15,5	6	HPR150Ø28H7M02G-HP612	30796100
29,00	16	17	6	HPR150Ø29H7M02G-HP612	30796101
30,00	16	17	6	HPR150Ø30H7M02G-HP612	30796102
31,00	16	17	6	HPR150Ø31H7M02G-HP612	30796103
32,00	16	17	6	HPR150Ø32H7M02G-HP612	30796104
33,00	16	17	6	HPR150Ø33H7M02G-HP612	30796105
34,00	16	17	6	HPR150Ø34H7M02G-HP612	30796106
35,00	16	17	6	HPR150Ø35H7M02G-HP612	30796107
36,00	16	17	6	HPR150Ø36H7M02G-HP612	30796108
37,00	20	17	8	HPR150Ø37H7M02G-HP612	30796109
38,00	20	17	8	HPR150Ø38H7M02G-HP612	30796110
39,00	20	17	8	HPR150Ø39H7M02G-HP612	30796111
40,00	20	17	8	HPR150Ø40H7M02G-HP612	30796112
41,00	20	17	8	HPR150Ø41H7M02G-HP612	30796113
42,00	20	17	8	HPR150Ø42H7M02G-HP612	30796114
43,00	20	17	8	HPR150Ø43H7M02G-HP612	30796115
44,00	20	17	8	HPR150Ø44H7M02G-HP612	30796116
45,00	24	19	8	HPR150Ø45H7M02G-HP612	30796117
46,00	24	19	8	HPR150Ø46H7M02G-HP612	30796118
47,00	24	19	8	HPR150Ø47H7M02G-HP612	30796119
48,00	24	19	8	HPR150Ø48H7M02G-HP612	30796120
49,00	24	19	8	HPR150Ø49H7M02G-HP612	30796121
50,00	24	19	8	HPR150Ø50H7M02G-HP612	30796122
51,00	24	25	8	HPR150Ø51H7M02G-HP612	30796123
52,00	24	25	8	HPR150Ø52H7M02G-HP612	30796124
53,00	24	25	8	HPR150Ø53H7M02G-HP612	30796125
54,00	24	25	8	HPR150Ø54H7M02G-HP612	30796126
55,00	24	25	8	HPR150Ø55H7M02G-HP612	30796127

HPR150 | Fixed design

Dimensions			z	Specification	Order No.
d ₁	HFS size	l ₄			
56,00	24	25	8	HPR150Ø56H7M02G-HP612	30796128
57,00	24	25	8	HPR150Ø57H7M02G-HP612	30796129
58,00	24	25	8	HPR150Ø58H7M02G-HP612	30796130
59,00	24	25	8	HPR150Ø59H7M02G-HP612	30796131
60,00	24	25	8	HPR150Ø60H7M02G-HP612	30796132
61,00	24	25	8	HPR150Ø61H7M02G-HP612	30796133
62,00	24	25	8	HPR150Ø62H7M02G-HP612	30796134
63,00	24	25	8	HPR150Ø63H7M02G-HP612	30796135
64,00	24	25	8	HPR150Ø64H7M02G-HP612	30796136
65,00	24	25	8	HPR150Ø65H7M02G-HP612	30796137

Dimensions in mm.

Cutting data recommendation from page 436.

For related HFS replaceable head holders see page 308.

Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "HPR replaceable head reamers".

HPR150

Fixed design

Design:

Reamer diameter:

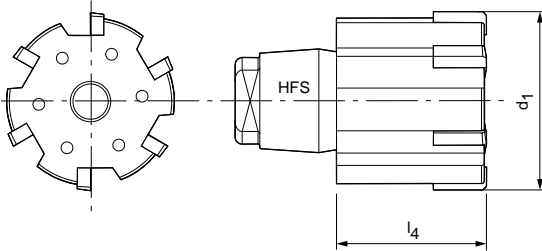
17.00 - 65.00 mm

Lead:

ML2G

Cutting material:

CU134



Dimensions			z	Specification	Order No.
d ₁	HFS size	l ₄			
17,00	10	14	6	HPR150Ø17H7ML2G-CU134	30710350
18,00	10	14	6	HPR150Ø18H7ML2G-CU134	30077116
19,00	10	14	6	HPR150Ø19H7ML2G-CU134	30710351
20,00	10	14	6	HPR150Ø20H7ML2G-CU134	30610874
21,00	10	14	6	HPR150Ø21H7ML2G-CU134	30710352
22,00	12	15,5	6	HPR150Ø22H7ML2G-CU134	30495497
23,00	12	15,5	6	HPR150Ø23H7ML2G-CU134	30480634
24,00	12	15,5	6	HPR150Ø24H7ML2G-CU134	30710353
25,00	14	15,5	6	HPR150Ø25H7ML2G-CU134	30089451
26,00	14	15,5	6	HPR150Ø26H7ML2G-CU134	30236854
27,00	14	15,5	6	HPR150Ø27H7ML2G-CU134	30710354
28,00	14	15,5	6	HPR150Ø28H7ML2G-CU134	30092414
29,00	16	17	6	HPR150Ø29H7ML2G-CU134	30710355
30,00	16	17	6	HPR150Ø30H7ML2G-CU134	30228289
31,00	16	17	6	HPR150Ø31H7ML2G-CU134	30710356
32,00	16	17	6	HPR150Ø32H7ML2G-CU134	30660857
33,00	16	17	6	HPR150Ø33H7ML2G-CU134	30710357
34,00	16	17	6	HPR150Ø34H7ML2G-CU134	30710358
35,00	16	17	6	HPR150Ø35H7ML2G-CU134	30046124
36,00	16	17	6	HPR150Ø36H7ML2G-CU134	30498053
37,00	20	17	8	HPR150Ø37H7ML2G-CU134	30710359
38,00	20	17	8	HPR150Ø38H7ML2G-CU134	30656184
39,00	20	17	8	HPR150Ø39H7ML2G-CU134	30710360
40,00	20	17	8	HPR150Ø40H7ML2G-CU134	30215788
41,00	20	17	8	HPR150Ø41H7ML2G-CU134	30710361
42,00	20	17	8	HPR150Ø42H7ML2G-CU134	30710362
43,00	20	17	8	HPR150Ø43H7ML2G-CU134	30710363
44,00	20	17	8	HPR150Ø44H7ML2G-CU134	30710364
45,00	24	19	8	HPR150Ø45H7ML2G-CU134	30710365
46,00	24	19	8	HPR150Ø46H7ML2G-CU134	30710366
47,00	24	19	8	HPR150Ø47H7ML2G-CU134	30710367
48,00	24	19	8	HPR150Ø48H7ML2G-CU134	30710368
49,00	24	19	8	HPR150Ø49H7ML2G-CU134	30710369
50,00	24	19	8	HPR150Ø50H7ML2G-CU134	30710370
51,00	24	25	8	HPR150Ø51H7ML2G-CU134	30710371
52,00	24	25	8	HPR150Ø52H7ML2G-CU134	30710372
53,00	24	25	8	HPR150Ø53H7ML2G-CU134	30710373
54,00	24	25	8	HPR150Ø54H7ML2G-CU134	30710374
55,00	24	25	8	HPR150Ø55H7ML2G-CU134	30239641

HPR150 | Fixed design

Dimensions			z	Specification	Order No.
d ₁	HFS size	l ₄			
56,00	24	25	8	HPR150Ø56H7ML2G-CU134	30710375
57,00	24	25	8	HPR150Ø57H7ML2G-CU134	30710376
58,00	24	25	8	HPR150Ø58H7ML2G-CU134	30710377
59,00	24	25	8	HPR150Ø59H7ML2G-CU134	30710378
60,00	24	25	8	HPR150Ø60H7ML2G-CU134	30710379
61,00	24	25	8	HPR150Ø61H7ML2G-CU134	30710380
62,00	24	25	8	HPR150Ø62H7ML2G-CU134	30710381
63,00	24	25	8	HPR150Ø63H7ML2G-CU134	30710382
64,00	24	25	8	HPR150Ø64H7ML2G-CU134	30710383
65,00	24	25	8	HPR150Ø65H7ML2G-CU134	30710384

Dimensions in mm.

Cutting data recommendation from page 436.

For related HFS replaceable head holders see page 308.

Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "HPR replaceable head reamers".

HPR150

Fixed design

Design:

Reamer diameter:

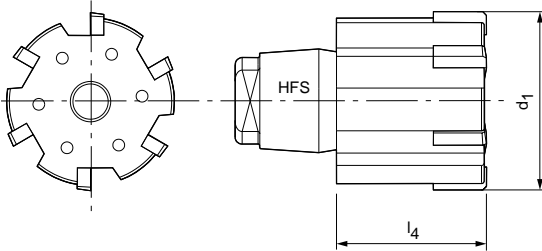
17.00 - 65.00 mm

Lead:

MC1G

Cutting material:

CP134



Dimensions			z	Specification	Order No.
d ₁	HFS size	l ₄			
17,00	10	14	6	HPR150Ø17H7MC1G-CP134	30796051
18,00	10	14	6	HPR150Ø18H7MC1G-CP134	30796052
19,00	10	14	6	HPR150Ø19H7MC1G-CP134	30796053
20,00	10	14	6	HPR150Ø20H7MC1G-CP134	30165163
21,00	10	14	6	HPR150Ø21H7MC1G-CP134	30796054
22,00	12	15,5	6	HPR150Ø22H7MC1G-CP134	30099655
23,00	12	15,5	6	HPR150Ø23H7MC1G-CP134	30796055
24,00	12	15,5	6	HPR150Ø24H7MC1G-CP134	30796056
25,00	14	15,5	6	HPR150Ø25H7MC1G-CP134	30098888
26,00	14	15,5	6	HPR150Ø26H7MC1G-CP134	30796057
27,00	14	15,5	6	HPR150Ø27H7MC1G-CP134	30796058
28,00	14	15,5	6	HPR150Ø28H7MC1G-CP134	30796059
29,00	16	17	6	HPR150Ø29H7MC1G-CP134	30796060
30,00	16	17	6	HPR150Ø30H7MC1G-CP134	30725220
31,00	16	17	6	HPR150Ø31H7MC1G-CP134	30796061
32,00	16	17	6	HPR150Ø32H7MC1G-CP134	30796062
33,00	16	17	6	HPR150Ø33H7MC1G-CP134	30796063
34,00	16	17	6	HPR150Ø34H7MC1G-CP134	30796064
35,00	16	17	6	HPR150Ø35H7MC1G-CP134	30618581
36,00	16	17	6	HPR150Ø36H7MC1G-CP134	30796065
37,00	20	17	8	HPR150Ø37H7MC1G-CP134	30796066
38,00	20	17	8	HPR150Ø38H7MC1G-CP134	30796067
39,00	20	17	8	HPR150Ø39H7MC1G-CP134	30099720
40,00	20	17	8	HPR150Ø40H7MC1G-CP134	30796068
41,00	20	17	8	HPR150Ø41H7MC1G-CP134	30796069
42,00	20	17	8	HPR150Ø42H7MC1G-CP134	30796070
43,00	20	17	8	HPR150Ø43H7MC1G-CP134	30796071
44,00	20	17	8	HPR150Ø44H7MC1G-CP134	30796072
45,00	24	19	8	HPR150Ø45H7MC1G-CP134	30076946
46,00	24	19	8	HPR150Ø46H7MC1G-CP134	30796073
47,00	24	19	8	HPR150Ø47H7MC1G-CP134	30796074
48,00	24	19	8	HPR150Ø48H7MC1G-CP134	30796075
49,00	24	19	8	HPR150Ø49H7MC1G-CP134	30796076
50,00	24	19	8	HPR150Ø50H7MC1G-CP134	30160952
51,00	24	25	8	HPR150Ø51H7MC1G-CP134	30640595
52,00	24	25	8	HPR150Ø52H7MC1G-CP134	30796077
53,00	24	25	8	HPR150Ø53H7MC1G-CP134	30796078
54,00	24	25	8	HPR150Ø54H7MC1G-CP134	30796079
55,00	24	25	8	HPR150Ø55H7MC1G-CP134	30597435

HPR150 | Fixed design

Dimensions			z	Specification	Order No.
d ₁	HFS size	l ₄			
56,00	24	25	8	HPR150Ø56H7MC1G-CP134	30796080
57,00	24	25	8	HPR150Ø57H7MC1G-CP134	30796081
58,00	24	25	8	HPR150Ø58H7MC1G-CP134	30282344
59,00	24	25	8	HPR150Ø59H7MC1G-CP134	30796082
60,00	24	25	8	HPR150Ø60H7MC1G-CP134	30796083
61,00	24	25	8	HPR150Ø61H7MC1G-CP134	30796084
62,00	24	25	8	HPR150Ø62H7MC1G-CP134	30796085
63,00	24	25	8	HPR150Ø63H7MC1G-CP134	30796086
64,00	24	25	8	HPR150Ø64H7MC1G-CP134	30796087
65,00	24	25	8	HPR150Ø65H7MC1G-CP134	30796088

Dimensions in mm.

Cutting data recommendation from page 436.

For related HFS replaceable head holders see page 308.

Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "HPR replaceable head reamers".

HPR150

Fixed design

Design:

Reamer diameter:

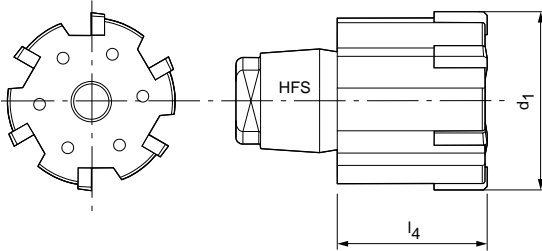
17.00 - 65.00 mm

Lead:

ML2G

Cutting material:

CP134



Dimensions			z	Specification	Order No.
d ₁	HFS size	l ₄			
17,00	10	14	6	HPR150017H7ML2G-CP134	30796004
18,00	10	14	6	HPR150018H7ML2G-CP134	30796005
19,00	10	14	6	HPR150019H7ML2G-CP134	30796006
20,00	10	14	6	HPR150020H7ML2G-CP134	30796007
21,00	10	14	6	HPR150021H7ML2G-CP134	30796008
22,00	12	15,5	6	HPR150022H7ML2G-CP134	30796009
23,00	12	15,5	6	HPR150023H7ML2G-CP134	30796010
24,00	12	15,5	6	HPR150024H7ML2G-CP134	30796011
25,00	14	15,5	6	HPR150025H7ML2G-CP134	30796012
26,00	14	15,5	6	HPR150026H7ML2G-CP134	30796013
27,00	14	15,5	6	HPR150027H7ML2G-CP134	30796014
28,00	14	15,5	6	HPR150028H7ML2G-CP134	30796015
29,00	16	17	6	HPR150029H7ML2G-CP134	30796016
30,00	16	17	6	HPR150030H7ML2G-CP134	30625664
31,00	16	17	6	HPR150031H7ML2G-CP134	30796017
32,00	16	17	6	HPR150032H7ML2G-CP134	30796018
33,00	16	17	6	HPR150033H7ML2G-CP134	30796019
34,00	16	17	6	HPR150034H7ML2G-CP134	30540024
35,00	16	17	6	HPR150035H7ML2G-CP134	30796020
36,00	16	17	6	HPR150036H7ML2G-CP134	30796021
37,00	20	17	8	HPR150037H7ML2G-CP134	30796022
38,00	20	17	8	HPR150038H7ML2G-CP134	30796023
39,00	20	17	8	HPR150039H7ML2G-CP134	30796024
40,00	20	17	8	HPR150040H7ML2G-CP134	30796025
41,00	20	17	8	HPR150041H7ML2G-CP134	30796026
42,00	20	17	8	HPR150042H7ML2G-CP134	30796027
43,00	20	17	8	HPR150043H7ML2G-CP134	30796028
44,00	20	17	8	HPR150044H7ML2G-CP134	30796029
45,00	24	19	8	HPR150045H7ML2G-CP134	30796030
46,00	24	19	8	HPR150046H7ML2G-CP134	30796031
47,00	24	19	8	HPR150047H7ML2G-CP134	30796032
48,00	24	19	8	HPR150048H7ML2G-CP134	30796033
49,00	24	19	8	HPR150049H7ML2G-CP134	30796034
50,00	24	19	8	HPR150050H7ML2G-CP134	30796035
51,00	24	25	8	HPR150051H7ML2G-CP134	30796036
52,00	24	25	8	HPR150052H7ML2G-CP134	30796037
53,00	24	25	8	HPR150053H7ML2G-CP134	30796038
54,00	24	25	8	HPR150054H7ML2G-CP134	30796039
55,00	24	25	8	HPR150055H7ML2G-CP134	30796040

HPR150 | Fixed design

Dimensions			z	Specification	Order No.
d ₁	HFS size	l ₄			
56,00	24	25	8	HPR150056H7ML2G-CP134	30796041
57,00	24	25	8	HPR150057H7ML2G-CP134	30796042
58,00	24	25	8	HPR150058H7ML2G-CP134	30796043
59,00	24	25	8	HPR150059H7ML2G-CP134	30796044
60,00	24	25	8	HPR150060H7ML2G-CP134	30796045
61,00	24	25	8	HPR150061H7ML2G-CP134	30796046
62,00	24	25	8	HPR150062H7ML2G-CP134	30796047
63,00	24	25	8	HPR150063H7ML2G-CP134	30796048
64,00	24	25	8	HPR150064H7ML2G-CP134	30796049
65,00	24	25	8	HPR150065H7ML2G-CP134	30796050

Dimensions in mm.

Cutting data recommendation from page 436.

For related HFS replaceable head holders see page 308.

Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "HPR replaceable head reamers".

HPR150

Fixed design

Design:

Reamer diameter:

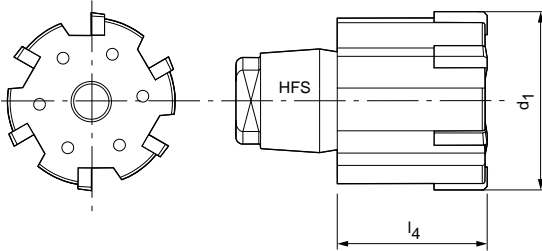
17.00 - 65.00 mm

Lead:

MA0A

Cutting material:

PU620



Dimensions			z	Specification	Order No.
d ₁	HFS size	l ₄			
17,00	10	14	6	HPR150Ø17H7MA0A-PU620	30710426
18,00	10	14	6	HPR150Ø18H7MA0A-PU620	30710427
19,00	10	14	6	HPR150Ø19H7MA0A-PU620	30710428
20,00	10	14	6	HPR150Ø20H7MA0A-PU620	30022857
21,00	10	14	6	HPR150Ø21H7MA0A-PU620	30681809
22,00	12	15,5	6	HPR150Ø22H7MA0A-PU620	30710429
23,00	12	15,5	6	HPR150Ø23H7MA0A-PU620	30710430
24,00	12	15,5	6	HPR150Ø24H7MA0A-PU620	30710431
25,00	14	15,5	6	HPR150Ø25H7MA0A-PU620	30022855
26,00	14	15,5	6	HPR150Ø26H7MA0A-PU620	30710432
27,00	14	15,5	6	HPR150Ø27H7MA0A-PU620	30710433
28,00	14	15,5	6	HPR150Ø28H7MA0A-PU620	30710434
29,00	16	17	6	HPR150Ø29H7MA0A-PU620	30710435
30,00	16	17	6	HPR150Ø30H7MA0A-PU620	30710436
31,00	16	17	6	HPR150Ø31H7MA0A-PU620	30710437
32,00	16	17	6	HPR150Ø32H7MA0A-PU620	30710438
33,00	16	17	6	HPR150Ø33H7MA0A-PU620	30710439
34,00	16	17	6	HPR150Ø34H7MA0A-PU620	30710440
35,00	16	17	6	HPR150Ø35H7MA0A-PU620	30710441
36,00	16	17	6	HPR150Ø36H7MA0A-PU620	30710442
37,00	20	17	8	HPR150Ø37H7MA0A-PU620	30710443
38,00	20	17	8	HPR150Ø38H7MA0A-PU620	30710444
39,00	20	17	8	HPR150Ø39H7MA0A-PU620	30710445
40,00	20	17	8	HPR150Ø40H7MA0A-PU620	30710446
41,00	20	17	8	HPR150Ø41H7MA0A-PU620	30710447
42,00	20	17	8	HPR150Ø42H7MA0A-PU620	30710448
43,00	20	17	8	HPR150Ø43H7MA0A-PU620	30710449
44,00	20	17	8	HPR150Ø44H7MA0A-PU620	30710450
45,00	24	19	8	HPR150Ø45H7MA0A-PU620	30710451
46,00	24	19	8	HPR150Ø46H7MA0A-PU620	30710452
47,00	24	19	8	HPR150Ø47H7MA0A-PU620	30710453
48,00	24	19	8	HPR150Ø48H7MA0A-PU620	30710454
49,00	24	19	8	HPR150Ø49H7MA0A-PU620	30710455
50,00	24	19	8	HPR150Ø50H7MA0A-PU620	30710456
51,00	24	25	8	HPR150Ø51H7MA0A-PU620	30710457
52,00	24	25	8	HPR150Ø52H7MA0A-PU620	30710458
53,00	24	25	8	HPR150Ø53H7MA0A-PU620	30710459
54,00	24	25	8	HPR150Ø54H7MA0A-PU620	30710460
55,00	24	25	8	HPR150Ø55H7MA0A-PU620	30710461

HPR150 | Fixed design

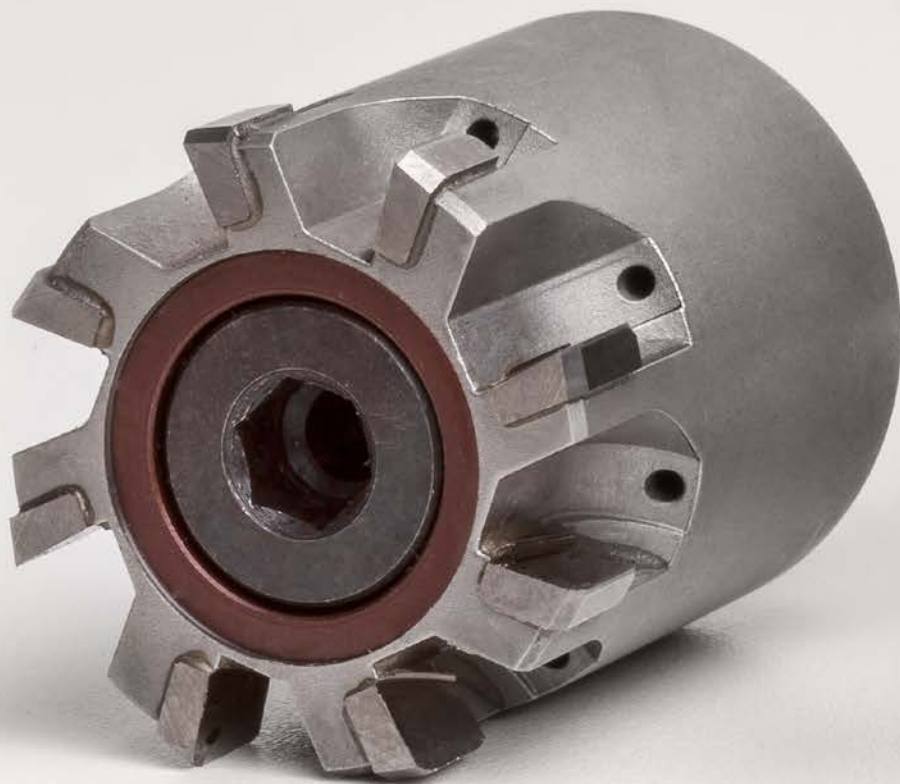
Dimensions			z	Specification	Order No.
d ₁	HFS size	l ₄			
56,00	24	25	8	HPR150Ø56H7MA0A-PU620	30710462
57,00	24	25	8	HPR150Ø57H7MA0A-PU620	30710463
58,00	24	25	8	HPR150Ø58H7MA0A-PU620	30710464
59,00	24	25	8	HPR150Ø59H7MA0A-PU620	30710465
60,00	24	25	8	HPR150Ø60H7MA0A-PU620	30710466
61,00	24	25	8	HPR150Ø61H7MA0A-PU620	30710467
62,00	24	25	8	HPR150Ø62H7MA0A-PU620	30710468
63,00	24	25	8	HPR150Ø63H7MA0A-PU620	30710469
64,00	24	25	8	HPR150Ø64H7MA0A-PU620	30710470
65,00	24	25	8	HPR150Ø65H7MA0A-PU620	30710471

Dimensions in mm.

Cutting data recommendation from page 436.

For related HFS replaceable head holders see page 308.

Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "HPR replaceable head reamers".





HPR - FINELY ADJUSTABLE DESIGN

HPR replaceable head reamers

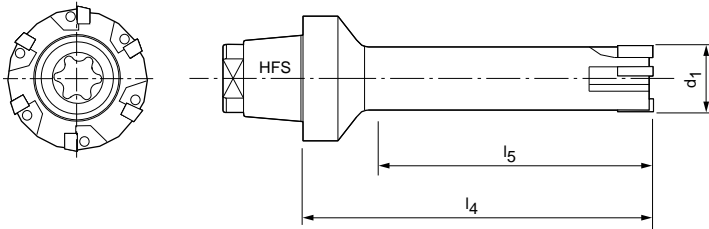
HPR230	_____	262
HPR231	_____	265
HPR280	_____	270
HPR200	_____	277
HPR210	_____	283
HPR250	_____	293

HPR230

Finely adjustable design

Design:

Reamer diameter: 7.00 - 18.00 mm
 Lead: MC1G
 Cutting material: HP421



Dimensions				z	Specification	Order No.
d ₁	HFS size	l ₄	l ₅			
7,00	12	60	45	4	HPR230Ø7H7MC1G-HP421	30710472
8,00	12	60	45	4	HPR230Ø8H7MC1G-HP421	30710473
9,00	12	60	45	4	HPR230Ø9H7MC1G-HP421	30710474
10,00	12	60	45	6	HPR230Ø10H7MC1G-HP421	30710475
11,00	12	60	45	6	HPR230Ø11H7MC1G-HP421	30710476
12,00	12	60	45	6	HPR230Ø12H7MC1G-HP421	30710477
13,00	12	60	45	6	HPR230Ø13H7MC1G-HP421	30710478
14,00	12	60	45	6	HPR230Ø14H7MC1G-HP421	30710479
15,00	12	60	45	6	HPR230Ø15H7MC1G-HP421	30710480
16,00	12	60	45	6	HPR230Ø16H7MC1G-HP421	30710481
17,00	12	60	45	6	HPR230Ø17H7MC1G-HP421	30710482
18,00	12	60	45	6	HPR230Ø18H7MC1G-HP421	30710483

Dimensions in mm.

Cutting data recommendation from page 436.

For related HFS replaceable head holders see page 308.

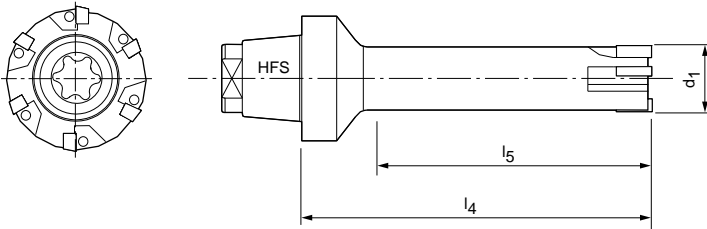
Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "HPR replaceable head reamers".

HPR230

Finely adjustable design

Design:

Reamer diameter: 7.00 - 18.00 mm
 Lead: MC1G
 Cutting material: CP134



Dimensions				z	Specification	Order No.
d ₁	HFS size	l ₄	l ₅			
7,00	12	60	45	4	HPR230Ø7H7MC1G-CP134	30795465
8,00	12	60	45	4	HPR230Ø8H7MC1G-CP134	30795466
9,00	12	60	45	4	HPR230Ø9H7MC1G-CP134	30795467
10,00	12	60	45	6	HPR230Ø10H7MC1G-CP134	30795468
11,00	12	60	45	6	HPR230Ø11H7MC1G-CP134	30795469
12,00	12	60	45	6	HPR230Ø12H7MC1G-CP134	30266011
13,00	12	60	45	6	HPR230Ø13H7MC1G-CP134	30795470
14,00	12	60	45	6	HPR230Ø14H7MC1G-CP134	30795471
15,00	12	60	45	6	HPR230Ø15H7MC1G-CP134	30795472
16,00	12	60	45	6	HPR230Ø16H7MC1G-CP134	30795473
17,00	12	60	45	6	HPR230Ø17H7MC1G-CP134	30795474
18,00	12	60	45	6	HPR230Ø18H7MC1G-CP134	30795475

Dimensions in mm.

Cutting data recommendation from page 436.

For related HFS replaceable head holders see page 308.

Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "HPR replaceable head reamers".

HPR230

Finely adjustable design

Design:

Reamer diameter:

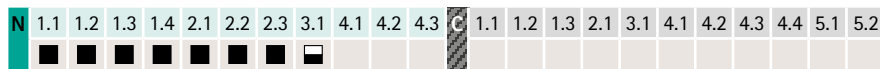
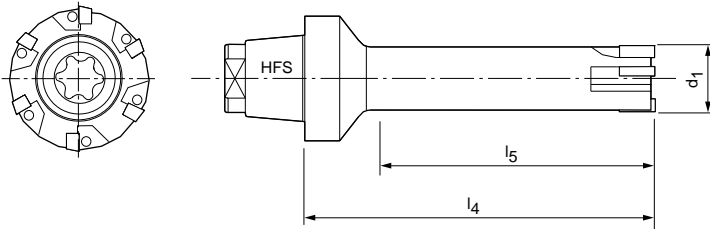
7.00 - 18.00 mm

Lead:

MA0A

Cutting material:

PU620



Dimensions				z	Specification	Order No.
d ₁	HFS size	l ₄	l ₅			
7,00	12	60	45	4	HPR230Ø7H7MA0A-PU620	30710496
8,00	12	60	45	4	HPR230Ø8H7MA0A-PU620	30710497
9,00	12	60	45	4	HPR230Ø9H7MA0A-PU620	30710498
10,00	12	60	45	6	HPR230Ø10H7MA0A-PU620	30710499
11,00	12	60	45	6	HPR230Ø11H7MA0A-PU620	30710500
12,00	12	60	45	6	HPR230Ø12H7MA0A-PU620	30710501
13,00	12	60	45	6	HPR230Ø13H7MA0A-PU620	30710502
14,00	12	60	45	6	HPR230Ø14H7MA0A-PU620	30710503
15,00	12	60	45	6	HPR230Ø15H7MA0A-PU620	30710504
16,00	12	60	45	6	HPR230Ø16H7MA0A-PU620	30710505
17,00	12	60	45	6	HPR230Ø17H7MA0A-PU620	30710506
18,00	12	60	45	6	HPR230Ø18H7MA0A-PU620	30710507

Dimensions in mm.

Cutting data recommendation from page 436.

For related HFS replaceable head holders see page 308.

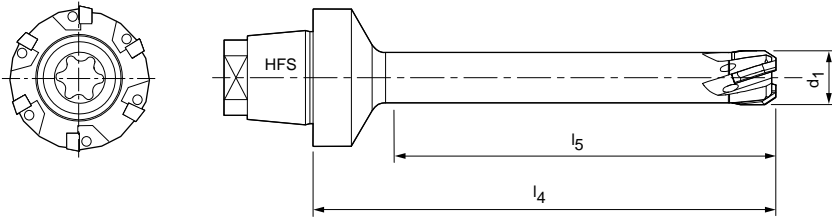
Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "HPR replaceable head reamers".

HPR231

Finely adjustable design

Design:

Reamer diameter: 7.00 - 18.00 mm
 Lead: ME1G
 Cutting material: HP421



Dimensions				z	Specification	Order No.
d_1	HFS size	l_4	l_5			
7,00	12	60	45	4	HPR231Ø7H7ME1G-HP421	30710520
8,00	12	60	45	4	HPR231Ø8H7ME1G-HP421	30473136
9,00	12	60	45	4	HPR231Ø9H7ME1G-HP421	30710521
10,00	12	60	45	6	HPR231Ø10H7ME1G-HP421	30473143
11,00	12	60	45	6	HPR231Ø11H7ME1G-HP421	30710522
12,00	12	60	45	6	HPR231Ø12H7ME1G-HP421	30473144
13,00	12	60	45	6	HPR231Ø13H7ME1G-HP421	30710523
14,00	12	60	45	6	HPR231Ø14H7ME1G-HP421	30710524
15,00	12	60	45	6	HPR231Ø15H7ME1G-HP421	30710525
16,00	12	60	45	6	HPR231Ø16H7ME1G-HP421	30473145
17,00	12	60	45	6	HPR231Ø17H7ME1G-HP421	30710526
18,00	12	60	45	6	HPR231Ø18H7ME1G-HP421	30473146

Dimensions in mm.

Cutting data recommendation from page 436.

For related HFS replaceable head holders see page 308.

Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "HPR replaceable head reamers".

HPR231

Finely adjustable design

Design:

Reamer diameter:

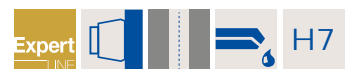
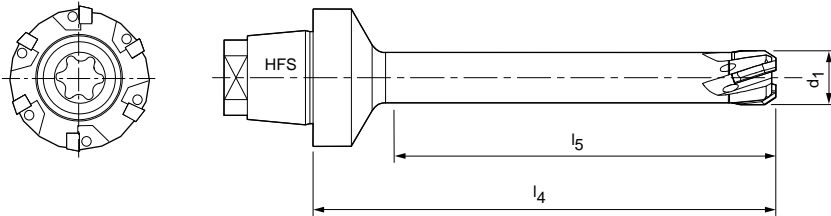
7.00 - 18.00 mm

Lead:

MF1G

Cutting material:

HP421



Dimensions				z	Specification	Order No.
d ₁	HFS size	l ₄	l ₅			
7,00	12	60	45	4	HPR231Ø7H7MF1G-HP421	30710508
8,00	12	60	45	4	HPR231Ø8H7MF1G-HP421	30710509
9,00	12	60	45	4	HPR231Ø9H7MF1G-HP421	30710510
10,00	12	60	45	6	HPR231Ø10H7MF1G-HP421	30710511
11,00	12	60	45	6	HPR231Ø11H7MF1G-HP421	30710512
12,00	12	60	45	6	HPR231Ø12H7MF1G-HP421	30710513
13,00	12	60	45	6	HPR231Ø13H7MF1G-HP421	30710514
14,00	12	60	45	6	HPR231Ø14H7MF1G-HP421	30710515
15,00	12	60	45	6	HPR231Ø15H7MF1G-HP421	30710516
16,00	12	60	45	6	HPR231Ø16H7MF1G-HP421	30710517
17,00	12	60	45	6	HPR231Ø17H7MF1G-HP421	30710518
18,00	12	60	45	6	HPR231Ø18H7MF1G-HP421	30710519

Dimensions in mm.

Cutting data recommendation from page 436.

For related HFS replaceable head holders see page 308.

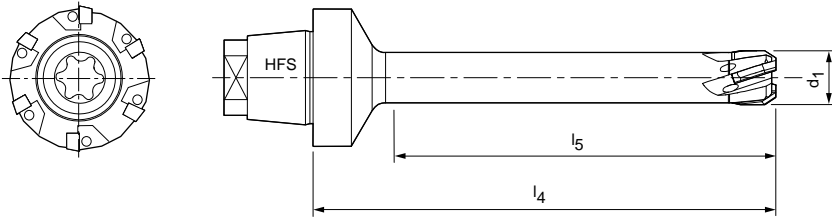
Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "HPR replaceable head reamers".

HPR231

Finely adjustable design

Design:

Reamer diameter: 7.00 - 18.00 mm
 Lead: MF1G
 Cutting material: HP612



Dimensions				z	Specification	Order No.
d_1	HFS size	l_4	l_5			
7,00	12	60	45	4	HPR231Ø7H7MF1G-HP612	30795671
8,00	12	60	45	4	HPR231Ø8H7MF1G-HP612	30795672
9,00	12	60	45	4	HPR231Ø9H7MF1G-HP612	30795673
10,00	12	60	45	6	HPR231Ø10H7MF1G-HP612	30795674
11,00	12	60	45	6	HPR231Ø11H7MF1G-HP612	30795675
12,00	12	60	45	6	HPR231Ø12H7MF1G-HP612	30795676
13,00	12	60	45	6	HPR231Ø13H7MF1G-HP612	30795677
14,00	12	60	45	6	HPR231Ø14H7MF1G-HP612	30795678
15,00	12	60	45	6	HPR231Ø15H7MF1G-HP612	30795679
16,00	12	60	45	6	HPR231Ø16H7MF1G-HP612	30795680
17,00	12	60	45	6	HPR231Ø17H7MF1G-HP612	30795681
18,00	12	60	45	6	HPR231Ø18H7MF1G-HP612	30795682

Dimensions in mm.

Cutting data recommendation from page 436.

For related HFS replaceable head holders see page 308.

Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "HPR replaceable head reamers".

HPR231

Finely adjustable design

Design:

Reamer diameter:

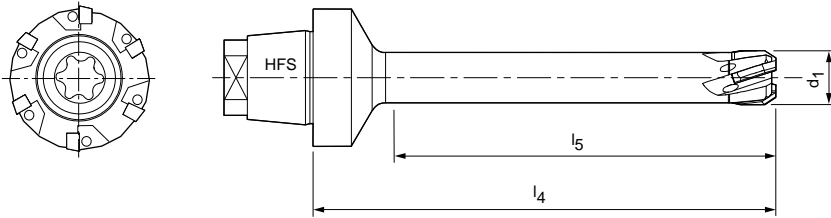
7.00 - 18.00 mm

Lead:

ME1G

Cutting material:

CU134



Dimensions				z	Specification	Order No.
d ₁	HFS size	l ₄	l ₅			
7,00	12	60	45	4	HPR231Ø7H7ME1G-CU134	30710527
8,00	12	60	45	4	HPR231Ø8H7ME1G-CU134	30710528
9,00	12	60	45	4	HPR231Ø9H7ME1G-CU134	30710529
10,00	12	60	45	6	HPR231Ø10H7ME1G-CU134	30094371
11,00	12	60	45	6	HPR231Ø11H7ME1G-CU134	30710530
12,00	12	60	45	6	HPR231Ø12H7ME1G-CU134	30710531
13,00	12	60	45	6	HPR231Ø13H7ME1G-CU134	30710532
14,00	12	60	45	6	HPR231Ø14H7ME1G-CU134	30710533
15,00	12	60	45	6	HPR231Ø15H7ME1G-CU134	30250083
16,00	12	60	45	6	HPR231Ø16H7ME1G-CU134	30710534
17,00	12	60	45	6	HPR231Ø17H7ME1G-CU134	30710535
18,00	12	60	45	6	HPR231Ø18H7ME1G-CU134	30710536

Dimensions in mm.

Cutting data recommendation from page 436.

For related HFS replaceable head holders see page 308.

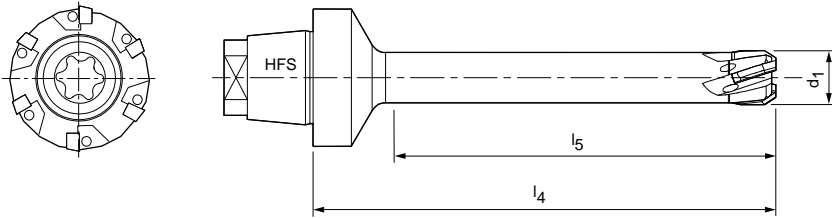
Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "HPR replaceable head reamers".

HPR231

Finely adjustable design

Design:

Reamer diameter: 7.00 - 18.00 mm
 Lead: ME1G
 Cutting material: CP134



Dimensions				z	Specification	Order No.
d ₁	HFS size	l ₄	l ₅			
7,00	12	60	45	4	HPR231Ø7H7ME1G-CP134	30795476
8,00	12	60	45	4	HPR231Ø8H7ME1G-CP134	30334247
9,00	12	60	45	4	HPR231Ø9H7ME1G-CP134	30795477
10,00	12	60	45	6	HPR231Ø10H7ME1G-CP134	30795478
11,00	12	60	45	6	HPR231Ø11H7ME1G-CP134	30795479
12,00	12	60	45	6	HPR231Ø12H7ME1G-CP134	30334242
13,00	12	60	45	6	HPR231Ø13H7ME1G-CP134	30795480
14,00	12	60	45	6	HPR231Ø14H7ME1G-CP134	30795481
15,00	12	60	45	6	HPR231Ø15H7ME1G-CP134	30334243
16,00	12	60	45	6	HPR231Ø16H7ME1G-CP134	30334245
17,00	12	60	45	6	HPR231Ø17H7ME1G-CP134	30795482
18,00	12	60	45	6	HPR231Ø18H7ME1G-CP134	30334246

Dimensions in mm.

Cutting data recommendation from page 436.

For related HFS replaceable head holders see page 308.

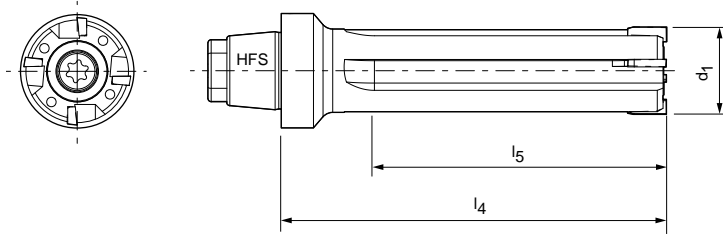
Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "HPR replaceable head reamers".

HPR280

Finely adjustable design

Design:

Reamer diameter: 7.00 - 21.00 mm
 Lead: MC1G
 Cutting material: HP421



Dimensions				z	Specification	Order No.
d ₁	HFS size	l ₄	l ₅			
7,00	12	60	40	4	HPR280Ø7H7MC1G-HP421	30795698
8,00	12	60	40	4	HPR280Ø8H7MC1G-HP421	30795699
9,00	12	60	40	4	HPR280Ø9H7MC1G-HP421	30795700
10,00	12	60	40	4	HPR280Ø10H7MC1G-HP421	30795701
11,00	12	60	40	4	HPR280Ø11H7MC1G-HP421	30795702
12,00	12	60	40	4	HPR280Ø12H7MC1G-HP421	30795703
13,00	12	60	40	4	HPR280Ø13H7MC1G-HP421	30795704
14,00	12	60	40	4	HPR280Ø14H7MC1G-HP421	30795705
15,00	12	60	40	6	HPR280Ø15H7MC1G-HP421	30795706
16,00	12	60	40	6	HPR280Ø16H7MC1G-HP421	30795707
17,00	12	60	40	6	HPR280Ø17H7MC1G-HP421	30795708
18,00	12	60	40	6	HPR280Ø18H7MC1G-HP421	30795709
19,00	12	60	40	6	HPR280Ø19H7MC1G-HP421	30795710
20,00	12	60	40	6	HPR280Ø20H7MC1G-HP421	30795711
21,00	12	60	40	6	HPR280Ø21H7MC1G-HP421	30795712

Dimensions in mm.

Cutting data recommendation from page 436.

For related HFS replaceable head holders see page 308.

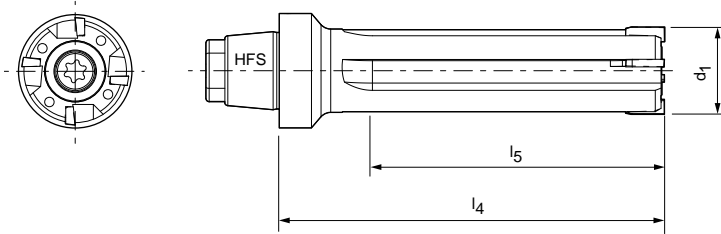
Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "HPR replaceable head reamers".

HPR280

Finely adjustable design

Design:

Reamer diameter: 7.00 - 21.00 mm
 Lead: ML2G
 Cutting material: HP421



Dimensions				z	Specification	Order No.
d_1	HFS size	l_4	l_5			
7,00	12	60	40	4	HPR28007H7ML2G-HP421	30710552
8,00	12	60	40	4	HPR28008H7ML2G-HP421	30710553
9,00	12	60	40	4	HPR28009H7ML2G-HP421	30710554
10,00	12	60	40	4	HPR280010H7ML2G-HP421	30710555
11,00	12	60	40	4	HPR280011H7ML2G-HP421	30710556
12,00	12	60	40	4	HPR280012H7ML2G-HP421	30710557
13,00	12	60	40	4	HPR280013H7ML2G-HP421	30710558
14,00	12	60	40	4	HPR280014H7ML2G-HP421	30710559
15,00	12	60	40	6	HPR280015H7ML2G-HP421	30710560
16,00	12	60	40	6	HPR280016H7ML2G-HP421	30710561
17,00	12	60	40	6	HPR280017H7ML2G-HP421	30710562
18,00	12	60	40	6	HPR280018H7ML2G-HP421	30710563
19,00	12	60	40	6	HPR280019H7ML2G-HP421	30710564
20,00	12	60	40	6	HPR280020H7ML2G-HP421	30710565
21,00	12	60	40	6	HPR280021H7ML2G-HP421	30710566

Dimensions in mm.

Cutting data recommendation from page 436.

For related HFS replaceable head holders see page 308.

Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "HPR replaceable head reamers".

HPR280

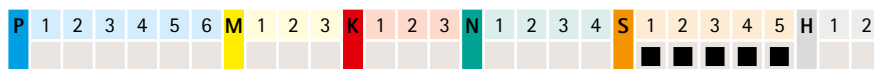
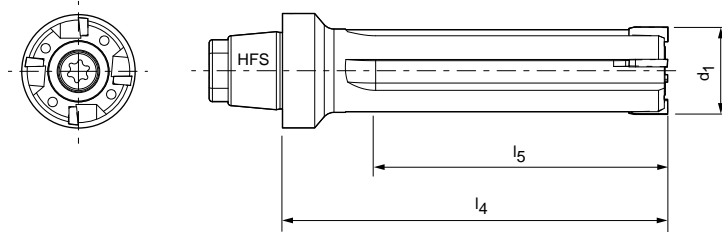
Finely adjustable design

Design:

Reamer diameter: 7.00 - 21.00 mm

Lead: M02G

Cutting material: HP612



Dimensions				z	Specification	Order No.
d ₁	HFS size	l ₄	l ₅			
7,00	12	60	40	4	HPR280Ø7H7M02G-HP612	30795683
8,00	12	60	40	4	HPR280Ø8H7M02G-HP612	30795684
9,00	12	60	40	4	HPR280Ø9H7M02G-HP612	30795685
10,00	12	60	40	4	HPR280Ø10H7M02G-HP612	30795686
11,00	12	60	40	4	HPR280Ø11H7M02G-HP612	30795687
12,00	12	60	40	4	HPR280Ø12H7M02G-HP612	30795688
13,00	12	60	40	4	HPR280Ø13H7M02G-HP612	30795689
14,00	12	60	40	4	HPR280Ø14H7M02G-HP612	30795690
15,00	12	60	40	6	HPR280Ø15H7M02G-HP612	30795691
16,00	12	60	40	6	HPR280Ø16H7M02G-HP612	30795692
17,00	12	60	40	6	HPR280Ø17H7M02G-HP612	30795693
18,00	12	60	40	6	HPR280Ø18H7M02G-HP612	30795694
19,00	12	60	40	6	HPR280Ø19H7M02G-HP612	30795695
20,00	12	60	40	6	HPR280Ø20H7M02G-HP612	30795696
21,00	12	60	40	6	HPR280Ø21H7M02G-HP612	30795697

Dimensions in mm.

Cutting data recommendation from page 436.

For related HFS replaceable head holders see page 308.

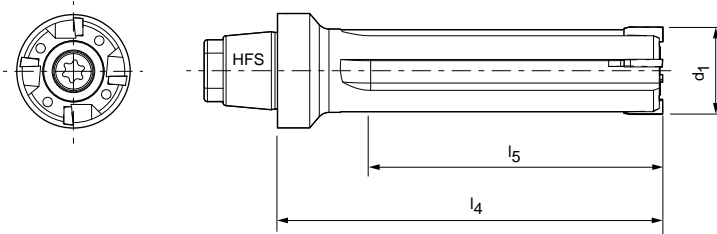
Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "HPR replaceable head reamers".

HPR280

Finely adjustable design

Design:

Reamer diameter: 7.00 - 21.00 mm
 Lead: ML2G
 Cutting material: CU134



Dimensions				z	Specification	Order No.
d ₁	HFS size	l ₄	l ₅			
7,00	12	60	40	4	HPR280Ø7H7ML2G-CU134	30710537
8,00	12	60	40	4	HPR280Ø8H7ML2G-CU134	30710538
9,00	12	60	40	4	HPR280Ø9H7ML2G-CU134	30710539
10,00	12	60	40	4	HPR280Ø10H7ML2G-CU134	30710540
11,00	12	60	40	4	HPR280Ø11H7ML2G-CU134	30710541
12,00	12	60	40	4	HPR280Ø12H7ML2G-CU134	30710542
13,00	12	60	40	4	HPR280Ø13H7ML2G-CU134	30710543
14,00	12	60	40	4	HPR280Ø14H7ML2G-CU134	30710544
15,00	12	60	40	6	HPR280Ø15H7ML2G-CU134	30710545
16,00	12	60	40	6	HPR280Ø16H7ML2G-CU134	30710546
17,00	12	60	40	6	HPR280Ø17H7ML2G-CU134	30710547
18,00	12	60	40	6	HPR280Ø18H7ML2G-CU134	30710548
19,00	12	60	40	6	HPR280Ø19H7ML2G-CU134	30710549
20,00	12	60	40	6	HPR280Ø20H7ML2G-CU134	30710550
21,00	12	60	40	6	HPR280Ø21H7ML2G-CU134	30710551

Dimensions in mm.

Cutting data recommendation from page 436.

For related HFS replaceable head holders see page 308.

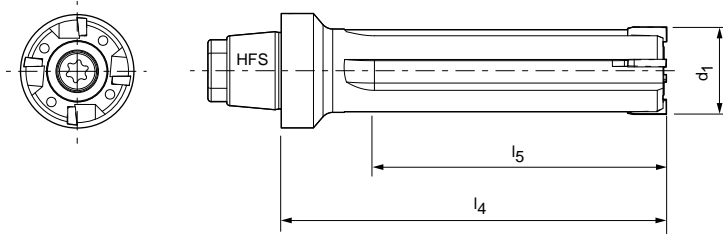
Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "HPR replaceable head reamers".

HPR280

Finely adjustable design

Design:

Reamer diameter: 7.00 - 21.00 mm
 Lead: MC1G
 Cutting material: CP134



Dimensions				z	Specification	Order No.
d ₁	HFS size	l ₄	l ₅			
7,00	12	60	40	4	HPR280Ø7H7MC1G-CP134	30795498
8,00	12	60	40	4	HPR280Ø8H7MC1G-CP134	30795499
9,00	12	60	40	4	HPR280Ø9H7MC1G-CP134	30795500
10,00	12	60	40	4	HPR280Ø10H7MC1G-CP134	30795501
11,00	12	60	40	4	HPR280Ø11H7MC1G-CP134	30795502
12,00	12	60	40	4	HPR280Ø12H7MC1G-CP134	30795503
13,00	12	60	40	4	HPR280Ø13H7MC1G-CP134	30795504
14,00	12	60	40	4	HPR280Ø14H7MC1G-CP134	30795505
15,00	12	60	40	6	HPR280Ø15H7MC1G-CP134	30795506
16,00	12	60	40	6	HPR280Ø16H7MC1G-CP134	30795507
17,00	12	60	40	6	HPR280Ø17H7MC1G-CP134	30795508
18,00	12	60	40	6	HPR280Ø18H7MC1G-CP134	30795509
19,00	12	60	40	6	HPR280Ø19H7MC1G-CP134	30795510
20,00	12	60	40	6	HPR280Ø20H7MC1G-CP134	30795511
21,00	12	60	40	6	HPR280Ø21H7MC1G-CP134	30795512

Dimensions in mm.

Cutting data recommendation from page 436.

For related HFS replaceable head holders see page 308.

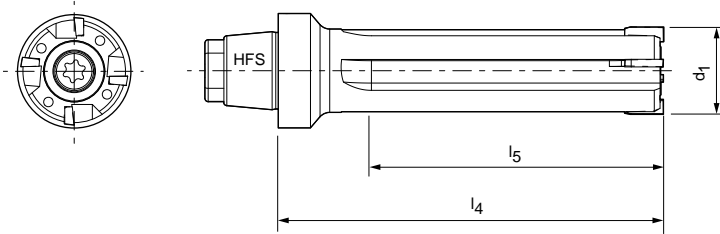
Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "HPR replaceable head reamers".

HPR280

Finely adjustable design

Design:

Reamer diameter: 7.00 - 21.00 mm
 Lead: ML2G
 Cutting material: CP134



Dimensions				z	Specification	Order No.
d ₁	HFS size	l ₄	l ₅			
7,00	12	60	40	4	HPR28007H7ML2G-CP134	30795483
8,00	12	60	40	4	HPR28008H7ML2G-CP134	30795484
9,00	12	60	40	4	HPR28009H7ML2G-CP134	30795485
10,00	12	60	40	4	HPR280010H7ML2G-CP134	30795486
11,00	12	60	40	4	HPR280011H7ML2G-CP134	30795487
12,00	12	60	40	4	HPR280012H7ML2G-CP134	30795488
13,00	12	60	40	4	HPR280013H7ML2G-CP134	30795489
14,00	12	60	40	4	HPR280014H7ML2G-CP134	30795490
15,00	12	60	40	6	HPR280015H7ML2G-CP134	30795491
16,00	12	60	40	6	HPR280016H7ML2G-CP134	30795492
17,00	12	60	40	6	HPR280017H7ML2G-CP134	30795493
18,00	12	60	40	6	HPR280018H7ML2G-CP134	30795494
19,00	12	60	40	6	HPR280019H7ML2G-CP134	30795495
20,00	12	60	40	6	HPR280020H7ML2G-CP134	30795496
21,00	12	60	40	6	HPR280021H7ML2G-CP134	30795497

Dimensions in mm.

Cutting data recommendation from page 436.

For related HFS replaceable head holders see page 308.

Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "HPR replaceable head reamers".

HPR280

Finely adjustable design

Design:

Reamer diameter:

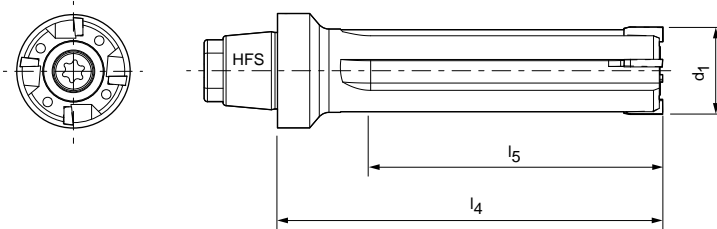
7.00 - 21.00 mm

Lead:

MA0A

Cutting material:

PU620



Dimensions				z	Specification	Order No.
d ₁	HFS size	l ₄	l ₅			
7,00	12	60	40	4	HPR280Ø7H7MA0A-PU620	30710567
8,00	12	60	40	4	HPR280Ø8H7MA0A-PU620	30710568
9,00	12	60	40	4	HPR280Ø9H7MA0A-PU620	30710569
10,00	12	60	40	4	HPR280Ø10H7MA0A-PU620	30710570
11,00	12	60	40	4	HPR280Ø11H7MA0A-PU620	30710571
12,00	12	60	40	4	HPR280Ø12H7MA0A-PU620	30710572
13,00	12	60	40	4	HPR280Ø13H7MA0A-PU620	30710573
14,00	12	60	40	4	HPR280Ø14H7MA0A-PU620	30710574
15,00	12	60	40	6	HPR280Ø15H7MA0A-PU620	30710575
16,00	12	60	40	6	HPR280Ø16H7MA0A-PU620	30710576
17,00	12	60	40	6	HPR280Ø17H7MA0A-PU620	30710577
18,00	12	60	40	6	HPR280Ø18H7MA0A-PU620	30710578
19,00	12	60	40	6	HPR280Ø19H7MA0A-PU620	30710579
20,00	12	60	40	6	HPR280Ø20H7MA0A-PU620	30710580
21,00	12	60	40	6	HPR280Ø21H7MA0A-PU620	30710581

Dimensions in mm.

Cutting data recommendation from page 436.

For related HFS replaceable head holders see page 308.

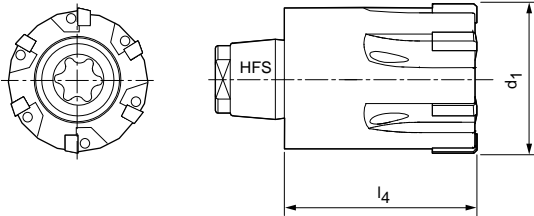
Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "HPR replaceable head reamers".

HPR200

Finely adjustable design

Design:

Reamer diameter: 19.00 - 65.00 mm
 Lead: MC1G
 Cutting material: HP421



Dimensions			z	Specification	Order No.
d ₁	HFS size	l ₄			
19,00	12	25	6	HPR200Ø19H7MC1G-HP421	30710582
20,00	12	25	6	HPR200Ø20H7MC1G-HP421	30412023
21,00	12	27	6	HPR200Ø21H7MC1G-HP421	30710583
22,00	14	27	6	HPR200Ø22H7MC1G-HP421	30710584
23,00	14	27	6	HPR200Ø23H7MC1G-HP421	30710585
24,00	16	35	6	HPR200Ø24H7MC1G-HP421	30267608
25,00	16	35	6	HPR200Ø25H7MC1G-HP421	30710586
26,00	16	35	6	HPR200Ø26H7MC1G-HP421	30710587
27,00	16	35	6	HPR200Ø27H7MC1G-HP421	30275918
28,00	16	35	6	HPR200Ø28H7MC1G-HP421	30267609
29,00	16	35	6	HPR200Ø29H7MC1G-HP421	30710588
30,00	20	41	8	HPR200Ø30H7MC1G-HP421	30710589
31,00	20	41	8	HPR200Ø31H7MC1G-HP421	30710590
32,00	20	41	8	HPR200Ø32H7MC1G-HP421	30267610
33,00	20	41	8	HPR200Ø33H7MC1G-HP421	30710591
34,00	20	41	8	HPR200Ø34H7MC1G-HP421	30710592
35,00	20	41	8	HPR200Ø35H7MC1G-HP421	30372733
36,00	20	41	8	HPR200Ø36H7MC1G-HP421	30710593
37,00	20	41	8	HPR200Ø37H7MC1G-HP421	30710594
38,00	20	41	8	HPR200Ø38H7MC1G-HP421	30710595
39,00	20	41	8	HPR200Ø39H7MC1G-HP421	30710596
40,00	24	47	8	HPR200Ø40H7MC1G-HP421	30710597
41,00	24	47	8	HPR200Ø41H7MC1G-HP421	30710598
42,00	24	47	8	HPR200Ø42H7MC1G-HP421	30710599
43,00	24	47	8	HPR200Ø43H7MC1G-HP421	30710600
44,00	24	47	8	HPR200Ø44H7MC1G-HP421	30710601
45,00	24	47	8	HPR200Ø45H7MC1G-HP421	30710602
46,00	24	47	8	HPR200Ø46H7MC1G-HP421	30710603
47,00	24	47	8	HPR200Ø47H7MC1G-HP421	30710604
48,00	24	47	8	HPR200Ø48H7MC1G-HP421	30710605
49,00	24	47	8	HPR200Ø49H7MC1G-HP421	30710606
50,00	24	47	8	HPR200Ø50H7MC1G-HP421	30710607
51,00	24	47	8	HPR200Ø51H7MC1G-HP421	30710608
52,00	24	47	8	HPR200Ø52H7MC1G-HP421	30710609
53,00	24	47	8	HPR200Ø53H7MC1G-HP421	30710610
54,00	24	47	8	HPR200Ø54H7MC1G-HP421	30710611
55,00	24	47	8	HPR200Ø55H7MC1G-HP421	30710612
56,00	24	47	8	HPR200Ø56H7MC1G-HP421	30710613
57,00	24	47	8	HPR200Ø57H7MC1G-HP421	30710614

HPR200 | Finely adjustable design

Dimensions			z	Specification	Order No.
d ₁	HFS size	l ₄			
58,00	24	47	8	HPR200Ø58H7MC1G-HP421	30710615
59,00	24	47	8	HPR200Ø59H7MC1G-HP421	30710616
60,00	24	47	8	HPR200Ø60H7MC1G-HP421	30710617
61,00	24	47	8	HPR200Ø61H7MC1G-HP421	30710618
62,00	24	47	8	HPR200Ø62H7MC1G-HP421	30710619
63,00	24	47	8	HPR200Ø63H7MC1G-HP421	30710620
64,00	24	47	8	HPR200Ø64H7MC1G-HP421	30710621
65,00	24	47	8	HPR200Ø65H7MC1G-HP421	30710622

Dimensions in mm.

Cutting data recommendation from page 436.

For related HFS replaceable head holders see page 308.

Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "HPR replaceable head reamers".

HPR200

Finely adjustable design

Design:

Reamer diameter:

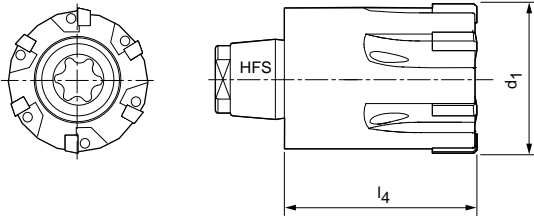
19.00 - 65.00 mm

Lead:

MC1G

Cutting material:

CP134



Dimensions			z	Specification	Order No.
d ₁	HFS size	l ₄			
19,00	12	25	6	HPR200Ø19H7MC1G-CP134	30795513
20,00	12	25	6	HPR200Ø20H7MC1G-CP134	30795514
21,00	12	27	6	HPR200Ø21H7MC1G-CP134	30795515
22,00	14	27	6	HPR200Ø22H7MC1G-CP134	30795516
23,00	14	27	6	HPR200Ø23H7MC1G-CP134	30795517
24,00	16	35	6	HPR200Ø24H7MC1G-CP134	30795518
25,00	16	35	6	HPR200Ø25H7MC1G-CP134	30795519
26,00	16	35	6	HPR200Ø26H7MC1G-CP134	30795520
27,00	16	35	6	HPR200Ø27H7MC1G-CP134	30795521
28,00	16	35	6	HPR200Ø28H7MC1G-CP134	30795522
29,00	16	35	6	HPR200Ø29H7MC1G-CP134	30795523
30,00	20	41	8	HPR200Ø30H7MC1G-CP134	30795524
31,00	20	41	8	HPR200Ø31H7MC1G-CP134	30795525
32,00	20	41	8	HPR200Ø32H7MC1G-CP134	30795526
33,00	20	41	8	HPR200Ø33H7MC1G-CP134	30795527
34,00	20	41	8	HPR200Ø34H7MC1G-CP134	30795528
35,00	20	41	8	HPR200Ø35H7MC1G-CP134	30795529
36,00	20	41	8	HPR200Ø36H7MC1G-CP134	30795530
37,00	20	41	8	HPR200Ø37H7MC1G-CP134	30795531
38,00	20	41	8	HPR200Ø38H7MC1G-CP134	30795532
39,00	20	41	8	HPR200Ø39H7MC1G-CP134	30795533
40,00	24	47	8	HPR200Ø40H7MC1G-CP134	30795534
41,00	24	47	8	HPR200Ø41H7MC1G-CP134	30795535
42,00	24	47	8	HPR200Ø42H7MC1G-CP134	30795536
43,00	24	47	8	HPR200Ø43H7MC1G-CP134	30795537
44,00	24	47	8	HPR200Ø44H7MC1G-CP134	30795538
45,00	24	47	8	HPR200Ø45H7MC1G-CP134	30795539
46,00	24	47	8	HPR200Ø46H7MC1G-CP134	30795540
47,00	24	47	8	HPR200Ø47H7MC1G-CP134	30795541
48,00	24	47	8	HPR200Ø48H7MC1G-CP134	30795542
49,00	24	47	8	HPR200Ø49H7MC1G-CP134	30795543
50,00	24	47	8	HPR200Ø50H7MC1G-CP134	30795544
51,00	24	47	8	HPR200Ø51H7MC1G-CP134	30795545
52,00	24	47	8	HPR200Ø52H7MC1G-CP134	30795546
53,00	24	47	8	HPR200Ø53H7MC1G-CP134	30795547
54,00	24	47	8	HPR200Ø54H7MC1G-CP134	30795548
55,00	24	47	8	HPR200Ø55H7MC1G-CP134	30795549
56,00	24	47	8	HPR200Ø56H7MC1G-CP134	30795550
57,00	24	47	8	HPR200Ø57H7MC1G-CP134	30795551

HPR200 | Finely adjustable design

Dimensions			z	Specification	Order No.
d ₁	HFS size	l ₄			
58,00	24	47	8	HPR200Ø58H7MC1G-CP134	30795552
59,00	24	47	8	HPR200Ø59H7MC1G-CP134	30795553
60,00	24	47	8	HPR200Ø60H7MC1G-CP134	30795554
61,00	24	47	8	HPR200Ø61H7MC1G-CP134	30795555
62,00	24	47	8	HPR200Ø62H7MC1G-CP134	30795556
63,00	24	47	8	HPR200Ø63H7MC1G-CP134	30795557
64,00	24	47	8	HPR200Ø64H7MC1G-CP134	30795558
65,00	24	47	8	HPR200Ø65H7MC1G-CP134	30795559

Dimensions in mm.

Cutting data recommendation from page 436.

For related HFS replaceable head holders see page 308.

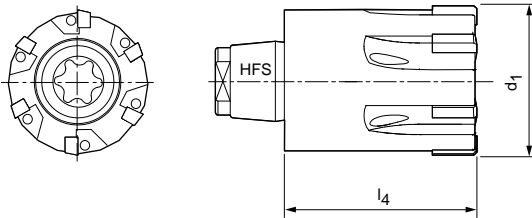
Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "HPR replaceable head reamers".

HPR200

Finely adjustable design

Design:

Reamer diameter: 19.00 - 65.00 mm
 Lead: MA0A
 Cutting material: PU620



Dimensions			z	Specification	Order No.
d ₁	HFS size	l ₄			
19,00	12	25	6	HPR200Ø19H7MA0A-PU620	30796177
20,00	12	25	6	HPR200Ø20H7MA0A-PU620	30482729
21,00	12	27	6	HPR200Ø21H7MA0A-PU620	30796178
22,00	14	27	6	HPR200Ø22H7MA0A-PU620	30305109
23,00	14	27	6	HPR200Ø23H7MA0A-PU620	30796179
24,00	16	35	6	HPR200Ø24H7MA0A-PU620	30796180
25,00	16	35	6	HPR200Ø25H7MA0A-PU620	30796181
26,00	16	35	6	HPR200Ø26H7MA0A-PU620	30796182
27,00	16	35	6	HPR200Ø27H7MA0A-PU620	30796183
28,00	16	35	6	HPR200Ø28H7MA0A-PU620	30796184
29,00	16	35	6	HPR200Ø29H7MA0A-PU620	30796185
30,00	20	41	8	HPR200Ø30H7MA0A-PU620	30393218
31,00	20	41	8	HPR200Ø31H7MA0A-PU620	30796186
32,00	20	41	8	HPR200Ø32H7MA0A-PU620	30796187
33,00	20	41	8	HPR200Ø33H7MA0A-PU620	30796188
34,00	20	41	8	HPR200Ø34H7MA0A-PU620	30796189
35,00	20	41	8	HPR200Ø35H7MA0A-PU620	30796190
36,00	20	41	8	HPR200Ø36H7MA0A-PU620	30796191
37,00	20	41	8	HPR200Ø37H7MA0A-PU620	30796192
38,00	20	41	8	HPR200Ø38H7MA0A-PU620	30796193
39,00	20	41	8	HPR200Ø39H7MA0A-PU620	30796194
40,00	24	47	8	HPR200Ø40H7MA0A-PU620	30796195
41,00	24	47	8	HPR200Ø41H7MA0A-PU620	30796197
42,00	24	47	8	HPR200Ø42H7MA0A-PU620	30796198
43,00	24	47	8	HPR200Ø43H7MA0A-PU620	30796199
44,00	24	47	8	HPR200Ø44H7MA0A-PU620	30796200
45,00	24	47	8	HPR200Ø45H7MA0A-PU620	30796201
46,00	24	47	8	HPR200Ø46H7MA0A-PU620	30796202
47,00	24	47	8	HPR200Ø47H7MA0A-PU620	30796203
48,00	24	47	8	HPR200Ø48H7MA0A-PU620	30796204
49,00	24	47	8	HPR200Ø49H7MA0A-PU620	30796205
50,00	24	47	8	HPR200Ø50H7MA0A-PU620	30796206
51,00	24	47	8	HPR200Ø51H7MA0A-PU620	30796207
52,00	24	47	8	HPR200Ø52H7MA0A-PU620	30796208
53,00	24	47	8	HPR200Ø53H7MA0A-PU620	30796209
54,00	24	47	8	HPR200Ø54H7MA0A-PU620	30796210
55,00	24	47	8	HPR200Ø55H7MA0A-PU620	30796211
56,00	24	47	8	HPR200Ø56H7MA0A-PU620	30796212
57,00	24	47	8	HPR200Ø57H7MA0A-PU620	30796213

HPR200 | Finely adjustable design

Dimensions			z	Specification	Order No.
d ₁	HFS size	l ₄			
58,00	24	47	8	HPR200Ø58H7MA0A-PU620	30796214
59,00	24	47	8	HPR200Ø59H7MA0A-PU620	30796215
60,00	24	47	8	HPR200Ø60H7MA0A-PU620	30796216
61,00	24	47	8	HPR200Ø61H7MA0A-PU620	30796217
62,00	24	47	8	HPR200Ø62H7MA0A-PU620	30796218
63,00	24	47	8	HPR200Ø63H7MA0A-PU620	30796219
64,00	24	47	8	HPR200Ø64H7MA0A-PU620	30796220
65,00	24	47	8	HPR200Ø65H7MA0A-PU620	30796221

Dimensions in mm.

Cutting data recommendation from page 436.

For related HFS replaceable head holders see page 308.

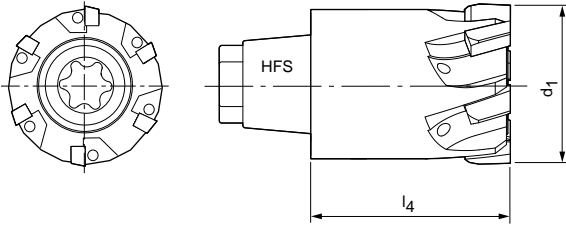
Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "HPR replaceable head reamers".

HPR210

Finely adjustable design

Design:

Reamer diameter: 19.00 - 65.00 mm
 Lead: ME1G
 Cutting material: HP421



Dimensions			z	Specification	Order No.
d ₁	HFS size	l ₄			
19,00	12	25	6	HPR210Ø19H7ME1G-HP421	30710711
20,00	12	25	6	HPR210Ø20H7ME1G-HP421	30473147
21,00	12	27	6	HPR210Ø21H7ME1G-HP421	30710712
22,00	14	27	6	HPR210Ø22H7ME1G-HP421	30473148
23,00	14	27	6	HPR210Ø23H7ME1G-HP421	30710713
24,00	16	35	6	HPR210Ø24H7ME1G-HP421	30710714
25,00	16	35	6	HPR210Ø25H7ME1G-HP421	30473149
26,00	16	35	6	HPR210Ø26H7ME1G-HP421	30710715
27,00	16	35	6	HPR210Ø27H7ME1G-HP421	30710716
28,00	16	35	6	HPR210Ø28H7ME1G-HP421	30710717
29,00	16	35	6	HPR210Ø29H7ME1G-HP421	30710718
30,00	20	41	8	HPR210Ø30H7ME1G-HP421	30473150
31,00	20	41	8	HPR210Ø31H7ME1G-HP421	30710719
32,00	20	41	8	HPR210Ø32H7ME1G-HP421	30710720
33,00	20	41	8	HPR210Ø33H7ME1G-HP421	30710721
34,00	20	41	8	HPR210Ø34H7ME1G-HP421	30710722
35,00	20	41	8	HPR210Ø35H7ME1G-HP421	30473152
36,00	20	41	8	HPR210Ø36H7ME1G-HP421	30710723
37,00	20	41	8	HPR210Ø37H7ME1G-HP421	30473153
38,00	20	41	8	HPR210Ø38H7ME1G-HP421	30710724
39,00	20	41	8	HPR210Ø39H7ME1G-HP421	30710725
40,00	24	47	8	HPR210Ø40H7ME1G-HP421	30473154
41,00	24	47	8	HPR210Ø41H7ME1G-HP421	30710726
42,00	24	47	8	HPR210Ø42H7ME1G-HP421	30473155
43,00	24	47	8	HPR210Ø43H7ME1G-HP421	30710727
44,00	24	47	8	HPR210Ø44H7ME1G-HP421	30710728
45,00	24	47	8	HPR210Ø45H7ME1G-HP421	30473157
46,00	24	47	8	HPR210Ø46H7ME1G-HP421	30710729
47,00	24	47	8	HPR210Ø47H7ME1G-HP421	30710730
48,00	24	47	8	HPR210Ø48H7ME1G-HP421	30710731
49,00	24	47	8	HPR210Ø49H7ME1G-HP421	30710732
50,00	24	47	8	HPR210Ø50H7ME1G-HP421	30473158
51,00	24	47	8	HPR210Ø51H7ME1G-HP421	30710733
52,00	24	47	8	HPR210Ø52H7ME1G-HP421	30473160
53,00	24	47	8	HPR210Ø53H7ME1G-HP421	30710734
54,00	24	47	8	HPR210Ø54H7ME1G-HP421	30710735
55,00	24	47	8	HPR210Ø55H7ME1G-HP421	30473161
56,00	24	47	8	HPR210Ø56H7ME1G-HP421	30710736
57,00	24	47	8	HPR210Ø57H7ME1G-HP421	30710737

HPR210 | Finely adjustable design

Dimensions			z	Specification	Order No.
d ₁	HFS size	l ₄			
58,00	24	47	8	HPR210Ø58H7ME1G-HP421	30710738
59,00	24	47	8	HPR210Ø59H7ME1G-HP421	30710739
60,00	24	47	8	HPR210Ø60H7ME1G-HP421	30710740
61,00	24	47	8	HPR210Ø61H7ME1G-HP421	30710741
62,00	24	47	8	HPR210Ø62H7ME1G-HP421	30473162
63,00	24	47	8	HPR210Ø63H7ME1G-HP421	30710742
64,00	24	47	8	HPR210Ø64H7ME1G-HP421	30710743
65,00	24	47	8	HPR210Ø65H7ME1G-HP421	30710744

Dimensions in mm.

Cutting data recommendation from page 436.

For related HFS replaceable head holders see page 308.

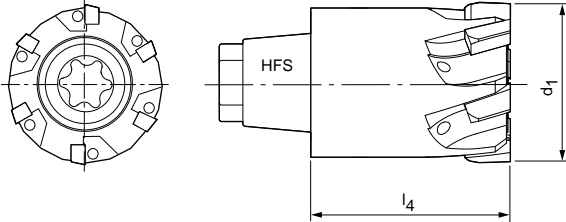
Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "HPR replaceable head reamers".

HPR210

Finely adjustable design

Design:

Reamer diameter: 19.00 - 65.00 mm
 Lead: MF1G
 Cutting material: HP421



Dimensions			z	Specification	Order No.
d ₁	HFS size	l ₄			
19,00	12	25	6	HPR210Ø19H7MF1G-HP421	30710664
20,00	12	25	6	HPR210Ø20H7MF1G-HP421	30710665
21,00	12	27	6	HPR210Ø21H7MF1G-HP421	30710666
22,00	14	27	6	HPR210Ø22H7MF1G-HP421	30710667
23,00	14	27	6	HPR210Ø23H7MF1G-HP421	30710668
24,00	16	35	6	HPR210Ø24H7MF1G-HP421	30710669
25,00	16	35	6	HPR210Ø25H7MF1G-HP421	30710670
26,00	16	35	6	HPR210Ø26H7MF1G-HP421	30710671
27,00	16	35	6	HPR210Ø27H7MF1G-HP421	30710672
28,00	16	35	6	HPR210Ø28H7MF1G-HP421	30710673
29,00	16	35	6	HPR210Ø29H7MF1G-HP421	30710674
30,00	20	41	8	HPR210Ø30H7MF1G-HP421	30710675
31,00	20	41	8	HPR210Ø31H7MF1G-HP421	30710676
32,00	20	41	8	HPR210Ø32H7MF1G-HP421	30710677
33,00	20	41	8	HPR210Ø33H7MF1G-HP421	30710678
34,00	20	41	8	HPR210Ø34H7MF1G-HP421	30710679
35,00	20	41	8	HPR210Ø35H7MF1G-HP421	30710680
36,00	20	41	8	HPR210Ø36H7MF1G-HP421	30710681
37,00	20	41	8	HPR210Ø37H7MF1G-HP421	30710682
38,00	20	41	8	HPR210Ø38H7MF1G-HP421	30710683
39,00	20	41	8	HPR210Ø39H7MF1G-HP421	30710684
40,00	24	47	8	HPR210Ø40H7MF1G-HP421	30710685
41,00	24	47	8	HPR210Ø41H7MF1G-HP421	30710686
42,00	24	47	8	HPR210Ø42H7MF1G-HP421	30710687
43,00	24	47	8	HPR210Ø43H7MF1G-HP421	30710688
44,00	24	47	8	HPR210Ø44H7MF1G-HP421	30710689
45,00	24	47	8	HPR210Ø45H7MF1G-HP421	30710690
46,00	24	47	8	HPR210Ø46H7MF1G-HP421	30710691
47,00	24	47	8	HPR210Ø47H7MF1G-HP421	30710692
48,00	24	47	8	HPR210Ø48H7MF1G-HP421	30710693
49,00	24	47	8	HPR210Ø49H7MF1G-HP421	30710694
50,00	24	47	8	HPR210Ø50H7MF1G-HP421	30710695
51,00	24	47	8	HPR210Ø51H7MF1G-HP421	30710696
52,00	24	47	8	HPR210Ø52H7MF1G-HP421	30710697
53,00	24	47	8	HPR210Ø53H7MF1G-HP421	30710698
54,00	24	47	8	HPR210Ø54H7MF1G-HP421	30710699
55,00	24	47	8	HPR210Ø55H7MF1G-HP421	30710700
56,00	24	47	8	HPR210Ø56H7MF1G-HP421	30710701
57,00	24	47	8	HPR210Ø57H7MF1G-HP421	30710702

HPR210 | Finely adjustable design

Dimensions			z	Specification	Order No.
d ₁	HFS size	l ₄			
58,00	24	47	8	HPR210Ø58H7MF1G-HP421	30710703
59,00	24	47	8	HPR210Ø59H7MF1G-HP421	30710704
60,00	24	47	8	HPR210Ø60H7MF1G-HP421	30710705
61,00	24	47	8	HPR210Ø61H7MF1G-HP421	30710706
62,00	24	47	8	HPR210Ø62H7MF1G-HP421	30710707
63,00	24	47	8	HPR210Ø63H7MF1G-HP421	30710708
64,00	24	47	8	HPR210Ø64H7MF1G-HP421	30710709
65,00	24	47	8	HPR210Ø65H7MF1G-HP421	30710710

Dimensions in mm.

Cutting data recommendation from page 436.

For related HFS replaceable head holders see page 308.

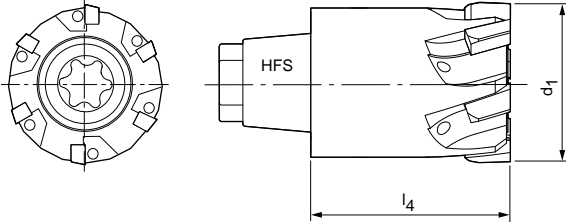
Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "HPR replaceable head reamers".

HPR210

Finely adjustable design

Design:

Reamer diameter: 19.00 - 65.00 mm
 Lead: MF1G
 Cutting material: HP612



Dimensions			z	Specification	Order No.
d ₁	HFS size	l ₄			
19,00	12	25	6	HPR210Ø19H7MF1G-HP612	30795713
20,00	12	25	6	HPR210Ø20H7MF1G-HP612	30795714
21,00	12	27	6	HPR210Ø21H7MF1G-HP612	30795715
22,00	14	27	6	HPR210Ø22H7MF1G-HP612	30795716
23,00	14	27	6	HPR210Ø23H7MF1G-HP612	30795717
24,00	16	35	6	HPR210Ø24H7MF1G-HP612	30795718
25,00	16	35	6	HPR210Ø25H7MF1G-HP612	30795719
26,00	16	35	6	HPR210Ø26H7MF1G-HP612	30795720
27,00	16	35	6	HPR210Ø27H7MF1G-HP612	30795721
28,00	16	35	6	HPR210Ø28H7MF1G-HP612	30795722
29,00	16	35	6	HPR210Ø29H7MF1G-HP612	30795723
30,00	20	41	8	HPR210Ø30H7MF1G-HP612	30795724
31,00	20	41	8	HPR210Ø31H7MF1G-HP612	30795725
32,00	20	41	8	HPR210Ø32H7MF1G-HP612	30795726
33,00	20	41	8	HPR210Ø33H7MF1G-HP612	30795727
34,00	20	41	8	HPR210Ø34H7MF1G-HP612	30795728
35,00	20	41	8	HPR210Ø35H7MF1G-HP612	30795729
36,00	20	41	8	HPR210Ø36H7MF1G-HP612	30795730
37,00	20	41	8	HPR210Ø37H7MF1G-HP612	30795731
38,00	20	41	8	HPR210Ø38H7MF1G-HP612	30795732
39,00	20	41	8	HPR210Ø39H7MF1G-HP612	30795733
40,00	24	47	8	HPR210Ø40H7MF1G-HP612	30795734
41,00	24	47	8	HPR210Ø41H7MF1G-HP612	30795735
42,00	24	47	8	HPR210Ø42H7MF1G-HP612	30795736
43,00	24	47	8	HPR210Ø43H7MF1G-HP612	30795737
44,00	24	47	8	HPR210Ø44H7MF1G-HP612	30795738
45,00	24	47	8	HPR210Ø45H7MF1G-HP612	30795739
46,00	24	47	8	HPR210Ø46H7MF1G-HP612	30795740
47,00	24	47	8	HPR210Ø47H7MF1G-HP612	30795741
48,00	24	47	8	HPR210Ø48H7MF1G-HP612	30795742
49,00	24	47	8	HPR210Ø49H7MF1G-HP612	30795743
50,00	24	47	8	HPR210Ø50H7MF1G-HP612	30795744
51,00	24	47	8	HPR210Ø51H7MF1G-HP612	30795745
52,00	24	47	8	HPR210Ø52H7MF1G-HP612	30795746
53,00	24	47	8	HPR210Ø53H7MF1G-HP612	30795747
54,00	24	47	8	HPR210Ø54H7MF1G-HP612	30795748
55,00	24	47	8	HPR210Ø55H7MF1G-HP612	30795749
56,00	24	47	8	HPR210Ø56H7MF1G-HP612	30795750
57,00	24	47	8	HPR210Ø57H7MF1G-HP612	30795751

HPR210 | Finely adjustable design

Dimensions			z	Specification	Order No.
d ₁	HFS size	l ₄			
58,00	24	47	8	HPR210Ø58H7MF1G-HP612	30795752
59,00	24	47	8	HPR210Ø59H7MF1G-HP612	30795753
60,00	24	47	8	HPR210Ø60H7MF1G-HP612	30795754
61,00	24	47	8	HPR210Ø61H7MF1G-HP612	30795755
62,00	24	47	8	HPR210Ø62H7MF1G-HP612	30795756
63,00	24	47	8	HPR210Ø63H7MF1G-HP612	30795757
64,00	24	47	8	HPR210Ø64H7MF1G-HP612	30795758
65,00	24	47	8	HPR210Ø65H7MF1G-HP612	30795759

Dimensions in mm.

Cutting data recommendation from page 436.

For related HFS replaceable head holders see page 308.

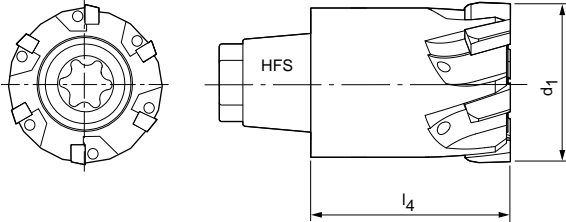
Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "HPR replaceable head reamers".

HPR210

Finely adjustable design

Design:

Reamer diameter: 19.00 - 65.00 mm
 Lead: ME1G
 Cutting material: CU134



Dimensions			z	Specification	Order No.
d ₁	HFS size	l ₄			
19,00	12	25	6	HPR210Ø19H7ME1G-CU134	30710745
20,00	12	25	6	HPR210Ø20H7ME1G-CU134	30710746
21,00	12	27	6	HPR210Ø21H7ME1G-CU134	30710747
22,00	14	27	6	HPR210Ø22H7ME1G-CU134	30342805
23,00	14	27	6	HPR210Ø23H7ME1G-CU134	30140277
24,00	16	35	6	HPR210Ø24H7ME1G-CU134	30252251
25,00	16	35	6	HPR210Ø25H7ME1G-CU134	30250611
26,00	16	35	6	HPR210Ø26H7ME1G-CU134	30710748
27,00	16	35	6	HPR210Ø27H7ME1G-CU134	30325213
28,00	16	35	6	HPR210Ø28H7ME1G-CU134	30710749
29,00	16	35	6	HPR210Ø29H7ME1G-CU134	30323328
30,00	20	41	8	HPR210Ø30H7ME1G-CU134	30598933
31,00	20	41	8	HPR210Ø31H7ME1G-CU134	30710750
32,00	20	41	8	HPR210Ø32H7ME1G-CU134	30710751
33,00	20	41	8	HPR210Ø33H7ME1G-CU134	30710752
34,00	20	41	8	HPR210Ø34H7ME1G-CU134	30315409
35,00	20	41	8	HPR210Ø35H7ME1G-CU134	30710753
36,00	20	41	8	HPR210Ø36H7ME1G-CU134	30623546
37,00	20	41	8	HPR210Ø37H7ME1G-CU134	30710754
38,00	20	41	8	HPR210Ø38H7ME1G-CU134	30710755
39,00	20	41	8	HPR210Ø39H7ME1G-CU134	30312347
40,00	24	47	8	HPR210Ø40H7ME1G-CU134	30467000
41,00	24	47	8	HPR210Ø41H7ME1G-CU134	30710756
42,00	24	47	8	HPR210Ø42H7ME1G-CU134	30466998
43,00	24	47	8	HPR210Ø43H7ME1G-CU134	30710757
44,00	24	47	8	HPR210Ø44H7ME1G-CU134	30357102
45,00	24	47	8	HPR210Ø45H7ME1G-CU134	30466997
46,00	24	47	8	HPR210Ø46H7ME1G-CU134	30710758
47,00	24	47	8	HPR210Ø47H7ME1G-CU134	30710759
48,00	24	47	8	HPR210Ø48H7ME1G-CU134	30710760
49,00	24	47	8	HPR210Ø49H7ME1G-CU134	30710761
50,00	24	47	8	HPR210Ø50H7ME1G-CU134	30710762
51,00	24	47	8	HPR210Ø51H7ME1G-CU134	30710763
52,00	24	47	8	HPR210Ø52H7ME1G-CU134	30710764
53,00	24	47	8	HPR210Ø53H7ME1G-CU134	30710765
54,00	24	47	8	HPR210Ø54H7ME1G-CU134	30710766
55,00	24	47	8	HPR210Ø55H7ME1G-CU134	30710767
56,00	24	47	8	HPR210Ø56H7ME1G-CU134	30710768
57,00	24	47	8	HPR210Ø57H7ME1G-CU134	30710769

HPR210 | Finely adjustable design

Dimensions			z	Specification	Order No.
d ₁	HFS size	l ₄			
58,00	24	47	8	HPR210Ø58H7ME1G-CU134	30710770
59,00	24	47	8	HPR210Ø59H7ME1G-CU134	30710771
60,00	24	47	8	HPR210Ø60H7ME1G-CU134	30407559
61,00	24	47	8	HPR210Ø61H7ME1G-CU134	30710772
62,00	24	47	8	HPR210Ø62H7ME1G-CU134	30710773
63,00	24	47	8	HPR210Ø63H7ME1G-CU134	30710774
64,00	24	47	8	HPR210Ø64H7ME1G-CU134	30710775
65,00	24	47	8	HPR210Ø65H7ME1G-CU134	30710776

Dimensions in mm.

Cutting data recommendation from page 436.

For related HFS replaceable head holders see page 308.

Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "HPR replaceable head reamers".

HPR210

Finely adjustable design

Design:

Reamer diameter:

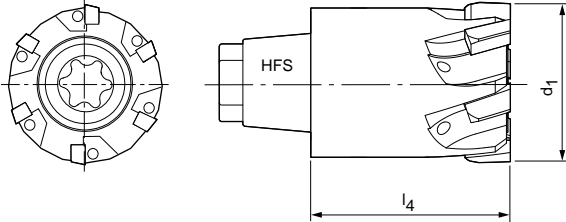
19.00 - 65.00 mm

Lead:

ME1G

Cutting material:

CP134



Dimensions			z	Specification	Order No.
d ₁	HFS size	l ₄			
19,00	12	25	6	HPR210Ø19H7ME1G-CP134	30795560
20,00	12	25	6	HPR210Ø20H7ME1G-CP134	30334226
21,00	12	27	6	HPR210Ø21H7ME1G-CP134	30795561
22,00	14	27	6	HPR210Ø22H7ME1G-CP134	30334229
23,00	14	27	6	HPR210Ø23H7ME1G-CP134	30795562
24,00	16	35	6	HPR210Ø24H7ME1G-CP134	30350109
25,00	16	35	6	HPR210Ø25H7ME1G-CP134	30334231
26,00	16	35	6	HPR210Ø26H7ME1G-CP134	30473163
27,00	16	35	6	HPR210Ø27H7ME1G-CP134	30795563
28,00	16	35	6	HPR210Ø28H7ME1G-CP134	30334232
29,00	16	35	6	HPR210Ø29H7ME1G-CP134	30795564
30,00	20	41	8	HPR210Ø30H7ME1G-CP134	30334234
31,00	20	41	8	HPR210Ø31H7ME1G-CP134	30795565
32,00	20	41	8	HPR210Ø32H7ME1G-CP134	30334235
33,00	20	41	8	HPR210Ø33H7ME1G-CP134	30795566
34,00	20	41	8	HPR210Ø34H7ME1G-CP134	30578408
35,00	20	41	8	HPR210Ø35H7ME1G-CP134	30334236
36,00	20	41	8	HPR210Ø36H7ME1G-CP134	30795567
37,00	20	41	8	HPR210Ø37H7ME1G-CP134	30795568
38,00	20	41	8	HPR210Ø38H7ME1G-CP134	30438598
39,00	20	41	8	HPR210Ø39H7ME1G-CP134	30795569
40,00	24	47	8	HPR210Ø40H7ME1G-CP134	30379552
41,00	24	47	8	HPR210Ø41H7ME1G-CP134	30645320
42,00	24	47	8	HPR210Ø42H7ME1G-CP134	30645319
43,00	24	47	8	HPR210Ø43H7ME1G-CP134	30795570
44,00	24	47	8	HPR210Ø44H7ME1G-CP134	30334237
45,00	24	47	8	HPR210Ø45H7ME1G-CP134	30403420
46,00	24	47	8	HPR210Ø46H7ME1G-CP134	30403422
47,00	24	47	8	HPR210Ø47H7ME1G-CP134	30403424
48,00	24	47	8	HPR210Ø48H7ME1G-CP134	30795571
49,00	24	47	8	HPR210Ø49H7ME1G-CP134	30538298
50,00	24	47	8	HPR210Ø50H7ME1G-CP134	30334239
51,00	24	47	8	HPR210Ø51H7ME1G-CP134	30795572
52,00	24	47	8	HPR210Ø52H7ME1G-CP134	30438597
53,00	24	47	8	HPR210Ø53H7ME1G-CP134	30795573
54,00	24	47	8	HPR210Ø54H7ME1G-CP134	30795574
55,00	24	47	8	HPR210Ø55H7ME1G-CP134	30427554
56,00	24	47	8	HPR210Ø56H7ME1G-CP134	30795575
57,00	24	47	8	HPR210Ø57H7ME1G-CP134	30795576

HPR210 | Finely adjustable design

Dimensions			z	Specification	Order No.
d ₁	HFS size	l ₄			
58,00	24	47	8	HPR210Ø58H7ME1G-CP134	30795577
59,00	24	47	8	HPR210Ø59H7ME1G-CP134	30795578
60,00	24	47	8	HPR210Ø60H7ME1G-CP134	30403426
61,00	24	47	8	HPR210Ø61H7ME1G-CP134	30473166
62,00	24	47	8	HPR210Ø62H7ME1G-CP134	30473167
63,00	24	47	8	HPR210Ø63H7ME1G-CP134	30795579
64,00	24	47	8	HPR210Ø64H7ME1G-CP134	30795580
65,00	24	47	8	HPR210Ø65H7ME1G-CP134	30334241

Dimensions in mm.

Cutting data recommendation from page 436.

For related HFS replaceable head holders see page 308.

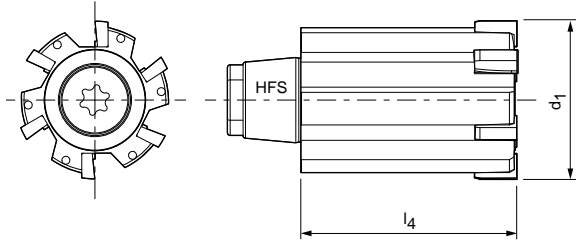
Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "HPR replaceable head reamers".

HPR250

Finely adjustable design

Design:

Reamer diameter: 17.00 - 65.00 mm
 Lead: MC1G
 Cutting material: HP421



Dimensions			z	Specification	Order No.
d ₁	HFS size	l ₄			
17,00	10	25	6	HPR250Ø17H7MC1G-HP421	30795809
18,00	10	25	6	HPR250Ø18H7MC1G-HP421	30795810
19,00	10	25	6	HPR250Ø19H7MC1G-HP421	30795811
20,00	10	25	6	HPR250Ø20H7MC1G-HP421	30795812
21,00	10	25	6	HPR250Ø21H7MC1G-HP421	30795813
22,00	12	27	6	HPR250Ø22H7MC1G-HP421	30795814
23,00	12	27	6	HPR250Ø23H7MC1G-HP421	30795815
24,00	12	27	6	HPR250Ø24H7MC1G-HP421	30795816
25,00	14	35	6	HPR250Ø25H7MC1G-HP421	30795817
26,00	14	35	6	HPR250Ø26H7MC1G-HP421	30795818
27,00	14	35	6	HPR250Ø27H7MC1G-HP421	30795819
28,00	14	35	6	HPR250Ø28H7MC1G-HP421	30795820
29,00	16	35	6	HPR250Ø29H7MC1G-HP421	30795821
30,00	16	35	6	HPR250Ø30H7MC1G-HP421	30795822
31,00	16	35	6	HPR250Ø31H7MC1G-HP421	30795823
32,00	16	35	6	HPR250Ø32H7MC1G-HP421	30795824
33,00	16	41	6	HPR250Ø33H7MC1G-HP421	30795825
34,00	16	41	6	HPR250Ø34H7MC1G-HP421	30795826
35,00	16	41	6	HPR250Ø35H7MC1G-HP421	30795827
36,00	16	41	6	HPR250Ø36H7MC1G-HP421	30795828
37,00	20	41	8	HPR250Ø37H7MC1G-HP421	30795829
38,00	20	41	8	HPR250Ø38H7MC1G-HP421	30795830
39,00	20	41	8	HPR250Ø39H7MC1G-HP421	30795831
40,00	20	41	8	HPR250Ø40H7MC1G-HP421	30795832
41,00	20	41	8	HPR250Ø41H7MC1G-HP421	30795833
42,00	20	47	8	HPR250Ø42H7MC1G-HP421	30795834
43,00	20	47	8	HPR250Ø43H7MC1G-HP421	30795835
44,00	20	47	8	HPR250Ø44H7MC1G-HP421	30795836
45,00	24	47	8	HPR250Ø45H7MC1G-HP421	30795837
46,00	24	47	8	HPR250Ø46H7MC1G-HP421	30795838
47,00	24	47	8	HPR250Ø47H7MC1G-HP421	30795839
48,00	24	47	8	HPR250Ø48H7MC1G-HP421	30795840
49,00	24	47	8	HPR250Ø49H7MC1G-HP421	30795841
50,00	24	47	8	HPR250Ø50H7MC1G-HP421	30795842
51,00	24	47	8	HPR250Ø51H7MC1G-HP421	30795843
52,00	24	47	8	HPR250Ø52H7MC1G-HP421	30795844
53,00	24	47	8	HPR250Ø53H7MC1G-HP421	30795845
54,00	24	47	8	HPR250Ø54H7MC1G-HP421	30795846
55,00	24	47	8	HPR250Ø55H7MC1G-HP421	30795847

HPR250 | Finely adjustable design

Dimensions			z	Specification	Order No.
d ₁	HFS size	l ₄			
56,00	24	47	8	HPR250Ø56H7MC1G-HP421	30795848
57,00	24	47	8	HPR250Ø57H7MC1G-HP421	30795849
58,00	24	47	8	HPR250Ø58H7MC1G-HP421	30795850
59,00	24	47	8	HPR250Ø59H7MC1G-HP421	30795851
60,00	24	47	8	HPR250Ø60H7MC1G-HP421	30795852
61,00	24	47	8	HPR250Ø61H7MC1G-HP421	30795853
62,00	24	47	8	HPR250Ø62H7MC1G-HP421	30795854
63,00	24	47	8	HPR250Ø63H7MC1G-HP421	30795855
64,00	24	47	8	HPR250Ø64H7MC1G-HP421	30795856
65,00	24	47	8	HPR250Ø65H7MC1G-HP421	30795857

Dimensions in mm.

Cutting data recommendation from page 436.

For related HFS replaceable head holders see page 308.

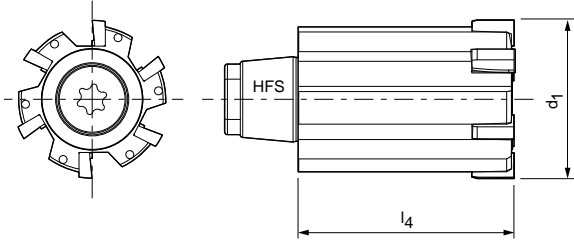
Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "HPR replaceable head reamers".

HPR250

Finely adjustable design

Design:

Reamer diameter: 17.00 - 65.00 mm
 Lead: ML2G
 Cutting material: HP421



Dimensions			z	Specification	Order No.
d ₁	HFS size	l ₄			
17,00	10	25	6	HPR250Ø17H7ML2G-HP421	30710826
18,00	10	25	6	HPR250Ø18H7ML2G-HP421	30710827
19,00	10	25	6	HPR250Ø19H7ML2G-HP421	30710828
20,00	10	25	6	HPR250Ø20H7ML2G-HP421	30710829
21,00	10	25	6	HPR250Ø21H7ML2G-HP421	30710830
22,00	12	27	6	HPR250Ø22H7ML2G-HP421	30710831
23,00	12	27	6	HPR250Ø23H7ML2G-HP421	30710832
24,00	12	27	6	HPR250Ø24H7ML2G-HP421	30710833
25,00	14	35	6	HPR250Ø25H7ML2G-HP421	30710834
26,00	14	35	6	HPR250Ø26H7ML2G-HP421	30710835
27,00	14	35	6	HPR250Ø27H7ML2G-HP421	30710836
28,00	14	35	6	HPR250Ø28H7ML2G-HP421	30710837
29,00	16	35	6	HPR250Ø29H7ML2G-HP421	30710838
30,00	16	35	6	HPR250Ø30H7ML2G-HP421	30710839
31,00	16	35	6	HPR250Ø31H7ML2G-HP421	30710840
32,00	16	35	6	HPR250Ø32H7ML2G-HP421	30710841
33,00	16	41	6	HPR250Ø33H7ML2G-HP421	30710842
34,00	16	41	6	HPR250Ø34H7ML2G-HP421	30710843
35,00	16	41	6	HPR250Ø35H7ML2G-HP421	30710844
36,00	16	41	6	HPR250Ø36H7ML2G-HP421	30710845
37,00	20	41	8	HPR250Ø37H7ML2G-HP421	30710846
38,00	20	41	8	HPR250Ø38H7ML2G-HP421	30710847
39,00	20	41	8	HPR250Ø39H7ML2G-HP421	30710848
40,00	20	41	8	HPR250Ø40H7ML2G-HP421	30710849
41,00	20	41	8	HPR250Ø41H7ML2G-HP421	30710850
42,00	20	47	8	HPR250Ø42H7ML2G-HP421	30710851
43,00	20	47	8	HPR250Ø43H7ML2G-HP421	30710852
44,00	20	47	8	HPR250Ø44H7ML2G-HP421	30710853
45,00	24	47	8	HPR250Ø45H7ML2G-HP421	30710854
46,00	24	47	8	HPR250Ø46H7ML2G-HP421	30710855
47,00	24	47	8	HPR250Ø47H7ML2G-HP421	30710857
48,00	24	47	8	HPR250Ø48H7ML2G-HP421	30710858
49,00	24	47	8	HPR250Ø49H7ML2G-HP421	30710859
50,00	24	47	8	HPR250Ø50H7ML2G-HP421	30710860
51,00	24	47	8	HPR250Ø51H7ML2G-HP421	30710861
52,00	24	47	8	HPR250Ø52H7ML2G-HP421	30710862
53,00	24	47	8	HPR250Ø53H7ML2G-HP421	30710863
54,00	24	47	8	HPR250Ø54H7ML2G-HP421	30710864
55,00	24	47	8	HPR250Ø55H7ML2G-HP421	30710865

HPR250 | Finely adjustable design

Dimensions			z	Specification	Order No.
d ₁	HFS size	l ₄			
56,00	24	47	8	HPR250Ø56H7ML2G-HP421	30710866
57,00	24	47	8	HPR250Ø57H7ML2G-HP421	30710867
58,00	24	47	8	HPR250Ø58H7ML2G-HP421	30710868
59,00	24	47	8	HPR250Ø59H7ML2G-HP421	30710869
60,00	24	47	8	HPR250Ø60H7ML2G-HP421	30710870
61,00	24	47	8	HPR250Ø61H7ML2G-HP421	30710871
62,00	24	47	8	HPR250Ø62H7ML2G-HP421	30710872
63,00	24	47	8	HPR250Ø63H7ML2G-HP421	30710873
64,00	24	47	8	HPR250Ø64H7ML2G-HP421	30710874
65,00	24	47	8	HPR250Ø65H7ML2G-HP421	30710875

Dimensions in mm.

Cutting data recommendation from page 436.

For related HFS replaceable head holders see page 308.

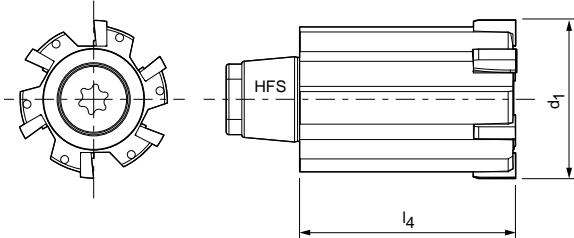
Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "HPR replaceable head reamers".

HPR250

Finely adjustable design

Design:

Reamer diameter: 17.00 - 65.00 mm
 Lead: MO2G
 Cutting material: HP612



Dimensions			z	Specification	Order No.
d ₁	HFS size	l ₄			
17,00	10	25	6	HPR250Ø17H7M02G-HP612	30795760
18,00	10	25	6	HPR250Ø18H7M02G-HP612	30795761
19,00	10	25	6	HPR250Ø19H7M02G-HP612	30795762
20,00	10	25	6	HPR250Ø20H7M02G-HP612	30795763
21,00	10	25	6	HPR250Ø21H7M02G-HP612	30795764
22,00	12	27	6	HPR250Ø22H7M02G-HP612	30795765
23,00	12	27	6	HPR250Ø23H7M02G-HP612	30795766
24,00	12	27	6	HPR250Ø24H7M02G-HP612	30795767
25,00	14	35	6	HPR250Ø25H7M02G-HP612	30795768
26,00	14	35	6	HPR250Ø26H7M02G-HP612	30795769
27,00	14	35	6	HPR250Ø27H7M02G-HP612	30795770
28,00	14	35	6	HPR250Ø28H7M02G-HP612	30795771
29,00	16	35	6	HPR250Ø29H7M02G-HP612	30795772
30,00	16	35	6	HPR250Ø30H7M02G-HP612	30795773
31,00	16	35	6	HPR250Ø31H7M02G-HP612	30795774
32,00	16	35	6	HPR250Ø32H7M02G-HP612	30795775
33,00	16	41	6	HPR250Ø33H7M02G-HP612	30795776
34,00	16	41	6	HPR250Ø34H7M02G-HP612	30795777
35,00	16	41	6	HPR250Ø35H7M02G-HP612	30795778
36,00	16	41	6	HPR250Ø36H7M02G-HP612	30795779
37,00	20	41	8	HPR250Ø37H7M02G-HP612	30795780
38,00	20	41	8	HPR250Ø38H7M02G-HP612	30795781
39,00	20	41	8	HPR250Ø39H7M02G-HP612	30795782
40,00	20	41	8	HPR250Ø40H7M02G-HP612	30795783
41,00	20	41	8	HPR250Ø41H7M02G-HP612	30795784
42,00	20	47	8	HPR250Ø42H7M02G-HP612	30795785
43,00	20	47	8	HPR250Ø43H7M02G-HP612	30795786
44,00	20	47	8	HPR250Ø44H7M02G-HP612	30795787
45,00	24	47	8	HPR250Ø45H7M02G-HP612	30795788
46,00	24	47	8	HPR250Ø46H7M02G-HP612	30795789
47,00	24	47	8	HPR250Ø47H7M02G-HP612	30795790
48,00	24	47	8	HPR250Ø48H7M02G-HP612	30795791
49,00	24	47	8	HPR250Ø49H7M02G-HP612	30795792
50,00	24	47	8	HPR250Ø50H7M02G-HP612	30795793
51,00	24	47	8	HPR250Ø51H7M02G-HP612	30795794
52,00	24	47	8	HPR250Ø52H7M02G-HP612	30795795
53,00	24	47	8	HPR250Ø53H7M02G-HP612	30795796
54,00	24	47	8	HPR250Ø54H7M02G-HP612	30795797
55,00	24	47	8	HPR250Ø55H7M02G-HP612	30795798

HPR250 | Finely adjustable design

Dimensions			z	Specification	Order No.
d ₁	HFS size	l ₄			
56,00	24	47	8	HPR250Ø56H7M02G-HP612	30795799
57,00	24	47	8	HPR250Ø57H7M02G-HP612	30795800
58,00	24	47	8	HPR250Ø58H7M02G-HP612	30795801
59,00	24	47	8	HPR250Ø59H7M02G-HP612	30795802
60,00	24	47	8	HPR250Ø60H7M02G-HP612	30795803
61,00	24	47	8	HPR250Ø61H7M02G-HP612	30795804
62,00	24	47	8	HPR250Ø62H7M02G-HP612	30795805
63,00	24	47	8	HPR250Ø63H7M02G-HP612	30795806
64,00	24	47	8	HPR250Ø64H7M02G-HP612	30795807
65,00	24	47	8	HPR250Ø65H7M02G-HP612	30795808

Dimensions in mm.

Cutting data recommendation from page 436.

For related HFS replaceable head holders see page 308.

Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "HPR replaceable head reamers".

HPR250

Finely adjustable design

Design:

Reamer diameter:

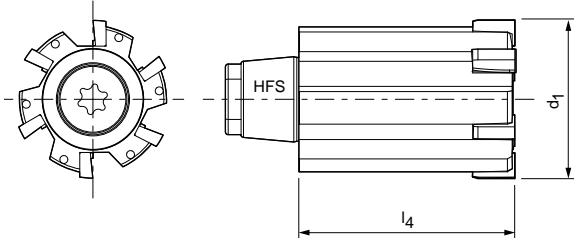
17.00 - 65.00 mm

Lead:

ML2G

Cutting material:

CU134



Dimensions			z	Specification	Order No.
d ₁	HFS size	l ₄			
17,00	10	25	6	HPR250Ø17H7ML2G-CU134	30710777
18,00	10	25	6	HPR250Ø18H7ML2G-CU134	30710778
19,00	10	25	6	HPR250Ø19H7ML2G-CU134	30710779
20,00	10	25	6	HPR250Ø20H7ML2G-CU134	30710780
21,00	10	25	6	HPR250Ø21H7ML2G-CU134	30710781
22,00	12	27	6	HPR250Ø22H7ML2G-CU134	30710782
23,00	12	27	6	HPR250Ø23H7ML2G-CU134	30710783
24,00	12	27	6	HPR250Ø24H7ML2G-CU134	30710784
25,00	14	35	6	HPR250Ø25H7ML2G-CU134	30710785
26,00	14	35	6	HPR250Ø26H7ML2G-CU134	30710786
27,00	14	35	6	HPR250Ø27H7ML2G-CU134	30710787
28,00	14	35	6	HPR250Ø28H7ML2G-CU134	30710788
29,00	16	35	6	HPR250Ø29H7ML2G-CU134	30710789
30,00	16	35	6	HPR250Ø30H7ML2G-CU134	30710790
31,00	16	35	6	HPR250Ø31H7ML2G-CU134	30710791
32,00	16	35	6	HPR250Ø32H7ML2G-CU134	30710792
33,00	16	41	6	HPR250Ø33H7ML2G-CU134	30710793
34,00	16	41	6	HPR250Ø34H7ML2G-CU134	30710794
35,00	16	41	6	HPR250Ø35H7ML2G-CU134	30710795
36,00	16	41	6	HPR250Ø36H7ML2G-CU134	30710796
37,00	20	41	8	HPR250Ø37H7ML2G-CU134	30710797
38,00	20	41	8	HPR250Ø38H7ML2G-CU134	30710798
39,00	20	41	8	HPR250Ø39H7ML2G-CU134	30710799
40,00	20	41	8	HPR250Ø40H7ML2G-CU134	30710800
41,00	20	41	8	HPR250Ø41H7ML2G-CU134	30710801
42,00	20	47	8	HPR250Ø42H7ML2G-CU134	30710802
43,00	20	47	8	HPR250Ø43H7ML2G-CU134	30710803
44,00	20	47	8	HPR250Ø44H7ML2G-CU134	30710804
45,00	24	47	8	HPR250Ø45H7ML2G-CU134	30710805
46,00	24	47	8	HPR250Ø46H7ML2G-CU134	30710806
47,00	24	47	8	HPR250Ø47H7ML2G-CU134	30710807
48,00	24	47	8	HPR250Ø48H7ML2G-CU134	30710808
49,00	24	47	8	HPR250Ø49H7ML2G-CU134	30710809
50,00	24	47	8	HPR250Ø50H7ML2G-CU134	30710810
51,00	24	47	8	HPR250Ø51H7ML2G-CU134	30710811
52,00	24	47	8	HPR250Ø52H7ML2G-CU134	30710812
53,00	24	47	8	HPR250Ø53H7ML2G-CU134	30710813
54,00	24	47	8	HPR250Ø54H7ML2G-CU134	30710814
55,00	24	47	8	HPR250Ø55H7ML2G-CU134	30710815

HPR250 | Finely adjustable design

Dimensions			z	Specification	Order No.
d ₁	HFS size	l ₄			
56,00	24	47	8	HPR250Ø56H7ML2G-CU134	30710816
57,00	24	47	8	HPR250Ø57H7ML2G-CU134	30710817
58,00	24	47	8	HPR250Ø58H7ML2G-CU134	30710818
59,00	24	47	8	HPR250Ø59H7ML2G-CU134	30710819
60,00	24	47	8	HPR250Ø60H7ML2G-CU134	30710820
61,00	24	47	8	HPR250Ø61H7ML2G-CU134	30710821
62,00	24	47	8	HPR250Ø62H7ML2G-CU134	30710822
63,00	24	47	8	HPR250Ø63H7ML2G-CU134	30710823
64,00	24	47	8	HPR250Ø64H7ML2G-CU134	30710824
65,00	24	47	8	HPR250Ø65H7ML2G-CU134	30710825

Dimensions in mm.

Cutting data recommendation from page 436.

For related HFS replaceable head holders see page 308.

Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "HPR replaceable head reamers".

HPR250

Finely adjustable design

Design:

Reamer diameter:

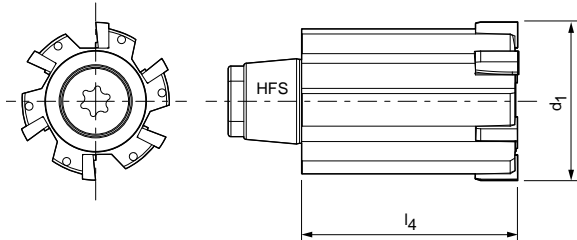
17.00 - 65.00 mm

Lead:

MC1G

Cutting material:

CP134



Dimensions			z	Specification	Order No.
d ₁	HFS size	l ₄			
17,00	10	25	6	HPR250Ø17H7MC1G-CP134	30795623
18,00	10	25	6	HPR250Ø18H7MC1G-CP134	30795624
19,00	10	25	6	HPR250Ø19H7MC1G-CP134	30795625
20,00	10	25	6	HPR250Ø20H7MC1G-CP134	30795626
21,00	10	25	6	HPR250Ø21H7MC1G-CP134	30795627
22,00	12	27	6	HPR250Ø22H7MC1G-CP134	30795628
23,00	12	27	6	HPR250Ø23H7MC1G-CP134	30795629
24,00	12	27	6	HPR250Ø24H7MC1G-CP134	30795630
25,00	14	35	6	HPR250Ø25H7MC1G-CP134	30784188
26,00	14	35	6	HPR250Ø26H7MC1G-CP134	30795631
27,00	14	35	6	HPR250Ø27H7MC1G-CP134	30795632
28,00	14	35	6	HPR250Ø28H7MC1G-CP134	30795633
29,00	16	35	6	HPR250Ø29H7MC1G-CP134	30795634
30,00	16	35	6	HPR250Ø30H7MC1G-CP134	30795635
31,00	16	35	6	HPR250Ø31H7MC1G-CP134	30795636
32,00	16	35	6	HPR250Ø32H7MC1G-CP134	30795637
33,00	16	41	6	HPR250Ø33H7MC1G-CP134	30795638
34,00	16	41	6	HPR250Ø34H7MC1G-CP134	30795639
35,00	16	41	6	HPR250Ø35H7MC1G-CP134	30795640
36,00	16	41	6	HPR250Ø36H7MC1G-CP134	30795641
37,00	20	41	8	HPR250Ø37H7MC1G-CP134	30795642
38,00	20	41	8	HPR250Ø38H7MC1G-CP134	30795643
39,00	20	41	8	HPR250Ø39H7MC1G-CP134	30795644
40,00	20	41	8	HPR250Ø40H7MC1G-CP134	30795645
41,00	20	41	8	HPR250Ø41H7MC1G-CP134	30795646
42,00	20	47	8	HPR250Ø42H7MC1G-CP134	30795647
43,00	20	47	8	HPR250Ø43H7MC1G-CP134	30795648
44,00	20	47	8	HPR250Ø44H7MC1G-CP134	30795649
45,00	24	47	8	HPR250Ø45H7MC1G-CP134	30795650
46,00	24	47	8	HPR250Ø46H7MC1G-CP134	30795651
47,00	24	47	8	HPR250Ø47H7MC1G-CP134	30795652
48,00	24	47	8	HPR250Ø48H7MC1G-CP134	30795653
49,00	24	47	8	HPR250Ø49H7MC1G-CP134	30795654
50,00	24	47	8	HPR250Ø50H7MC1G-CP134	30795655
51,00	24	47	8	HPR250Ø51H7MC1G-CP134	30795656
52,00	24	47	8	HPR250Ø52H7MC1G-CP134	30795657
53,00	24	47	8	HPR250Ø53H7MC1G-CP134	30795658
54,00	24	47	8	HPR250Ø54H7MC1G-CP134	30795659
55,00	24	47	8	HPR250Ø55H7MC1G-CP134	30795660

Continued on next page.

HPR250 | Finely adjustable design

Dimensions			z	Specification	Order No.
d ₁	HFS size	l ₄			
56,00	24	47	8	HPR250Ø56H7MC1G-CP134	30795661
57,00	24	47	8	HPR250Ø57H7MC1G-CP134	30795662
58,00	24	47	8	HPR250Ø58H7MC1G-CP134	30795663
59,00	24	47	8	HPR250Ø59H7MC1G-CP134	30795664
60,00	24	47	8	HPR250Ø60H7MC1G-CP134	30795665
61,00	24	47	8	HPR250Ø61H7MC1G-CP134	30795666
62,00	24	47	8	HPR250Ø62H7MC1G-CP134	30795667
63,00	24	47	8	HPR250Ø63H7MC1G-CP134	30795668
64,00	24	47	8	HPR250Ø64H7MC1G-CP134	30795669
65,00	24	47	8	HPR250Ø65H7MC1G-CP134	30795670

Dimensions in mm.

Cutting data recommendation from page 436.

For related HFS replaceable head holders see page 308.

Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "HPR replaceable head reamers".

HPR250

Finely adjustable design

Design:

Reamer diameter:

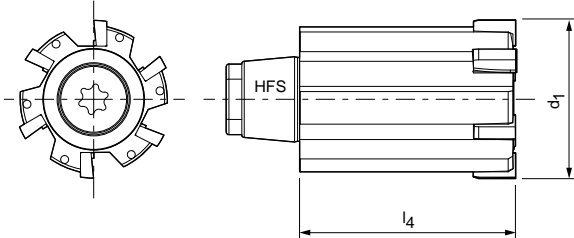
17.00 - 65.00 mm

Lead:

ML2G

Cutting material:

CP134



Dimensions			z	Specification	Order No.
d ₁	HFS size	l ₄			
17,00	10	25	6	HPR250017H7ML2G-CP134	30795581
18,00	10	25	6	HPR250018H7ML2G-CP134	30795582
19,00	10	25	6	HPR250019H7ML2G-CP134	30795583
20,00	10	25	6	HPR250020H7ML2G-CP134	30795584
21,00	10	25	6	HPR250021H7ML2G-CP134	30795585
22,00	12	27	6	HPR250022H7ML2G-CP134	30795586
23,00	12	27	6	HPR250023H7ML2G-CP134	30795587
24,00	12	27	6	HPR250024H7ML2G-CP134	30795588
25,00	14	35	6	HPR250025H7ML2G-CP134	30795589
26,00	14	35	6	HPR250026H7ML2G-CP134	30795590
27,00	14	35	6	HPR250027H7ML2G-CP134	30795591
28,00	14	35	6	HPR250028H7ML2G-CP134	30795592
29,00	16	35	6	HPR250029H7ML2G-CP134	30795593
30,00	16	35	6	HPR250030H7ML2G-CP134	30795594
31,00	16	35	6	HPR250031H7ML2G-CP134	30795595
32,00	16	35	6	HPR250032H7ML2G-CP134	30795596
33,00	16	41	6	HPR250033H7ML2G-CP134	30795597
34,00	16	41	6	HPR250034H7ML2G-CP134	30795598
35,00	16	41	6	HPR250035H7ML2G-CP134	30795599
36,00	16	41	6	HPR250036H7ML2G-CP134	30795601
37,00	20	41	8	HPR250037H7ML2G-CP134	30795602
38,00	20	41	8	HPR250038H7ML2G-CP134	30795603
39,00	20	41	8	HPR250039H7ML2G-CP134	30795604
40,00	20	41	8	HPR250040H7ML2G-CP134	30795605
41,00	20	41	8	HPR250041H7ML2G-CP134	30686041
42,00	20	47	8	HPR250042H7ML2G-CP134	30454538
43,00	20	47	8	HPR250043H7ML2G-CP134	30795606
44,00	20	47	8	HPR250044H7ML2G-CP134	30516417
45,00	24	47	8	HPR250045H7ML2G-CP134	30795607
46,00	24	47	8	HPR250046H7ML2G-CP134	30795608
47,00	24	47	8	HPR250047H7ML2G-CP134	30795609
48,00	24	47	8	HPR250048H7ML2G-CP134	30795610
49,00	24	47	8	HPR250049H7ML2G-CP134	30403952
50,00	24	47	8	HPR250050H7ML2G-CP134	30434492
51,00	24	47	8	HPR250051H7ML2G-CP134	30795611
52,00	24	47	8	HPR250052H7ML2G-CP134	30795612
53,00	24	47	8	HPR250053H7ML2G-CP134	30795613
54,00	24	47	8	HPR250054H7ML2G-CP134	30795614
55,00	24	47	8	HPR250055H7ML2G-CP134	30795615

HPR250 | Finely adjustable design

Dimensions			z	Specification	Order No.
d ₁	HFS size	l ₄			
56,00	24	47	8	HPR250056H7ML2G-CP134	30454540
57,00	24	47	8	HPR250057H7ML2G-CP134	30795616
58,00	24	47	8	HPR250058H7ML2G-CP134	30795617
59,00	24	47	8	HPR250059H7ML2G-CP134	30795618
60,00	24	47	8	HPR250060H7ML2G-CP134	30434493
61,00	24	47	8	HPR250061H7ML2G-CP134	30552777
62,00	24	47	8	HPR250062H7ML2G-CP134	30795619
63,00	24	47	8	HPR250063H7ML2G-CP134	30795620
64,00	24	47	8	HPR250064H7ML2G-CP134	30795621
65,00	24	47	8	HPR250065H7ML2G-CP134	30795622

Dimensions in mm.

Cutting data recommendation from page 436.

For related HFS replaceable head holders see page 308.

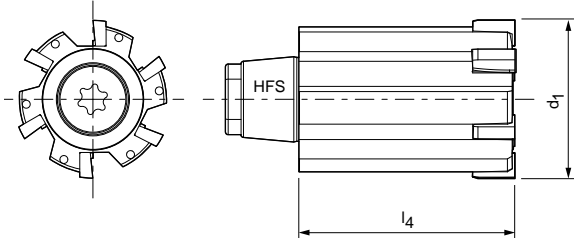
Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "HPR replaceable head reamers".

HPR250

Finely adjustable design

Design:

Reamer diameter: 17.00 - 65.00 mm
 Lead: MA0A
 Cutting material: PU620



Dimensions			z	Specification	Order No.
d ₁	HFS size	l ₄			
17,00	10	25	6	HPR250Ø17H7MA0A-PU620	30710876
18,00	10	25	6	HPR250Ø18H7MA0A-PU620	30710877
19,00	10	25	6	HPR250Ø19H7MA0A-PU620	30710878
20,00	10	25	6	HPR250Ø20H7MA0A-PU620	30710879
21,00	10	25	6	HPR250Ø21H7MA0A-PU620	30710880
22,00	12	27	6	HPR250Ø22H7MA0A-PU620	30710881
23,00	12	27	6	HPR250Ø23H7MA0A-PU620	30710882
24,00	12	27	6	HPR250Ø24H7MA0A-PU620	30710883
25,00	14	35	6	HPR250Ø25H7MA0A-PU620	30710884
26,00	14	35	6	HPR250Ø26H7MA0A-PU620	30710885
27,00	14	35	6	HPR250Ø27H7MA0A-PU620	30710886
28,00	14	35	6	HPR250Ø28H7MA0A-PU620	30710887
29,00	16	35	6	HPR250Ø29H7MA0A-PU620	30710888
30,00	16	35	6	HPR250Ø30H7MA0A-PU620	30710889
31,00	16	35	6	HPR250Ø31H7MA0A-PU620	30710890
32,00	16	35	6	HPR250Ø32H7MA0A-PU620	30710891
33,00	16	41	6	HPR250Ø33H7MA0A-PU620	30710892
34,00	16	41	6	HPR250Ø34H7MA0A-PU620	30710893
35,00	16	41	6	HPR250Ø35H7MA0A-PU620	30710894
36,00	16	41	6	HPR250Ø36H7MA0A-PU620	30710895
37,00	20	41	8	HPR250Ø37H7MA0A-PU620	30710896
38,00	20	41	8	HPR250Ø38H7MA0A-PU620	30710897
39,00	20	41	8	HPR250Ø39H7MA0A-PU620	30710898
40,00	20	41	8	HPR250Ø40H7MA0A-PU620	30710899
41,00	20	41	8	HPR250Ø41H7MA0A-PU620	30710900
42,00	20	47	8	HPR250Ø42H7MA0A-PU620	30710901
43,00	20	47	8	HPR250Ø43H7MA0A-PU620	30710902
44,00	20	47	8	HPR250Ø44H7MA0A-PU620	30710903
45,00	24	47	8	HPR250Ø45H7MA0A-PU620	30710904
46,00	24	47	8	HPR250Ø46H7MA0A-PU620	30710905
47,00	24	47	8	HPR250Ø47H7MA0A-PU620	30710906
48,00	24	47	8	HPR250Ø48H7MA0A-PU620	30710907
49,00	24	47	8	HPR250Ø49H7MA0A-PU620	30710908
50,00	24	47	8	HPR250Ø50H7MA0A-PU620	30710909
51,00	24	47	8	HPR250Ø51H7MA0A-PU620	30710910
52,00	24	47	8	HPR250Ø52H7MA0A-PU620	30710911
53,00	24	47	8	HPR250Ø53H7MA0A-PU620	30710912
54,00	24	47	8	HPR250Ø54H7MA0A-PU620	30710913
55,00	24	47	8	HPR250Ø55H7MA0A-PU620	30710914

HPR250 | Finely adjustable design

Dimensions			z	Specification	Order No.
d ₁	HFS size	l ₄			
56,00	24	47	8	HPR250Ø56H7MA0A-PU620	30710915
57,00	24	47	8	HPR250Ø57H7MA0A-PU620	30710916
58,00	24	47	8	HPR250Ø58H7MA0A-PU620	30710917
59,00	24	47	8	HPR250Ø59H7MA0A-PU620	30710918
60,00	24	47	8	HPR250Ø60H7MA0A-PU620	30710919
61,00	24	47	8	HPR250Ø61H7MA0A-PU620	30710920
62,00	24	47	8	HPR250Ø62H7MA0A-PU620	30710921
63,00	24	47	8	HPR250Ø63H7MA0A-PU620	30710922
64,00	24	47	8	HPR250Ø64H7MA0A-PU620	30710923
65,00	24	47	8	HPR250Ø65H7MA0A-PU620	30710924

Dimensions in mm.

Cutting data recommendation from page 436.

For related HFS replaceable head holders see page 308.

Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "HPR replaceable head reamers".



HFS REPLACEABLE HEAD HOLDERS

Introduction

Designation key _____ 310

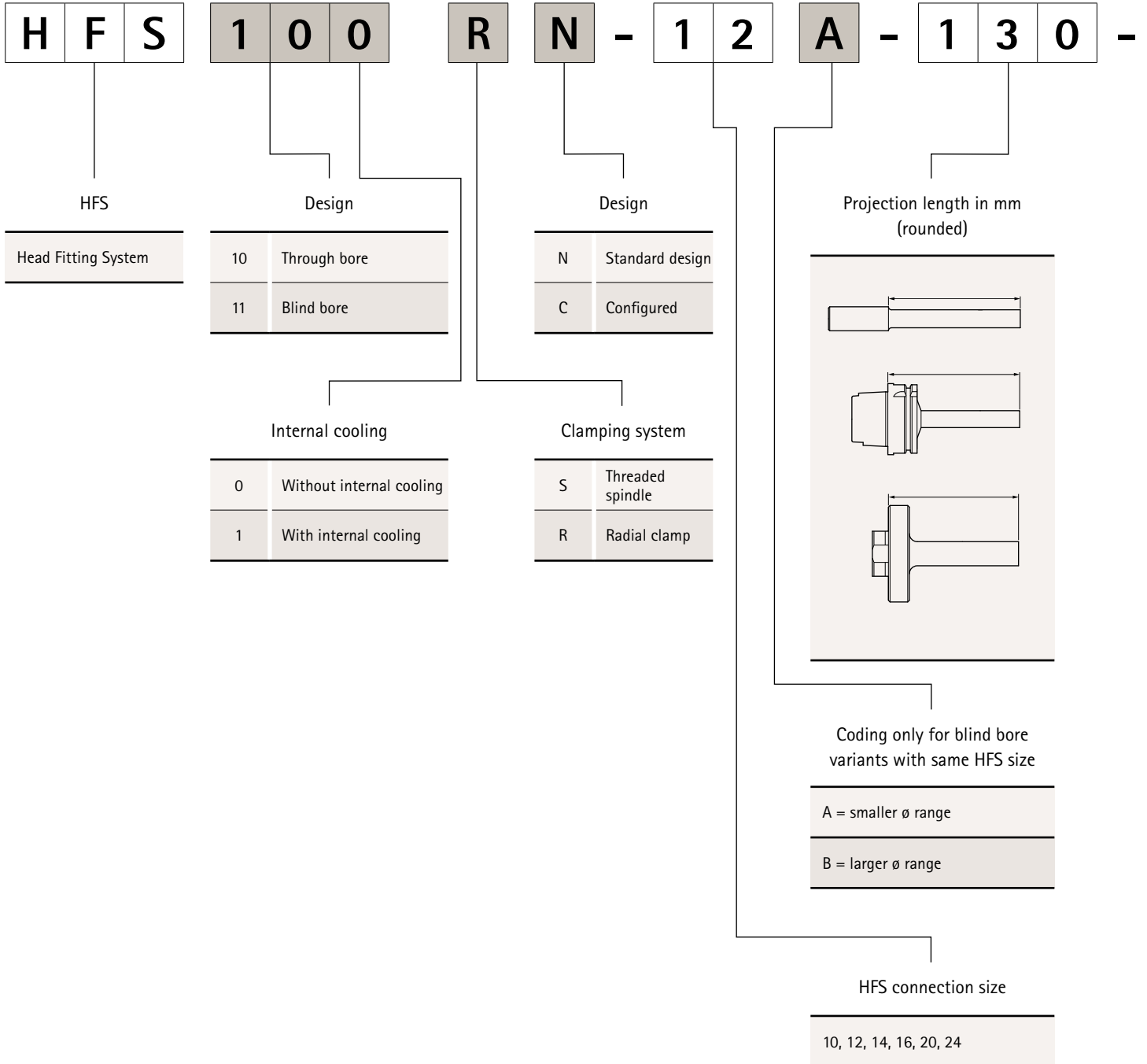
HFS replaceable head holder

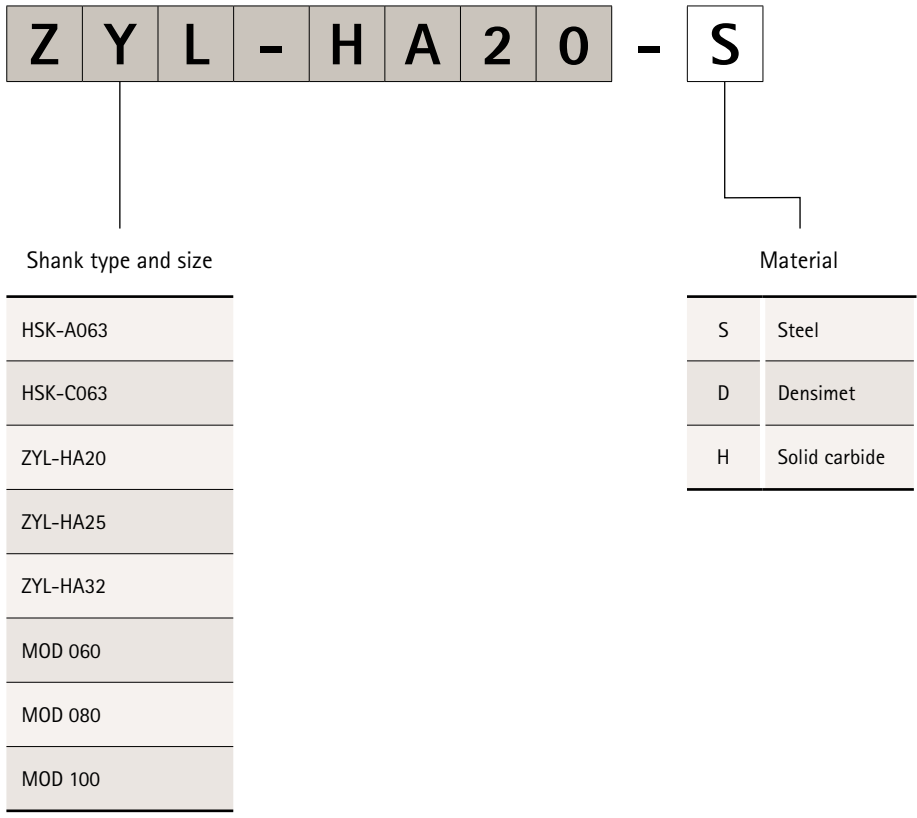
Holder range _____ 312



Designation key

HFS replaceable head holder

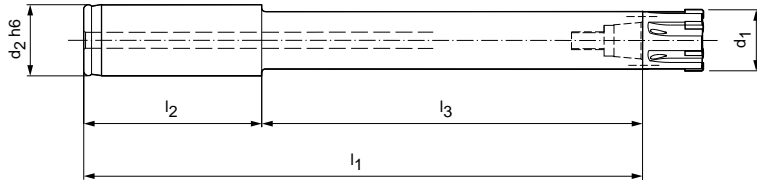




HFS replaceable head holder

With axial clamping system

Shank in accordance with MN 623, similar to DIN 1835-A



Long design with cylindrical shank

Dimensions						Specification	Order No.
d_1	HFS size	d_2 h6	l_1	l_2	l_3		
15,60 - 18,59	10	20	160	50	110	HFS101SN-10-110-ZYL-HA20-S	30010248
18,60 - 21,29	12	20	179,5	50	129,5	HFS101SN-12-130-ZYL-HA20-S	30010249
21,30 - 23,99	14	20	180,5	50	130,5	HFS101SN-14-131-ZYL-HA20-S	30010250
24,00 - 29,99	16	25	211	60	151	HFS101SN-16-151-ZYL-HA25-S	30010251
30,00 - 39,99	20	25	210	60	150	HFS101SN-20-150-ZYL-HA25-S	30010252
40,00 - 50,70	24	32	266	60	206	HFS101SN-24-206-ZYL-HA32-S	30010253
50,71 - 65,00							

Short design with cylindrical shank

Dimensions						Specification	Order No.
d_1	HFS size	d_2 h6	l_1	l_2	l_3		
15,60 - 18,59	10	20	99	50	49	HFS101SN-10-049-ZYL-HA20-S	30010256
18,60 - 21,29	12	20	118,5	50	68,5	HFS101SN-12-069-ZYL-HA20-S	30010257
21,30 - 23,99	14	20	119,5	50	69,5	HFS101SN-14-070-ZYL-HA20-S	30010258
24,00 - 29,99	16	25	150	60	90	HFS101SN-16-090-ZYL-HA25-S	30010259
30,00 - 39,99	20	25	149	60	89	HFS101SN-20-089-ZYL-HA25-S	30010260
40,00 - 50,70	24	32	167	60	107	HFS101SN-24-107-ZYL-HA32-S	30010261
50,71 - 65,00							

Extra short design with cylindrical shank

Dimensions						Specification	Order No.
d_1	HFS size	d_2 h6	l_1	l_2	l_3		
18,60 - 21,29	12	20	82	50	32	HFS101SN-12-032-ZYL-HA20-S	30078683

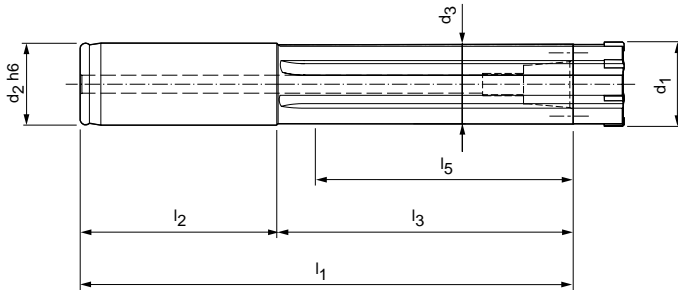
Dimensions in mm.

Items included: Tool holder with threaded spindle and hexagonal T-key.

HFS replaceable head holder

With axial clamping system

Shank in accordance with MN 623, similar to DIN 1835-A



Long design with cylindrical shank

Dimensions								Specification	Order No.
d_1	HFS size	d_2 h6	d_3	l_1	l_2	l_3	l_5		
16,60 - 19,39	10	20	16	160	50	110	94	HFS111SN-10A-110-ZYL-HA20-S	30026380
19,40 - 21,29	10	20	18,6	160	50	110	94	HFS111SN-10B-110-ZYL-HA20-S	30026488
21,30 - 24,99	12	20	20,5	180,5	50	130,5	114,5	HFS111SN-12-131-ZYL-HA20-S	30026489
25,00 - 28,99	14	25	24,2	211,5	60	151,5	132,5	HFS111SN-14-152-ZYL-HA25-S	30026510
29,00 - 32,29	16	25	28,2	210	60	150	131	HFS111SN-16A-150-ZYL-HA25-S	30026511
32,30 - 36,99	16	25	31,5	210	60	150	140	HFS111SN-16B-150-ZYL-HA25-S	30026512
37,00 - 41,19	20	25	36,2	210	60	150	140	HFS111SN-20A-150-ZYL-HA25-S	30026513
41,20 - 44,99	20	25	40,2	210	60	150	140	HFS111SN-20B-150-ZYL-HA25-S	30026514
45,00 - 50,70	24	32	44	266	60	206	195	HFS111SN-24-206-ZYL-HA32-S	30026515
50,71 - 65,00									

Short design with cylindrical shank

Dimensions								Specification	Order No.
d_1	HFS size	d_2 h6	d_3	l_1	l_2	l_3	l_5		
16,60 - 19,39	10	20	16	99	50	49	33	HFS111SN-10A-049-ZYL-HA20-S	30026516
19,40 - 21,29	10	20	18,6	99	50	49	33	HFS111SN-10B-049-ZYL-HA20-S	30026521
21,30 - 24,99	12	20	20,5	117,5	50	67,5	51,5	HFS111SN-12-068-ZYL-HA20-S	30026522
25,00 - 28,99	14	25	24,2	150,5	60	90,5	71,5	HFS111SN-14-091-ZYL-HA25-S	30026523
29,00 - 32,29	16	25	28,2	149	60	89	70	HFS111SN-16A-089-ZYL-HA25-S	30026525
32,30 - 36,99	16	25	31,5	149	60	89	79	HFS111SN-16B-089-ZYL-HA25-S	30026526
37,00 - 41,19	20	25	36,2	149	60	89	79	HFS111SN-20A-089-ZYL-HA25-S	30026527
41,20 - 44,99	20	25	40,2	149	60	89	79	HFS111SN-20B-089-ZYL-HA25-S	30026528
45,00 - 50,70	24	32	44	167	60	107	96	HFS111SN-24-107-ZYL-HA32-S	30026529
50,71 - 65,00									

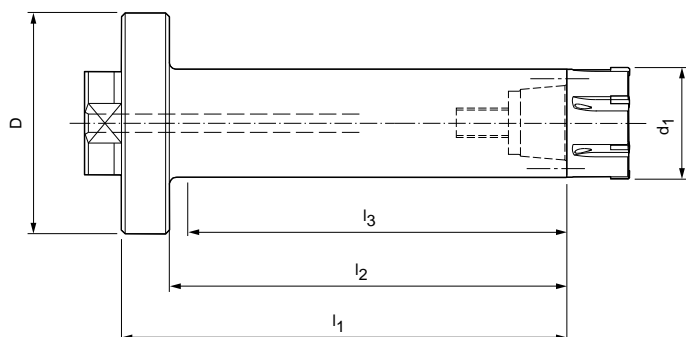
Dimensions in mm.

Items included: Tool holder with threaded spindle and hexagonal T-key.

HFS replaceable head holder

With axial clamping system with radial and angular alignment

Module connection sizes as per MN 5000-14



Long design with module adapter (can be aligned radially and angularly)

Dimensions						Specification	Order No.
d ₁	HFS size	D	l ₁	l ₂	l ₃		
15,60 - 18,59	10	60	81	68	61	HFS101SN-10-081-MOD-060-S	30010264
18,60 - 21,29	12	60	100,5	87,5	80,5	HFS101SN-12-101-MOD-060-S	30010265
21,30 - 23,99	14	60	101,5	88,5	79,5	HFS101SN-14-102-MOD-060-S	30010266
24,00 - 29,99	16	60	122	109	104	HFS101SN-16-122-MOD-060-S	30010267
30,00 - 39,99	20	60	121	108	103	HFS101SN-20-121-MOD-060-S	30010268
40,00 - 50,70	24	60	133	120	116	HFS101SN-24-133-MOD-060-S	30010269
50,71 - 65,00	24	80	133	116	112	HFS101SN-24-133-MOD-080-S	30190195



List of spare parts for module adapters

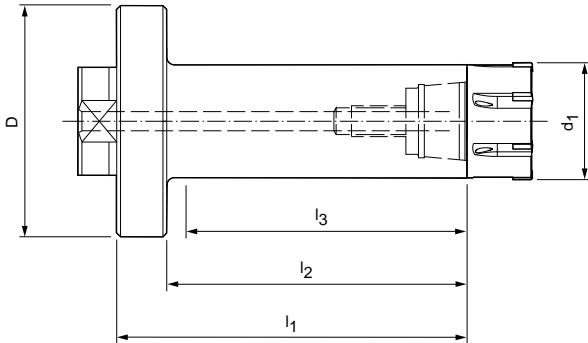
Module size D	Cylinder head screw* ISO 4762 (DIN 912)			Thrust pad*		Threaded pin*	
	Quantity required	Order No.	Size	Order No.	Size	Order No.	Size
60	4	M5x16-12,9	10003601	10,6x5	10040108	M8x1x8	10040109
80	4	M6x20-12,9	10003619	10,6x5	10040108	M8x1x11,5	10075074

Dimensions in mm.

Items included: Tool holder with threaded spindle, hexagonal wrench with T-key, fastening screws for module adapter and parts for angular alignment of the module adapter.

HFS replaceable head holder

With axial clamping system with radial and angular alignment
Module connection sizes as per MN 5000-14



Short design with module adapter (can be aligned radially and angularly)

Dimensions						Specification	Order No.
d ₁	HFS size	D	l ₁	l ₂	l ₃		
15,60 - 18,59	10	60	49	36	31	HFS101SN-10-049-MOD-060-S	30027896
18,60 - 21,29	12	60	58,5	45,5	40,5	HFS101SN-12-059-MOD-060-S	30027897
21,30 - 23,99	14	60	62,5	49,5	44,5	HFS101SN-14-063-MOD-060-S	30027898
24,00 - 29,99	16	60	72	59	54	HFS101SN-16-072-MOD-060-S	30027899
30,00 - 39,99	20	60	71	58	53	HFS101SN-20-071-MOD-060-S	30027900
40,00 - 50,70	24	60	84	71	66	HFS101SN-24-084-MOD-060-S	30027901
50,71 - 65,00	24	80	84	67	62	HFS101SN-24-084-MOD-080-S	30152510



List of spare parts for module adapters

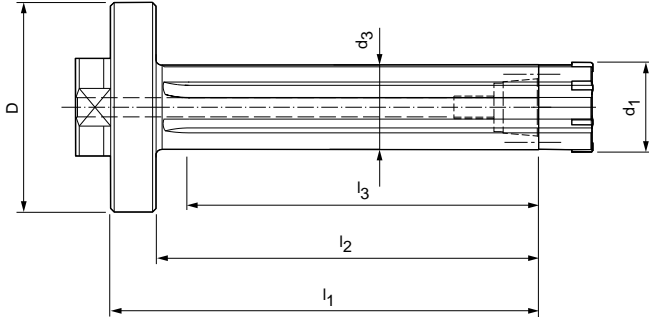
Module size D	Cylinder head screw* ISO 4762 (DIN 912)			Thrust pad*		Threaded pin*	
	Quantity required	Order No.	Size	Order No.	Size	Order No.	Size
60	4	M5x16-12,9	10003601	10,6x5	10040108	M8x1x8	10040109
80	4	M6x20-12,9	10003619	10,6x5	10040108	M8x1x11,5	10075074

Dimensions in mm.

Items included: Tool holder with threaded spindle, hexagonal wrench with T-key, fastening screws for module adapter and parts for angular alignment of the module adapter.

HFS replaceable head holder

With axial clamping system with radial and angular alignment
 Module connection sizes as per MN 5000-14



Long design with module adapter (can be aligned radially and angularly)

Dimensions							Specification	Order No.
d ₁	HFS size	D	d ₃	l ₁	l ₂	l ₃		
16,60 - 19,39	10	60	16	81	68	48	HFS111SN-10A-081-MOD-060-S	30026562
19,40 - 21,29	10	60	18,6	81	68	48	HFS111SN-10B-081-MOD-060-S	30026563
21,30 - 24,99	12	60	20,5	101,5	88,5	69,5	HFS111SN-12-102-MOD-060-S	30026564
25,00 - 28,99	14	60	24,2	122,5	109,5	90,5	HFS111SN-14-123-MOD-060-S	30026565
29,00 - 32,29	16	60	28,2	121	108	89	HFS111SN-16A-121-MOD-060-S	30026566
32,30 - 36,99	16	60	31,5	121	108	89	HFS111SN-16B-121-MOD-060-S	30026567
37,00 - 41,19	20	60	36,2	121	108	89	HFS111SN-20A-121-MOD-060-S	30026568
41,20 - 44,99	20	60	40,2	121	108	89	HFS111SN-20B-121-MOD-060-S	30026569
45,00 - 50,70	24	60	44	123	110	95	HFS111SN-24-123-MOD-060-S	30026570
50,71 - 65,00	24	80	44	133	116	110	HFS111SN-24-133-MOD-080-S	30193167



List of spare parts for module adapters

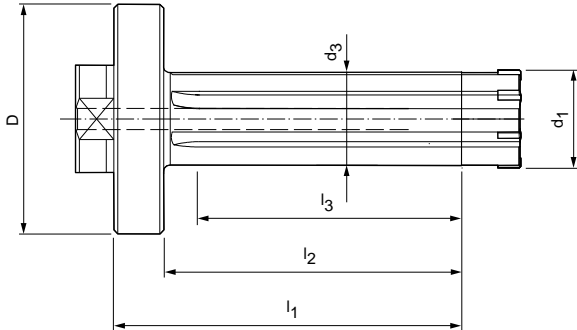
Module size D	Cylinder head screw* ISO 4762 (DIN 912)			Thrust pad*		Threaded pin*	
	Quantity required	Order No.	Size	Order No.	Size	Order No.	Size
60	4	M5x16-12,9	10003601	10,6x5	10040108	M8x1x8	10040109
80	4	M6x20-12,9	10003619	10,6x5	10040108	M8x1x11,5	10075074

Dimensions in mm.

Items included: Tool holder with threaded spindle, hexagonal wrench with T-key, fastening screws for module adapter and parts for angular alignment of the module adapter.

HFS replaceable head holder

With axial clamping system with radial and angular alignment
Module connection sizes as per MN 5000-14



Short design with module adapter (can be aligned radially and angularly)

Dimensions							Specification	Order No.
d ₁	HFS size	D	d ₃	l ₁	l ₂	l ₃		
16,60 - 19,39	10	60	16	49	36	31	HFS111SN-10A-049-MOD-060-S	30027885
19,40 - 21,29	10	60	18,6	59	46	41	HFS111SN-10B-059-MOD-060-S	30027886
21,30 - 24,99	12	60	20,5	62,5	49,5	44,5	HFS111SN-12-063-MOD-060-S	30027887
25,00 - 28,99	14	60	24,2	72,5	59,5	54,5	HFS111SN-14-073-MOD-060-S	30027888
29,00 - 32,29	16	60	28,2	71	58	53	HFS111SN-16A-071-MOD-060-S	30027889
32,30 - 36,99	16	60	31,5	71	58	53	HFS111SN-16B-071-MOD-060-S	30027890
37,00 - 41,19	20	60	36,2	71	58	53	HFS111SN-20A-071-MOD-060-S	30027891
41,20 - 44,99	20	60	40,2	81	68	63	HFS111SN-20B-081-MOD-060-S	30027892
45,00 - 50,70	24	60	44	84	71	66	HFS111SN-24-084-MOD-060-S	30027893
50,71 - 65,00	24	80	44	84	67	64	HFS111SN-24-084-MOD-080-S	30193168



List of spare parts for module adapters

Module size D	Cylinder head screw* ISO 4762 (DIN 912)			Thrust pad*		Threaded pin*	
	Quantity required	Order No.	Size	Order No.	Size	Order No.	Size
60	4	M5x16-12,9	10003601	10,6x5	10040108	M8x1x8	10040109
80	4	M6x20-12,9	10003619	10,6x5	10040108	M8x1x11,5	10075074

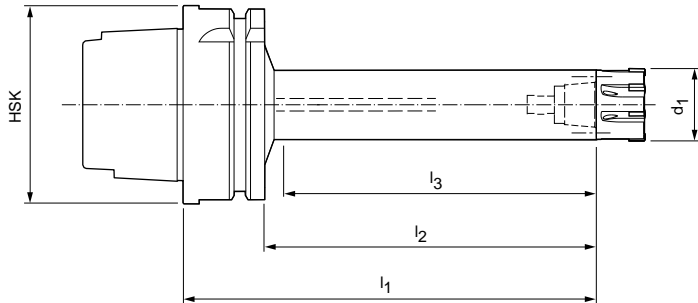
Dimensions in mm.

Items included: Tool holder with threaded spindle, hexagonal wrench with T-key, fastening screws for module adapter and parts for angular alignment of the module adapter.

HFS replaceable head holder

With axial clamping system

Shank HSK-A in accordance with DIN 69893-1



Long design with HSK-A 63

Dimensions						Specification	Order No.
d ₁	HFS size	l ₁	l ₂	l ₃	HSK-A size		
15,60 - 18,59	10	117	91	86	63	HFS101SN-10-117-HSK-A063-S	30010272
18,60 - 21,29	12	132,5	106,5	100,5	63	HFS101SN-12-133-HSK-A063-S	30010273
21,30 - 23,99	14	131,5	105,5	99,5	63	HFS101SN-14-132-HSK-A063-S	30010275
24,00 - 29,99	16	163	137	129	63	HFS101SN-16-163-HSK-A063-S	30010276
30,00 - 39,99	20	188	162	158	63	HFS101SN-20-188-HSK-A063-S	30010280
40,00 - 50,70	24	207	181	176	63	HFS101SN-24-207-HSK-A063-S	30010286
50,71 - 65,00							

Short design with HSK-A 63

Dimensions						Specification	Order No.
d ₁	HFS size	l ₁	l ₂	l ₃	HSK-A size		
15,60 - 18,59	10	77	51	46	63	HFS101SN-10-077-HSK-A063-S	30010283
18,60 - 21,29	12	92,5	66,5	60,5	63	HFS101SN-12-093-HSK-A063-S	30010285
21,30 - 23,99	14	91,5	65,5	59,5	63	HFS101SN-14-092-HSK-A063-S	30010287
24,00 - 29,99	16	112	86	79	63	HFS101SN-16-112-HSK-A063-S	30010288
30,00 - 39,99	20	111	85	78	63	HFS101SN-20-111-HSK-A063-S	30010289
40,00 - 50,70	24	109	83	76	63	HFS101SN-24-109-HSK-A063-S	30010291
50,71 - 65,00							

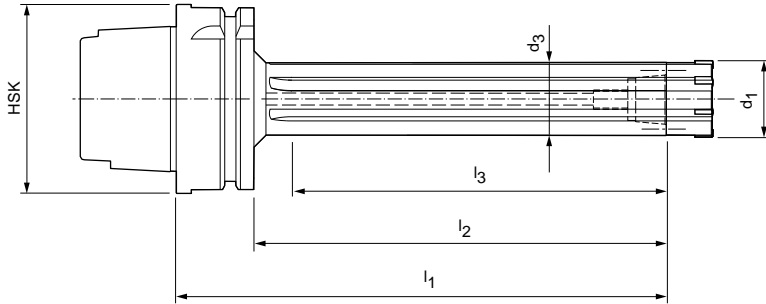
Dimensions in mm.

Items included: Tool holder with threaded spindle and hexagonal T-key.

HFS replaceable head holder

With axial clamping system

Shank HSK-A in accordance with DIN 69893-1



Long design with HSK-A 63

Dimensions							Specification	Order No.
d ₁	HFS size	d ₃	l ₁	l ₂	l ₃	HSK-A size		
16,60 - 19,39	10	16,0	117	91	71	63	HFS111SN-10A-117-HSK-A063-S	30026586
19,40 - 21,29	10	18,6	117	91	71	63	HFS111SN-10B-117-HSK-A063-S	30026587
21,30 - 24,99	12	20,5	131,5	105,5	86,5	63	HFS111SN-12-132-HSK-A063-S	30026588
25,00 - 28,99	14	24,2	163,5	137,5	118,5	63	HFS111SN-14-164-HSK-A063-S	30026589
29,00 - 32,29	16	28,2	188	162	143	63	HFS111SN-16A-188-HSK-A063-S	30026590
32,30 - 36,99	16	31,5	188	162	143	63	HFS111SN-16B-188-HSK-A063-S	30026591
37,00 - 41,19	20	36,2	188	162	152	63	HFS111SN-20A-188-HSK-A063-S	30026592
41,20 - 44,99	20	40,2	188	162	152	63	HFS111SN-20B-188-HSK-A063-S	30026593
45,00 - 50,70	24	44,0	233	207	197	63	HFS111SN-24-233-HSK-A063-S	30026594
50,71 - 65,00								

Short design with HSK-A 63

Dimensions							Specification	Order No.
d ₁	HFS size	d ₃	l ₁	l ₂	l ₃	HSK-A size		
16,60 - 19,39	10	16,0	77	51	31	63	HFS111SN-10A-077-HSK-A063-S	30026574
19,40 - 21,29	10	18,6	77	51	31	63	HFS111SN-10B-077-HSK-A063-S	30026575
21,30 - 24,99	12	20,5	91,5	65,5	46,5	63	HFS111SN-12-092-HSK-A063-S	30026576
25,00 - 28,99	14	24,2	112,5	86,5	67,5	63	HFS111SN-14-113-HSK-A063-S	30026577
29,00 - 32,29	16	28,2	111	85	66	63	HFS111SN-16A-111-HSK-A063-S	30026578
32,30 - 36,99	16	31,5	111	85	66	63	HFS111SN-16B-111-HSK-A063-S	30026579
37,00 - 41,19	20	36,2	111	85	75	63	HFS111SN-20A-111-HSK-A063-S	30026580
41,20 - 44,99	20	40,2	111	85	75	63	HFS111SN-20B-111-HSK-A063-S	30026581
45,00 - 50,70	24	44,0	109	83	73	63	HFS111SN-24-109-HSK-A063-S	30026582
50,71 - 65,00								

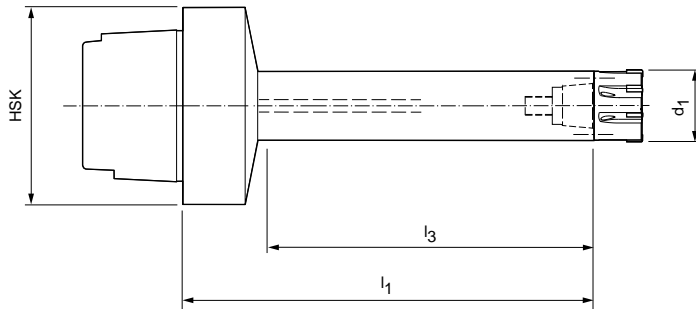
Dimensions in mm.

Items included: Tool holder with threaded spindle and hexagonal T-key.

HFS replaceable head holder

With axial clamping system

Shank HSK-C in accordance with DIN 69893-1



Long design with HSK-C 63

Dimensions					Specification	Order No.
d ₁	HFS size	l ₁	l ₃	HSK-C size		
15,60 - 18,59	10	117	91	63	HFS101SN-10-117-HSK-C063-S	30015335
18,60 - 21,29	12	132,5	105,5	63	HFS101SN-12-133-HSK-C063-S	30015336
21,30 - 23,99	14	131,5	104,5	63	HFS101SN-14-132-HSK-C063-S	30015337
24,00 - 29,99	16	163	139	63	HFS101SN-16-163-HSK-C063-S	30015338
30,00 - 39,99	20	188	163	63	HFS101SN-20-188-HSK-C063-S	30015339
40,00 - 50,70	24	207	186	63	HFS101SN-24-207-HSK-C063-S	30015340
50,71 - 65,00						

Short design with HSK-C 63

Dimensions					Specification	Order No.
d ₁	HFS size	l ₁	l ₃	HSK-C size		
15,60 - 18,59	10	77	51	63	HFS101SN-10-077-HSK-C063-S	30015343
18,60 - 21,29	12	92,5	65,5	63	HFS101SN-12-093-HSK-C063-S	30015344
21,30 - 23,99	14	91,5	64,5	63	HFS101SN-14-092-HSK-C063-S	30015345
24,00 - 29,99	16	112	84	63	HFS101SN-16-112-HSK-C063-S	30015346
30,00 - 39,99	20	111	88	63	HFS101SN-20-111-HSK-C063-S	30015347
40,00 - 50,70	24	109	86	63	HFS101SN-24-109-HSK-C063-S	30015348
50,71 - 65,00						

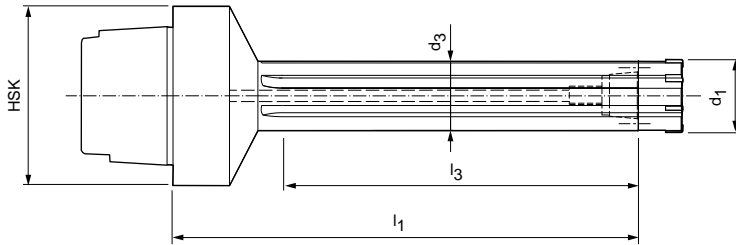
Dimensions in mm.

Items included: Tool holder with threaded spindle and hexagonal T-key.

HFS replaceable head holder

With axial clamping system

Shank HSK-C in accordance with DIN 69893-1



Long design with HSK-C 63

Dimensions						Specification	Order No.
d ₁	HFS size	d ₃	l ₁	l ₃	HSK-C size		
16,60 - 19,39	10	16	117	78	63	HFS111SN-10A-117-HSK-C063-S	30026634
19,40 - 21,29	10	18,6	117	78	63	HFS111SN-10B-117-HSK-C063-S	30026635
21,30 - 24,99	12	20,5	131,5	94,5	63	HFS111SN-12-132-HSK-C063-S	30026636
25,00 - 28,99	14	24,2	163,5	125,5	63	HFS111SN-14-164-HSK-C063-S	30026637
29,00 - 32,29	16	28,2	188	150	63	HFS111SN-16A-188-HSK-C063-S	30026638
32,30 - 36,99	16	31,5	188	150	63	HFS111SN-16B-188-HSK-C063-S	30026639
37,00 - 41,19	20	36,2	188	150	63	HFS111SN-20A-188-HSK-C063-S	30026640
41,20 - 44,99	20	40,2	188	150	63	HFS111SN-20B-188-HSK-C063-S	30026641
45,00 - 50,70	24	44	207	174	63	HFS111SN-24-207-HSK-C063-S	30026642
50,71 - 65,00							

Short design with HSK-C 63

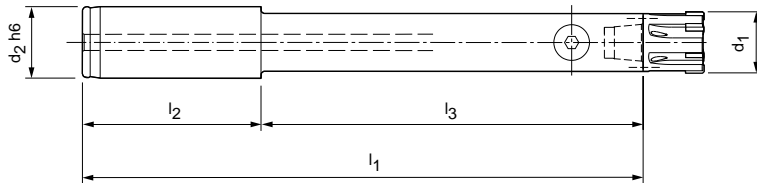
Dimensions						Specification	Order No.
d ₁	HFS size	d ₃	l ₁	l ₃	HSK-C size		
16,60 - 19,39	10	16	77	38	63	HFS111SN-10A-077-HSK-C063-S	30026610
19,40 - 21,29	10	18,6	77	38	63	HFS111SN-10B-077-HSK-C063-S	30026611
21,30 - 24,99	12	20,5	91,5	54,5	63	HFS111SN-12-092-HSK-C063-S	30026612
25,00 - 28,99	14	24,2	112,5	74,5	63	HFS111SN-14-113-HSK-C063-S	30026613
29,00 - 32,29	16	28,2	111	73	63	HFS111SN-16A-111-HSK-C063-S	30026614
32,30 - 36,99	16	31,5	111	73	63	HFS111SN-16B-111-HSK-C063-S	30026615
37,00 - 41,19	20	36,2	111	73	63	HFS111SN-20A-111-HSK-C063-S	30026616
41,20 - 44,99	20	40,2	111	73	63	HFS111SN-20B-111-HSK-C063-S	30026617
45,00 - 50,70	24	44	109	76	63	HFS111SN-24-109-HSK-C063-S	30026618
50,71 - 65,00							

Dimensions in mm.

Items included: Tool holder with threaded spindle and hexagonal T-key.

HFS replaceable head holder

With radial clamping system, shank in accordance with MN 623, similar to DIN 1835-A
For HPR replaceable head reamers HPR100, HPR110, HPR200, HPR210



Long design with cylindrical shank

Dimensions						Specification	Order No.
d ₁	HFS size	d ₂ h6	l ₁	l ₂	l ₃		
18,60 - 21,29	12	20	179,5	50	129,5	HFS101RN-12-130-ZYL-HA20-S	30078110
21,30 - 23,99	14	20	180,5	50	130,5	HFS101RN-14-131-ZYL-HA20-S	30078115
24,00 - 29,99	16	25	211	60	151	HFS101RN-16-151-ZYL-HA25-S	30078116
30,00 - 39,99	20	25	210	60	150	HFS101RN-20-150-ZYL-HA25-S	30080112

Short design with cylindrical shank

Dimensions						Specification	Order No.
d ₁	HFS size	d ₂ h6	l ₁	l ₂	l ₃		
18,60 - 21,29	12	20	118,5	50	68,5	HFS101RN-12-069-ZYL-HA20-S	30078117
21,30 - 23,99	14	20	119,5	50	69,5	HFS101RN-14-070-ZYL-HA20-S	30078118
24,00 - 29,99	16	25	150	60	90	HFS101RN-16-090-ZYL-HA25-S	30078119
30,00 - 39,99	20	25	149	60	89	HFS101RN-20-089-ZYL-HA25-S	30080151

Extra short design with cylindrical shank

Dimensions						Specification	Order No.
d ₁	HFS size	d ₂ h6	l ₁	l ₂	l ₃		
18,60 - 21,29	12	20	85	50	35	HFS101RN-12-035-ZYL-HA20-S	30115560

Dimensions in mm.

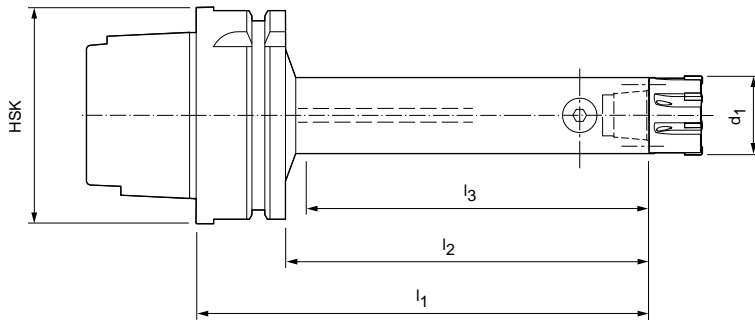
Recommendation: To make it possible to change reamers quickly using the radial clamping system, at least one additional pull stud should be ordered.

Items included: Tool holder with pull stud, hexagonal T-key and open-ended wrench for pull stud.

HFS replaceable head holder

With radial clamping system

Shank HSK-A in accordance with DIN 69893-1



Long design with HSK-A 63

Dimensions						Specification	Order No.
d ₁	HFS size	l ₁	l ₂	l ₃	HSK-A size		
18,60 - 21,29	12	132,5	106,5	100,5	63	HFS101RN-12-133-HSK-A063-S	30078136
21,30 - 23,99	14	131,5	105,5	99,5	63	HFS101RN-14-132-HSK-A063-S	30078137
24,00 - 29,99	16	163	137	129	63	HFS101RN-16-163-HSK-A063-S	30078138
30,00 - 39,99	20	188	162	158	63	HFS101RN-20-188-HSK-A063-S	30080156

Short design with HSK-A 63

Dimensions						Specification	Order No.
d ₁	HFS size	l ₁	l ₂	l ₃	HSK-A size		
18,60 - 21,29	12	92,5	66,5	60,5	63	HFS101RN-12-093-HSK-A063-S	30078139
21,30 - 23,99	14	91,5	65,5	59,5	63	HFS101RN-14-092-HSK-A063-S	30078140
24,00 - 29,99	16	112	86	79	63	HFS101RN-16-112-HSK-A063-S	30078141
30,00 - 39,99	20	111	85	78	63	HFS101RN-20-111-HSK-A063-S	30080157

Dimensions in mm.

Recommendation: To make it possible to change reamers quickly using the radial clamping system, at least one additional pull stud should be ordered.

Items included: Tool holder with pull stud, hexagonal T-key and open-ended wrench for pull stud.

Accessories and spare parts for HFS



Threaded spindles for axial clamping system

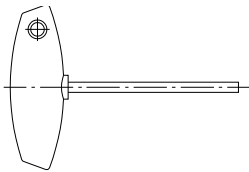
HFS size	Without coolant through-bore threaded spindle MN 618 Order No.	With coolant through-bore threaded spindle MN 618 Order No.
10	10024720	10025194
12	10024721	10025195
14	10024721	10025195
16	10024722	10025196
20	10024722	10025196
24	10024723	10025198



Pull studs for radial clamping system

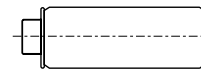
HFS size	Without coolant bore Order No.	With coolant bore Order No.
12	10059113	10059273
14	10059113	10059273
16	10059117	10059279
20	10059117	10059279

Recommendation: To make it possible to change reamers quickly using the radial clamping system, at least one additional pull stud should be ordered.



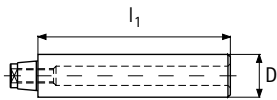
Hexagonal wrench with T-key

HFS size	Short design		Long design	
	Size	Order No.	Size	Order No.
10	sw2,5 x 100	10006233	sw2,5 x 200	10032722
12	sw3 x 100	10006234	sw3 x 200	10025313
14	sw3 x 100	10006234	sw3 x 200	10025313
16	sw4 x 100	10006235	sw4 x 200	10018010
20	sw4 x 100	10006235	sw4 x 200	10018010
24	sw5 x 100	10006236	sw5 x 200	10013349



Taper wipers for HFS internal tapers

HFS size	Order No.
10	10029989
12	10029990
14	10030002
16	10030003
20	10030004
24	10030005



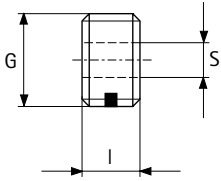
Test mandrel (alignment aid)

HFS size	l_1	D	Order No.
10	70	15	30036468
12	80	20	30036469
14	80	20,5	30036470
16	80	23,2	30036471
20	80	29,3	30036472
24	80	39	30036473

Dimensions in mm.

Design: Permissible run-out deviation of the cylindrical part in relation to the HFS connection max. 0.002 mm.

Accessories and spare parts for HSK-A 63

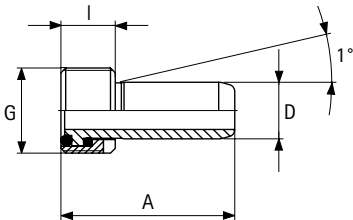


Blanking plug

HSK-A size	I	S	G	Order No.
63	11,5	8	M18x1	30326078

HFS size	Wrench size	Torque wrench				Blades and hexagonal inserts for torque wrenches			
		Torque	Design	Drive	Order No.	l [mm]	l ₁ [mm]	Drive	Order No.
10	2.5	4 Nm	Fixed – with blade	–	10044842	175	70	Blade	10044839
12	3	6 Nm	Adjustable – no bit	1/4"	10040125	55	30	Bit 1/4"	10040122
14	3	6 Nm	Adjustable – no bit	1/4"	10040125	55	30	Bit 1/4"	10040122
16	4	15 Nm	Adjustable – no bit	3/8"	10040126	60	35	Bit 3/8"	10040123
20	4	15 Nm	Adjustable – no bit	3/8"	10040126	60	35	Bit 3/8"	10040123
24	5	20 Nm	Adjustable – no bit	3/8"	10040126	70	45	Bit 3/8"	10040124

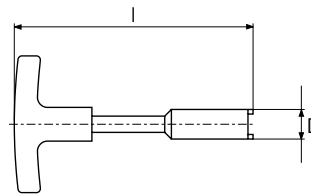
Torque wrench and hexagonal bits only from HFS size 12 or wrench size 3.



Coolant tube

HSK-A size	A	I	G	D	Order No.
63	36.6	11,5	M18x1	12	30326006

Items included: Coolant tube with two O-rings and union nut.
 Design: Free angular movement 1° self-centring, axially sealed.
 Note: Designed in accordance with DIN 69893.



Assembly tool

HSK-A size	I	D	Order No.
63	182	17	10040110

Use: For installation and removal of coolant tubes.

Dimensions in mm.

Use: For sealing the threaded bore in HSK tool shanks if a coolant tube is not used.

Design: With Nylok insert for screw locking.

Material: Stainless steel.



A close-up, diagonal view of a reamer handle, showing a dark grey grip section and a lighter grey shaft section. The background is a soft, out-of-focus light grey.

CPR – REPLACEABLE HEAD REAMERS

Introduction

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CPR replaceable head reamers

Solid carbide design series 500	332
Tipped design series 600	334

CFS replaceable head holders

Designation key	348
Holder range	350

PRODUCT OVERVIEW

CPR replaceable head reamers

The standard programme of CPR replaceable head reamers include series for through and blind bores from a diameter of 8.00 mm. The replaceable head reamers are available either of solid carbide design (series 500) or can be tipped with different cutting materials such as carbide, cermet, PcBN or PCD (series 600). The reamers can be configured in the diameter range from 8.00 to 40.00 mm in steps of 0.10 mm; the tolerance range can also be configured. A broad range of H7 dimensions is available as a preferred series.

The related CFS holder range is designed for the best possible stability and rigidity with a taper and face connection. The special design and manufacture to the μ of the thread and taper-face section guarantee a highly precise radial run-out accuracy of 5 μ m. Thanks to the simple and safe handling, the reaming heads can be replaced in the machine tool quickly and easily.



Solid carbide design series 500 510 | 505



Solid carbide design

Ø range: 8.00 – 40.00 mm*



Tipped design series 600 600 | 610 | 605



Design with brazed cutting edges

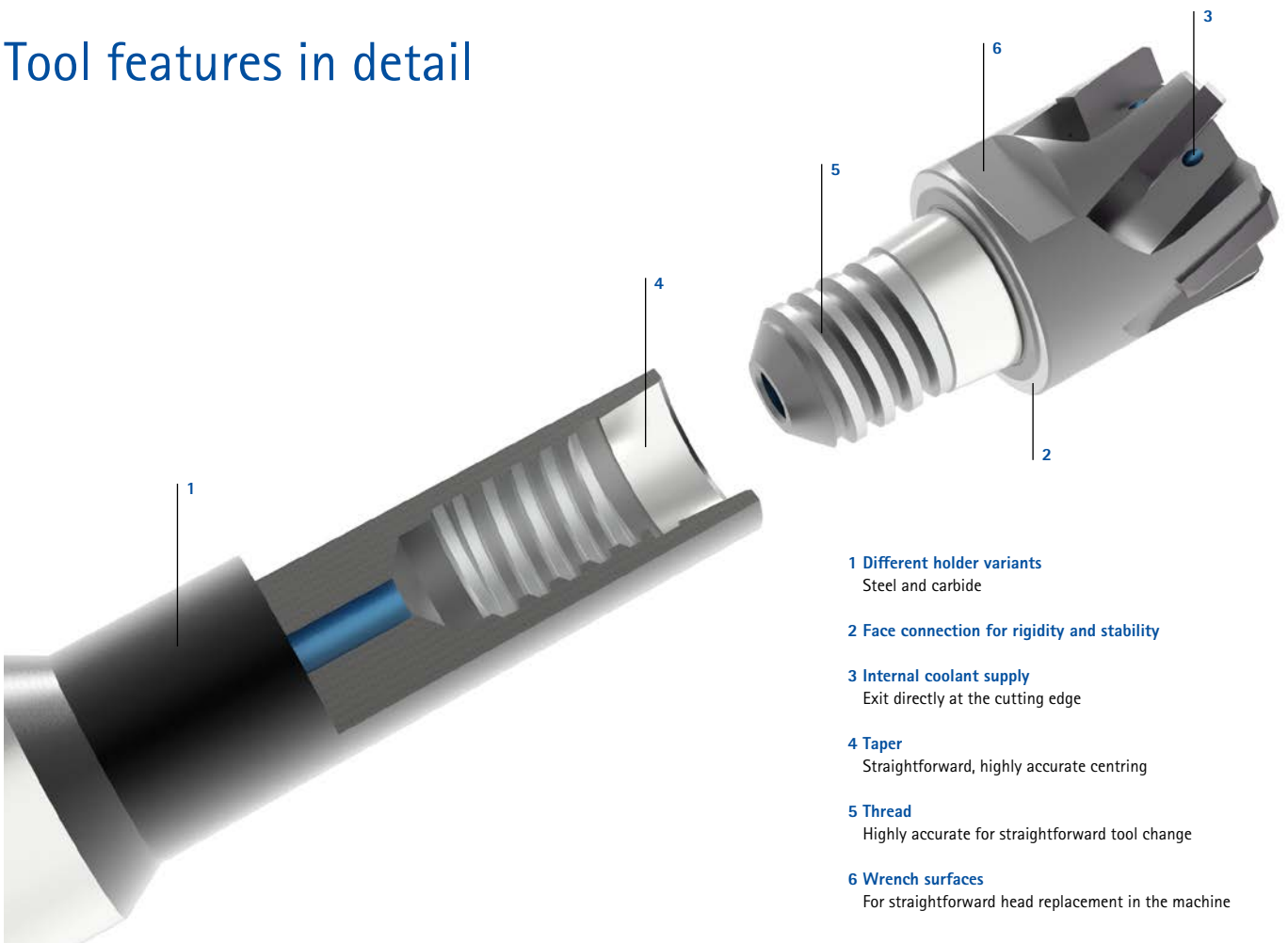
Ø range: 8.00 – 40.00 mm*



* The diameter range can vary, depending on the series.



Tool features in detail



1 Different holder variants
Steel and carbide

2 Face connection for rigidity and stability

3 Internal coolant supply
Exit directly at the cutting edge

4 Taper
Straightforward, highly accurate centring

5 Thread
Highly accurate for straightforward tool change

6 Wrench surfaces
For straightforward head replacement in the machine

Selection overview CPR | Ordering example

1. Series

Type of bore	Material	Coolant supply	FIXED Design with brazed cutting edge	FIXED Solid carbide design
	P M K N	✓	605	-
	P K	✓	-	505
	K N	✓	600	-
	P M K	✓	610	-
	P K	✓	-	510

2. Tool dimensions

CPR610 | CPR600

	ød ₁	l ₁	Wrench size	CFS size	z
CPR610 CPR600	8,000-9,700	18	6	6	4
	9,701-10,700	18	8	6	6
	10,701-12,700	20	8	8	6
	12,701-16,200	22	10	10	6
	16,201-17,200	22	13	10	6
	17,201-19,200	26	13	12	6
	19,201-21,200	26	16	12	6
	21,201-24,200	26	16	16	6
	24,201-26,200	26	19	16	6
	26,201-28,200	26	21	16	6
	28,201-29,200	26	24	16	6
	29,201-30,200	26	24	16	8
	30,201-32,200	30	24	24	8
	32,201-34,200	30	27	24	8
34,201-40,200	30	30	24	8	

CPR605

	ød ₁	l ₁	Wrench size	CFS size	z
CPR605	12,201-12,700	20	6	6	6
	12,701-14,200	22	6	6	6
	14,201-16,200	22	8	8	6
	16,201-17,200	22	10	10	6
	17,201-20,200	26	10	10	6
	20,201-24,200	26	13	12	6
	24,201-29,200	26	16	16	6
	29,201-30,200	26	16	16	8
	30,201-32,200	26	16	16	8
	32,201-40,200	30	24	24	8

CPR510 | CPR505

	ød ₁	l ₁	Wrench size	CFS size	z
CPR510	8,000-10,700	18	6	6	6
	10,701-12,700	20	8	8	6
	12,701-16,200	22	10	10	6
	16,201-17,200	22	10	10	8
	17,201-21,200	26	13	12	8
	21,201-30,200	26	16	16	8
	30,201-40,200	30	24	16	8
	CPR505	9,701-10,700	18	6	6
10,701-12,700		20	6	6	6
12,701-14,200		22	6	6	6
14,201-16,200		22	8	8	6
16,201-17,200		22	10	10	8
17,201-20,200		26	10	10	8
20,201-24,200		26	13	12	8
24,201-30,200		26	16	16	8
30,201-32,200		30	16	16	8
32,201-40,200		30	24	16	8

Ordering example:

1. Series

C P R

CPRream

Designs:

5 = Solid carbide
6 = Brazed cutting edge, fixed

2. Diameter

6 0 0

Type of bore:
0 = Through bore
5 = Blind bore

Flute helix angle on the cutting edges:

0 = Straight fluted
1 = Left-hand spiral fluted

ø 2 0 .

Bore diameter

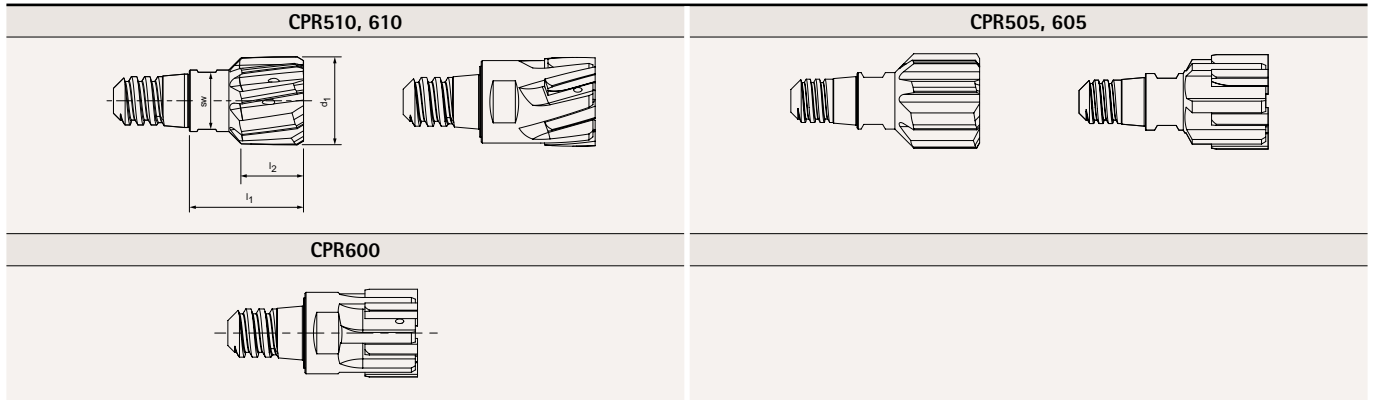
0 0 0

Tolerance

H 7

IT or allowance in µm
(example: +30+10)

Tool dimensions

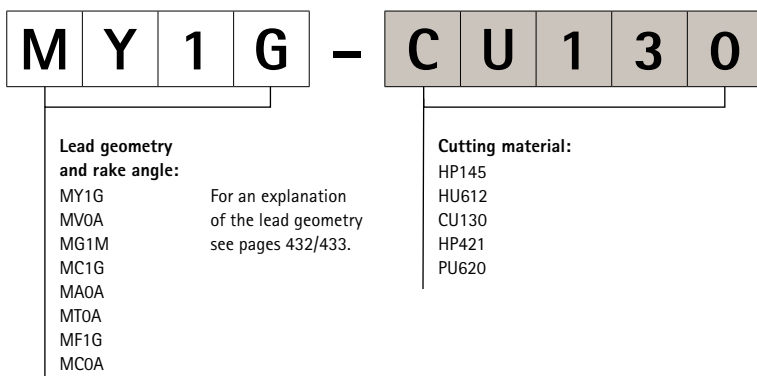


3. Lead and cutting material

		P				M		K						N	
		P1 - P5		P6		M1 - M3		K1		K2		K3		N1 - N2	
510 505	Lead	MVOA	MG1M					MVOA	MG1M	MVOA	MG1M	MVOA	MG1M		
	Cutting material	HP145	HP145					HP145	HP145	HP145	HP145	HP145	HP145		
	Preferred series H7	P. 333	P. 332					P. 333	P. 332	P. 333	P. 332	P. 333	P. 332		
610 605	Lead	MVOA	MY1G	MT0A	MF1G	MT0A	MF1G	MVOA	MY1G	MVOA	MY1G	MVOA	MY1G	MVOA	
	Cutting material	CU130	CU130	HP421	HP421	HP421	HP421	HP421	HP421	HP421	CU130	HP421	HP421	HU612	
	Preferred series H7	P. 343	P. 336	P. 342	P. 334	P. 342	P. 334	P. 341	P. 335	P. 341	P. 336	P. 341	P. 335	P. 340	
	Lead	MVOA	MY1G					MVOA	MY1G	MVOA	MY1G				MA0A
	Cutting material	HP421	HP421					CU130	CU130	CU130	HP421				PU620
	Preferred series H7	P. 341	P. 335					P. 343	P. 336	P. 343	P. 335				P. 344
600	Lead								MC1G		MC1G		MC1G		MCOA
	Cutting material								HP421		HP421		HP421		PU620
	Preferred series H7								P. 338		P. 338		P. 338		P. 339
	Lead														MC1G
	Cutting material														HU612
	Preferred series H7														P. 337

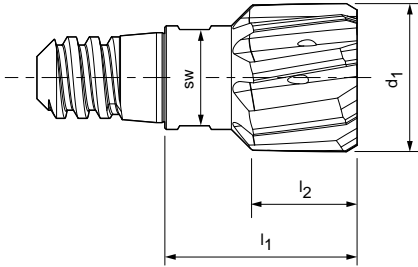
3. Lead

Cutting material



CPRream CPR510

Design: Solid carbide
Reamer diameter: 8.00 - 40.00 mm
Lead: MG1M
Cutting material: HP145



Dimensions				z	Wrench size (sw)	Specification	Order No.
d ₁	CFS size	l ₁	l ₂				
8,00	6	18	10	6	6	CPR510Ø8H7MG1M-HP145	30552593
8,50	6	18	10	6	6	CPR510Ø8.5H7MG1M-HP145	30559626
9,00	6	18	10	6	6	CPR510Ø9H7MG1M-HP145	30552594
9,50	6	18	10	6	6	CPR510Ø9.5H7MG1M-HP145	30552595
10,00	6	18	10	6	6	CPR510Ø10H7MG1M-HP145	30552596
10,50	6	18	10	6	6	CPR510Ø10.5H7MG1M-HP145	30552597
11,00	8	20	10	6	8	CPR510Ø11H7MG1M-HP145	30552598
11,50	8	20	10	6	8	CPR510Ø11.5H7MG1M-HP145	30552599
12,00	8	20	10	6	8	CPR510Ø12H7MG1M-HP145	30552600
12,50	8	20	10	6	8	CPR510Ø12.5H7MG1M-HP145	30552601
13,00	10	22	10	6	10	CPR510Ø13H7MG1M-HP145	30552602
14,00	10	22	12	6	10	CPR510Ø14H7MG1M-HP145	30552603
15,00	10	22	12	6	10	CPR510Ø15H7MG1M-HP145	30552604
16,00	10	22	12	6	10	CPR510Ø16H7MG1M-HP145	30552605
17,00	10	22	12	8	10	CPR510Ø17H7MG1M-HP145	30552606
18,00	12	26	14	8	13	CPR510Ø18H7MG1M-HP145	30552607
19,00	12	26	14	8	13	CPR510Ø19H7MG1M-HP145	30552608
20,00	12	26	14	8	13	CPR510Ø20H7MG1M-HP145	30552609
21,00	12	26	14	8	13	CPR510Ø21H7MG1M-HP145	30559627
22,00	16	26	14	8	16	CPR510Ø22H7MG1M-HP145	30559628
23,00	16	26	14	8	16	CPR510Ø23H7MG1M-HP145	30559629
24,00	16	26	14	8	16	CPR510Ø24H7MG1M-HP145	30559630
25,00	16	26	14	8	16	CPR510Ø25H7MG1M-HP145	30559631
26,00	16	26	14	8	16	CPR510Ø26H7MG1M-HP145	30559632
27,00	16	26	14	8	16	CPR510Ø27H7MG1M-HP145	30559633
28,00	16	26	14	8	24	CPR510Ø28H7MG1M-HP145	30559634
29,00	16	26	14	8	24	CPR510Ø29H7MG1M-HP145	30559635
30,00	16	26	14	8	24	CPR510Ø30H7MG1M-HP145	30559636
31,00	16	30	14	8	24	CPR510Ø31H7MG1M-HP145	30559637
32,00	16	30	14	8	24	CPR510Ø32H7MG1M-HP145	30559638
33,00	16	30	14	8	24	CPR510Ø33H7MG1M-HP145	30559639
34,00	16	30	14	8	24	CPR510Ø34H7MG1M-HP145	30559640
35,00	16	30	14	8	24	CPR510Ø35H7MG1M-HP145	30559641
36,00	16	30	14	8	24	CPR510Ø36H7MG1M-HP145	30559642
37,00	16	30	14	8	24	CPR510Ø37H7MG1M-HP145	30559643
38,00	16	30	14	8	24	CPR510Ø38H7MG1M-HP145	30559644
39,00	16	30	14	8	24	CPR510Ø39H7MG1M-HP145	30559645
40,00	16	30	14	8	24	CPR510Ø40H7MG1M-HP145	30552629

Dimensions in mm.

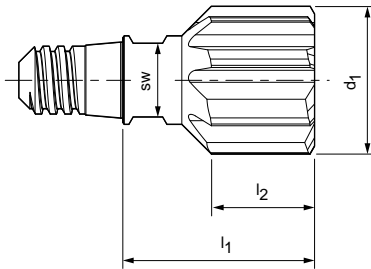
Cutting data recommendation from page 436.

Related CFS replaceable head holders with enlarged face connection for CFS size 16 see page 350.

Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "Complete-Performance-Reamers".

CPRream CPR505

Design: Solid carbide
Reamer diameter: 10.00 - 40.00 mm
Lead: MV0A
Cutting material: HP145



Dimensions				z	Wrench size (sw)	Specification	Order No.
d ₁	CFS size	l ₁	l ₂				
10,00	6	18	10	6	6	CPR505Ø10H7MV0A-HP145	30552630
10,50	6	18	10	6	6	CPR505Ø10.5H7MV0A-HP145	30552631
11,00	6	20	10	6	6	CPR505Ø11H7MV0A-HP145	30552632
11,50	6	20	10	6	6	CPR505Ø11.5H7MV0A-HP145	30552633
12,00	6	20	10	6	6	CPR505Ø12H7MV0A-HP145	30552634
12,50	6	20	10	6	6	CPR505Ø12.5H7MV0A-HP145	30552635
13,00	6	22	12	6	6	CPR505Ø13H7MV0A-HP145	30552636
14,00	6	22	12	6	6	CPR505Ø14H7MV0A-HP145	30552637
15,00	8	22	12	6	8	CPR505Ø15H7MV0A-HP145	30552638
16,00	8	22	12	6	8	CPR505Ø16H7MV0A-HP145	30552639
17,00	10	22	12	8	10	CPR505Ø17H7MV0A-HP145	30552640
18,00	10	26	14	8	10	CPR505Ø18H7MV0A-HP145	30552641
19,00	10	26	14	8	10	CPR505Ø19H7MV0A-HP145	30552642
20,00	10	26	14	8	10	CPR505Ø20H7MV0A-HP145	30552643
21,00	12	26	14	8	13	CPR505Ø21H7MV0A-HP145	30559646
22,00	12	26	14	8	13	CPR505Ø22H7MV0A-HP145	30559647
23,00	12	26	14	8	13	CPR505Ø23H7MV0A-HP145	30559648
24,00	12	26	14	8	13	CPR505Ø24H7MV0A-HP145	30559649
25,00	16	26	14	8	16	CPR505Ø25H7MV0A-HP145	30559650
26,00	16	26	14	8	16	CPR505Ø26H7MV0A-HP145	30559651
27,00	16	26	14	8	16	CPR505Ø27H7MV0A-HP145	30559652
28,00	16	26	14	8	16	CPR505Ø28H7MV0A-HP145	30559653
29,00	16	26	14	8	16	CPR505Ø29H7MV0A-HP145	30559654
30,00	16	26	14	8	16	CPR505Ø30H7MV0A-HP145	30559655
31,00	16	30	14	8	16	CPR505Ø31H7MV0A-HP145	30559656
32,00	16	30	14	8	16	CPR505Ø32H7MV0A-HP145	30559657
33,00	16	30	14	8	24	CPR505Ø33H7MV0A-HP145	30559658
34,00	16	30	14	8	24	CPR505Ø34H7MV0A-HP145	30559659
35,00	16	30	14	8	24	CPR505Ø35H7MV0A-HP145	30559660
36,00	16	30	14	8	24	CPR505Ø36H7MV0A-HP145	30559661
37,00	16	30	14	8	24	CPR505Ø37H7MV0A-HP145	30559662
38,00	16	30	14	8	24	CPR505Ø38H7MV0A-HP145	30559663
39,00	16	30	14	8	24	CPR505Ø39H7MV0A-HP145	30559664
40,00	16	30	14	8	24	CPR505Ø40H7MV0A-HP145	30559665

Dimensions in mm.

Cutting data recommendation from page 436.

Related CFS replaceable head holders with enlarged face connection for CFS size 16 see page 350.

Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "Complete-Performance-Reamers".

CPRream CPR610

Version with brazed cutting edges

Design:

Reamer diameter:

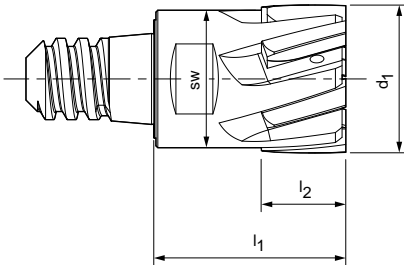
8.00 - 40.00 mm

Lead:

MF1G

Cutting material:

HP421



Dimensions				z	Wrench size (sw)	Specification	Order No.
d_1	CFS size	l_1	l_2				
8,00	6	18	8	4	6	CPR61008H7MF1G-HP421	30384549
10,00	6	18	8	6	8	CPR610010H7MF1G-HP421	30384550
12,00	8	20	8	6	8	CPR610012H7MF1G-HP421	30384551
14,00	10	22	8	6	10	CPR610014H7MF1G-HP421	30384552
16,00	10	22	8	6	10	CPR610016H7MF1G-HP421	30384553
18,00	12	26	12	6	13	CPR610018H7MF1G-HP421	30384554
20,00	12	26	12	6	16	CPR610020H7MF1G-HP421	30384555
22,00	16	26	12	6	16	CPR610022H7MF1G-HP421	30384556
24,00	16	26	12	6	16	CPR610024H7MF1G-HP421	30384557
25,00	16	26	12	6	19	CPR610025H7MF1G-HP421	30384558
26,00	16	26	12	6	19	CPR610026H7MF1G-HP421	30384559
28,00	16	26	12	6	21	CPR610028H7MF1G-HP421	30384560
30,00	16	26	12	8	24	CPR610030H7MF1G-HP421	30384561
32,00	24	30	12	8	24	CPR610032H7MF1G-HP421	30455142
34,00	24	30	12	8	27	CPR610034H7MF1G-HP421	30455143
36,00	24	30	12	8	30	CPR610036H7MF1G-HP421	30455144
38,00	24	30	12	8	30	CPR610038H7MF1G-HP421	30455145
40,00	24	30	12	8	30	CPR610040H7MF1G-HP421	30455146

Dimensions in mm.

Cutting data recommendation from page 436.

For related CFS replaceable head holders see page 346.

Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "Complete-Performance-Reamers".

CPRream CPR610

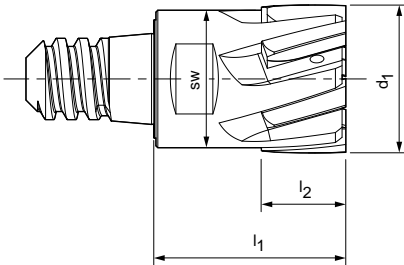
Version with brazed cutting edges

Design:

Reamer diameter: 8.00 - 40.00 mm

Lead: MY1G

Cutting material: HP421



Dimensions				z	Wrench size (sw)	Specification	Order No.
d ₁	CFS size	l ₁	l ₂				
8,00	6	18	8	4	6	CPR610Ø8H7MY1G-HP421	30432542
10,00	6	18	8	6	8	CPR610Ø10H7MY1G-HP421	30432543
12,00	8	20	8	6	8	CPR610Ø12H7MY1G-HP421	30432544
14,00	10	22	8	6	10	CPR610Ø14H7MY1G-HP421	30432545
16,00	10	22	8	6	10	CPR610Ø16H7MY1G-HP421	30432546
18,00	12	26	12	6	13	CPR610Ø18H7MY1G-HP421	30432547
20,00	12	26	12	6	16	CPR610Ø20H7MY1G-HP421	30432548
22,00	16	26	12	6	16	CPR610Ø22H7MY1G-HP421	30432549
24,00	16	26	12	6	16	CPR610Ø24H7MY1G-HP421	30432550
25,00	16	26	12	6	19	CPR610Ø25H7MY1G-HP421	30432551
26,00	16	26	12	6	19	CPR610Ø26H7MY1G-HP421	30432552
28,00	16	26	12	6	21	CPR610Ø28H7MY1G-HP421	30432553
30,00	16	26	12	8	24	CPR610Ø30H7MY1G-HP421	30432554
32,00	24	30	12	8	24	CPR610Ø32H7MY1G-HP421	30432673
34,00	24	30	12	8	27	CPR610Ø34H7MY1G-HP421	30432674
36,00	24	30	12	8	30	CPR610Ø36H7MY1G-HP421	30432675
38,00	24	30	12	8	30	CPR610Ø38H7MY1G-HP421	30432676
40,00	24	30	12	8	30	CPR610Ø40H7MY1G-HP421	30432677

Dimensions in mm.

Cutting data recommendation from page 436.

For related CFS replaceable head holders see page 346.

Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "Complete-Performance-Reamers".

CPRream CPR610

Version with brazed cutting edges

Design:

Reamer diameter:

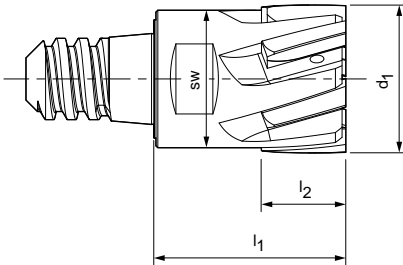
8.00 - 40.00 mm

Lead:

MY1G

Cutting material:

CU130



Dimensions				z	Wrench size (sw)	Specification	Order No.
d ₁	CFS size	l ₁	l ₂				
8,00	6	18	8	4	6	CPR610Ø8H7MY1G-CU130	30384536
10,00	6	18	8	6	8	CPR610Ø10H7MY1G-CU130	30384537
12,00	8	20	8	6	8	CPR610Ø12H7MY1G-CU130	30384538
14,00	10	22	8	6	10	CPR610Ø14H7MY1G-CU130	30384539
16,00	10	22	8	6	10	CPR610Ø16H7MY1G-CU130	30384540
18,00	12	26	12	6	13	CPR610Ø18H7MY1G-CU130	30384541
20,00	12	26	12	6	16	CPR610Ø20H7MY1G-CU130	30384542
22,00	16	26	12	6	16	CPR610Ø22H7MY1G-CU130	30384543
24,00	16	26	12	6	16	CPR610Ø24H7MY1G-CU130	30384544
25,00	16	26	12	6	19	CPR610Ø25H7MY1G-CU130	30384545
26,00	16	26	12	6	19	CPR610Ø26H7MY1G-CU130	30384546
28,00	16	26	12	6	21	CPR610Ø28H7MY1G-CU130	30384547
30,00	16	26	12	8	24	CPR610Ø30H7MY1G-CU130	30384548
32,00	24	30	12	8	24	CPR610Ø32H7MY1G-CU130	30455137
34,00	24	30	12	8	27	CPR610Ø34H7MY1G-CU130	30455138
36,00	24	30	12	8	30	CPR610Ø36H7MY1G-CU130	30455139
38,00	24	30	12	8	30	CPR610Ø38H7MY1G-CU130	30455140
40,00	24	30	12	8	30	CPR610Ø40H7MY1G-CU130	30455141

Dimensions in mm.

Cutting data recommendation from page 436.

For related CFS replaceable head holders see page 346.

Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "Complete-Performance-Reamers".

CPRream CPR600

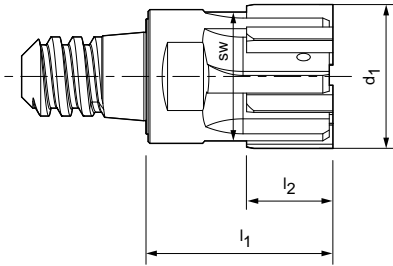
Version with brazed cutting edges

Design:

Reamer diameter: 8.00 - 40.00 mm

Lead: MC1G

Cutting material: HU612



Dimensions				z	Wrench size (sw)	Specification	Order No.
d ₁	CFS size	l ₁	l ₂				
8,00	6	18	8	4	6	CPR600Ø8H7MC1G-HU612	30384575
10,00	6	18	8	6	8	CPR600Ø10H7MC1G-HU612	30384576
12,00	8	20	8	6	8	CPR600Ø12H7MC1G-HU612	30384577
14,00	10	22	8	6	10	CPR600Ø14H7MC1G-HU612	30384578
16,00	10	22	8	6	10	CPR600Ø16H7MC1G-HU612	30384579
18,00	12	26	12	6	13	CPR600Ø18H7MC1G-HU612	30384580
20,00	12	26	12	6	16	CPR600Ø20H7MC1G-HU612	30384581
22,00	16	26	12	6	16	CPR600Ø22H7MC1G-HU612	30384582
24,00	16	26	12	6	16	CPR600Ø24H7MC1G-HU612	30384583
25,00	16	26	12	6	19	CPR600Ø25H7MC1G-HU612	30384584
26,00	16	26	12	6	19	CPR600Ø26H7MC1G-HU612	30384585
28,00	16	26	12	6	21	CPR600Ø28H7MC1G-HU612	30384586
30,00	16	26	12	8	24	CPR600Ø30H7MC1G-HU612	30384587
32,00	24	30	12	8	24	CPR600Ø32H7MC1G-HU612	30455153
34,00	24	30	12	8	27	CPR600Ø34H7MC1G-HU612	30455154
36,00	24	30	12	8	30	CPR600Ø36H7MC1G-HU612	30455155
38,00	24	30	12	8	30	CPR600Ø38H7MC1G-HU612	30455156
40,00	24	30	12	8	30	CPR600Ø40H7MC1G-HU612	30455157

Dimensions in mm.

Cutting data recommendation from page 436.

For related CFS replaceable head holders see page 346.

Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "Complete-Performance-Reamers".

CPRream CPR600

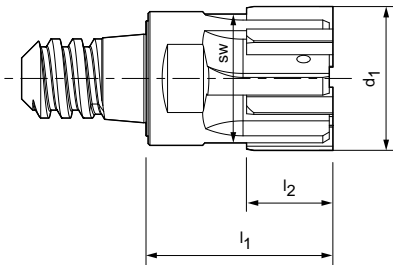
Version with brazed cutting edges

Design:

Reamer diameter: 8.00 - 40.00 mm

Lead: MC1G

Cutting material: HP421



Dimensions				z	Wrench size (sw)	Specification	Order No.
d ₁	CFS size	l ₁	l ₂				
8,00	6	18	8	4	6	CPR600Ø8H7MC1G-HP421	30384562
10,00	6	18	8	6	8	CPR600Ø10H7MC1G-HP421	30384563
12,00	8	20	8	6	8	CPR600Ø12H7MC1G-HP421	30384564
14,00	10	22	8	6	10	CPR600Ø14H7MC1G-HP421	30384565
16,00	10	22	8	6	10	CPR600Ø16H7MC1G-HP421	30384566
18,00	12	26	12	6	13	CPR600Ø18H7MC1G-HP421	30384567
20,00	12	26	12	6	16	CPR600Ø20H7MC1G-HP421	30384568
22,00	16	26	12	6	16	CPR600Ø22H7MC1G-HP421	30384569
24,00	16	26	12	6	16	CPR600Ø24H7MC1G-HP421	30384570
25,00	16	26	12	6	19	CPR600Ø25H7MC1G-HP421	30384571
26,00	16	26	12	6	19	CPR600Ø26H7MC1G-HP421	30384572
28,00	16	26	12	6	21	CPR600Ø28H7MC1G-HP421	30384573
30,00	16	26	12	8	24	CPR600Ø30H7MC1G-HP421	30384574
32,00	24	30	12	8	24	CPR600Ø32H7MC1G-HP421	30455147
34,00	24	30	12	8	27	CPR600Ø34H7MC1G-HP421	30455148
36,00	24	30	12	8	30	CPR600Ø36H7MC1G-HP421	30455149
38,00	24	30	12	8	30	CPR600Ø38H7MC1G-HP421	30455151
40,00	24	30	12	8	30	CPR600Ø40H7MC1G-HP421	30455152

Dimensions in mm.

Cutting data recommendation from page 436.

For related CFS replaceable head holders see page 346.

Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "Complete-Performance-Reamers".

CPRream CPR600

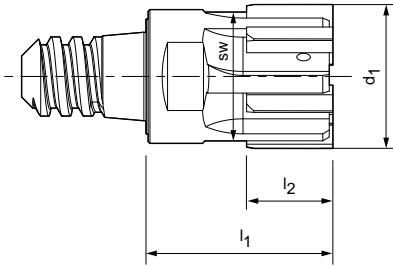
Version with brazed cutting edges

Design:

Reamer diameter: 8.00 - 40.00 mm

Lead: MCOA

Cutting material: PU620



Dimensions				z	Wrench size (sw)	Specification	Order No.
d ₁	CFS size	l ₁	l ₂				
8,00	6	18	8	4	6	CPR600Ø8H7MCOA-PU620	30384588
10,00	6	18	8	6	8	CPR600Ø10H7MCOA-PU620	30384589
12,00	8	20	8	6	8	CPR600Ø12H7MCOA-PU620	30384590
14,00	10	22	8	6	10	CPR600Ø14H7MCOA-PU620	30384591
16,00	10	22	8	6	10	CPR600Ø16H7MCOA-PU620	30384592
18,00	12	26	12	6	13	CPR600Ø18H7MCOA-PU620	30384593
20,00	12	26	12	6	16	CPR600Ø20H7MCOA-PU620	30384594
22,00	16	26	12	6	16	CPR600Ø22H7MCOA-PU620	30384595
24,00	16	26	12	6	16	CPR600Ø24H7MCOA-PU620	30384596
25,00	16	26	12	6	19	CPR600Ø25H7MCOA-PU620	30384597
26,00	16	26	12	6	19	CPR600Ø26H7MCOA-PU620	30384598
28,00	16	26	12	6	21	CPR600Ø28H7MCOA-PU620	30384599
30,00	16	26	12	8	24	CPR600Ø30H7MCOA-PU620	30384600
32,00	24	30	12	8	24	CPR600Ø32H7MCOA-PU620	30455158
34,00	24	30	12	8	27	CPR600Ø34H7MCOA-PU620	30455159
36,00	24	30	12	8	30	CPR600Ø36H7MCOA-PU620	30455160
38,00	24	30	12	8	30	CPR600Ø38H7MCOA-PU620	30455161
40,00	24	30	12	8	30	CPR600Ø40H7MCOA-PU620	30455162

Dimensions in mm.

Cutting data recommendation from page 436.

For related CFS replaceable head holders see page 346.

Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "Complete-Performance-Reamers".

CPRream CPR605

Version with brazed cutting edges

Design:

Reamer diameter:

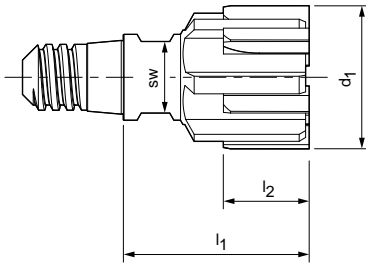
14.00 - 40.00 mm

Lead:

MV0A

Cutting material:

HU612



Dimensions				z	Wrench size (sw)	Specification	Order No.
d ₁	CFS size	l ₁	l ₂				
14,00	6	22	8	6	6	CPR605Ø14H7MV0A-HU612	30384635
16,00	8	22	8	6	8	CPR605Ø16H7MV0A-HU612	30384636
18,00	10	26	12	6	10	CPR605Ø18H7MV0A-HU612	30384637
20,00	10	26	12	6	10	CPR605Ø20H7MV0A-HU612	30384638
22,00	12	26	12	6	13	CPR605Ø22H7MV0A-HU612	30384639
24,00	12	26	12	6	13	CPR605Ø24H7MV0A-HU612	30384640
25,00	16	26	12	6	16	CPR605Ø25H7MV0A-HU612	30384641
26,00	16	26	12	6	16	CPR605Ø26H7MV0A-HU612	30384642
28,00	16	26	12	6	16	CPR605Ø28H7MV0A-HU612	30384643
30,00	16	26	12	8	16	CPR605Ø30H7MV0A-HU612	30384644
32,00	16	30	12	8	16	CPR605Ø32H7MV0A-HU612	30455179
34,00	24	30	12	8	24	CPR605Ø34H7MV0A-HU612	30455180
36,00	24	30	12	8	24	CPR605Ø36H7MV0A-HU612	30455181
38,00	24	30	12	8	24	CPR605Ø38H7MV0A-HU612	30455182
40,00	24	30	12	8	24	CPR605Ø40H7MV0A-HU612	30455183

Dimensions in mm.

Cutting data recommendation from page 436.

For related CFS replaceable head holders see page 346.

Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "Complete-Performance-Reamers".

CPRream CPR605

Version with brazed cutting edges

Design:

Reamer diameter:

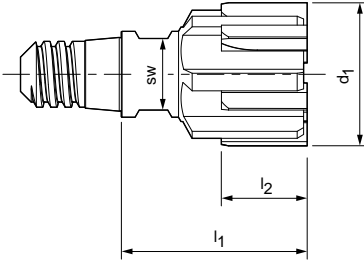
14.00 - 40.00 mm

Lead:

MVOA

Cutting material:

HP421



Dimensions				z	Wrench size (sw)	Specification	Order No.
d_1	CFS size	l_1	l_2				
14,00	6	22	8	6	6	CPR605Ø14H7MV0A-HP421	30384624
16,00	8	22	8	6	8	CPR605Ø16H7MV0A-HP421	30384625
18,00	10	26	12	6	10	CPR605Ø18H7MV0A-HP421	30384626
20,00	10	26	12	6	10	CPR605Ø20H7MV0A-HP421	30384627
22,00	12	26	12	6	13	CPR605Ø22H7MV0A-HP421	30384628
24,00	12	26	12	6	13	CPR605Ø24H7MV0A-HP421	30384629
25,00	16	26	12	6	16	CPR605Ø25H7MV0A-HP421	30384630
26,00	16	26	12	6	16	CPR605Ø26H7MV0A-HP421	30384631
28,00	16	26	12	6	16	CPR605Ø28H7MV0A-HP421	30384632
30,00	16	26	12	8	16	CPR605Ø30H7MV0A-HP421	30384633
32,00	16	30	12	8	16	CPR605Ø32H7MV0A-HP421	30455174
34,00	24	30	12	8	24	CPR605Ø34H7MV0A-HP421	30455175
36,00	24	30	12	8	24	CPR605Ø36H7MV0A-HP421	30455176
38,00	24	30	12	8	24	CPR605Ø38H7MV0A-HP421	30455177
40,00	24	30	12	8	24	CPR605Ø40H7MV0A-HP421	30455178

Dimensions in mm.

Cutting data recommendation from page 436.

For related CFS replaceable head holders see page 346.

Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "Complete-Performance-Reamers".

CPRream CPR605

Version with brazed cutting edges

Design:

Reamer diameter:

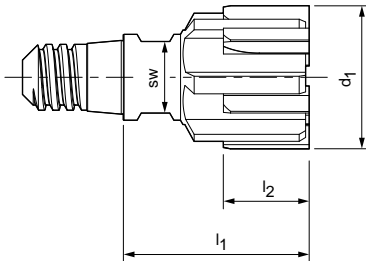
14.00 - 40.00 mm

Lead:

MTOA

Cutting material:

HP421



Dimensions				z	Wrench size (sw)	Specification	Order No.
d_1	CFS size	l_1	l_2				
14,00	6	22	8	6	6	CPR605Ø14H7MT0A-HP421	30384613
16,00	8	22	8	6	8	CPR605Ø16H7MT0A-HP421	30384614
18,00	10	26	12	6	10	CPR605Ø18H7MT0A-HP421	30384615
20,00	10	26	12	6	10	CPR605Ø20H7MT0A-HP421	30384616
22,00	12	26	12	6	13	CPR605Ø22H7MT0A-HP421	30384617
24,00	12	26	12	6	13	CPR605Ø24H7MT0A-HP421	30384618
25,00	16	26	12	6	16	CPR605Ø25H7MT0A-HP421	30384619
26,00	16	26	12	6	16	CPR605Ø26H7MT0A-HP421	30384620
28,00	16	26	12	6	16	CPR605Ø28H7MT0A-HP421	30384621
30,00	16	26	12	8	16	CPR605Ø30H7MT0A-HP421	30384622
32,00	16	30	12	8	16	CPR605Ø32H7MT0A-HP421	30455169
34,00	24	30	12	8	24	CPR605Ø34H7MT0A-HP421	30455170
36,00	24	30	12	8	24	CPR605Ø36H7MT0A-HP421	30455171
38,00	24	30	12	8	24	CPR605Ø38H7MT0A-HP421	30455172
40,00	24	30	12	8	24	CPR605Ø40H7MT0A-HP421	30455173

Dimensions in mm.

Cutting data recommendation from page 436.

For related CFS replaceable head holders see page 346.

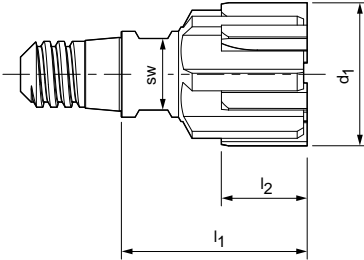
Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "Complete-Performance-Reamers".

CPRream CPR605

Version with brazed cutting edges

Design:

Reamer diameter: 14.00 - 40.00 mm
 Lead: MV0A
 Cutting material: CU130



Dimensions				z	Wrench size (sw)	Specification	Order No.
d_1	CFS size	l_1	l_2				
14,00	6	22	8	6	6	CPR605Ø14H7MV0A-CU130	30384602
16,00	8	22	8	6	8	CPR605Ø16H7MV0A-CU130	30384603
18,00	10	26	12	6	10	CPR605Ø18H7MV0A-CU130	30384604
20,00	10	26	12	6	10	CPR605Ø20H7MV0A-CU130	30384605
22,00	12	26	12	6	13	CPR605Ø22H7MV0A-CU130	30384606
24,00	12	26	12	6	13	CPR605Ø24H7MV0A-CU130	30384607
25,00	16	26	12	6	16	CPR605Ø25H7MV0A-CU130	30384608
26,00	16	26	12	6	16	CPR605Ø26H7MV0A-CU130	30384609
28,00	16	26	12	6	16	CPR605Ø28H7MV0A-CU130	30384610
30,00	16	26	12	8	16	CPR605Ø30H7MV0A-CU130	30384611
32,00	16	30	12	8	16	CPR605Ø32H7MV0A-CU130	30455163
34,00	24	30	12	8	24	CPR605Ø34H7MV0A-CU130	30455164
36,00	24	30	12	8	24	CPR605Ø36H7MV0A-CU130	30455166
38,00	24	30	12	8	24	CPR605Ø38H7MV0A-CU130	30455167
40,00	24	30	12	8	24	CPR605Ø40H7MV0A-CU130	30455168

Dimensions in mm.

Cutting data recommendation from page 436.

For related CFS replaceable head holders see page 346.

Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "Complete-Performance-Reamers".

CPRream CPR605

Version with brazed cutting edges

Design:

Reamer diameter:

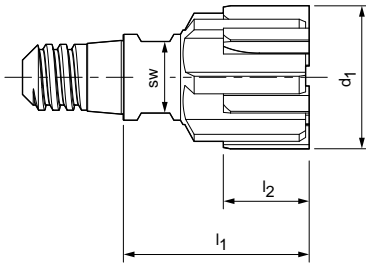
14.00 - 40.00 mm

Lead:

MA0A

Cutting material:

PU620



Dimensions				z	Wrench size (sw)	Specification	Order No.
d ₁	CFS size	l ₁	l ₂				
14,00	6	22	8	6	6	CPR605Ø14H7MA0A-PU620	30384646
16,00	8	22	8	6	8	CPR605Ø16H7MA0A-PU620	30384647
18,00	10	26	12	6	10	CPR605Ø18H7MA0A-PU620	30384648
20,00	10	26	12	6	10	CPR605Ø20H7MA0A-PU620	30384649
22,00	12	26	12	6	13	CPR605Ø22H7MA0A-PU620	30384650
24,00	12	26	12	6	13	CPR605Ø24H7MA0A-PU620	30384651
25,00	16	26	12	6	16	CPR605Ø25H7MA0A-PU620	30384652
26,00	16	26	12	6	16	CPR605Ø26H7MA0A-PU620	30384653
28,00	16	26	12	6	16	CPR605Ø28H7MA0A-PU620	30384654
30,00	16	26	12	8	16	CPR605Ø30H7MA0A-PU620	30384655
32,00	16	30	12	8	16	CPR605Ø32H7MA0A-PU620	30455184
34,00	24	30	12	8	24	CPR605Ø34H7MA0A-PU620	30455185
36,00	24	30	12	8	24	CPR605Ø36H7MA0A-PU620	30455186
38,00	24	30	12	8	24	CPR605Ø38H7MA0A-PU620	30455187
40,00	24	30	12	8	24	CPR605Ø40H7MA0A-PU620	30455188

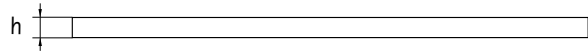
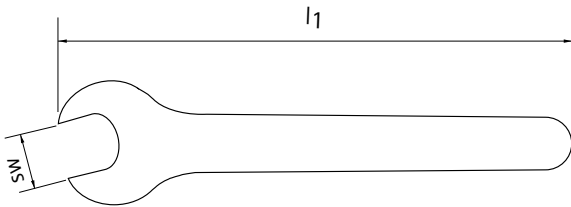
Dimensions in mm.

Cutting data recommendation from page 436.

For related CFS replaceable head holders see page 346.

Please order intermediate sizes and tolerances other than H7 using the configuration description at the beginning of the section "Complete-Performance-Reamers".

Assembly tool



Connection size CFS	Dimensions			Order No.
	Wrench size (sw)	l_1	h	
6	6	75	2,3	30352660
8	8	92	2,8	30352661
10	10	100	3,8	30352662
12	13	135	3,8	30352663
16	16	145	4,8	30352667
20	21	195	4,8	30352668



CFS - REPLACEABLE HEAD HOLDERS

Introduction

Designation key _____ 348

CFS replaceable head holders

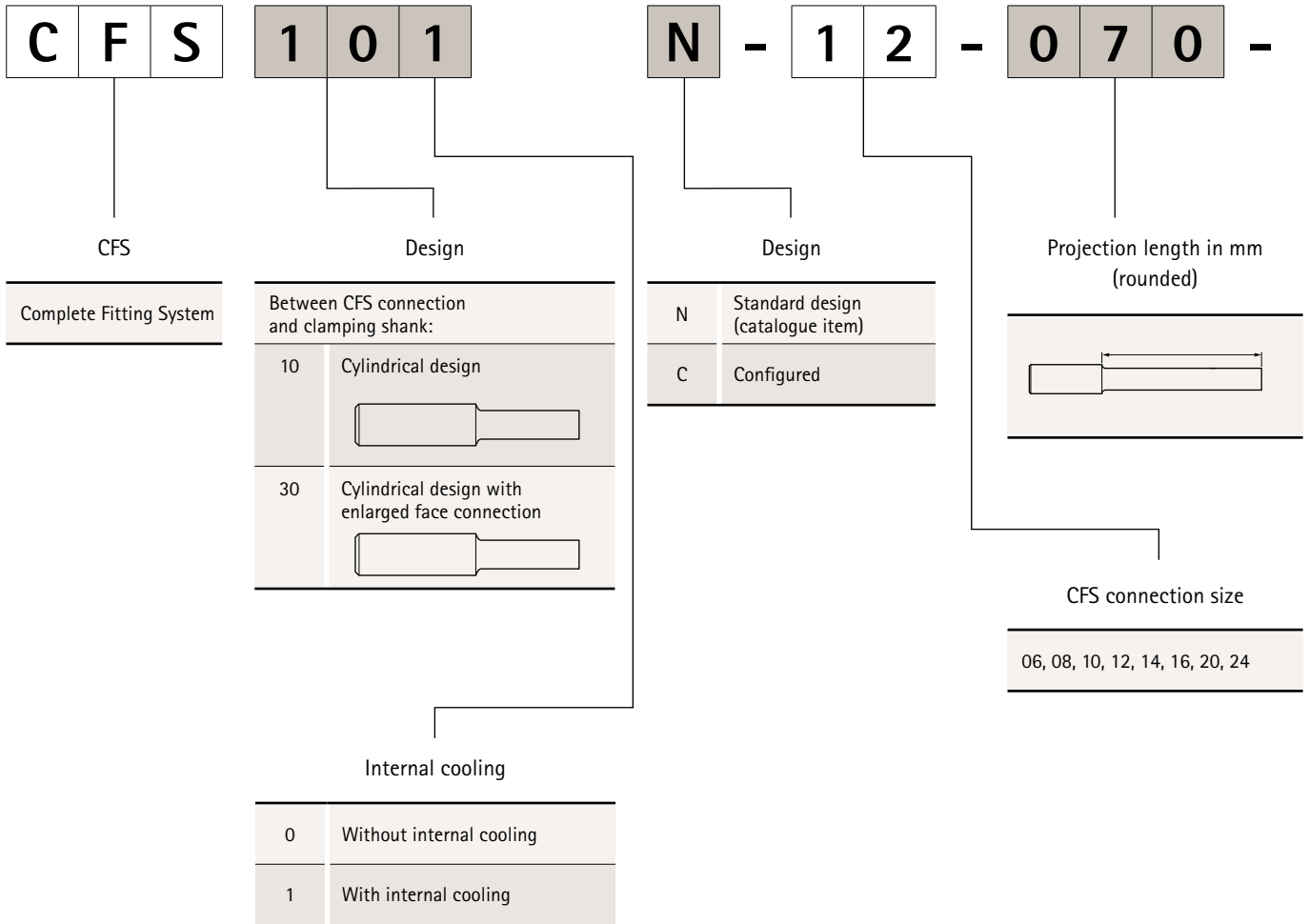
Holder range _____ 350

Accessories and spare parts _____ 386



Designation key

CFS replaceable head holders





Shank type and size

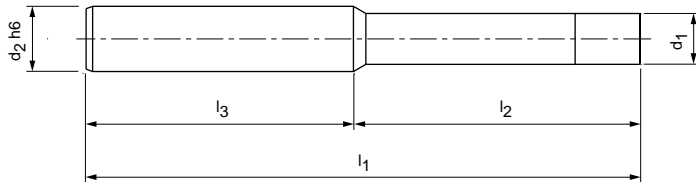
ZYL-HA10
ZYL-HA12
ZYL-HA16
ZYL-HA25
ZYL-HA32

Material

S	Steel
D	Densimet
H	Solid carbide

CFS replaceable head holders | Steel

CFS101 (cylindrical design) with CFS connection,
internal coolant supply



Dimensions						Specification	Order No.
d ₁	CFS size	d ₂ h6	l ₁	l ₂	l ₃		
7,80	6	10	60	20	40	CFS101N-06-020-ZYL-HA10-S	30393770
7,80	6	10	85	45	40	CFS101N-06-045-ZYL-HA10-S	30393771
7,80	6	10	150	110	40	CFS101N-06-110-ZYL-HA10-S	30393774
9,80	8	12	70	25	45	CFS101N-08-025-ZYL-HA12-S	30393781
9,80	8	12	90	45	45	CFS101N-08-045-ZYL-HA12-S	30393782
9,80	8	12	150	105	45	CFS101N-08-105-ZYL-HA12-S	30393785
11,80	10	16	70	22	48	CFS101N-10-022-ZYL-HA16-S	30393792
11,80	10	16	90	42	48	CFS101N-10-042-ZYL-HA16-S	30393793
11,80	10	16	150	102	48	CFS101N-10-102-ZYL-HA16-S	30393796
15,80	12	16	80	32	48	CFS101N-12-032-ZYL-HA16-S	30393803
15,80	12	16	105	57	48	CFS101N-12-057-ZYL-HA16-S	30393956
15,80	12	16	150	102	48	CFS101N-12-102-ZYL-HA16-S	30393959
15,80	12	16	200	152	48	CFS101N-12-152-ZYL-HA16-S	30393961
19,80	16*	25	90	34	56	CFS101N-16-034-ZYL-HA25-S	30393968
19,80	16*	25	120	64	56	CFS101N-16-064-ZYL-HA25-S	30393969
19,80	16*	25	200	144	56	CFS101N-16-144-ZYL-HA25-S	30393972
19,80	16*	25	250	194	56	CFS101N-16-194-ZYL-HA25-S	30393974
24,80	20	25	90	34	56	CFS101N-20-034-ZYL-HA25-S	30393981
24,80	20	25	120	64	56	CFS101N-20-064-ZYL-HA25-S	30393982
24,80	20	25	200	144	56	CFS101N-20-144-ZYL-HA25-S	30393984
27,80	24	32	90	30	60	CFS101N-24-030-ZYL-HA32-S	30393990
27,80	24	32	120	60	60	CFS101N-24-060-ZYL-HA32-S	30393991
27,80	24	32	200	140	60	CFS101N-24-140-ZYL-HA32-S	30393994

With enlarged face connection for CPReam solid carbide replaceable heads from Ø27.201 for series CPR510 and from Ø32.201 for series CPR505

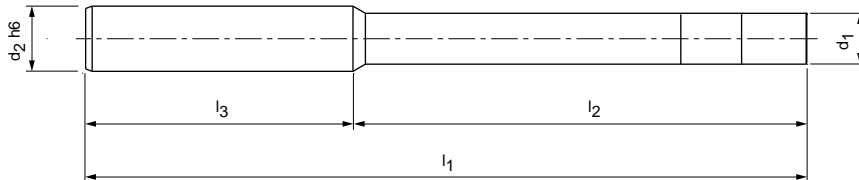
26	16	25	90	34	56	CFS301N-16-034-ZYL-HA25-S	30723729
26	16	25	120	64	56	CFS301N-16-064-ZYL-HA25-S	30723730
26	16	25	200	144	56	CFS301N-16-144-ZYL-HA25-S	30723731
26	16	25	250	194	56	CFS301N-16-194-ZYL-HA25-S	30723733

Dimensions in mm.

* Only use for series 600 | 610 | 605

CFS replaceable head holders | Carbide

CFS101 (cylindrical design) with CFS connection,
internal coolant supply



Dimensions						Specification	Order No.
d ₁	CFS size	d ₂ h6	l ₁	l ₂	l ₃		
7,80	6	10	85	45	40	CFS101N-06-045-ZYL-HA10-H	30393947
7,80	6	10	110	70	40	CFS101N-06-070-ZYL-HA10-H	30393948
7,80	6	10	150	110	40	CFS101N-06-110-ZYL-HA10-H	30393949
9,80	8	12	90	45	45	CFS101N-08-045-ZYL-HA12-H	30393950
9,80	8	12	110	65	45	CFS101N-08-065-ZYL-HA12-H	30393951
9,80	8	12	150	105	45	CFS101N-08-105-ZYL-HA12-H	30393952
11,80	10	16	90	42	48	CFS101N-10-042-ZYL-HA16-H	30393953
11,80	10	16	110	62	48	CFS101N-10-062-ZYL-HA16-H	30393954
11,80	10	16	150	102	48	CFS101N-10-102-ZYL-HA16-H	30393955
15,80	12	16	105	57	48	CFS101N-12-057-ZYL-HA16-H	30393957
15,80	12	16	130	82	48	CFS101N-12-082-ZYL-HA16-H	30393958
15,80	12	16	150	102	48	CFS101N-12-102-ZYL-HA16-H	30393960
15,80	12	16	200	152	48	CFS101N-12-152-ZYL-HA16-H	30393962
19,80	16	25	120	64	56	CFS101N-16-064-ZYL-HA25-H	30393970
19,80	16	25	150	94	56	CFS101N-16-094-ZYL-HA25-H	30393971
19,80	16	25	200	144	56	CFS101N-16-144-ZYL-HA25-H	30393973
19,80	16	25	250	194	56	CFS101N-16-194-ZYL-HA25-H	30393975
24,80	20	25	150	94	56	CFS101N-20-094-ZYL-HA25-H	30393983
24,80	20	25	200	144	56	CFS101N-20-144-ZYL-HA25-H	30393985
27,80	24	32	120	60	60	CFS101N-24-060-ZYL-HA32-H	30393992
27,80	24	32	150	90	60	CFS101N-24-090-ZYL-HA32-H	30393993
27,80	24	32	200	140	60	CFS101N-24-140-ZYL-HA32-H	30393995





SOLUTIONS FOR LARGE DIAMETERS

Introduction

Programme overview _____ 354

Reamers for large diameters

HPR300 _____ 356

HPR400 _____ 358

MultiCut cutting rings and tool holders _____ 360



PROGRAMME OVERVIEW

Multi-cutting edge high-performance reamers for large diameter ranges

To finely machine bores with large diameters within a defined tolerance range, users are often faced with the question: reaming or single point cutting? On the one hand it is possible to work significantly faster with multi-cutting edge reaming tools and they are less sensitive to an interrupted cut. On the other hand the reconditioning of reamers with fixed cutting edges is a complex process.

To optimise the reconditioning process, MAPAL offers two HPR systems:

HPR300

The cutting edges on the HPR300 are not brazed or bonded instead they are clamped securely in the tool body using clamping jaws and then ground with μ -precision. The tools offer the same performance and process reliability as brazed tools. This system permits quick and inexpensive reconditioning without the introduction of heat through to the removal or brazing of the cutting edges in the tool body. As a consequence the number of times the tool can be reconditioned increases.

HPR400





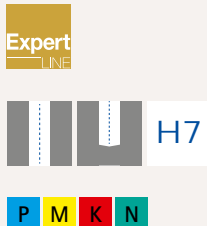
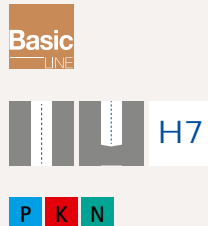
Simple insert change on site

To reduce the number of tools in circulation and the tool inventory, MAPAL offers the system HPR400 on which the customer can change the inserts directly on site. It is not necessary to recondition the tool bodies, it is only necessary to keep the cutting edges required in stock.

MultiCut

In addition to the HPR programme for large diameters, in the Basic line MAPAL offers the MultiCut program comprising cutting rings and related holders.



HPR300	HPR400	MultiCut
		
<p>Optimised for economical reconditioning.</p> <p>Ø range: 65.00 - 300.00 mm</p> <p>Performance LINE</p> 	<p>Simple insert change on site.</p> <p>Ø range: 65.00 - 400.00 mm</p> <p>Expert LINE</p> 	<p>Cutting rings with matching holder range.</p> <p>Ø range: 21.60 - 200.59 mm</p> <p>Basic LINE</p> 
<p>Page 356</p>	<p>Page 358</p>	<p>Page 360</p>

HPR300

Reduced costs due to innovative reconditioning

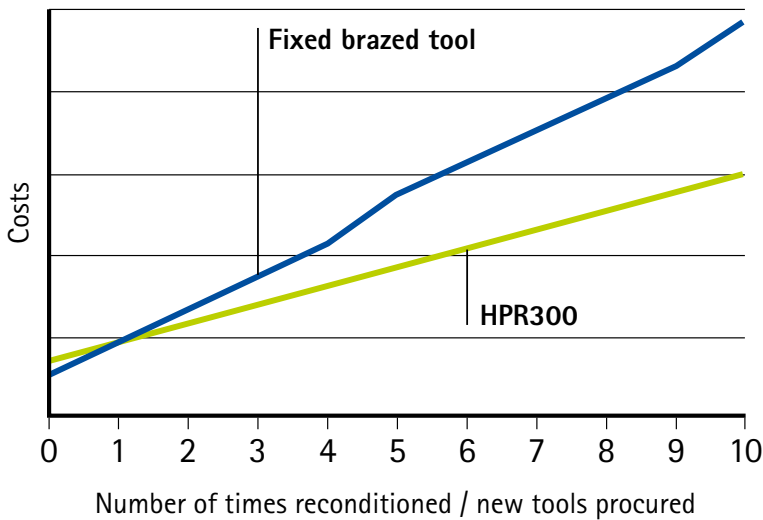
With the HPR300, MAPAL offers a system on which fixed tools can be re-tipped and re-coated far more quickly and less expensively. The cutting edges are securely clamped in the tool body by clamping jaws as blanks. Then the diameter and cutting lead geometry are ground with high precision. For reconditioning after reaching the end of the tool life, the worn cutting edges can be easily and quickly replaced with new cutting edge blanks and again ground to the original quality with μ precision.

A further crucial advantage of the HPR300 system is that the tool body and in particular the shank retain their original, high accuracy. On the replacement of the cutting elements, the tool body is not subjected to any thermal loads whatsoever and complex cleaning processes are not required. On average, brazed

tools can be reconditioned a maximum of four times, while the HPR300 reamers can be re-tipped at least ten times. As such the tools pay for themselves already after the first few times they are reconditioned and provide significant cost savings over the entire service life without degradations in the performance compared with brazed tools.

AT A GLANCE

- Quick and cost-effective reconditioning
- Tools can be reconditioned a large number of times
- High process reliability
- HSK and module connection
- For through bores and blind bores



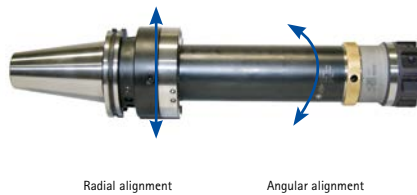


HPR300



Cutting materials

A large selection of cutting materials can be used through the HPR300 system with innovative cutting edge fastening in the tool. Even delicate cutting materials that cannot be brazed, for example ceramic, can be fastened highly accurately in this system.



Modular system

On tools with multiple cutting edges the radial run-out accuracy must be carefully monitored, as the radial run-out errors are transferred directly to the bore. On the HPR300 the radial run-out can be aligned axially and radially via the module connection for larger diameters and large projection lengths.



Easy handling

On the HPR300 there is a choice of two shank designs. Depending on the machine type, the tool can be used directly with HSK or alternatively with a module adapter. The axial and angular alignment via HSK and tool extension must be undertaken only once in the machine. During subsequent tool changes, the HPR300 can be inserted in the machine to the μ .

HPR400

Reaming large diameters with simple insert change on site

Due to special, high-accuracy insert seats on the HPR400, users can change the inserts directly on site using a torque wrench with this system. The inserts cannot be fitted incorrectly, as only one installation orientation is possible and the inserts can be fitted at any position. As a result there is no setting effort, or the need to send tools for reconditioning. Users only need to have the inserts from MAPAL in stock. The quantity of tools required is low, as tool bodies do not need to be reconditioned. With minimal effort and a low number of tools in circulation, the user achieves high-accuracy bores with the HPR400.

The cutting edges are optimally adapted to the material and the machining operation. The HPR400 is available in the diameter range from 65 to 400 mm with an HSK or MAPAL's own module adapter. MAPAL offers various

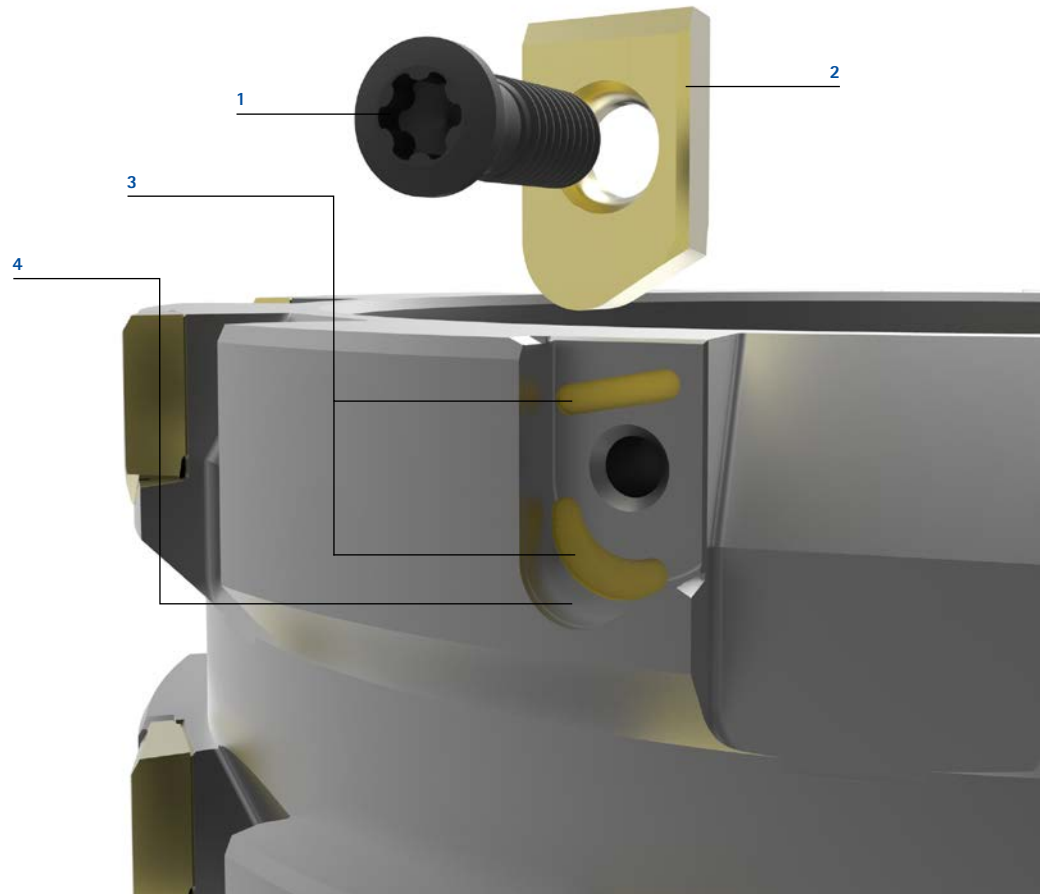
inserts made of carbide without or with CVD coating, made of cermet and tipped with PCD or PcBN.

AT A GLANCE

- Independent insert change by the user on site
- Insert arrangement independent of the insert seat
- Reduction of the cost per part
- Reduced coating costs
- Reduction of the number of tools in circulation
- All cutting materials can be used
- Tolerance H7
- \varnothing 65 – 400 mm



Tool features in detail

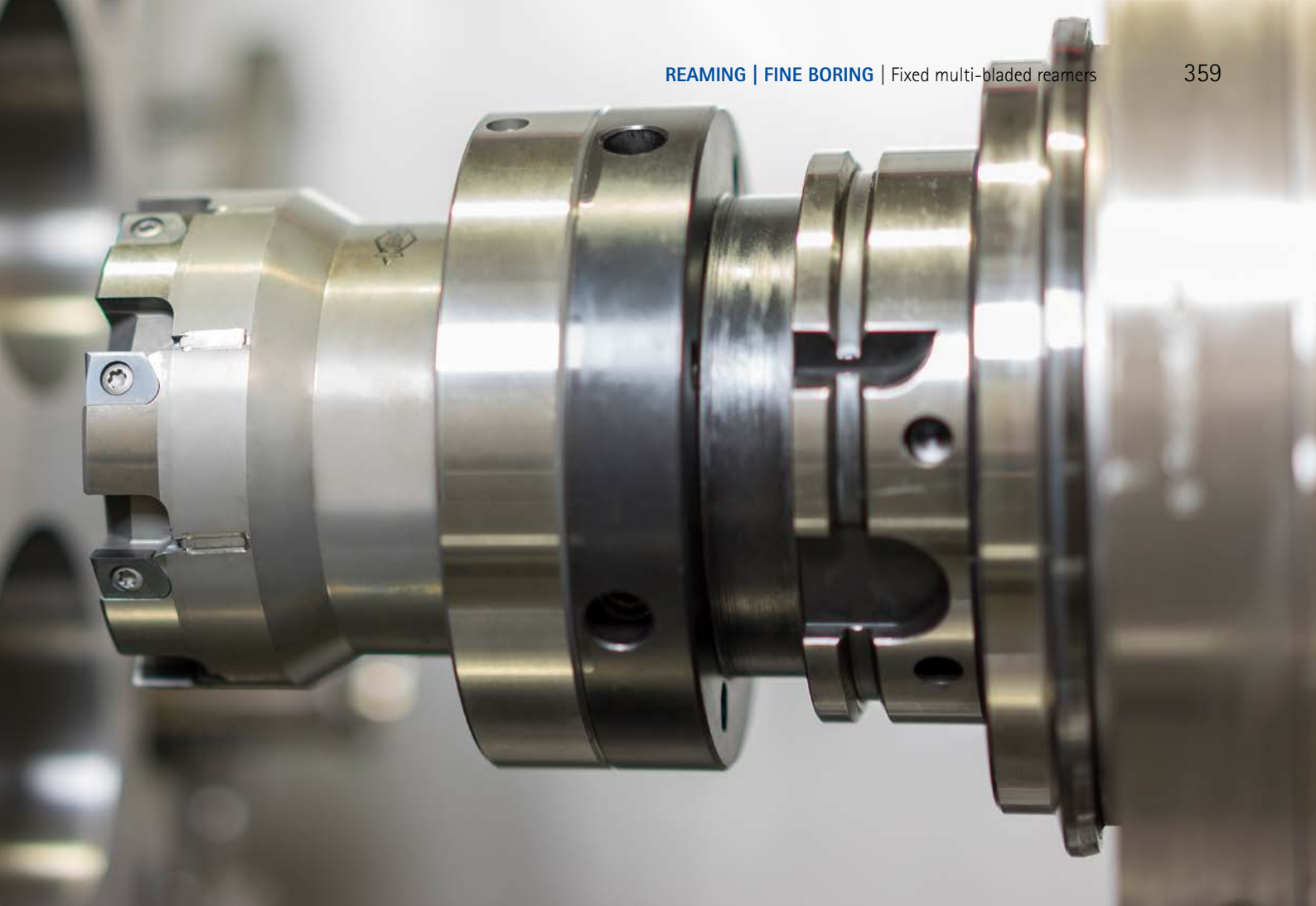


1 Clamping screw TORX®

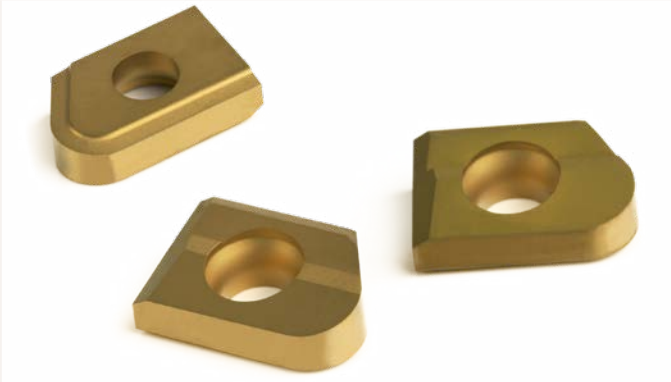
2 Insert
v-block shape for optimal seating

3 Scraping pocket
For removing microsoiling

4 Insert seat
Highly accurate for optimal adherence to tolerances



CVD-coated inserts



Optimally matched to the reaming of cast materials

The CVD-coated cutting materials available for the HPR400, which have the cutting material code HC, were developed especially for reaming ductile cast materials GJL, GJS and GJV, in difficult machining conditions, for example with interrupted cut. The CVD coating features in particular a significantly higher ductility with good wear resistance. Up to three times the tool life compared to existing PVD-coated inserts can be achieved with high process reliability using the CVD-coated inserts. Due to the clamping system, almost all other cutting materials can be supplied in the HPR400 system.

Cost-effective system



Simple insert change on site

With the HPR400, MAPAL offers a system on which the inserts can be changed by the customer on site. The replaceable inserts are pushed axially into the insert seat and are fixed reliably and highly accurately in the highly accurate insert seat using a Torx screw. The insert arrangement is independent of the insert seat. The coating costs are reduced with a reduction in the number of tools in circulation at the same time.





MultiCut

The MAPAL MultiCut reamers with re-adjustable cutting rings make it possible to fine machine bores down to a tolerance range below IT7. Straightforward handling on setting and measuring the cutting rings as well as the possibility of combining with various holders are the advantages of this system. Re-adjustable cutting rings are manufactured to half the stipulated tolerance.

Cutting rings

Adjustable cutting rings _____ 362

Holder

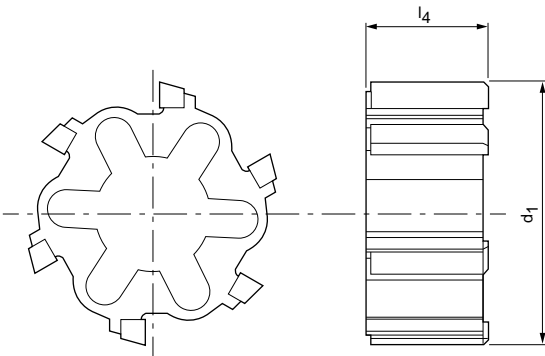
Holder range _____ 365

Spare parts _____ 386

Adjustable cutting rings MN73101

Design:
Reamer diameter:
Cutting material:

Uncoated carbide
21.60 - 200.59 mm
HU612



Dimensions		z
d ₁	l ₄	
21,60 - 25,59	11,5	6
25,60 - 28,59	13,5	6
28,60 - 32,59	13,5	6
32,60 - 36,59	15,5	6
36,60 - 40,59	15,5	6
40,60 - 45,59	15,5	6
45,60 - 50,59	18,5	6
50,60 - 55,59	18,5	6
55,60 - 60,59	18,5	6
60,60 - 65,59	18,5	6
65,60 - 70,59	18,5	6
70,60 - 75,59	18,5	6
75,60 - 79,59	18,5	6
79,60 - 85,59	18,5	8
85,60 - 90,59	18,5	8
90,60 - 95,59	18,5	8
95,60 - 100,59	18,5	8
100,60 - 110,59	18,5	10
110,60 - 115,59	18,5	12
115,60 - 120,59	18,5	12
120,60 - 125,59	18,5	12
125,60 - 139,59	18,5	12
139,60 - 145,59	18,5	12
145,60 - 155,59	18,5	12
155,60 - 165,59	18,5	12
165,60 - 175,59	18,5	12
175,60 - 185,59	18,5	12
185,60 - 195,59	18,5	12
195,60 - 200,59	18,5	12

Information required to order a cutting ring

Type	ø	Tolerance	Cutting material	Lead
e.g. MN73101	45.75	H7	Carbide	45°

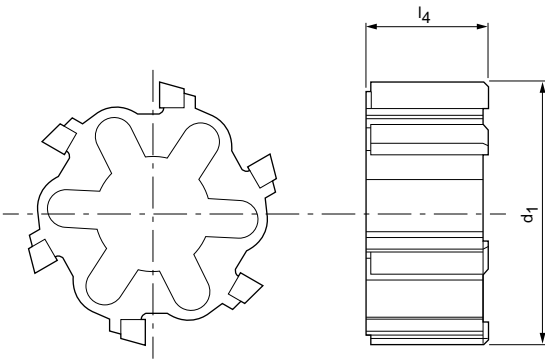
Dimensions in mm.
Cutting data recommendation on request.

Please note that the holder and cutting ring must be ordered separately.
The tools are supplied fully assembled and set to the nominal size.

Adjustable cutting rings MN73102

Design:
 Reamer diameter:
 Cutting material:

Coated carbide
 21.60 - 200.59 mm
 HP342



Dimensions		z
d ₁	l ₄	
21,60 - 25,59	11,5	6
25,60 - 28,59	13,5	6
28,60 - 32,59	13,5	6
32,60 - 36,59	15,5	6
36,60 - 40,59	15,5	6
40,60 - 45,59	15,5	6
45,60 - 50,59	18,5	6
50,60 - 55,59	18,5	6
55,60 - 60,59	18,5	6
60,60 - 65,59	18,5	6
65,60 - 70,59	18,5	6
70,60 - 75,59	18,5	6
75,60 - 79,59	18,5	6
79,60 - 85,59	18,5	8
85,60 - 90,59	18,5	8
90,60 - 95,59	18,5	8
95,60 - 100,59	18,5	8
100,60 - 110,59	18,5	10
110,60 - 115,59	18,5	12
115,60 - 120,59	18,5	12
120,60 - 125,59	18,5	12
125,60 - 139,59	18,5	12
139,60 - 145,59	18,5	12
145,60 - 155,59	18,5	12
155,60 - 165,59	18,5	12
165,60 - 175,59	18,5	12
175,60 - 185,59	18,5	12
185,60 - 195,59	18,5	12
195,60 - 200,59	18,5	12

Information required to order a cutting ring

Type	ø	Tolerance	Cutting material	Lead
e.g. MN73101	45.75	H7	Carbide	45°

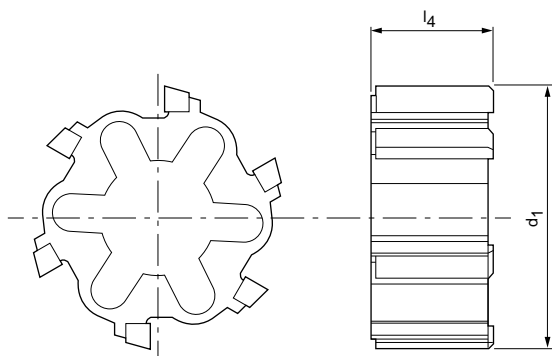
Dimensions in mm.
 Cutting data recommendation on request.

Please note that the holder and cutting ring must be ordered separately.
 The tools are supplied fully assembled and set to the nominal size.

Adjustable cutting rings MN73104

Design:
Reamer diameter:
Cutting material:

Uncoated cermet
21.60 - 200.59 mm
CU134



Dimensions		z
d ₁	l ₄	
21,60 - 25,59	11,5	6
25,60 - 28,59	13,5	6
28,60 - 32,59	13,5	6
32,60 - 36,59	15,5	6
36,60 - 40,59	15,5	6
40,60 - 45,59	15,5	6
45,60 - 50,59	18,5	6
50,60 - 55,59	18,5	6
55,60 - 60,59	18,5	6
60,60 - 65,59	18,5	6
65,60 - 70,59	18,5	6
70,60 - 75,59	18,5	6
75,60 - 79,59	18,5	6
79,60 - 85,59	18,5	8
85,60 - 90,59	18,5	8
90,60 - 95,59	18,5	8
95,60 - 100,59	18,5	8
100,60 - 110,59	18,5	10
110,60 - 115,59	18,5	12
115,60 - 120,59	18,5	12
120,60 - 125,59	18,5	12
125,60 - 139,59	18,5	12
139,60 - 145,59	18,5	12
145,60 - 155,59	18,5	12
155,60 - 165,59	18,5	12
165,60 - 175,59	18,5	12
175,60 - 185,59	18,5	12
185,60 - 195,59	18,5	12
195,60 - 200,59	18,5	12

Information required to order a cutting ring

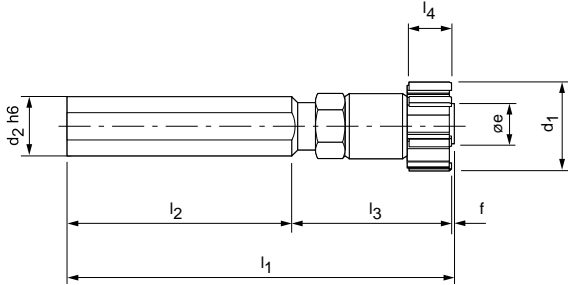
Type	ø	Tolerance	Cutting material	Lead
e.g. MN73101	45.75	H7	Carbide	45°

Dimensions in mm.
Cutting data recommendation on request.

Please note that the holder and cutting ring must be ordered separately.
The tools are supplied fully assembled and set to the nominal size.

HOLDERS for cutting rings

Cylindrical shank with lateral clamping surface,
without internal coolant supply



MN73237 - For through bore, short design

Dimensions									z	Size	Order No.
d ₁	MK	d ₂ h6	l ₁	l ₂	l ₃	l ₄	øe	f			
21,60 - 25,59	6	16	94	40	51	11,5	12	3	2	021.6	30008875
25,60 - 32,59	6	20	94,5	40	51	13,5	15,8	3,5	3	025.6	30008876
32,60 - 40,59	6	20	95,5	40	51	15,5	21,4	4,5	3	032.6	30008877
40,60 - 45,59	6	25	125	65	55	15,5	25,5	5	3	040.6	30022400
45,60 - 60,59	6	20	134	65	62	18,5	29,6	7	3	045.6	30006305
60,60 - 79,59	6	25	148	65	73	18,5	39,8	10	4	060.6	30022401
79,60 - 100,59	8	40	162,5	65	85	18,5	57	12,5	8	079.6	30183686

MN73238 - For through bore and blind bore, short design | Please note øe and f

21,60 - 25,59	6	16	92,8	40	51,8	11,5	11,2	1	2	021.6	30008882
25,60 - 32,59	6	20	93	40	52	13,5	15,2	1	3	025.6	30008883
32,60 - 40,59	6	20	92,5	40	51,5	15,5	20,3	1	3	032.6	30008884
40,60 - 45,59	6	25	121	65	55	15,5	24,1	1	3	040.6	30028685
45,60 - 60,59	6	20	129,5	65	63	18,5	27,8	1,5	3	045.6	30183680
60,60 - 79,59	6	25	141,5	65	75	18,5	37	1,5	4	060.6	30183681
79,60 - 100,59	8	40	154,5	65	88	18,5	53,2	1,5	5	079.6	30183682

Information required to order

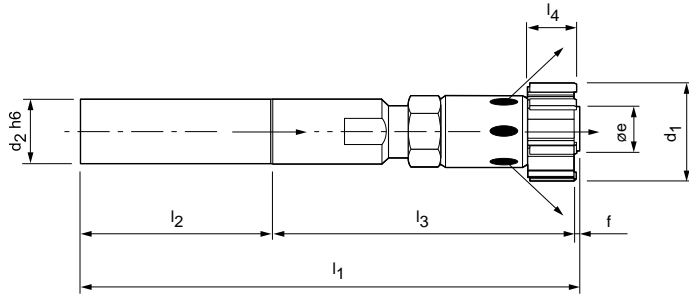
Holder		+	Cutting ring					Spare parts	
Type	Size		Type	ø	Tolerance	Cutting material	Lead	Page	
e.g. MN73227	045.6		e.g. MN73101	45.75	H7	Carbide	45°	386	

Dimensions in mm.

Please note that the holder and cutting ring must be ordered separately.
The tools are supplied fully assembled and set to the nominal size.

HOLDERS for cutting rings

Cylindrical shank,
with internal coolant supply



MN75236 - For through bore, short design

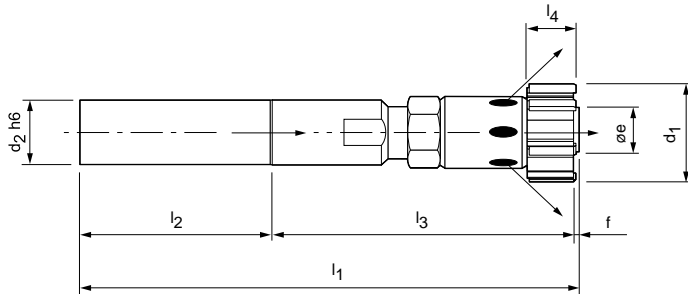
Dimensions								z	Size	Order No.
d ₁	d ₂ h6	l ₁	l ₂	l ₃	l ₄	øe	f			
21,60 - 25,59	20	132	50	81	11,5	11,2	1	6	021.6	30008889
25,60 - 32,59	20	153	50	102	13,5	15,2	1	6	025.6	30008900
32,60 - 36,59	25	159,5	56	102	15,5	20,3	1,5	6	032.6	30008901
36,60 - 40,59	25	159,5	56	102	15,5	20,3	1,5	6	036.6	30023642
40,60 - 45,59	25	159,5	56	102	15,5	24,1	1,5	6	040.6	30016440
45,60 - 50,59	32	166,5	60	105	18,5	27,8	1,5	6	045.6	30183643
50,60 - 60,59	32	166,5	60	105	18,5	27,8	1,5	6	050.6	30023643
60,60 - 70,59	32	166,5	60	105	18,5	37	1,5	6	060.6	30023644
70,60 - 79,59	32	166,5	60	105	18,5	37	1,5	6	070.6	30023645
79,60 - 90,59	40	176,5	70	105	18,5	53,2	1,5	8	079.6	30023646
90,60 - 100,59	40	176,5	70	105	18,5	53,2	1,5	8	090.6	30023647

Information required to order

Holder		+	Cutting ring					Spare parts	
Type	Size		Type	ø	Tolerance	Cutting material	Lead	Page	
e.g. MN73227	045.6		e.g. MN73217	45.75	H7	Carbide	45°	386	

Holders for cutting rings

Cylindrical shank,
with internal coolant supply



MN76236 - For blind bore, short design

Dimensions								z	Size	Order No.
d ₁	d ₂ h6	l ₁	l ₂	l ₃	l ₄	øe	f			
21,60 - 25,59	20	132	50	81	11,5	11,2	1	6	021.6	30183632
25,60 - 32,59	20	153	50	102	13,5	15,2	1	6	025.6	30183633
32,60 - 36,59	25	159,5	56	102	15,5	20,3	1,5	6	032.6	30183634
36,60 - 40,59	25	159,5	56	102	15,5	20,3	1,5	6	036.6	30183635
40,60 - 45,59	25	159,5	56	102	15,5	24,1	1,5	6	040.6	30183636
45,60 - 50,59	32	166,5	60	105	18,5	27,8	1,5	6	045.6	30183637
50,60 - 60,59	32	166,5	60	105	18,5	27,8	1,5	6	050.6	30183638
60,60 - 70,59	32	166,5	60	105	18,5	37	1,5	6	060.6	30183639
70,60 - 79,59	32	166,5	60	105	18,5	37	1,5	6	070.6	30183640
79,60 - 90,59	40	176,5	70	105	18,5	53,2	1,5	8	079.6	30183641
90,60 - 100,59	40	176,5	70	105	18,5	53,2	1,5	8	090.6	30183642

Information required to order

Holder	
Type	Size
e.g. MN73227	045.6

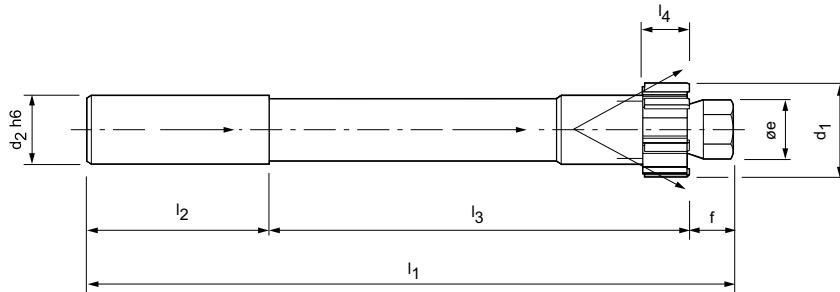


Cutting ring				
Type	ø	Tolerance	Cutting material	Lead
e.g. MN73217	45.75	H7	Carbide	45°

Spare parts
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HOLDERS for cutting rings

Cylindrical shank,
with internal coolant supply



MN75247 - For through bore, short design

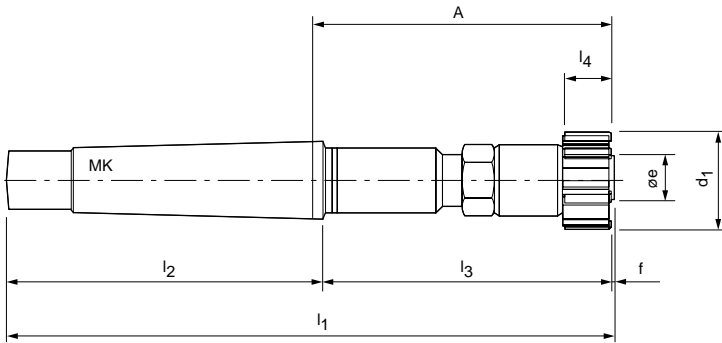
Dimensions								z	Size	Order No.
d ₁	d ₂ h6	l ₁	l ₂	l ₃	l ₄	øe	f			
21,60 - 25,59	20	142	50	81	11,5	11,5	11	6	021.6	30008872
25,60 - 32,59	20	163	50	102	13,5	15	11	6	025.6	30008873
32,60 - 36,59	25	172	56	102	15,5	21,9	14	6	032.6	30008874
36,60 - 40,59	25	172	56	102	15,5	21,9	14	6	036.6	30183644
40,60 - 45,59	25	173	56	102	15,5	21,9	15	6	040.6	30011658
45,60 - 50,59	32	185,5	60	105	18,5	30,3	20,5	6	045.6	30101615
50,60 - 60,59	32	185,5	60	105	18,5	30,3	20,5	6	050.6	30014625
60,60 - 70,59	32	189,5	60	105	18,5	40	24,5	6	060.6	30183645
70,60 - 79,59	32	189,5	60	105	18,5	40	24,5	6	070.6	30183646
79,60 - 90,59	40	203,5	70	105	18,5	56,2	28,5	8	079.6	30159444
90,60 - 100,59	40	203,5	70	105	18,5	56,2	28,5	8	090.6	30183647

Information required to order

Holder		+	Cutting ring					Spare parts	
Type	Size		Type	ø	Tolerance	Cutting material	Lead	Page	
e.g. MN73227	045.6		e.g. MN73217	45.75	H7	Carbide	45°	386	

HOLDERS for cutting rings

Morse taper shank,
without internal coolant supply



MN73217 - For through bore, short design

Dimensions									z	Size	Order No.
d ₁	MK	l ₁	l ₂	l ₃	l ₄	A	øe	f			
21,60 - 25,59	2	164	80	81	11,5	86	12	3	6	021.6	30183663
25,60 - 32,59	3	204,5	99	102	13,5	107	15,8	3,5	6	025.6	30032438
32,60 - 40,59	3	205,5	99	102	15,5	107,1	21,4	4,5	6	032.6	30183664
40,60 - 45,59	3	206	99	102	15,5	107,1	25,5	5	6	040.6	30183666
45,60 - 60,59	3	208	97	104	18,5	109	29,6	7	6	045.6	30018476
60,60 - 79,59	4	237	124	103	18,5	109	39,8	10	6	060.6	30183668
79,60 - 100,59	5	273,5	156	105	18,5	111,5	57	12,5	8	079.6	30183670

MN73218 - For through bore and blind bore, short design | Please note øe and f

21,60 - 25,59	2	162,8	80	81,8	11,5	86	11,2	1	6	021.6	30183649
25,60 - 32,59	3	203	99	103	13,5	107	15,2	1	6	025.6	30183650
32,60 - 40,59	3	202,5	99	102,5	15,5	107,1	20,3	1	6	032.6	30183651
40,60 - 45,59	3	202	99	102	15,5	107,1	24,1	1	6	040.6	30183652
45,60 - 60,59	3	201,5	97	103	18,5	108	27,8	1,5	6	045.6	30183653
60,60 - 79,59	4	226,5	124	101	18,5	107,5	37	1,5	6	060.6	30183654
79,60 - 100,59	5	261,5	156	104	18,5	110,5	53,2	1,5	8	079.6	30183655

Information required to order

Holder	
Type	Size
e.g. MN73217	045.6

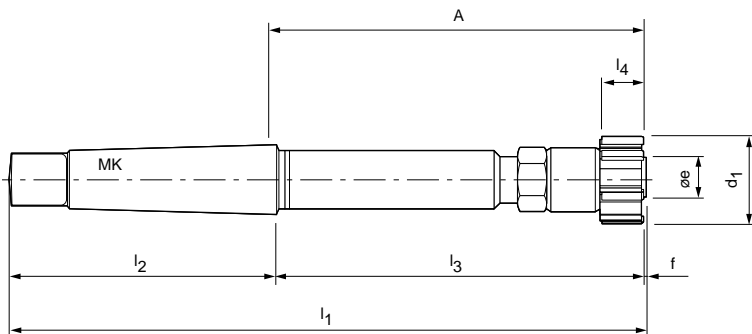


Cutting ring				
Type	ø	Tolerance	Cutting material	Lead
e.g. MN73101	45.75	H7	Carbide	45°

Spare parts
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HOLDERS for cutting rings

Morse taper shank,
without internal coolant supply



MN73227 - For through bore, long design

Dimensions									z	Size	Order No.
d ₁	MK	l ₁	l ₂	l ₃	l ₄	A	øe	f			
21,60 - 25,59	2	204	80	121	11,5	126	12	3	6	021.6	30183671
25,60 - 32,59	3	255,5	99	153	13,5	158	15,8	3,5	6	025.6	30183672
32,60 - 40,59	3	282,5	99	179	15,5	184	21,4	4,5	6	032.6	30011768
40,60 - 45,59	3	304	99	200	15,5	205	25,5	5	6	040.6	30183674
45,60 - 60,59	3	318	97	214	18,5	219	29,6	7	6	045.6	30183675
60,60 - 79,59	4	372	124	238	18,5	244,5	39,8	10	6	060.6	30183677
79,60 - 100,59	5	413,5	156	245	18,5	251,5	57	12,5	8	079.6	30183679

MN73228 - For through bore and blind bore, long design | Please note øe and f

21,60 - 25,59	2	202,8	80	121,8	11,5	126	11,2	1	6	021.6	30032509
25,60 - 32,59	3	254	99	154	13,5	158	15,2	1	6	025.6	30183657
32,60 - 40,59	3	279,5	99	179,5	15,5	184	20,3	1	6	032.6	30009573
40,60 - 45,59	3	300	99	200	15,5	205	24,1	1	6	040.6	30183659
45,60 - 60,59	3	310,5	97	212	18,5	217	27,8	1,5	6	045.6	30046300
60,60 - 79,59	4	361,5	124	236	18,5	242,5	37	1,5	6	060.6	30159446
79,60 - 100,59	5	401,5	156	244	18,5	250,5	53,2	1,5	8	079.6	30159445

Information required to order

Holder		+	Cutting ring				
Type	Size		Type	ø	Tolerance	Cutting material	Lead
e.g. MN73227	045.6		e.g. MN73101	45.75	H7	Carbide	45°

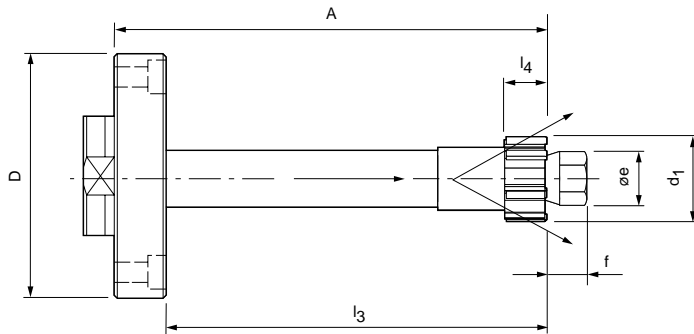
Dimensions in mm.

Please note that the holder and cutting ring must be ordered separately.
The tools are supplied fully assembled and set to the nominal size.

HOLDERS for cutting rings

With radial and angular alignment

Module connection sizes as per MN 5000-14, with internal coolant supply



MN75287 - For through bore, short design

Dimensions							z	Size	Order No.
d ₁	D	l ₃	l ₄	A	øe	f			
21,60 - 25,59	60	81	11,5	94	11,5	11	6	021.6	30183584
25,60 - 32,59	60	102	13,5	115	15	11	6	025.6	30183586
32,60 - 36,59	60	102	15,5	115	21,9	14	6	032.6	30032760
36,60 - 40,59	60	102	15,5	115	21,9	14	6	036.6	30183588
40,60 - 45,59	60	102	15,5	115	25,4	15	6	040.6	30183600
45,60 - 50,59	60	105	18,5	118	30,3	20,5	6	045.6	30020589
50,60 - 60,59	60	105	18,5	118	30,3	20,5	6	050.6	30096638
60,60 - 70,59	100	105	18,5	126	40	24,5	6	060.6	30009234
70,60 - 79,59	100	105	18,5	126	40	24,5	6	070.6	30009236
79,60 - 90,59	100	105	18,5	126	56,2	28,5	8	079.6	30087508
90,60 - 100,59	100	105	18,5	126	56,2	28,5	8	090.6	30183602
100,60 - 110,59	100	106	18,5	127	73,4	35,5	10	100.6	30183605
110,60 - 115,59	100	136	18,5	157	90,4	35,5	12	110.6	30183607
115,60 - 120,59	100	136	18,5	157	90,4	35,5	12	115.6	30183608
120,60 - 125,59	100	136	18,5	157	90,4	35,5	12	120.6	30183609
125,60 - 132,59	100	136	18,5	157	90,4	35,5	12	125.6	30183610
132,60 - 139,59	100	136	18,5	157	90,4	35,5	12	132.6	30183611
139,60 - 145,59	100	136	18,5	157	d1 - 12	35,5	12	139.6	30183612
145,60 - 155,59	100	136	18,5	157	d1 - 12	35,5	12	145.6	30183613
155,60 - 165,59	100	136	18,5	157	d1 - 12	48,5	12	155.6	30183614
165,60 - 175,59	100	136	18,5	157	d1 - 12	48,5	12	165.6	30183615
175,60 - 185,59	100	136	18,5	157	d1 - 12	48,5	12	175.6	30183616
185,60 - 195,59	100	136	18,5	157	d1 - 12	48,5	12	185.6	30183617
195,60 - 200,59	100	136	18,5	157	d1 - 12	48,5	12	195.6	30183618

Information required to order

Holder	
Type	Size
e.g. MN73227	045.6



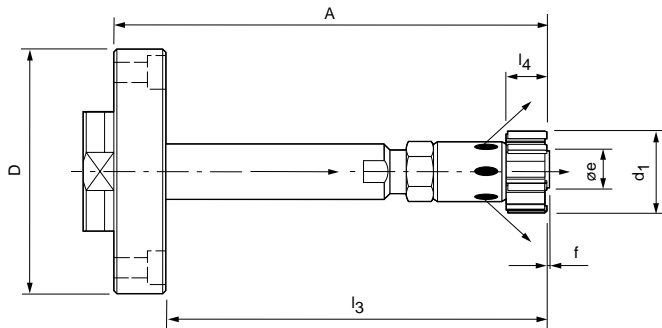
Cutting ring				
Type	ø	Tolerance	Cutting material	Lead
e.g. MN73217	45.75	H7	Carbide	45°

Spare parts
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HOLDERS for cutting rings

With radial and angular alignment

Module connection sizes as per MN 5000-14, with internal coolant supply



MN76286 - For blind bore, short design

Dimensions							z	Size	Order No.
d ₁	D	l ₃	l ₄	A	øe	f			
21,60 - 25,59	60	81	11,5	94	11,2	1	6	021.6	30183540
25,60 - 32,59	60	102	13,5	115	15,2	1	6	025.6	30183542
32,60 - 36,59	60	102	15,5	115	20,3	1,5	6	032.6	30183544
36,60 - 40,59	60	102	15,5	115	20,3	1,5	6	036.6	30183546
40,60 - 45,59	60	102	15,5	115	24,1	1,5	6	040.6	30183548
45,60 - 50,59	60	105	18,5	118	27,8	1,5	6	045.6	30183550
50,60 - 60,59	60	105	18,5	118	27,8	1,5	6	050.6	30183552
60,60 - 70,59	100	105	18,5	126	37	1,5	6	060.6	30183554
70,60 - 79,59	100	105	18,5	126	37	1,5	6	070.6	30183556
79,60 - 90,59	100	117	18,5	138	53,2	1,5	8	079.6	30183558
90,60 - 100,59	100	117	18,5	138	53,2	1,5	8	090.6	30183560

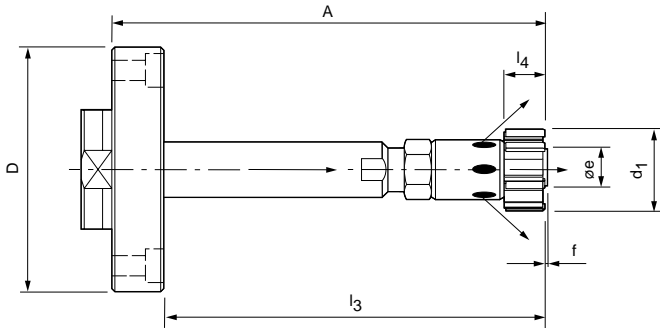
Information required to order

Holder		+	Cutting ring					Spare parts	
Type	Size		Type	ø	Tolerance	Cutting material	Lead	Page	
e.g. MN73227	045.6		e.g. MN73217	45.75	H7	Carbide	45°	386	

Holders for cutting rings

With radial and angular alignment

Module connection sizes as per MN 5000-14, with internal coolant supply



MN75286 - For through bore and blind bore, short design

Dimensions							z	Size	Order No.
d ₁	D	l ₃	l ₄	A	øe	f			
21,60 - 25,59	60	81	11,5	94	11,2	1	6	021.6	30183564
25,60 - 32,59	60	102	13,5	115	15,2	1	6	025.6	30183566
32,60 - 36,59	60	102	15,5	115	20,3	1,5	6	032.6	30183568
36,60 - 40,59	60	102	15,5	115	20,3	1,5	6	036.6	30183570
40,60 - 45,59	60	102	15,5	115	24,1	1,5	6	040.6	30183572
45,60 - 50,59	60	105	18,5	118	27,8	1,5	6	045.6	30183574
50,60 - 60,59	60	105	18,5	118	27,8	1,5	6	050.6	30018640
60,60 - 70,59	100	105	18,5	126	37	1,5	6	060.6	30018490
70,60 - 79,59	100	105	18,5	126	37	1,5	6	070.6	30183576
79,60 - 90,59	100	117	18,5	138	53,2	1,5	8	079.6	30183578
90,60 - 100,59	100	117	18,5	138	53,2	1,5	8	090.6	30183580

Information required to order

Holder	
Type	Size
e.g. MN73227	045.6

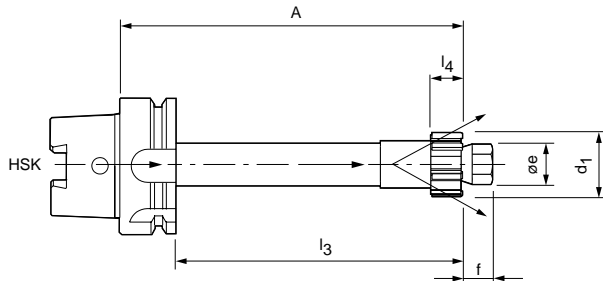


Cutting ring				
Type	ø	Tolerance	Cutting material	Lead
e.g. MN73217	45.75	H7	Carbide	45°

Spare parts
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Holders for cutting rings

Shank HSK-A in accordance with DIN 69893-A
 with internal coolant supply



MN75257 - For through bore, short design

Dimensions							z	Size	Order No.
d ₁	HSK	l ₃	l ₄	A	øe	f			
21,60 - 25,59	63	81	11,5	107	11,5	11	6	021.6	30183334
25,60 - 32,59	63	102	13,5	128	15	11	6	025.6	30183335
32,60 - 36,59	63	102	15,5	128	21,9	14	6	032.6	30183336
36,60 - 40,59	63	102	15,5	128	21,9	14	6	036.6	30183337
40,60 - 45,59	63	102	15,5	128	25,4	15	6	040.6	30183338
45,60 - 50,59	63	105	18,5	131	30,3	20,5	6	045.6	30183339
50,60 - 60,59	63	105	18,5	131	30,3	20,5	6	050.6	30183340
60,60 - 70,59	63	105	18,5	131	40	24,5	6	060.6	30183341
70,60 - 79,59	63	105	18,5	131	40	24,5	6	070.6	30183342
79,60 - 90,59	63	105	18,5	131	56,2	28,5	8	079.6	30183343
90,60 - 100,59	63	105	18,5	131	56,2	28,5	8	090.6	30183344
100,60 - 110,59	63	106	18,5	132	73,4	35,5	10	100.6	30183345
110,60 - 115,59	63	136	18,5	162	90,4	35,5	12	110.6	30183346
115,60 - 120,59	63	136	18,5	162	90,4	35,5	12	115.6	30183347
120,60 - 125,59	63	136	18,5	162	90,4	35,5	12	120.6	30183348
125,60 - 132,59	63	136	18,5	162	90,4	35,5	12	125.6	30183349
132,60 - 139,59	63	136	18,5	162	90,4	35,5	12	132.6	30183350
139,60 - 145,59	63	136	18,5	162	d1 - 12	35,5	12	139.6	30183351
145,60 - 155,59	63	136	18,5	162	d1 - 12	35,5	12	145.6	30183352
155,60 - 165,59	63	136	18,5	162	d1 - 12	48,5	12	155.6	30183353

MN75257 - For through bore, short design

Dimensions							z	Size	Order No.
d ₁	HSK	l ₃	l ₄	A	øe	f			
165,60 - 175,59	63	136	18,5	162	d1 -12	48,5	12	165.6	30183354
175,60 - 185,59	63	136	18,5	162	d1 -12	48,5	12	175.6	30183355
185,60 - 195,59	63	136	18,5	162	d1 -12	48,5	12	185.6	30183356
195,60 - 200,59	63	136	18,5	162	d1 -12	48,5	12	195.6	30183357
200,60 - 205,59	63	136	18,5	162	d1 -12	48,5	12	200.6	30183358
205,60 - 210,59	63	136	18,5	162	d1 -12	48,5	12	205.6	30183359
210,60 - 215,59	63	136	18,5	162	d1 -12	48,5	12	210.6	30183360
215,60 - 225,59	63	136	18,5	162	d1 -12	48,5	12	215.6	30183361
225,60 - 235,59	63	136	18,5	162	d1 -12	48,5	12	225.6	30183362
235,60 - 245,59	63	136	18,5	162	d1 -12	48,5	12	235.6	30183363
245,60 - 255,59	63	136	18,5	162	d1 -12	48,5	12	245.6	30183364
255,60 - 265,59	63	160	18,5	196	d1 -12	51,5	12	255.6	30183365
265,60 - 275,59	63	160	18,5	196	d1 -12	51,5	12	265.6	30183366
275,60 - 285,59	63	160	18,5	196	d1 -12	51,5	12	275.6	30183367
285,60 - 295,59	63	160	18,5	196	d1 -12	51,5	12	285.6	30183368
295,60 - 300,59	63	160	18,5	196	d1 -12	51,5	12	295.6	30183369

Information required to order

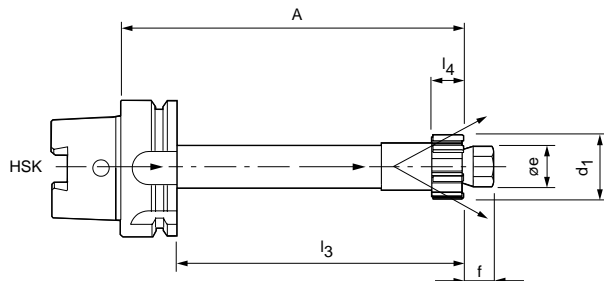
Holder		+	Cutting ring					Spare parts	
Type	Size		Type	ø	Tolerance	Cutting material	Lead	Page	
e.g. MN73227	045.6		e.g. MN73217	45.75	H7	Carbide	45°	386	

Dimensions in mm.

Please note that the holder and cutting ring must be ordered separately.
The tools are supplied fully assembled and set to the nominal size.

Holders for cutting rings

Shank HSK-A in accordance with DIN 69893-A
 with internal coolant supply



MN75267 - For through bore, long design

Dimensions							z	Size	Order No.
d ₁	HSK	l ₃	l ₄	A	øe	f			
21,60 - 25,59	63	121	11,5	147	11,5	11	6	021.6	30183383
25,60 - 32,59	63	153	13,5	179	15	11	6	025.6	30183384
32,60 - 36,59	63	179	15,5	205	21,9	14	6	032.6	30183385
36,60 - 40,59	63	179	15,5	205	21,9	14	6	036.6	30183386
40,60 - 45,59	63	201	15,5	227	25,4	15	6	040.6	30183387
45,60 - 50,59	63	214	18,5	240	30,3	20,5	6	045.6	30183388
50,60 - 60,59	63	214	18,5	240	30,3	20,5	6	050.6	30183389
60,60 - 70,59	63	237	18,5	263	40	24,5	6	060.6	30183390
70,60 - 79,59	63	237	18,5	263	40	24,5	6	070.6	30183391
79,60 - 90,59	63	245	18,5	271	56,2	28,5	8	079.6	30183392
90,60 - 100,59	63	245	18,5	271	56,2	28,5	8	090.6	30183393
100,60 - 110,59	63	245	18,5	271	73,4	35,5	10	100.6	30183394
110,60 - 115,59	63	245	18,5	271	90,4	35,5	12	110.6	30183395
115,60 - 120,59	63	245	18,5	271	90,4	35,5	12	115.6	30183396
120,60 - 125,59	63	245	18,5	271	90,4	35,5	12	120.6	30183397
125,60 - 132,59	63	245	18,5	271	90,4	35,5	12	125.6	30183398
132,60 - 139,59	63	245	18,5	271	90,4	35,5	12	132.6	30183399
139,60 - 145,59	63	245	18,5	271	d1 - 12	35,5	12	139.6	30183400
145,60 - 155,59	63	245	18,5	271	d1 - 12	35,5	12	145.6	30183401
155,60 - 165,59	63	245	18,5	271	d1 - 12	48,5	12	155.6	30183402

MN75267 - For through bore, long design

Dimensions							z	Size	Order No.
d ₁	HSK	l ₃	l ₄	A	øe	f			
165,60 - 175,59	63	245	18,5	271	d1 -12	48,5	12	165.6	30183403
175,60 - 185,59	63	245	18,5	271	d1 -12	48,5	12	175.6	30183404
185,60 - 195,59	63	245	18,5	271	d1 -12	48,5	12	185.6	30183405
195,60 - 200,59	63	245	18,5	271	d1 -12	48,5	12	195.6	30183406
200,60 - 205,59	63	245	18,5	271	d1 -12	48,5	12	200.6	30183407
205,60 - 210,59	63	245	18,5	271	d1 -12	48,5	12	205.6	30183408
210,60 - 215,59	63	245	18,5	271	d1 -12	48,5	12	210.6	30183409
215,60 - 225,59	63	245	18,5	271	d1 -12	48,5	12	215.6	30183410
225,60 - 235,59	63	245	18,5	271	d1 -12	48,5	12	225.6	30183411
235,60 - 245,59	63	245	18,5	271	d1 -12	48,5	12	235.6	30183412
245,60 - 255,59	63	245	18,5	271	d1 -12	48,5	12	245.6	30183413
255,60 - 265,59	63	245	18,5	271	d1 -12	51,5	12	255.6	30183414
265,60 - 275,59	63	245	18,5	271	d1 -12	51,5	12	265.6	30183415
275,60 - 285,59	63	245	18,5	271	d1 -12	51,5	12	275.6	30183416
285,60 - 295,59	63	245	18,5	271	d1 -12	51,5	12	285.6	30183417
295,60 - 300,59	63	245	18,5	271	d1 -12	51,5	12	295.6	30183418

Information required to order

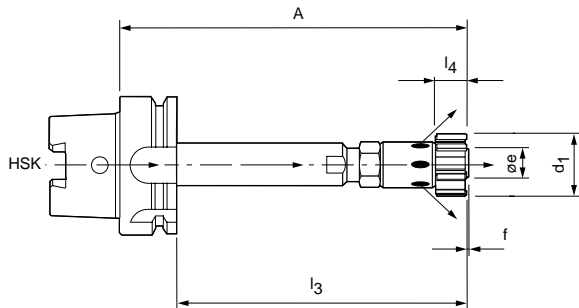
Holder		+	Cutting ring					Spare parts	
Type	Size		Type	ø	Tolerance	Cutting material	Lead	Page	
e.g. MN73227	045.6		e.g. MN73217	45.75	H7	Carbide	45°	386	

Dimensions in mm.

Please note that the holder and cutting ring must be ordered separately.
The tools are supplied fully assembled and set to the nominal size.

Holders for cutting rings

Shank HSK-A in accordance with DIN 69893-A
 with internal coolant supply



MN75256 - For through bore and blind bore, short design

Dimensions							z	Size	Order No.
d ₁	HSK	l ₃	l ₄	A	øe	f			
21,60 - 25,59	50	81	11,5	107	11,2	1	6	021.6	30183322
25,60 - 32,59	50	102	13,5	128	15,2	1	6	025.6	30183323
32,60 - 36,59	50	102	15,5	128	20,3	1,5	6	032.6	30183324
36,60 - 40,59	50	102	15,5	128	20,3	1,5	6	036.6	30183325
40,60 - 45,59	50	102	15,5	128	24,1	1,5	6	040.6	30183326
45,60 - 50,59	50	105	18,5	131	27,8	1,5	6	045.6	30183327
50,60 - 60,59	50	105	18,5	131	27,8	1,5	6	050.6	30183328
60,60 - 70,59	63	105	18,5	131	37	1,5	6	060.6	30183329
70,60 - 79,59	63	105	18,5	131	37	1,5	6	070.6	30183330
79,60 - 90,59	63	117	18,5	143	53,2	1,5	8	079.6	30183331
90,60 - 100,59	63	117	18,5	143	53,2	1,5	8	090.6	30183332

MN75266 - For through bore and blind bore, long design

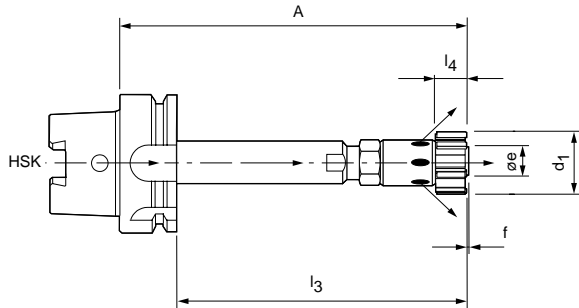
21,60 - 25,59	50	121	11,5	147	11,2	1	6	021.6	30183371
25,60 - 32,59	50	153	13,5	179	15,2	1	6	025.6	30183372
32,60 - 36,59	50	179	15,5	205	20,3	1,5	6	032.6	30183373
36,60 - 40,59	50	179	15,5	205	20,3	1,5	6	036.6	30183374
40,60 - 45,59	50	200	15,5	226	24,1	1,5	6	040.6	30183375
45,60 - 50,59	50	214	18,5	240	27,8	1,5	6	045.6	30183376
50,60 - 60,59	50	214	18,5	240	27,8	1,5	6	050.6	30183377
60,60 - 70,59	63	237	18,5	263	37	1,5	6	060.6	30183378
70,60 - 79,59	63	237	18,5	263	37	1,5	6	070.6	30183379
79,60 - 90,59	63	245	18,5	271	53,2	1,5	8	079.6	30183380
90,60 - 100,59	63	245	18,5	271	53,2	1,5	8	090.6	30183381

Information required to order

Holder		+	Cutting ring					Spare parts	
Type	Size		Type	ø	Tolerance	Cutting material	Lead	Page	
e.g. MN73227	045.6		e.g. MN73217	45.75	H7	Carbide	45°	386	

Holders for cutting rings

Shank HSK-A in accordance with DIN 69893-A
with internal coolant supply



MN76256 – For blind bore, short design

Dimensions							z	Size	Order No.
d ₁	HSK	l ₃	l ₄	A	øe	f			
21,60 - 25,59	50	81	11,5	107	11,2	1	6	021.6	30183299
25,60 - 32,59	50	102	13,5	128	15,2	1	6	025.6	30183300
32,60 - 36,59	50	102	15,5	128	20,3	1,5	6	032.6	30183301
36,60 - 40,59	50	102	15,5	128	20,3	1,5	6	036.6	30183302
40,60 - 45,59	50	102	15,5	128	24,1	1,5	6	040.6	30183303
45,60 - 50,59	50	105	18,5	131	27,8	1,5	6	045.6	30183304
50,60 - 60,59	50	105	18,5	131	27,8	1,5	6	050.6	30183305
60,60 - 70,59	63	105	18,5	131	37	1,5	6	060.6	30183306
70,60 - 79,59	63	105	18,5	131	37	1,5	6	070.6	30244049
79,60 - 90,59	63	117	18,5	143	53,2	1,5	8	079.6	30183307
90,60 - 100,59	63	117	18,5	143	53,2	1,5	8	090.6	30183308

MN76266 – For blind bore, long design

21,60 - 25,59	50	121	11,5	147	11,2	1	6	021.6	30183310
25,60 - 32,59	50	153	13,5	179	15,2	1	6	025.6	30183311
32,60 - 36,59	50	179	15,5	205	20,3	1,5	6	032.6	30183312
36,60 - 40,59	50	179	15,5	205	20,3	1,5	6	036.6	30183313
40,60 - 45,59	50	200	15,5	226	24,1	1,5	6	040.6	30183314
45,60 - 50,59	50	214	18,5	240	27,8	1,5	6	045.6	30183315
50,60 - 60,59	50	214	18,5	240	27,8	1,5	6	050.6	30183316
60,60 - 70,59	63	237	18,5	263	37	1,5	6	060.6	30183317
70,60 - 79,59	63	237	18,5	263	37	1,5	6	070.6	30183318
79,60 - 90,59	63	245	18,5	271	53,2	1,5	8	079.6	30183319
90,60 - 100,59	63	245	18,5	271	53,2	1,5	8	090.6	30183320

Information required to order

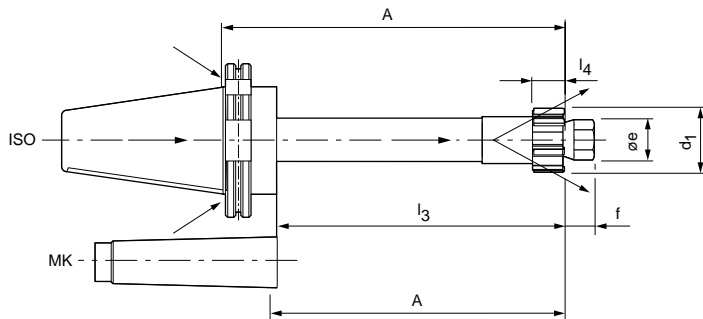
Holder		+	Cutting ring					Spare parts	
Type	Size		Type	ø	Tolerance	Cutting material	Lead	Page	
e.g. MN73227	045.6		e.g. MN73217	45.75	H7	Carbide	45°	386	

Dimensions in mm.

Please note that the holder and cutting ring must be ordered separately.
The tools are supplied fully assembled and set to the nominal size.

HOLDERS for cutting rings

Morse taper shank | Shank SK in accordance with ISO 7388-1 Form AD/AF
with internal coolant supply



MN75217 - For through bore, short design

Dimensions								z	Size	Order No.
d ₁	MK	SK	l ₃	l ₄	A	øe	f			
21,60 - 25,59	2	-	81	11,5	86	11,5	11	6	021.6	30183484
25,60 - 32,59	3	-	102	13,5	107	15	11	6	025.6	30183485
32,60 - 36,59	3	-	102	15,5	107	21,9	14	6	032.6	30183486
36,60 - 40,59	3	-	102	15,5	107	21,9	14	6	036.6	30082419
40,60 - 45,59	3	-	102	15,5	107	25,4	15	6	040.6	30183487
45,60 - 50,59	4	-	105	18,5	111,5	30,3	20,5	6	045.6	30183488
50,60 - 60,59	4	-	105	18,5	111,5	30,3	20,5	6	050.6	30082417
60,60 - 70,59	-	50	105	18,5	143,1	40,0	24,5	6	060.6	30057566
70,60 - 79,59	-	50	105	18,5	143,1	40,0	24,5	6	070.6	30183489
79,60 - 90,59	-	50	105	18,5	124,1	56,2	28,5	8	079.6	30183490
90,60 - 100,59	-	50	105	18,5	124,1	56,2	28,5	8	090.6	30077763
100,60 - 110,59	-	50	106	18,5	125,1	73,4	35,5	10	100.6	30183491
110,60 - 115,59	-	50	136	18,5	155,1	90,4	35,5	12	110.6	30058626
115,60 - 120,59	-	50	136	18,5	155,1	90,4	35,5	12	115.6	30076909
120,60 - 125,59	-	50	136	18,5	155,1	90,4	35,5	12	120.6	30183492
125,60 - 132,59	-	50	136	18,5	155,1	90,4	35,5	12	125.6	30183493
132,60 - 139,59	-	50	136	18,5	155,1	90,4	35,5	12	132.6	30183494
139,60 - 145,59	-	50	136	18,5	155,1	d1 -12	35,5	12	139.6	30183495
145,60 - 155,59	-	50	136	18,5	155,1	d1 -12	35,5	12	145.6	30058627
155,60 - 165,59	-	50	136	18,5	155,1	d1 -12	48,5	12	155.6	30077764

MN75217 - For through bore, short design

Dimensions								z	Size	Order No.
d ₁	MK	SK	l ₃	l ₄	A	øe	f			
165,60 - 175,59	-	50	136	18,5	155,1	d1 -12	48,5	12	165.6	30183496
175,60 - 185,59	-	50	136	18,5	155,1	d1 -12	48,5	12	175.6	30183497
185,60 - 195,59	-	50	136	18,5	155,1	d1 -12	48,5	12	185.6	30243815
195,60 - 200,59	-	50	136	18,5	155,1	d1 -12	48,5	12	195.6	30183498
200,60 - 205,59	-	50	136	18,5	155,1	d1 -12	48,5	12	200.6	30077765
205,60 - 210,59	-	50	136	18,5	155,1	d1 -12	48,5	12	205.6	30183499
210,60 - 215,59	-	50	136	18,5	155,1	d1 -12	48,5	12	210.6	30183500
215,60 - 225,59	-	50	136	18,5	155,1	d1 -12	48,5	12	215.6	30183501
225,60 - 235,59	-	50	136	18,5	155,1	d1 -12	48,5	12	225.6	30183502
235,60 - 245,59	-	50	136	18,5	155,1	d1 -12	48,5	12	235.6	30183503
245,60 - 255,59	-	50	136	18,5	155,1	d1 -12	48,5	12	245.6	30183504
255,60 - 265,59	-	50	160	18,5	179,1	d1 -12	51,5	12	255.6	30183505
265,60 - 275,59	-	50	160	18,5	179,1	d1 -12	51,5	12	265.6	30183506
275,60 - 285,59	-	50	160	18,5	179,1	d1 -12	51,5	12	275.6	30183507
285,60 - 295,59	-	50	160	18,5	179,1	d1 -12	51,5	12	285.6	30183508
295,60 - 300,59	-	50	160	18,5	179,1	d1 -12	51,5	12	295.6	30183509

Information required to order

Holder	
Type	Size
e.g. MN73227	045.6



Cutting ring				
Type	ø	Tolerance	Cutting material	Lead
e.g. MN73217	45.75	H7	Carbide	45°

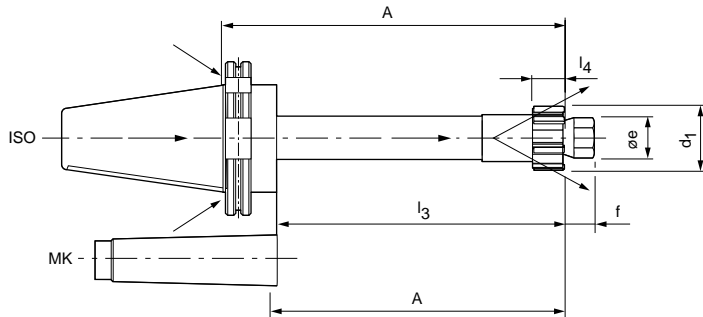
Spare parts
Page
386

Dimensions in mm.

Please note that the holder and cutting ring must be ordered separately. The tools are supplied fully assembled and set to the nominal size.

HOLDERS for cutting rings

Morse taper shank | Shank SK in accordance with ISO 7388-1 Form AD/AF with internal coolant supply



MN75227 - For through bore, long design

Dimensions								z	Size	Order No.
d ₁	MK	SK	l ₃	l ₄	A	øe	f			
21,60 - 25,59	2	-	121	11,5	126	11,5	11	6	021.6	30183525
25,60 - 32,59	3	-	153	13,5	158	15	11	6	025.6	30183527
32,60 - 36,59	3	-	179	15,5	184	21,9	14	6	032.6	30183529
36,60 - 40,59	3	-	179	15,5	184	21,9	14	6	036.6	30183530
40,60 - 45,59	3	-	201	15,5	206	25,4	15	6	040.6	30183532
45,60 - 50,59	4	-	214	18,5	220,5	30,3	20,5	6	045.6	30183535
50,60 - 60,59	4	-	214	18,5	220,5	30,3	20,5	6	050.6	30183536
60,60 - 70,59	-	50	237	18,5	275,1	40	24,5	6	060.6	30183422
70,60 - 79,59	-	50	237	18,5	275,1	40	24,5	6	070.6	30183423
79,60 - 90,59	-	50	245	18,5	264,1	56,2	28,5	8	079.6	30183424
90,60 - 100,59	-	50	245	18,5	264,1	56,2	28,5	8	090.6	30183425
100,60 - 110,59	-	50	245	18,5	264,1	73,4	35,5	10	100.6	30183426
110,60 - 115,59	-	50	245	18,5	264,1	90,4	35,5	12	110.6	30183427
115,60 - 120,59	-	50	245	18,5	264,1	90,4	35,5	12	115.6	30033907
120,60 - 125,59	-	50	245	18,5	264,1	90,4	35,5	12	120.6	30183428
125,60 - 132,59	-	50	245	18,5	264,1	90,4	35,5	12	125.6	30183429
132,60 - 139,59	-	50	245	18,5	264,1	90,4	35,5	12	132.6	30183430
139,60 - 145,59	-	50	245	18,5	264,1	d1 -12	35,5	12	139.6	30183431
145,60 - 155,59	-	50	245	18,5	264,1	d1 -12	35,5	12	145.6	30183432
155,60 - 165,59	-	50	245	18,5	264,1	d1 -12	48,5	12	155.6	30183433

MN75227 - For through bore, long design

Dimensions								z	Size	Order No.
d ₁	MK	SK	l ₃	l ₄	A	øe	f			
165,60 - 175,59	-	50	245	18,5	264,1	d1 -12	48,5	12	165.6	30183434
175,60 - 185,59	-	50	245	18,5	264,1	d1 -12	48,5	12	175.6	30183435
185,60 - 195,59	-	50	245	18,5	264,1	d1 -12	48,5	12	185.6	30183436
195,60 - 200,59	-	50	245	18,5	264,1	d1 -12	48,5	12	195.6	30183437
200,60 - 205,59	-	50	245	18,5	264,1	d1 -12	48,5	12	200.6	30183438
205,60 - 210,59	-	50	245	18,5	264,1	d1 -12	48,5	12	205.6	30183439
210,60 - 215,59	-	50	245	18,5	264,1	d1 -12	48,5	12	210.6	30183440
215,60 - 225,59	-	50	245	18,5	264,1	d1 -12	48,5	12	215.6	30183441
225,60 - 235,59	-	50	245	18,5	264,1	d1 -12	48,5	12	225.6	30183442
235,60 - 245,59	-	50	245	18,5	264,1	d1 -12	48,5	12	235.6	30183443
245,60 - 255,59	-	50	245	18,5	264,1	d1 -12	48,5	12	245.6	30183444
255,60 - 265,59	-	50	245	18,5	264,1	d1 -12	51,5	12	255.6	30183445
265,60 - 275,59	-	50	245	18,5	264,1	d1 -12	51,5	12	265.6	30183446
275,60 - 285,59	-	50	245	18,5	264,1	d1 -12	51,5	12	275.6	30183447
285,60 - 295,59	-	50	245	18,5	264,1	d1 -12	51,5	12	285.6	30183448
295,60 - 300,59	-	50	245	18,5	264,1	d1 -12	51,5	12	295.6	30183449

Information required to order

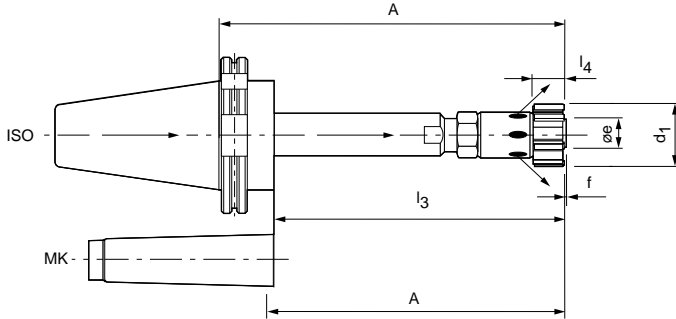
Holder		+	Cutting ring					Spare parts	
Type	Size		Type	ø	Tolerance	Cutting material	Lead	Page	
e.g. MN73227	045.6		e.g. MN73217	45.75	H7	Carbide	45°	386	

Dimensions in mm.

Please note that the holder and cutting ring must be ordered separately.
The tools are supplied fully assembled and set to the nominal size.

Holders for cutting rings

Morse taper shank | Shank SK in accordance with ISO 7388-1 Form AD/AF with internal coolant supply



MN76216 - For blind bore, short design

Dimensions								z	Size	Order No.
d ₁	MK	SK	l ₃	l ₄	A	øe	f			
21,60 - 25,59	2	-	81	11,5	86	11,2	1	6	021.6	30183451
25,60 - 32,59	3	-	102	13,5	107	15,2	1	6	025.6	30183452
32,60 - 36,59	3	-	102	15,5	107	20,3	1,5	6	032.6	30183453
36,60 - 40,59	3	-	102	15,5	107	20,3	1,5	6	036.6	30183454
40,60 - 45,59	3	-	102	15,5	107	24,1	1,5	6	040.6	30183455
45,60 - 50,59	4	-	105	18,5	111,5	27,8	1,5	6	045.6	30183456
50,60 - 60,59	4	-	105	18,5	111,5	27,8	1,5	6	050.6	30183457
60,60 - 70,59	-	50	105	18,5	143,1	37	1,5	6	060.6	30183458
70,60 - 79,59	-	50	107	18,5	143,1	37	1,5	6	070.6	30183459
79,60 - 90,59	-	50	117	18,5	136,1	53,2	1,5	8	079.6	30183460
90,60 - 100,59	-	50	117	18,5	136,1	53,2	1,5	8	090.6	30183461

MN76226 - For blind bore, long design

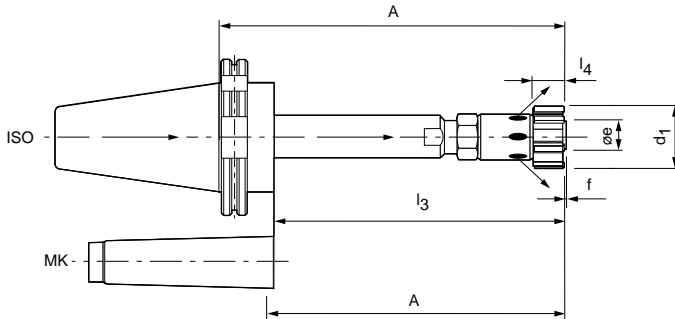
21,60 - 25,59	2	-	121	11,5	126	11,2	1	6	021.6	30183463
25,60 - 32,59	3	-	153	13,5	158	15,2	1	6	025.6	30183464
32,60 - 36,59	3	-	179	15,5	184	20,3	1,5	6	032.6	30183465
36,60 - 40,59	3	-	179	15,5	184	20,3	1,5	6	036.6	30183466
40,60 - 45,59	3	-	200	15,5	205	24,1	1,5	6	040.6	30183467
45,60 - 50,59	4	-	214	18,5	220,5	27,8	1,5	6	045.6	30183468
50,60 - 60,59	4	-	214	18,5	220,5	27,8	1,5	6	050.6	30206526
60,60 - 70,59	-	50	237	18,5	275,1	37	1,5	6	060.6	30183469
70,60 - 79,59	-	50	239	18,5	275,1	37	1,5	6	070.6	30243944
79,60 - 90,59	-	50	245	18,5	264,1	53,2	1,5	8	079.6	30183470
90,60 - 100,59	-	50	245	18,5	264,1	53,2	1,5	8	090.6	30183471

Information required to order

Holder		+	Cutting ring					Spare parts
Type	Size		Type	ø	Tolerance	Cutting material	Lead	Page
e.g. MN73227	045.6		e.g. MN73217	45.75	H7	Carbide	45°	386

HOLDERS for cutting rings

Morse taper shank | Shank SK in accordance with ISO 7388-1 Form AD/AF
with internal coolant supply



MN75216 - For through bore and blind bore, short design

Dimensions								z	Size	Order No.
d ₁	MK	SK	l ₃	l ₄	A	øe	f			
21,60 - 25,59	2	-	81	11,5	86	11,2	1	6	021.6	30183473
25,60 - 32,59	3	-	102	13,5	107	15,2	1	6	025.6	30183474
32,60 - 36,59	3	-	102	15,5	107	20,3	1,5	6	032.6	30183475
36,60 - 40,59	3	-	102	15,5	107	20,3	1,5	6	036.6	30183476
40,60 - 45,59	3	-	102	15,5	107	24,1	1,5	6	040.6	30183477
45,60 - 50,59	4	-	105	18,5	111,5	27,8	1,5	6	045.6	30183478
50,60 - 60,59	4	-	105	18,5	111,5	27,8	1,5	6	050.6	30183479
60,60 - 70,59	-	50	105	18,5	143,1	37	1,5	6	060.6	30036894
70,60 - 79,59	-	50	107	18,5	143,1	37	1,5	6	070.6	30183480
79,60 - 90,59	-	50	117	18,5	136,1	53,2	1,5	8	079.6	30183481
90,60 - 100,59	-	50	117	18,5	136,1	53,2	1,5	8	090.6	30183482

MN75226 - For through bore and blind bore, long design

21,60 - 25,59	2	-	121	11,5	126	11,2	1	6	021.6	30183511
25,60 - 32,59	3	-	153	13,5	158	15,2	1	6	025.6	30183512
32,60 - 36,59	3	-	179	15,5	184	20,3	1,5	6	032.6	30183513
36,60 - 40,59	3	-	179	15,5	184	20,3	1,5	6	036.6	30183514
40,60 - 45,59	3	-	200	15,5	205	24,1	1,5	6	040.6	30183516
45,60 - 50,59	4	-	214	18,5	220,5	27,8	1,5	6	045.6	30183518
50,60 - 60,59	4	-	214	18,5	220,5	27,8	1,5	6	050.6	30183520
60,60 - 70,59	-	50	237	18,5	275,1	37	1,5	6	060.6	30092179
70,60 - 79,59	-	50	239	18,5	275,1	37	1,5	6	070.6	30183419
79,60 - 90,59	-	50	245	18,5	264,1	53,2	1,5	8	079.6	30183420
90,60 - 100,59	-	50	245	18,5	264,1	53,2	1,5	8	090.6	30183421

Information required to order

Holder		+	Cutting ring					Spare parts
Type	Size		Type	ø	Tolerance	Cutting material	Lead	Page
e.g. MN73227	045.6		e.g. MN73217	45.75	H7	Carbide	45°	386

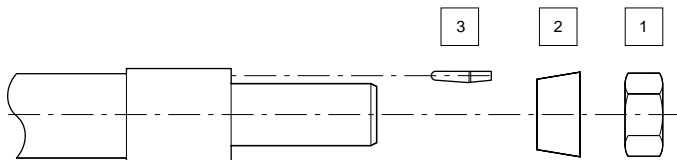
Dimensions in mm.

Please note that the holder and cutting ring must be ordered separately.
The tools are supplied fully assembled and set to the nominal size.

Spare parts

For cutting ring holders

For type:
MN75217, MN75227
MN75257, MN75267
MN75247
MN75287

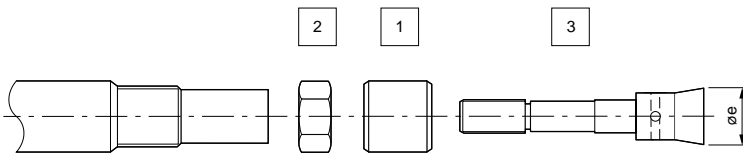


d ₁	1 Adjusting nut Order No.	2 Conical sleeve Order No.	3 Locking pin Order No.
21,60 - 25,59	10045282	10045293	10045321
25,60 - 32,59	10045285	10045294	10045322
32,60 - 36,59	10045286	10045295	10045323
36,60 - 40,59	10045286	10045295	10045323
40,60 - 45,59	10045287	10045296	10045324
45,60 - 50,59	10045288	10045297	10045325
50,60 - 60,59	10045288	10045297	10045325
60,60 - 70,59	10045289	10045298	10045326
70,60 - 79,59	10045289	10045298	10045326
79,60 - 90,59	10045290	10045299	10045327
90,60 - 100,59	10045290	10045299	10045327
100,60 - 110,59	10045291	10045300	10045327
110,60 - 115,59	10045291	10045301	10045327
115,60 - 120,59	10045291	10045302	10045327
120,60 - 125,59	10045291	10045302	10045327
125,60 - 132,59	10045291	10045303	10045328
132,60 - 139,59	10045291	10045303	10045328
139,60 - 145,59	10045291	10045304	10045328
145,60 - 155,59	10045291	10045305	10045329
155,60 - 165,59	10045292	10045306	10045329
165,60 - 175,59	10045292	10045307	10045329
175,60 - 185,59	10045292	10045308	10045329
185,60 - 195,59	10045292	10045309	10045329
195,60 - 200,59	10045292	10045310	10045329
200,60 - 205,59	10045292	10045310	10045329
205,60 - 210,59	10045292	10045311	10045329
210,60 - 215,59	10045292	10045311	10045329
215,60 - 225,59	10045292	10045312	10045329
225,60 - 235,59	10045292	10045313	10045329
235,60 - 245,59	10045292	10045314	10045329
245,60 - 255,59	10045292	10045315	10045329
255,60 - 265,59	50037875	10045316	10045329
265,60 - 275,59	50037875	10045317	10045329
275,60 - 285,59	50037875	10045318	10045329
285,60 - 295,59	50037875	10045319	10045329
295,60 - 300,59	50037875	10045320	10045329

Spare parts

For cutting ring holders

For type:
MN73227, MN73228
MN73237, MN73238
MN73217, MN73218



Sleeves and adjusting nuts for Ø21.60 - Ø45.59

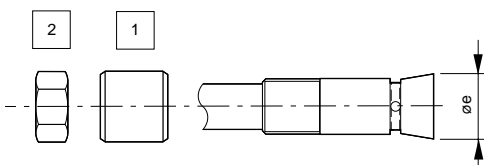
d_1	1 Sleeve Order No.	2 Adjusting nut Order No.
21,60 - 25,59	10045332	10045392
25,60 - 32,59	10045333	10045393
32,60 - 36,59	10045334	10045394
36,60 - 40,59	50034482	10045394
40,60 - 45,59	10045335	10045395

3 | Conical screws

d_1	Through bore Order No.	Blind bore $\varnothing e$ Order No.
21,60 - 25,59	10045342	10045347
25,60 - 32,59	10045343	10045348
32,60 - 36,59	10045344	10045349
36,60 - 40,59	10045344	10045349
40,60 - 45,59	10045345	10045350

3 | Conical screws - blind bore after repair

d_1	$\varnothing e + 1.2$ Order No.	$\varnothing e + 2.4$ Order No.
21,60 - 25,59	10045352	10045357
25,60 - 32,59	10045353	10045358
32,60 - 36,59	10045354	10045359
36,60 - 40,59	10045354	10045359
40,60 - 45,59	10045355	10045360



Sleeves and adjusting nuts for Ø45.60 - Ø100.59

d_1	1 Sleeve Order No.	2 Adjusting nut Order No.
45,60 - 60,59	10045361	10045364
60,60 - 79,59	10045362	10045365
79,60 - 100,59	10045363	10045366

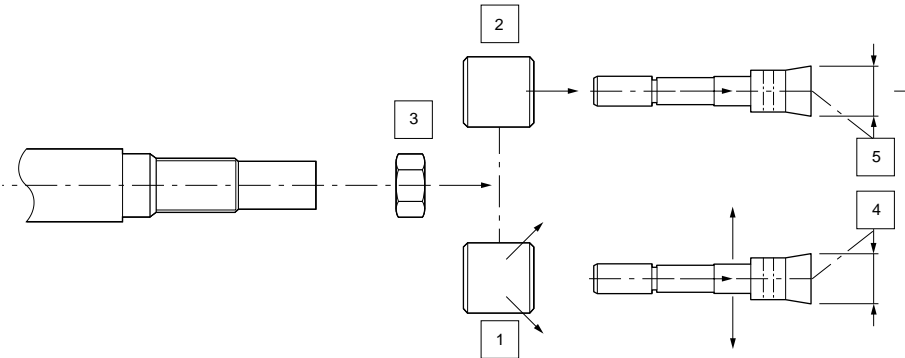
Dimensions in mm.

Spare parts

For cutting ring holders

For type:

- MN75216, MN75226
- MN76216, MN76226
- MN75256, MN75266
- MN76256, MN76266
- MN75236, MN76236
- MN76286, MN75286



Sleeves and adjusting nuts for Ø21.60 - Ø100.59

d ₁	1 Sleeve with coolant outlet bore Order No.	2 Sleeve Order No.	3 Adjusting nut Order No.
21,60 - 25,59	10045368	50034483	10045392
25,60 - 32,59	10045369	50034484	10045393
32,60 - 36,59	10045370	50034485	10045394
36,60 - 40,59	10045371	-	-
40,60 - 45,59	10045372	50034486	10045395
45,60 - 50,59	10045373	50034487	10045364
50,60 - 60,59	10045374	50034488	10045364
60,60 - 70,59	10045375	50034489	50034493
70,60 - 79,59	10045376	50034490	50034493
79,60 - 90,59	10045377	50034491	50034494
90,60 - 100,59	10045378	50034492	50034494

4 | Conical screws with coolant outlet bore

d ₁	Order No.	Repair e + 1.2 Order No.	Repair e + 2.4 Order No.
21,60 - 25,59	10045400	10045408	10045416
25,60 - 32,59	10045401	10045409	10045417
32,60 - 40,59	10045402	10045410	10045418
40,60 - 45,59	10045403	10045411	10045419
45,60 - 60,59	10045404	10045412	10045420
60,60 - 79,59	10045405	10045413	10045421
79,60 - 100,59	10045406	10045414	10045422

5 | Conical screws with central coolant supply

d ₁	Order No.	Repair øe + 1.2 Order No.	Repair øe + 2.4 Order No.
21,60 - 25,59	50034536	10045432	10045440
25,60 - 32,59	50034537	10045433	10045441
32,60 - 40,59	50034538	10045434	10045442
40,60 - 45,59	50034539	10045435	10045443
45,60 - 60,59	50034540	10045436	10045444
60,60 - 79,59	50034541	10045437	10045445
79,60 - 100,59	50034542	10045438	10045446



FLOATING HOLDERS

For reaming operations on lathes







FLOATING HOLDERS

Introduction

Product range 394

Chuck

Floating holders 396

Self-adjusting floating holders 409

Floating holders for multi-bladed reamers 412



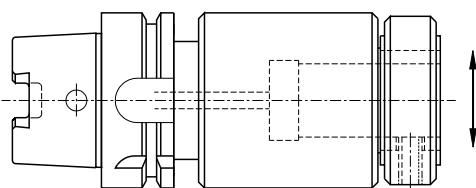
PRODUCT RANGE FLOATING HOLDERS

During fine bore machining, the alignment of the pilot bore with the tool axis is a prerequisite for the correct function of the reamer. On the usage of reamers on lathes it is often necessary to compensate for axial errors between the tool adapter and the bore to be machined. This error can be corrected either by aligning the tool on the machine or using a floating holder. A floating holder is particularly useful if the offset changes continuously due

to the thermal expansion of the machine or at different positions when rotating the revolver. MAPAL floating holders guarantee optimal results during machining at high speeds and feeds.

ADVANTAGES

- Long tool lives, even at high feed rates, due to trouble-free operation
- Consistent results in series production
- Reduction of scrap and re-work
- Small spacing on multiple spindle use due to slender design and small head diameter
- Advantageous at high spindle speeds
- No wearing parts, therefore no expensive stock of spare parts



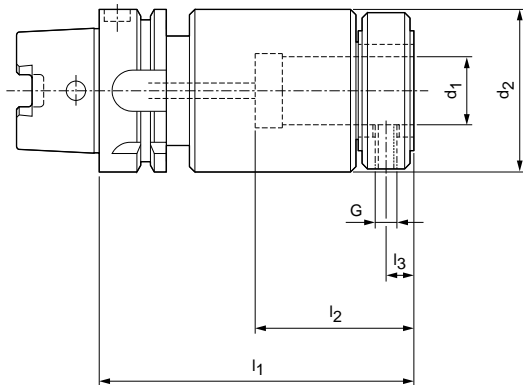


Floating holders	Self-adjusting floating holders	Floating holders for multi-bladed reamers
		
<p>The floating holders from MAPAL compensate for the axial and angular offset between the tool axis and the bore to be machined. In this way radial run-out and alignment errors are compensated, optimal surface finishes reliably achieved at high cutting speeds and increased tool life.</p>	<p>MAPAL developed the self-adjusting floating holders for the optimisation of the effectiveness on lathes and multiple spindle machines. Through the usage of components from the conventional floating holder in the self-adjusting floating holder, all the advantages of the floating holder technology can be exploited. The self-adjusting floating holders make it possible to manually adjust tool adapters that are not central in relation to the rotating spindle and slide guides that do not run parallel to the spindle axis. The radial play on the floating holder is further minimised. Radial run-out and alignment errors are compensated without vibration, long cutting times and tool lives are ensured. The integrated coolant supply guarantees an optimal supply of cooling lubricant to the reamer cutting edges. The spindle error can be adjusted directly via an easily accessible eccentric screw.</p>	<p>Floating holders have a significant weakness when used in conjunction with multi-bladed, high-performance reamers. Due to the function and the construction of the floating holder, when the tool initiates the cut at the beginning of the bore, a very low cutting speed must be selected initially. After the machining of the first few millimetres it is then possible to increase the cutting speed, depending on the material and conditions on the machine. The mechanism inside the floating holders for multi-bladed reamers is designed especially for machining using multi-bladed reamers so that the compensation direction, the floating path and the necessary force for deflection are optimal for a specific range of diameters and tools used in the holder. This exact matching is particularly important on starting the cut. As a result high cutting speeds are possible even at the start of the reaming operation.</p>
<p>Page 396</p>	<p>Page 409</p>	<p>Page 412</p>

Floating holders for cylindrical shanks

With lateral drive area

Shank HSK-A in accordance with DIN 69893-1



HSK-A	Dimensions					G	Radial play	Specification	Order No.
	d ₁	d ₂	l ₁	l ₂	l ₃				
32	16	49	100	40	9,5	M8	0,08	MFH-HSK-A032-16-100-1-0-W	30319775
40	16	49	100	40	9,5	M8	0,08	MFH-HSK-A040-16-100-1-0-W	30319776
50	16	49	107	40	9,5	M8	0,08	MFH-HSK-A050-16-107-1-0-W	30319777
63	16	49	93	40	9,5	M8	0,08	MFH-HSK-A063-16-093-1-0-W	30319778
32	20	49	110	50	9,5	M8	0,08	MFH-HSK-A032-20-110-1-0-W	30319779
40	20	49	110	50	9,5	M8	0,08	MFH-HSK-A040-20-110-1-0-W	30319780
50	20	49	117	50	9,5	M8	0,08	MFH-HSK-A050-20-117-1-0-W	30319781
63	20	49	103	50	9,5	M8	0,08	MFH-HSK-A063-20-103-1-0-W	30319782
40	25	59	121	60	9,5	M10	0,08	MFH-HSK-A040-25-121-1-0-W	30319783
50	25	59	128	60	9,5	M10	0,08	MFH-HSK-A050-25-128-1-0-W	30319784
63	25	59	128	60	9,5	M10	0,08	MFH-HSK-A063-25-128-1-0-W	30319785

Radial play 0.02 mm for HSC machining

HSK-A	Dimensions					G	Radial play	Specification	Order No.
	d ₁	d ₂	l ₁	l ₂	l ₃				
32	16	49	100	40	9,5	M8	0,02	MFH-HSK-A032-16-100-1-0-W	30319786
40	16	49	100	40	9,5	M8	0,02	MFH-HSK-A040-16-100-1-0-W	30319787
50	16	49	107	40	9,5	M8	0,02	MFH-HSK-A050-16-107-1-0-W	30319788
63	16	49	93	40	9,5	M8	0,02	MFH-HSK-A063-16-108-1-0-W	30319789
32	20	49	110	50	9,5	M8	0,02	MFH-HSK-A032-20-110-1-0-W	30319790
40	20	49	110	50	9,5	M8	0,02	MFH-HSK-A040-20-110-1-0-W	30319791
50	20	49	117	50	9,5	M8	0,02	MFH-HSK-A050-20-117-1-0-W	30319792
63	20	49	103	50	9,5	M8	0,02	MFH-HSK-A063-20-118-1-0-W	30319793
40	25	59	121	60	9,5	M10	0,02	MFH-HSK-A040-25-120-1-0-W	30319794
50	25	59	128	60	9,5	M10	0,02	MFH-HSK-A050-25-128-1-0-W	30319795
63	25	59	128	60	9,5	M10	0,02	MFH-HSK-A063-25-130-1-0-W	30319796

Dimensions in mm.

Use: For mounting tools with cylindrical shank and lateral drive area in accordance with MAPAL works standard.

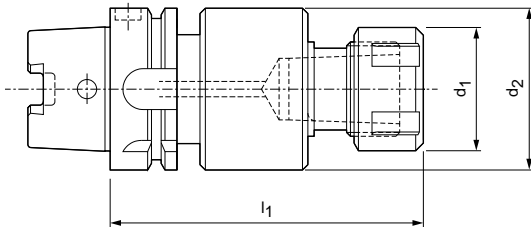
Items included: With holder ring and fastening screw (threaded pin ISO 4028). Without coolant tube.

Design: With central coolant supply.

Floating holders with collet holder

With clamping nut for internal coolant supply (HI-Q/ERC)

Shank HSK-A in accordance with DIN 69893-1



HSK-A	Clamping range	Nominal size	Dimensions			Radial play	Specification	Order No.
			d ₁	d ₂	l ₁			
32	1-13	ER-20	34	49,5	110	0,05	MFH-HSK-A032-20-110-1-0-W	30319797
40	1-13	ER-20	34	49,5	110	0,05	MFH-HSK-A040-20-110-1-0-W	30319798
50	1-13	ER-20	34	49,5	117	0,05	MFH-HSK-A050-20-117-1-0-W	30319799
63	1-13	ER-20	34	49,5	103	0,05	MFH-HSK-A063-20-103-1-0-W	30319800
32	1-16	ER-25	42	59	120	0,05	MFH-HSK-A032-25-120-1-0-W	30319801
40	1-16	ER-25	42	59	120	0,05	MFH-HSK-A040-25-120-1-0-W	30319802
50	1-16	ER-25	42	59	127	0,05	MFH-HSK-A050-25-127-1-0-W	30319803
63	1-16	ER-25	42	59	127	0,05	MFH-HSK-A063-25-127-1-0-W	30319804
40	2-20	ER-32	50	64	127	0,05	MFH-HSK-A040-32-127-1-0-W	30319805
50	2-20	ER-32	50	64	134	0,05	MFH-HSK-A050-32-134-1-0-W	30319806
63	2-20	ER-32	50	64	134	0,05	MFH-HSK-A063-32-134-1-0-W	30319807

Dimensions in mm.

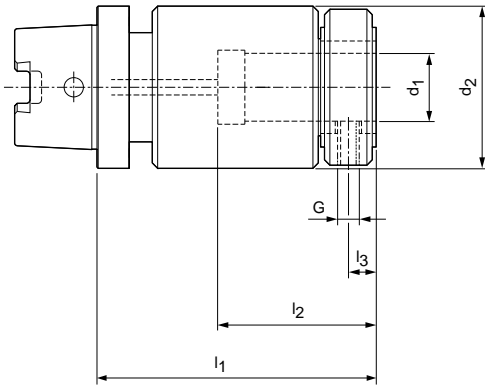
Items included: With clamping nut for internal coolant supply (HI-Q/ERC). Without sealing disc and collet. Without coolant tube.

Design: With central coolant supply.

Floating holders for cylindrical shanks

With lateral drive area

Shank HSK-C in accordance with DIN 69893-1



HSK-C	Dimensions					G	Radial play	Specification	Order No.
	d ₁	d ₂	l ₁	l ₂	l ₃				
32	16	49	77	40	9,5	M8	0,08	MFH-HSK-C032-16-077-1-0-W	30319808
40	16	49	77	40	9,5	M8	0,08	MFH-HSK-C040-16-077-1-0-W	30319809
50	16	49	80	40	9,5	M8	0,08	MFH-HSK-C050-16-080-1-0-W	30319810
63	16	49	80	40	9,5	M8	0,08	MFH-HSK-C063-16-080-1-0-W	30319811
32	20	49	87	50	9,5	M8	0,08	MFH-HSK-C032-20-087-1-0-W	30319812
40	20	49	87	50	9,5	M8	0,08	MFH-HSK-C040-20-087-1-0-W	30319813
50	20	49	90	50	9,5	M8	0,08	MFH-HSK-C050-20-090-1-0-W	30319814
63	20	49	90	50	9,5	M8	0,08	MFH-HSK-C063-20-090-1-0-W	30319815
50	25	59	98	60	9,5	M10	0,08	MFH-HSK-C050-25-098-1-0-W	30319816
63	25	59	101	60	9,5	M10	0,08	MFH-HSK-C063-25-101-1-0-W	30319817

Radial play 0.02 mm for HSC machining

HSK-C	Dimensions					G	Radial play	Specification	Order No.
	d ₁	d ₂	l ₁	l ₂	l ₃				
32	16	49	77	40	9,5	M8	0,02	MFH-HSK-C032-16-077-1-0-W	30319818
40	16	49	77	40	9,5	M8	0,02	MFH-HSK-C040-16-077-1-0-W	30319819
50	16	49	80	40	9,5	M8	0,02	MFH-HSK-C050-16-080-1-0-W	30319820
63	16	49	80	40	9,5	M8	0,02	MFH-HSK-C063-16-080-1-0-W	30319821
32	20	49	87	50	9,5	M8	0,02	MFH-HSK-C032-20-087-1-0-W	30319822
40	20	49	87	50	9,5	M8	0,02	MFH-HSK-C040-20-087-1-0-W	30319823
50	20	49	90	50	9,5	M8	0,02	MFH-HSK-C050-20-090-1-0-W	30319824
63	20	49	90	50	9,5	M8	0,02	MFH-HSK-C063-20-090-1-0-W	30319825
50	25	59	98	60	9,5	M10	0,02	MFH-HSK-C050-25-098-1-0-W	30319826
63	25	59	101	60	9,5	M10	0,02	MFH-HSK-C063-25-101-1-0-W	30319827

Dimensions in mm.

Use: For mounting tools with cylindrical shank and lateral drive area in accordance with MAPAL works standard.

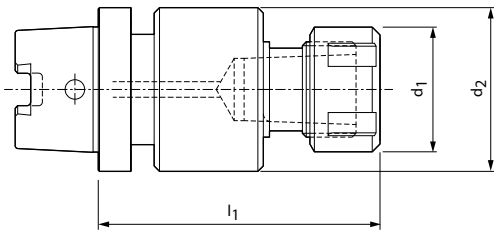
Items included: With holder ring and fastening screw (threaded pin ISO 4028). Without coolant tube.

Design: With central coolant supply.

Floating holders with collet holder

For internal coolant supply (HI-Q/ERC)

Shank HSK-C in accordance with DIN 69893-1



HSK-C	Clamping range	Nominal size	Dimensions			Radial play	Specification	Order No.
			d ₁	d ₂	l ₁			
32	1-13	ER-20	34	49,5	87	0,05	MFH-HSK-C032-20-087-1-0-W	30319828
40	1-13	ER-20	34	49,5	87	0,05	MFH-HSK-C040-20-087-1-0-W	30319829
50	1-13	ER-20	34	49,5	90	0,05	MFH-HSK-C050-20-090-1-0-W	30319830
63	1-13	ER-20	34	49,5	90	0,05	MFH-HSK-C063-20-090-1-0-W	30319831
32	1-16	ER-25	42	59	97	0,05	MFH-HSK-C032-25-097-1-0-W	30319832
40	1-16	ER-25	42	59	97	0,05	MFH-HSK-C040-25-097-1-0-W	30319833
50	1-16	ER-25	42	59	97	0,05	MFH-HSK-C050-25-097-1-0-W	30319834
63	1-16	ER-25	42	59	100	0,05	MFH-HSK-C063-25-100-1-0-W	30319835
40	2-20	ER-32	50	64	104	0,05	MFH-HSK-C040-32-104-1-0-W	30319836
50	2-20	ER-32	50	64	104	0,05	MFH-HSK-C050-32-104-1-0-W	30319837
63	2-20	ER-32	50	64	107	0,05	MFH-HSK-C063-32-107-1-0-W	30319838

Dimensions in mm.

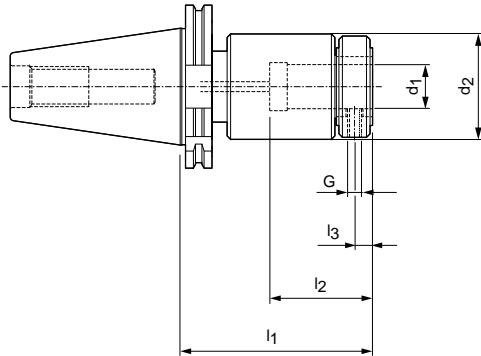
Items included: With clamping nut for internal coolant supply (HI-Q/ERC). Without sealing disc and collet. Without coolant tube.

Design: With central coolant supply.

Floating holders for cylindrical shanks

With lateral drive area

Shank SK in accordance with ISO 7388-1



Steep taper ISO 7388-1 Form AD

SK	Dimensions					G	Radial play	Specification	Order No.
	d ₁	d ₂	l ₁	l ₂	l ₃				
40	16	49	95	40	9,5	M8	0,05	MFH-SK040-16-095-1-0-W	30319839
40	20	49	105	50	9,5	M8	0,05	MFH-SK040-20-105-1-0-W	30319840
40	25	59	121	60	9,5	M10	0,05	MFH-SK040-25-121-1-0-W	30319841
50	16	49	99	40	9,5	M8	0,05	MFH-SK050-16-099-1-0-W	30319842
50	20	49	109	50	9,5	M8	0,05	MFH-SK050-20-109-1-0-W	30319843
50	25	59	118	60	9,5	M10	0,05	MFH-SK050-25-118-1-0-W	30319844

Steep taper ISO 7388-1 Form AF

SK	Dimensions					G	Radial play	Specification	Order No.
	d ₁	d ₂	l ₁	l ₂	l ₃				
40	16	49	95	40	9,5	M8	0,05	MFH-SK040-16-095-2-0-W	30319845
40	20	49	105	50	9,5	M8	0,05	MFH-SK040-20-105-2-0-W	30319846
40	25	59	121	60	9,5	M10	0,05	MFH-SK040-25-121-2-0-W	30319847
50	16	49	99	40	9,5	M8	0,05	MFH-SK050-16-099-2-0-W	30319848
50	20	49	109	50	9,5	M8	0,05	MFH-SK050-20-109-2-0-W	30319849
50	25	59	118	60	9,5	M10	0,05	MFH-SK050-25-118-2-0-W	30319850

Dimensions in mm.

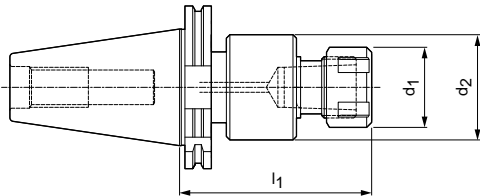
Use: For mounting tools with cylindrical shank and lateral drive area in accordance with MAPAL works standard.

Items included: With holder ring and fastening screw (threaded pin ISO 4028). Without pull stud.

Floating holders

With collet holder

Shank SK in accordance with ISO 7388-1



Steep taper ISO 7388-1 Form AD

SK	Clamping range	Nominal size	Dimensions			Radial play	Specification	Order No.
			d ₁	d ₂	l ₁			
40	1-16	ER-25	42	59	119	0,05	MFH-SK040-25-119-1-0-W	30319851
50	1-16	ER-25	42	59	116	0,05	MFH-SK050-25-116-1-0-W	30319852

Steep taper ISO 7388-1 Form AF

SK	Clamping range	Nominal size	Dimensions			Radial play	Specification	Order No.
			d ₁	d ₂	l ₁			
40	1-16	ER-25	42	59	119	0,05	MFH-SK040-25-119-2-0-W	30319853
50	1-16	ER-25	42	59	116	0,05	MFH-SK050-25-116-2-0-W	30319854

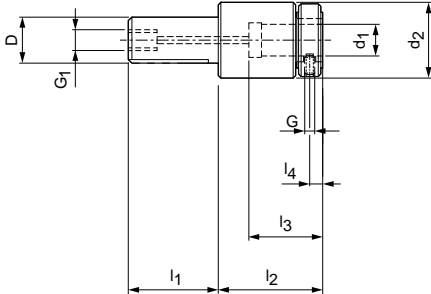
Dimensions in mm.

Items included: With clamping nut for internal coolant supply (HI-Q/ERC). Without sealing disc and collet. Without pull stud.

Mini-floating holders for cylindrical shanks

With lateral drive area

Shank with lateral clamping surface



With angular compensation

D	Dimensions						G ₁	G	Angular compensation	Radial play	Specification	Order No.
	d ₁	d ₂	l ₁	l ₂	l ₃	l ₄						
16	10	30	30	37	20	5	1/8"	M5	30'	0,12	MFH-ZYL016-10-037-1-0-W	30320141
19,05	10	30	30	37	20	5	1/8"	M5	30'	0,12	MFH-ZYL019-10-037-1-0-W	30319856
20	10	30	30	37	20	5	1/8"	M5	30'	0,12	MFH-ZYL020-10-037-1-0-W	30319857
25	10	30	30	37	20	5	1/8"	M5	30'	0,12	MFH-ZYL025-10-037-1-0-W	30319858
25,4	10	30	30	37	20	5	1/8"	M5	30'	0,12	MFH-ZYL025-10-037-1-0-W	30319859

Without angular compensation

D	Dimensions						G ₁	G	Angular compensation	Radial play	Specification	Order No.
	d ₁	d ₂	l ₁	l ₂	l ₃	l ₄						
16	10	30	30	34	20	5	1/8"	M5	-	0,12	MFH-ZYL016-10-034-1-0-W	30319860
19,05	10	30	30	34	20	5	1/8"	M5	-	0,12	MFH-ZYL019-10-034-1-0-W	30319861
20	10	30	30	34	20	5	1/8"	M5	-	0,12	MFH-ZYL020-10-034-1-0-W	30319862
25	10	30	30	34	20	5	1/8"	M5	-	0,12	MFH-ZYL025-10-034-1-0-W	30319863
25,4	10	30	30	34	20	5	1/8"	M5	-	0,12	MFH-ZYL025-10-034-1-0-W	30319864

Dimensions in mm.

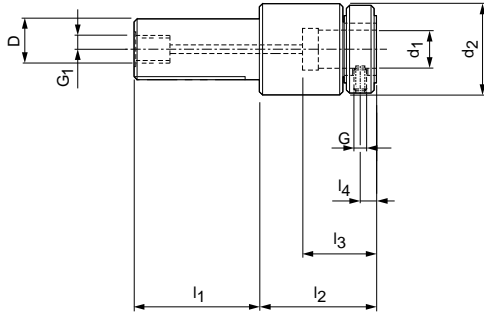
Use: For mounting tools with cylindrical shank and lateral drive area in accordance with MAPAL works standard.

Items included: With holder ring and fastening screw (threaded pin ISO 4028).

Design: With central coolant supply.

Floating holders for cylindrical shanks

With lateral drive area
Shank with lateral clamping surface



D	Dimensions						G ₁	G	Angular compensation	Radial play	Specification	Order No.
	d ₁	d ₂	l ₁	l ₂	l ₃	l ₄						
20	10	38,5	40	46	25	6	1/8"	M6	30'	0,08	MFH-ZYL020-10-046-1-0-W	30319865
25	10	38,5	40	46	25	6	1/4"	M6	30'	0,08	MFH-ZYL025-10-046-1-0-W	30319866
25,4	10	38,5	40	46	25	6	3/8"	M6	30'	0,08	MFH-ZYL025-10-046-1-0-W	30319867
30	10	38,5	40	46	25	6	3/8"	M6	30'	0,08	MFH-ZYL030-10-046-1-0-W	30319868
32	10	38,5	40	46	25	6	3/8"	M6	30'	0,08	MFH-ZYL032-10-046-1-0-W	30319869
19,05	16	38,5	46	44	26	6	1/8"	M6	-	0,08	MFH-ZYL019-16-044-1-0-W	30319870
20	16	49	46	46	29	7	1/8"	M8	30'	0,10	MFH-ZYL020-16-046-1-0-W	30319871
25	16	49	46	46	29	7	1/4"	M8	30'	0,10	MFH-ZYL025-16-046-1-0-W	30319872
25,4	16	49	46	46	29	7	1/4"	M8	30'	0,10	MFH-ZYL025-16-046-1-0-W	30319873
30	16	49	46	46	29	7	3/8"	M8	30'	0,10	MFH-ZYL030-16-046-1-0-W	30319874
32	16	49	46	46	29	7	3/8"	M8	30'	0,10	MFH-ZYL032-16-046-1-0-W	30319875
20	20	49	46	46	29	7	1/8"	M8	30'	0,12	MFH-ZYL020-20-046-1-0-W	30319876
25	20	49	46	46	29	7	1/4"	M8	30'	0,12	MFH-ZYL025-20-046-1-0-W	30319877
25,4	20	49	46	46	29	7	1/4"	M8	30'	0,12	MFH-ZYL025-20-046-1-0-W	30319878
30	20	49	46	46	29	7	3/8"	M8	30'	0,12	MFH-ZYL030-20-046-1-0-W	30319879
32	20	49	46	46	29	7	3/8"	M8	30'	0,12	MFH-ZYL032-20-046-1-0-W	30319880
25	25	59	48	51	34	7	1/4"	M8	30'	0,12	MFH-ZYL025-25-051-1-0-W	30319881
25,4	25	59	48	51	34	7	1/4"	M8	30'	0,12	MFH-ZYL025-25-051-1-0-W	30319882
30	25	59	48	51	34	7	3/8"	M8	30'	0,12	MFH-ZYL030-25-051-1-0-W	30319883
31,75	25	59	48	51	34	7	3/8"	M8	30'	0,12	MFH-ZYL031-25-051-1-0-W	30319884
32	25	59	48	51	34	7	3/8"	M8	30'	0,12	MFH-ZYL032-25-051-1-0-W	30319885
40	25	59	48	51	34	7	1/2"	M8	30'	0,12	MFH-ZYL040-25-051-1-0-W	30319886

Dimensions in mm.

Use: For mounting tools with cylindrical shank and lateral drive area in accordance with MAPAL works standard.

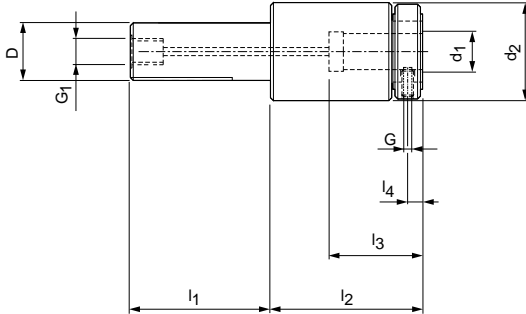
Items included: With holder ring and fastening screw (threaded pin ISO 4028).

Design: With central coolant supply.

Floating holders for cylindrical shanks

With lateral drive area

Shank with lateral clamping surface



D	Dimensions						G ₁	G	Angular compensation	Radial play	Specification	Order No.
	d ₁	d ₂	l ₁	l ₂	l ₃	l ₄						
20	16	49	50	65	40	9,5	1/8"	M8	30'	0,1	MFH-ZYL020-16-065-1-0-W	30319887
25	16	49	60	65	40	9,5	1/4"	M8	30'	0,1	MFH-ZYL025-16-065-1-0-W	30319888
25,4	16	49	60	65	40	9,5	1/4"	M8	30'	0,1	MFH-ZYL025-16-065-1-0-W	30319889
30	16	49	60	65	40	9,5	3/8"	M8	30'	0,1	MFH-ZYL030-16-065-1-0-W	30319890
32	16	49	80	65	40	9,5	3/8"	M8	30'	0,1	MFH-ZYL032-16-065-1-0-W	30319891
40	16	49	80	65	40	9,5	1/2"	M8	30'	0,1	MFH-ZYL040-16-065-1-0-W	30319892
40	16	49	150	65	40	9,5	1/2"	M8	30'	0,1	MFH-ZYL040-16-065-1-0-W	30319893
20	20	49	50	75	50	9,5	1/8"	M8	30'	0,12	MFH-ZYL020-20-075-1-0-W	30319894
25	20	49	60	75	50	9,5	1/4"	M8	30'	0,12	MFH-ZYL025-20-075-1-0-W	30319895
25,4	20	49	60	75	50	9,5	1/4"	M8	30'	0,12	MFH-ZYL025-20-075-1-0-W	30319896
30	20	49	60	75	50	9,5	3/8"	M8	30'	0,12	MFH-ZYL030-20-075-1-0-W	30319897
32	20	49	80	75	50	9,5	3/8"	M8	30'	0,12	MFH-ZYL032-20-075-1-0-W	30319898
40	20	49	80	75	50	9,5	1/2"	M8	30'	0,12	MFH-ZYL040-20-075-1-0-W	30319899
40	20	49	150	75	50	9,5	1/2"	M8	30'	0,12	MFH-ZYL040-20-075-1-0-W	30319900
25	25	59	60	85	60	9,5	1/4"	M10	30'	0,12	MFH-ZYL025-25-085-1-0-W	30319901
25,4	25	59	60	85	60	9,5	1/4"	M10	30'	0,12	MFH-ZYL025-25-085-1-0-W	30319902
30	25	59	60	85	60	9,5	3/8"	M10	30'	0,12	MFH-ZYL030-25-085-1-0-W	30319903
32	25	59	80	85	60	9,5	3/8"	M10	30'	0,12	MFH-ZYL032-25-085-1-0-W	30319904
40	25	59	80	85	60	9,5	1/2"	M10	30'	0,12	MFH-ZYL040-25-085-1-0-W	30319905
40	25	59	150	85	60	9,5	1/2"	M10	30'	0,12	MFH-ZYL040-25-085-1-0-W	30319906

Dimensions in mm.

Use: For mounting tools with cylindrical shank and lateral drive area in accordance with MAPAL works standard.

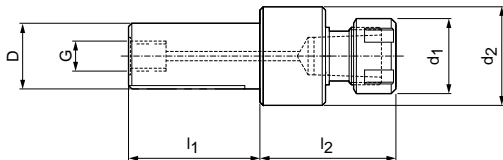
Items included: With holder ring and fastening screw (threaded pin ISO 4028).

Design: With central coolant supply.

Floating holders with collet holder

With clamping nut for internal coolant supply (HI-Q/ERC)

Shank with lateral drive area



D	Clamping range	Nominal size	Dimensions				G	Angular compensation	Radial play	Specification	Order No.
			d ₁	d ₂	l ₁	l ₂					
16	1-13	ER-20	34	49,5	40	75	1/8"	30'	0,06	MFH-ZYL016-20-075-1-0-W	30319907
19,05	1-13	ER-20	34	49,5	50	75	1/8"	30'	0,06	MFH-ZYL019-20-075-1-0-W	30319908
20	1-13	ER-20	34	49,5	50	75	1/8"	30'	0,06	MFH-ZYL020-20-075-1-0-W	30319909
25	1-13	ER-20	34	49,5	60	75	1/4"	30'	0,08	MFH-ZYL025-20-075-1-0-W	30319910
25,4	1-13	ER-20	34	49,5	60	75	1/4"	30'	0,1	MFH-ZYL025-20-075-1-0-W	30319911
19,05	1-16	ER-25	42	59	50	84	1/8"	30'	0,06	MFH-ZYL019-25-084-1-0-W	30319912
20	1-16	ER-25	42	59	50	84	1/8"	30'	0,06	MFH-ZYL020-25-084-1-0-W	30319913
25	1-16	ER-25	42	59	60	84	1/4"	30'	0,08	MFH-ZYL025-25-084-1-0-W	30319914
25,4	1-16	ER-25	42	59	60	84	1/4"	30'	0,1	MFH-ZYL025-25-084-1-0-W	30319915
30	1-16	ER-25	42	59	60	84	3/8"	30'	0,08	MFH-ZYL030-25-084-1-0-W	30319916
31,75	1-16	ER-25	42	59	80	84	3/8"	30'	0,08	MFH-ZYL031-25-084-1-0-W	30319917
32	1-16	ER-25	42	59	80	84	3/8"	30'	0,1	MFH-ZYL032-25-084-1-0-W	30319918
38,1	1-16	ER-25	42	59	80	84	3/8"	30'	0,12	MFH-ZYL038-25-084-1-0-W	30319919
40	1-16	ER-25	42	59	80	84	1/2"	30'	0,12	MFH-ZYL040-25-084-1-0-W	30319920
31,75	2-20	ER-32	50	64	80	91	3/8"	30'	0,08	MFH-ZYL031-32-091-1-0-W	30319921
32	2-20	ER-32	50	64	80	91	3/8"	30'	0,1	MFH-ZYL032-32-091-1-0-W	30319922
38,1	2-20	ER-32	50	64	80	91	3/8"	30'	0,12	MFH-ZYL038-32-091-1-0-W	30319923
40	2-20	ER-32	50	64	80	91	1/2"	30'	0,12	MFH-ZYL040-32-091-1-0-W	30319924

Dimensions in mm.

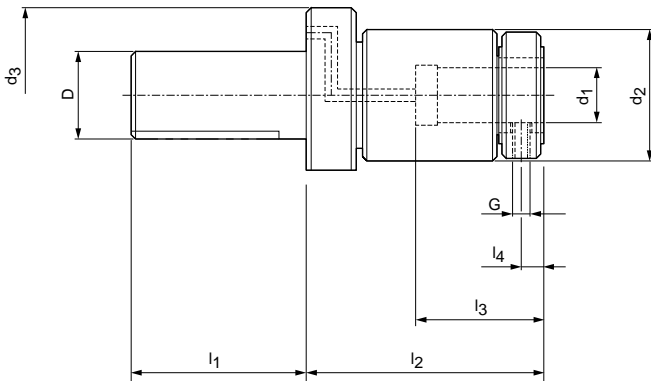
Items included: With clamping nut for internal coolant supply (HI-Q/ERC). Without sealing disc and collet.

Design: With central coolant supply.

Floating holders for cylindrical shanks

With lateral drive area

Shank similar to DIN ISO 10889



D	Dimensions							G	Angular compensation	Radial play	Specification	Order No.
	d ₁	d ₂	d ₃	l ₁	l ₂	l ₃	l ₄					
30	16	49	68	55	92	40	9,5	M8	30'	0,08	MFH-VDI030-16-092-2-0-W	30319925
40	16	49	83	63	92	40	9,5	M8	30'	0,08	MFH-VDI040-16-092-2-0-W	30319926
30	20	49	68	55	102	50	9,5	M8	30'	0,1	MFH-VDI030-20-102-2-0-W	30319927
40	20	49	83	63	102	50	9,5	M8	30'	0,1	MFH-VDI040-20-102-2-0-W	30319928
50	20	49	98	78	102	50	9,5	M8	30'	0,1	MFH-VDI050-20-102-2-0-W	30319929
30	25	59	68	55	111	60	9,5	M10	30'	0,12	MFH-VDI030-25-111-2-0-W	30319930
40	25	59	83	63	111	60	9,5	M10	30'	0,12	MFH-VDI040-25-111-2-0-W	30319931
50	25	59	98	78	111	60	9,5	M10	30'	0,12	MFH-VDI050-25-111-2-0-W	30319932

Dimensions in mm.

Use: For mounting tools with cylindrical shank and lateral drive area in accordance with MAPAL works standard.

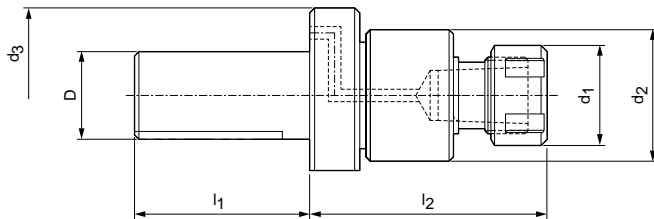
Items included: With holder ring and fastening screw (threaded pin ISO 4028).

Design: With coolant supply.

Floating holders with collet holder

With clamping nut for internal coolant supply (HI-Q/ERC)

Shank similar to DIN ISO 10889



D	Clamping range	Nominal size	Dimensions					Angular compensation	Radial play	Specification	Order No.
			d ₁	d ₂	d ₃	l ₁	l ₂				
30	1-16	ER-25	42	59	68	55	109	30'	0,08	MFH-VDI030-25-109-2-0-W	30319933
40	1-16	ER-25	42	59	83	63	109	30'	0,1	MFH-VDI040-25-109-2-0-W	30319934
50	1-16	ER-25	42	59	98	78	109	30'	0,12	MFH-VDI050-25-109-2-0-W	30319935
40	2-20	ER-32	50	64	83	63	116	30'	0,1	MFH-VDI040-32-116-2-0-W	30319936
50	2-20	ER-32	50	64	98	78	116	30'	0,12	MFH-VDI050-32-116-2-0-W	30319937

Dimensions in mm.

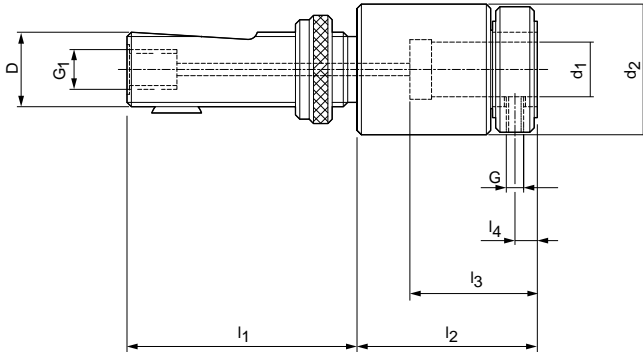
Items included: With clamping nut for internal coolant supply (HI-Q/ERC). Without sealing disc and collet.

Design: With coolant supply.

Floating holders for cylindrical shanks

With lateral drive area

Shank of adjusting bushing in accordance with DIN 6327-1



D	Dimensions						G ₁	G	Radial play	Specification	Order No.
	d ₁	d ₂	l ₁	l ₂	l ₃	l ₄					
Tr 16 x 1,5	10	38,5	85	46	25	6	1/8"	M6	0,15	MFH-STH016-10-046-1-0-W	30319938
Tr 20 x 2	10	38,5	88	46	25	6	1/8"	M6	0,15	MFH-STH020-10-046-1-0-W	30319939
Tr 20 x 2	16	49	88	65	40	9,5	1/8"	M8	0,2	MFH-STH020-16-065-1-0-W	30319940
Tr 28 x 2	16	49	95	65	40	9,5	1/4"	M8	0,2	MFH-STH028-16-065-1-0-W	30319941
Tr 36 x 2	16	49	118	65	40	9,5	1/2"	M8	0,2	MFH-STH036-16-065-1-0-W	30319942
Tr 20 x 2	20	49	88	75	50	9,5	1/8"	M8	0,2	MFH-STH020-20-075-1-0-W	30319943
Tr 28 x 2	20	49	95	75	50	9,5	3/8"	M8	0,2	MFH-STH028-20-075-1-0-W	30319944
Tr 36 x 2	20	49	118	75	50	9,5	1/2"	M8	0,2	MFH-STH036-20-075-1-0-W	30319945

Dimensions in mm.

Use: For mounting tools with cylindrical shank and lateral drive area in accordance with MAPAL works standard.

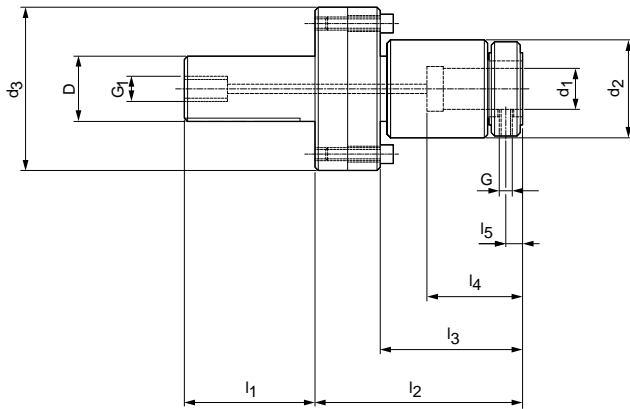
Items included: With holder ring and fastening screw (threaded pin ISO 4028).

Design: With central coolant supply.

Self-adjusting floating holders for cylindrical shanks

With lateral drive area

Shank with lateral clamping surface



D	Dimensions								G ₁	G	Angular compensation	Radial play	Specification	Order No.
	d ₁	d ₂	d ₃	l ₁	l ₂	l ₃	l ₄	l ₅						
25	16	49	80	50	93	60	40	9,5	1/4"	M8	30'	0,05	MFH-ZYL025-16-093-1-1-W	30319982
25,4	16	49	80	50	93	60	40	9,5	1/4"	M8	30'	0,05	MFH-ZYL025-16-093-1-1-W	30319983
30	16	49	80	60	93	60	40	9,5	3/8"	M8	30'	0,05	MFH-ZYL030-16-093-1-1-W	30319984
32	16	49	80	80	93	60	40	9,5	3/8"	M8	30'	0,05	MFH-ZYL032-16-093-1-1-W	30319985
40	16	49	80	80	93	60	40	9,5	1/2"	M8	30'	0,05	MFH-ZYL040-16-093-1-1-W	30319986
25	20	49	80	50	103	70	50	9,5	1/4"	M8	30'	0,05	MFH-ZYL025-20-103-1-1-W	30319987
25,4	20	49	80	50	103	70	50	9,5	1/4"	M8	30'	0,05	MFH-ZYL025-20-103-1-1-W	30319988
30	20	49	80	60	103	70	50	9,5	3/8"	M8	30'	0,05	MFH-ZYL030-20-103-1-1-W	30319989
32	20	49	80	80	103	70	50	9,5	3/8"	M8	30'	0,05	MFH-ZYL032-20-103-1-1-W	30319990
40	20	49	80	80	103	70	50	9,5	1/2"	M8	30'	0,05	MFH-ZYL040-20-103-1-1-W	30319991
25	25	59	90	50	115	80	60	9,5	1/4"	M10	30'	0,05	MFH-ZYL025-25-115-1-1-W	30319992
25,4	25	59	90	50	115	80	60	9,5	1/4"	M10	30'	0,05	MFH-ZYL025-25-115-1-1-W	30319993
30	25	59	90	60	115	80	60	9,5	3/8"	M10	30'	0,05	MFH-ZYL030-25-115-1-1-W	30319994
32	25	59	90	80	115	80	60	9,5	3/8"	M10	30'	0,05	MFH-ZYL032-25-115-1-1-W	30319995
40	25	59	90	80	115	80	60	9,5	1/2"	M10	30'	0,05	MFH-ZYL040-25-115-1-1-W	30319996

Dimensions in mm.

Use: For mounting tools with cylindrical shank and lateral drive area in accordance with MAPAL works standard.

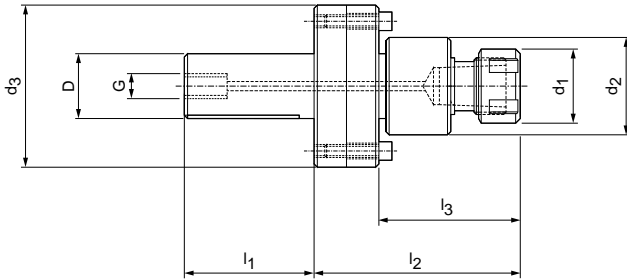
Items included: With holder ring and fastening screw (threaded pin ISO 4028).

Design: With central coolant supply.

Self-adjusting floating holders with collet holder

With clamping nut for internal coolant supply (HI-Q/ERC)

Shank with lateral clamping surface



D	Clamp- ing range	Nominal size	Dimensions						G	Angular compen- sation	Radial play	Specification	Order No.
			d ₁	d ₂	d ₃	l ₁	l ₂	l ₃					
25	1-16	ER-25	42	59	90	50	113	80	1/4"	30'	0,05	MFH-ZYL025-25-113-1-1-W	30319997
25,4	1-16	ER-25	42	59	90	50	113	80	1/4"	30'	0,05	MFH-ZYL025-25-113-1-1-W	30319998
30	1-16	ER-25	42	59	90	60	113	80	3/8"	30'	0,05	MFH-ZYL030-25-113-1-1-W	30319999
31,75	1-16	ER-25	42	59	90	60	113	80	3/8"	30'	0,05	MFH-ZYL031-25-113-1-1-W	30320000
32	1-16	ER-25	42	59	90	80	113	80	3/8"	30'	0,05	MFH-ZYL032-25-113-1-1-W	30320001
38,1	1-16	ER-25	42	59	90	80	113	80	3/8"	30'	0,05	MFH-ZYL038-25-113-1-1-W	30320002
40	1-16	ER-25	42	59	90	80	113	80	1/2"	30'	0,05	MFH-ZYL040-25-113-1-1-W	30320003

Dimensions in mm.

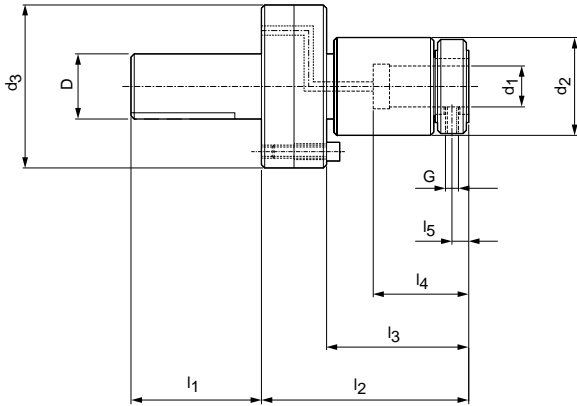
Items included: With clamping nut for internal coolant supply (HI-Q/ERC).

Without sealing disc and collet.

Design: With central coolant supply.

Self-adjusting floating holders for cylindrical shanks

With lateral drive area
 Shank similar to DIN ISO 10889



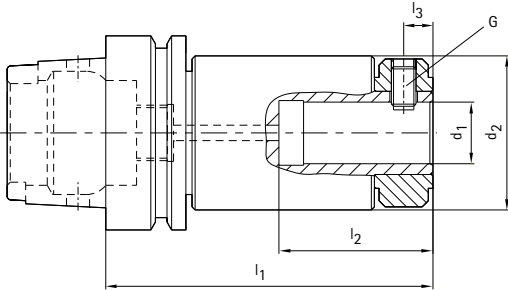
D	Dimensions								G	Angular compensation	Radial play	Specification	Order No.
	d ₁	d ₂	d ₃	l ₁	l ₂	l ₃	l ₄	l ₅					
30	16	49	80	55	104	60	40	9,5	M8	30'	0,05	MFH-VDI030-16-104-2-1-W	30320004
40	16	49	80	63	104	60	40	9,5	M8	30'	0,05	MFH-VDI040-16-104-2-1-W	30320005
30	20	49	80	55	114	70	50	9,5	M8	30'	0,05	MFH-VDI030-20-114-2-1-W	30320006
40	20	49	80	63	114	70	50	9,5	M8	30'	0,05	MFH-VDI040-20-114-2-1-W	30320007
30	25	59	90	55	126	80	60	9,5	M10	30'	0,05	MFH-VDI030-25-126-2-1-W	30320008
40	25	59	90	63	126	80	60	9,5	M10	30'	0,05	MFH-VDI040-25-126-2-1-W	30320009
50	25	59	98	78	126	80	60	9,5	M10	30'	0,05	MFH-VDI050-25-126-2-1-W	30320010

Dimensions in mm.
 Use: For mounting tools with cylindrical shank and lateral drive area in accordance with MAPAL works standard.
 Items included: With holder ring and fastening screw (threaded pin ISO 4028).
 Design: With coolant supply.

Floating holders for multi-bladed reamers

With cylindrical shank | Design with lateral drive area

Shank HSK-A in accordance with DIN 69893-1



Tool ø range	HSK-A	Dimensions					G	Radial play	Specification	Order No.
		d ₁	d ₂	l ₁	l ₂	l ₃				
8,00-14,20	32	10	38,5	83	25	9,5	M6	0,08	MFH-HSK-A032-10-083-1-0-W	30428343
8,00-14,20	40	10	38,5	83	25	9,5	M6	0,08	MFH-HSK-A040-10-083-1-0-W	30428344
7,70-12,20	32	12	38,5	83	25	9,5	M6	0,08	MFH-HSK-A032-12-083-1-0-W	30428345
7,70-12,20	40	12	38,5	83	25	9,5	M6	0,08	MFH-HSK-A040-12-083-1-0-W	30428346
12,21-16,20	32	12	38,5	83	25	9,5	M6	0,08	MFH-HSK-A032-12-083-1-0-W	30428347
12,21-16,20	40	12	38,5	83	25	9,5	M6	0,08	MFH-HSK-A040-12-083-1-0-W	30428348
11,71-17,20	32	16	49	104	40	9,5	M8	0,08	MFH-HSK-A032-16-104-1-0-W	30428349
11,71-17,20	40	16	49	104	40	9,5	M8	0,08	MFH-HSK-A040-16-104-1-0-W	30428350
11,71-17,20	50	16	49	111	40	9,5	M8	0,08	MFH-HSK-A050-16-111-1-0-W	30428351
11,71-17,20	63	16	49	97	40	9,5	M8	0,08	MFH-HSK-A063-16-097-1-0-W	30428352
15,60-22,00	32	20	49	114	50	9,5	M8	0,08	MFH-HSK-A032-20-114-1-0-W	30428353
15,60-22,00	40	20	49	114	50	9,5	M8	0,08	MFH-HSK-A040-20-114-1-0-W	30428354
15,60-22,00	50	20	49	121	50	9,5	M8	0,08	MFH-HSK-A050-20-121-1-0-W	30428355
15,60-22,00	63	20	49	107	50	9,5	M8	0,08	MFH-HSK-A063-20-107-1-0-W	30428356
22,01-27,20	32	20	49	114	50	9,5	M8	0,08	MFH-HSK-A032-20-114-1-0-W	30428357
22,01-27,20	40	20	49	114	50	9,5	M8	0,08	MFH-HSK-A040-20-114-1-0-W	30428358
22,01-27,20	50	20	49	121	50	9,5	M8	0,08	MFH-HSK-A050-20-121-1-0-W	30428359
22,01-27,20	63	25	49	107	50	9,5	M8	0,08	MFH-HSK-A063-25-107-1-0-W	30428360
21,20-28,00	32	25	59	125	60	9,5	M10	0,08	MFH-HSK-A032-25-125-1-0-W	30428361
21,20-28,00	40	25	59	125	60	9,5	M10	0,08	MFH-HSK-A040-25-125-1-0-W	30428362
21,20-28,00	50	25	59	132	60	9,5	M10	0,08	MFH-HSK-A050-25-132-1-0-W	30428363
21,20-28,00	63	25	59	132	60	9,5	M10	0,08	MFH-HSK-A063-25-132-1-0-W	30428364
28,01-35,00	32	25	59	125	60	9,5	M10	0,08	MFH-HSK-A032-25-125-1-0-W	30428365
28,01-35,00	40	25	59	125	60	9,5	M10	0,08	MFH-HSK-A040-25-125-1-0-W	30428366
28,01-35,00	50	25	59	132	60	9,5	M10	0,08	MFH-HSK-A050-25-132-1-0-W	30428367
28,01-35,00	63	25	59	132	60	9,5	M10	0,08	MFH-HSK-A063-25-132-1-0-W	30428368
30,20-40,20	50	32	80	137	63	9,5	M12	0,08	MFH-HSK-A050-32-137-1-0-W	30428369
30,20-40,20	63	32	80	137	63	9,5	M12	0,08	MFH-HSK-A063-32-137-1-0-W	30428370
40,01-50,70	50	32	80	137	63	9,5	M12	0,08	MFH-HSK-A050-32-137-1-0-W	30428371
40,01-50,70	63	32	80	137	63	9,5	M12	0,08	MFH-HSK-A063-32-137-1-0-W	30428372

Dimensions in mm.

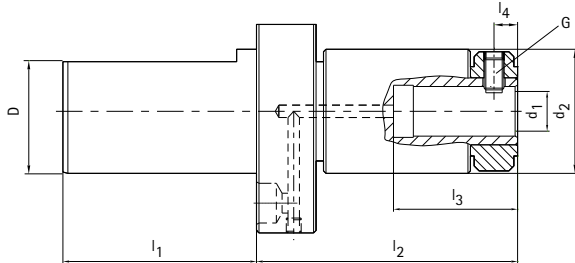
Use: Special design for MAPAL multi-bladed reamers. For mounting tools with cylindrical shank and lateral drive area in accordance with MAPAL works standard.

Items included: With holder ring and fastening screw (threaded pin ISO 4028). Without coolant tube.

Design: With central coolant supply.

Floating holders for multi-bladed reamers

With cylindrical shank | Design with lateral drive area
 Shank similar to DIN ISO 10889 (without serration)



Tool ø range	D	Dimensions						G	Radial play	Specification	Order No.
		d ₁	d ₂	l ₁	l ₂	l ₃	l ₄				
8,00-14,20	30	10	38,5	55	76	25	9,5	M6	0,08	MFH-VDI030-10-076-2-0-W	30428307
7,70-12,20	30	12	38,5	55	76	25	9,5	M6	0,08	MFH-VDI030-12-076-2-0-W	30428308
12,21-16,20	30	12	38,5	55	76	25	9,5	M6	0,08	MFH-VDI030-12-076-2-0-W	30428309
11,71-17,20	30	16	49	55	95	40	9,5	M8	0,08	MFH-VDI030-16-095-2-0-W	30428310
11,71-17,20	40	16	49	63	95	40	9,5	M8	0,08	MFH-VDI040-16-095-2-0-W	30428311
11,71-17,20	50	16	49	78	95	40	9,5	M8	0,08	MFH-VDI050-16-095-2-0-W	30428312
15,60-22,00	30	20	49	55	105	50	9,5	M8	0,08	MFH-VDI030-20-105-2-0-W	30428313
15,60-22,00	40	20	49	63	105	50	9,5	M8	0,08	MFH-VDI040-20-105-2-0-W	30428314
15,60-22,00	50	20	49	78	105	50	9,5	M8	0,08	MFH-VDI050-20-105-2-0-W	30428315
22,01-27,20	30	20	49	55	105	50	9,5	M8	0,08	MFH-VDI030-20-105-2-0-W	30428316
22,01-27,20	40	20	49	63	105	50	9,5	M8	0,08	MFH-VDI040-20-105-2-0-W	30428317
22,01-27,20	50	20	49	78	105	50	9,5	M8	0,08	MFH-VDI050-20-105-2-0-W	30428318
21,20-28,00	30	25	59	55	114	60	9,5	M10	0,08	MFH-VDI030-25-114-2-0-W	30428319
21,20-28,00	40	25	59	63	114	60	9,5	M10	0,08	MFH-VDI040-25-114-2-0-W	30428320
21,20-28,00	50	25	59	78	114	60	9,5	M10	0,08	MFH-VDI050-25-114-2-0-W	30428321
28,01-35,00	30	25	59	55	114	60	9,5	M10	0,08	MFH-VDI030-25-114-2-0-W	30428322
28,01-35,00	40	25	59	63	114	60	9,5	M10	0,08	MFH-VDI040-25-114-2-0-W	30428323
28,01-35,00	50	25	59	78	114	60	9,5	M10	0,08	MFH-VDI050-25-114-2-0-W	30428324
30,20-40,20	30	32	80	55	119	63	9,5	M12	0,08	MFH-VDI030-32-119-2-0-W	30428325
30,20-40,20	40	32	80	63	119	63	9,5	M12	0,08	MFH-VDI040-32-119-2-0-W	30428326
30,20-40,20	50	32	80	78	119	63	9,5	M12	0,08	MFH-VDI050-32-119-2-0-W	30428327
40,01-50,70	30	32	80	55	119	63	9,5	M12	0,08	MFH-VDI030-32-119-2-0-W	30428328
40,01-50,70	40	32	80	63	119	63	9,5	M12	0,08	MFH-VDI040-32-119-2-0-W	30428329
40,01-50,70	50	32	80	78	119	63	9,5	M12	0,08	MFH-VDI050-32-119-2-0-W	30428330

Dimensions in mm.

Use: Special design for MAPAL multi-bladed reamers. For mounting tools with cylindrical shank and lateral drive area in accordance with MAPAL works standard.

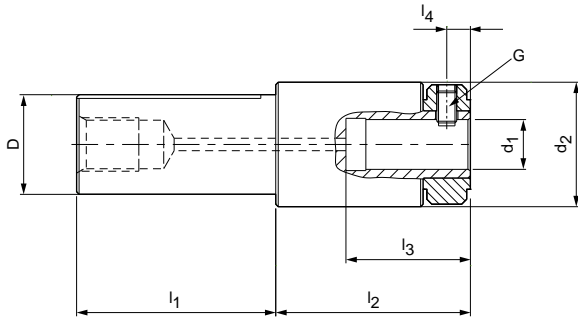
Items included: With holder ring and fastening screw (threaded pin ISO 4028).

Design: With coolant supply.

Floating holders for multi-bladed reamers

With cylindrical shank | Design with lateral drive area

Shank with lateral clamping surface



Tool ø range	D	Dimensions						G	Radial play	Specification	Order No.
		d ₁	d ₂	l ₁	l ₂	l ₃	l ₄				
11,71-17,20	20	16	49	50	68	50	9,5	M8	0,12	MFH-ZYL020-16-068-1-0-W	30428373
11,71-17,20	25	16	49	60	68	50	9,5	M8	0,12	MFH-ZYL025-16-068-1-0-W	30428374
11,71-17,20	30	16	49	60	68	50	9,5	M8	0,12	MFH-ZYL030-16-068-1-0-W	30428375
11,71-17,20	32	16	49	80	68	50	9,5	M8	0,12	MFH-ZYL032-16-068-1-0-W	30428376
11,71-17,20	40	16	49	80	68	50	9,5	M8	0,12	MFH-ZYL040-16-068-1-0-W	30428377
15,60-22,00	20	20	49	50	78	50	9,5	M8	0,12	MFH-ZYL020-20-078-1-0-W	30428378
15,60-22,00	25	20	49	60	78	50	9,5	M8	0,12	MFH-ZYL025-20-078-1-0-W	30428379
15,60-22,00	30	20	49	60	78	50	9,5	M8	0,12	MFH-ZYL030-20-078-1-0-W	30428380
15,60-22,00	32	20	49	80	78	50	9,5	M8	0,12	MFH-ZYL032-20-078-1-0-W	30428381
15,60-22,00	40	20	49	80	78	50	9,5	M8	0,12	MFH-ZYL040-20-078-1-0-W	30428382
22,01-27,20	20	20	49	50	78	50	9,5	M8	0,12	MFH-ZYL020-20-078-1-0-W	30428383
22,01-27,20	25	20	49	60	78	50	9,5	M8	0,12	MFH-ZYL025-20-078-1-0-W	30428384
22,01-27,20	30	20	49	60	78	50	9,5	M8	0,12	MFH-ZYL030-20-078-1-0-W	30428385
22,01-27,20	32	20	49	80	78	50	9,5	M8	0,12	MFH-ZYL032-20-078-1-0-W	30428386
22,01-27,20	40	20	49	80	78	50	9,5	M8	0,12	MFH-ZYL040-20-078-1-0-W	30428387
21,20-28,00	25	25	59	60	89	50	9,5	M10	0,12	MFH-ZYL025-25-089-1-0-W	30428388
21,20-28,00	30	25	59	60	89	50	9,5	M10	0,12	MFH-ZYL030-25-089-1-0-W	30428389
21,20-28,00	32	25	59	80	89	50	9,5	M10	0,12	MFH-ZYL032-25-089-1-0-W	30428390
28,01-35,00	40	25	59	80	89	50	9,5	M10	0,12	MFH-ZYL040-25-089-1-0-W	30428391
28,01-35,00	25	25	59	60	89	50	9,5	M10	0,12	MFH-ZYL025-25-089-1-0-W	30428392
28,01-35,00	30	25	59	60	89	50	9,5	M10	0,12	MFH-ZYL030-25-089-1-0-W	30428393
28,01-35,00	32	25	59	80	89	50	9,5	M10	0,12	MFH-ZYL032-25-089-1-0-W	30428394
28,01-35,00	40	25	59	80	89	50	9,5	M10	0,12	MFH-ZYL040-25-089-1-0-W	30428395
30,20-40,20	30	32	80	60	94	50	9,5	M12	0,12	MFH-ZYL030-32-094-1-0-W	30428396
30,20-40,20	32	32	80	80	94	50	9,5	M12	0,12	MFH-ZYL032-32-094-1-0-W	30428397
30,20-40,20	40	32	80	80	94	50	9,5	M12	0,12	MFH-ZYL040-32-094-1-0-W	30428398
40,01-50,70	30	32	80	60	94	50	9,5	M12	0,12	MFH-ZYL030-32-094-1-0-W	30428399
40,01-50,70	32	32	80	80	94	50	9,5	M12	0,12	MFH-ZYL032-32-094-1-0-W	30428400
40,01-50,70	40	32	80	80	94	50	9,5	M12	0,12	MFH-ZYL040-32-094-1-0-W	30428401

Dimensions in mm.

Use: Special design for MAPAL multi-bladed reamers. For mounting tools with cylindrical shank and lateral drive area in accordance with MAPAL works standard.

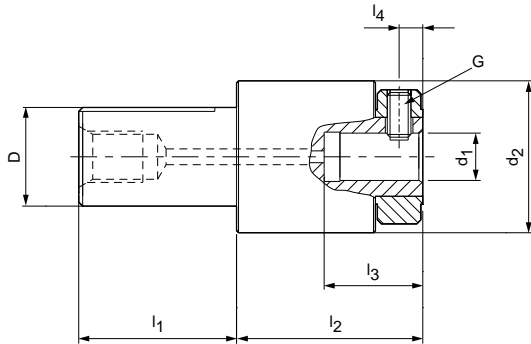
Items included: With holder ring and fastening screw (threaded pin ISO 4028).

Design: With coolant supply.

Floating holders for multi-bladed reamers

With cylindrical shank | Design with lateral drive area

Shank with lateral clamping surface, design for short cylindrical shanks



Tool ø range	D	Dimensions						G	Radial play	Specification	Order No.
		d ₁	d ₂	l ₁	l ₂	l ₃	l ₄				
8,00-14,20	20	10	38,5	40	47	25	6	M6	0,08	MFH-ZYLO20-10-047-1-0-W	30428331
8,00-14,20	25	10	38,5	40	47	25	6	M6	0,08	MFH-ZYLO25-10-047-1-0-W	30428332
8,00-14,20	30	10	38,5	40	47	25	6	M6	0,08	MFH-ZYLO30-10-047-1-0-W	30428333
8,00-14,20	32	10	38,5	40	47	25	6	M6	0,08	MFH-ZYLO32-10-047-1-0-W	30428334
7,70-12,20	20	12	38,5	40	47	25	6	M6	0,08	MFH-ZYLO20-12-047-1-0-W	30428335
7,70-12,20	25	12	38,5	40	47	25	6	M6	0,08	MFH-ZYLO25-12-047-1-0-W	30428336
7,70-12,20	30	12	38,5	40	47	25	6	M6	0,08	MFH-ZYLO30-12-047-1-0-W	30428337
7,70-12,20	32	12	38,5	40	47	25	6	M6	0,08	MFH-ZYLO32-12-047-1-0-W	30428338
12,21-16,20	20	12	38,5	40	47	25	6	M6	0,08	MFH-ZYLO20-12-047-1-0-W	30428339
12,21-16,20	25	12	38,5	40	47	25	6	M6	0,08	MFH-ZYLO25-12-047-1-0-W	30428340
12,21-16,20	30	12	38,5	40	47	25	6	M6	0,08	MFH-ZYLO30-12-047-1-0-W	30428341
12,21-16,20	32	12	38,5	40	47	25	6	M6	0,08	MFH-ZYLO32-12-047-1-0-W	30428342

Dimensions in mm.

Use: Special design for MAPAL multi-bladed reamers. For mounting tools with cylindrical shank and lateral drive area in accordance with MAPAL works standard.

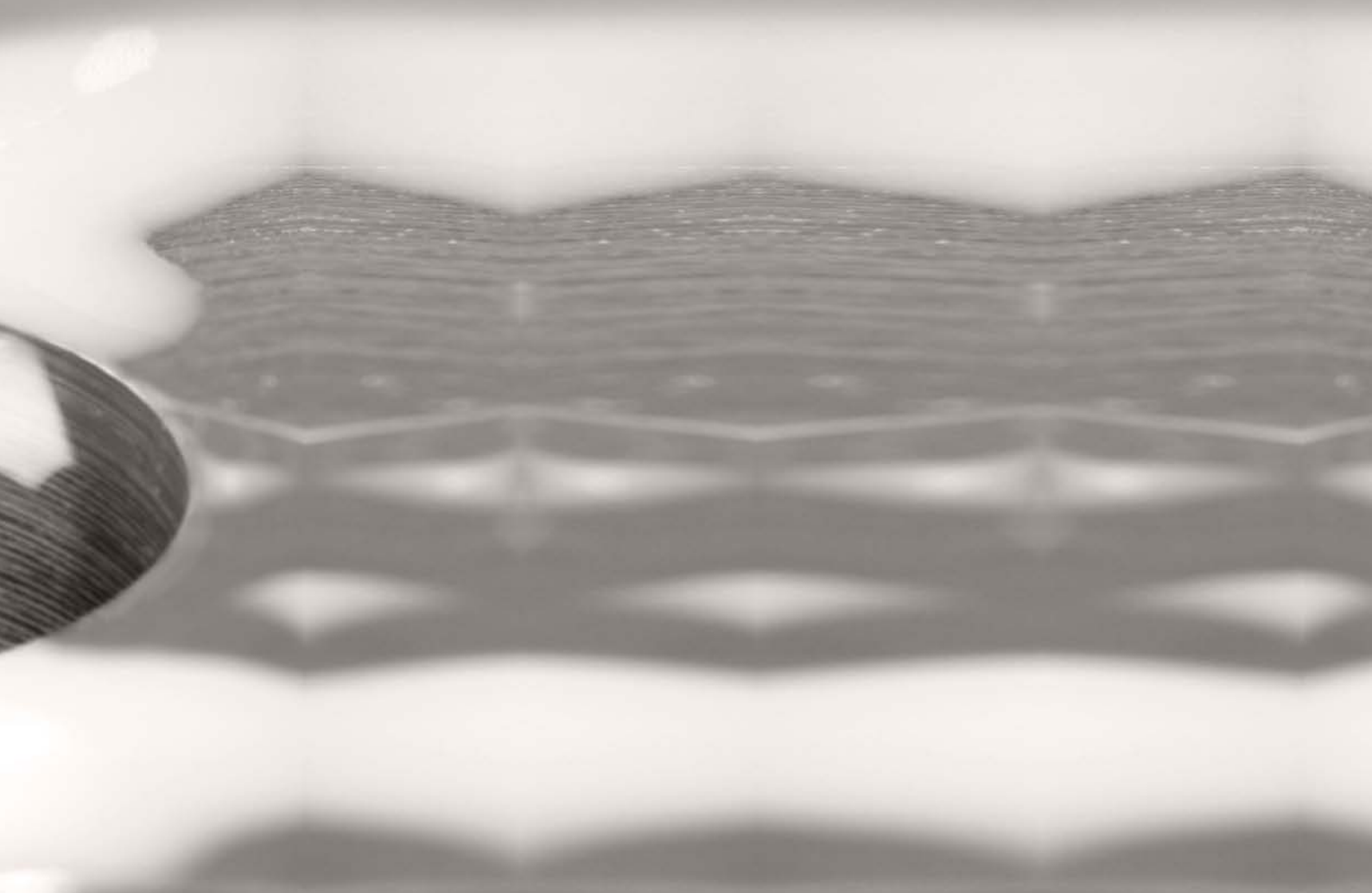
Items included: With holder ring and fastening screw (threaded pin ISO 4028).

Design: With coolant supply.



TECHNICAL APPENDIX

Notes on usage, handling as well as cutting data





TECHNICAL APPENDIX

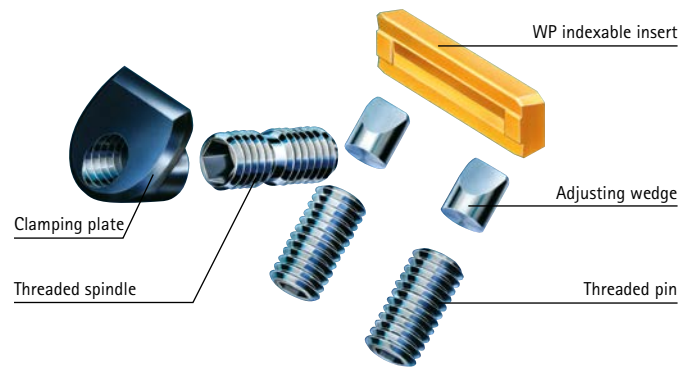
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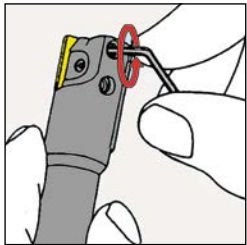
Setting instructions for WP single-bladed reamers



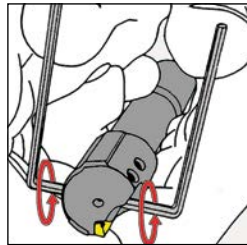
Accessories

Indexable insert	Torx screw/ threaded spindle MN 618	Clamping plate	Threaded pin MN 620	Adjusting wedge MN 619
1 piece	1 piece	1 piece	2 pieces	2 pieces

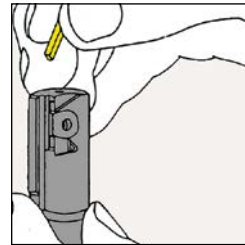
Indexable insert change and setting



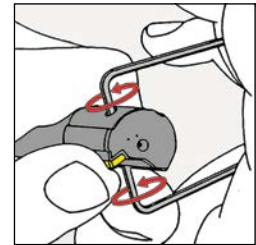
1. Turn the front and rear threaded pin half a turn counter-clockwise.



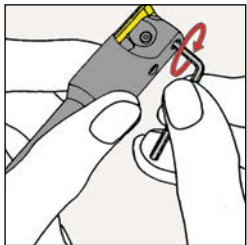
2. **Note:** Two wrenches must be used for undoing. To release the clamping plate turn the TORX® screw or the threaded spindle counter-clockwise from above and clockwise from underneath.



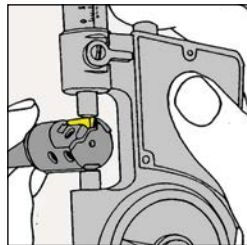
3. Remove the indexable insert. Clean the indexable insert and the indexable insert seat (do not use compressed air, pay attention to adjusting wedge). Rotate the indexable insert or fit a new indexable insert.



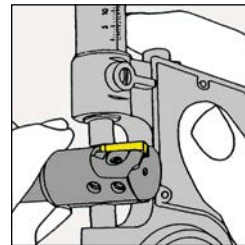
4. **Note:** Two wrenches must be used for tightening. Press the indexable insert against the rear stop and the adjusting wedge. To tighten the clamping plate turn the TORX® screw or the threaded spindle clockwise from above and counter-clockwise from underneath and tighten.



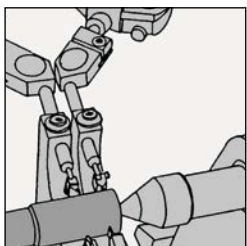
5. For coarse setting, turn the front and rear threaded pin one quarter of a turn clockwise.



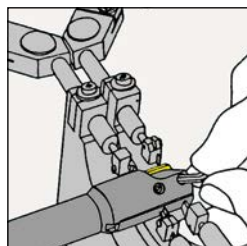
6. **Note:** We recommend using a precision pointer micrometer for measuring and fine setting. Set the front and rear setting dimension alternately using the threaded pins. The back taper is approx. 0.01 to 0.015 mm.



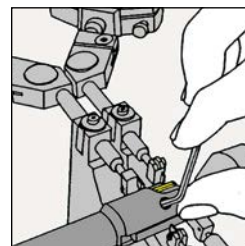
For straightforward handling and guaranteed reliable setting we recommend the usage of a MAPAL setting fixture.



7. Calibrate the MAPAL MASTERSET using a setting gauge (must be ordered separately). The setting gauge is the smallest dimension of the bore.



8. Set the front and rear setting dimension alternately using the threaded pins. The back taper is approx. 0.01 to 0.015 mm.

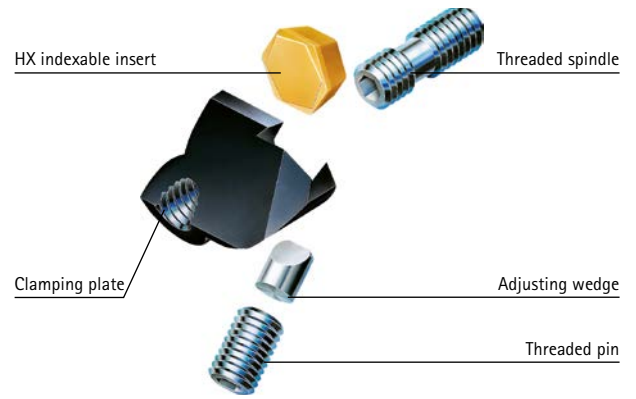


9. MAPAL UNISSET: For conveniently setting the reamers, MAPAL offers electronic setting fixtures of vertical and horizontal design. You will find more information in the catalogue "SETTING | MEASURING | DISPENSING".

You will find detailed setting instructions in the operating manual for the fixture.

Note:
For setting using the radial distance method, see setting instructions for WP twin-bladed reamers on page 424.

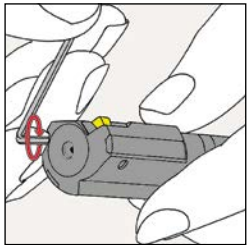
Setting instructions for HX single-bladed reamers



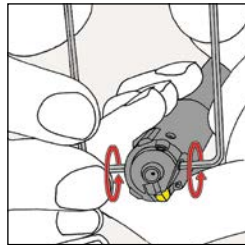
Accessories

Indexable insert	Threaded spindle MN 618	Clamping plate	Threaded pin MN 620	Adjusting wedge MN 619
1 piece	1 piece	1 piece	1 piece	1 piece

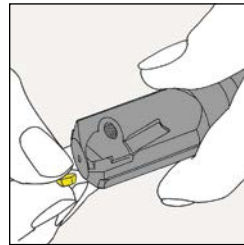
Indexable insert change and setting



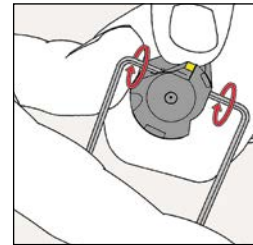
1. Turn the front and rear threaded pin half a turn counter-clockwise.



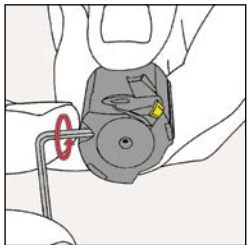
2. **Note:** Two wrenches must be used for undoing. To release the clamping plate turn the TORX® screw or the threaded spindle counter-clockwise from above and clockwise from underneath.



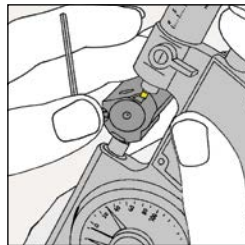
3. Remove the indexable insert. Clean the insert and the indexable insert seat (do not use compressed air, pay attention to adjusting wedge). Rotate the indexable insert by 60° or fit a new indexable insert.



4. **Note:** Two wrenches must be used for tightening. Press the indexable insert firmly into the indexable insert seat. To tighten the clamping plate turn the TORX® screw or the threaded spindle clockwise from above and counter-clockwise from underneath and tighten.

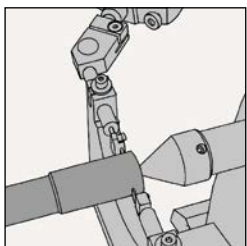


5. For coarse setting, turn again the threaded pin one quarter of a turn clockwise.

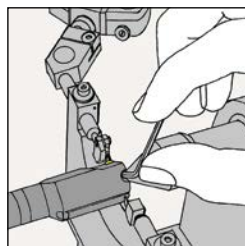


6. **Note:** We recommend using a precision pointer micrometer for measuring and fine setting. Set the required setting dimension by turning the threaded pin clockwise.

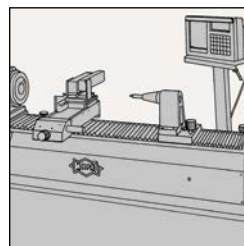
For straightforward handling and guaranteed reliable setting we recommend the usage of a MAPAL setting fixture.



7. Calibrate the MAPAL MASTERSET using a setting gauge (must be ordered separately). The setting gauge is the smallest dimension of the bore.



8. Set the required setting dimension by turning the threaded pin clockwise.



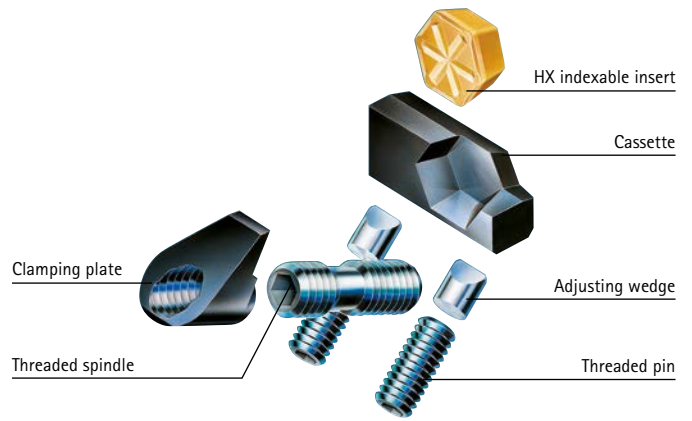
9. MAPAL UNISSET: For conveniently setting the reamers, MAPAL offers electronic setting fixtures of vertical and horizontal design. You will find more information in the catalogue "SETTING | MEASURING | DISPENSING".

You will find detailed setting instructions in the operating manual for the fixture.

Note: For setting using the radial distance method, see setting instructions for WP twin-bladed reamers on page 424.

Setting instructions for HX single-bladed reamers

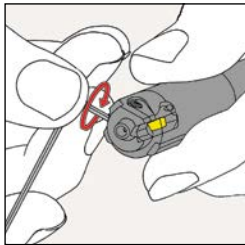
Size 2 and size 3



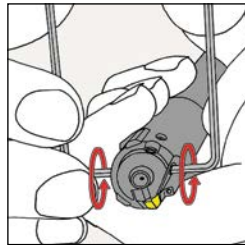
Accessories

Indexable insert	Cassette	Threaded spindle MN 618	Clamping plate	Threaded pin MN 620	Adjusting wedge MN 619
1 piece	1 piece	1 piece	1 piece	2 pieces	2 pieces

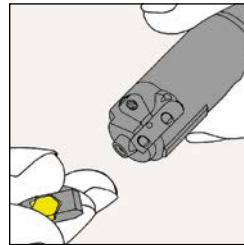
Indexable insert change and setting



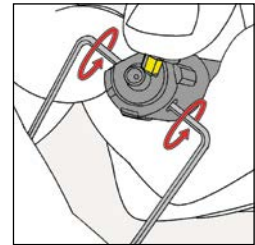
1. Turn the front and rear threaded pin half a turn counter-clockwise.



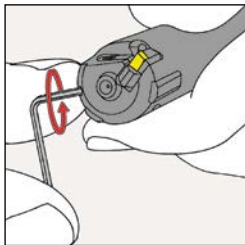
2. **Note:** Two wrenches must be used for undoing. To release the clamping plate and the cassette turn the TORX® screw or the threaded spindle counter-clockwise from above and clockwise from underneath.



3. Remove the indexable insert and the cassette. Clean the indexable insert, the cassette and the indexable insert seat (do not use compressed air, pay attention to adjusting wedge). Rotate the indexable insert by 60° or fit a new indexable insert in the cassette. Re-fit the cassette.

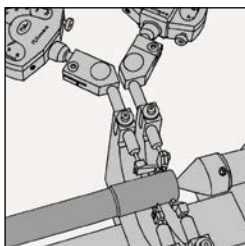


4. **Note:** Two wrenches must be used for tightening. Press the indexable insert and the cassette against the rear stop and the adjusting wedge. Tighten the TORX® screw or the threaded spindle clockwise from above and counter-clockwise from underneath and tighten.

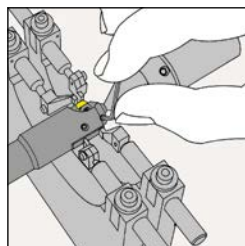


5. For coarse setting, turn the front and rear threaded pin one quarter of a turn clockwise.

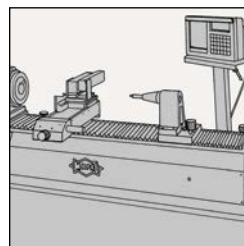
For straightforward handling and guaranteed reliable setting we recommend the usage of a MAPAL setting fixture.



7. Calibrate the MAPAL MASTERSET using a setting gauge (must be ordered separately). The setting gauge is the smallest dimension of the bore.



8. Set the front and rear setting dimension alternately using the threaded pins. The back taper is approx. 0.005 to 0.010 mm.



9. MAPAL UNISSET: For conveniently setting the reamers, MAPAL offers electronic setting fixtures of vertical and horizontal design. You will find more information in the catalogue "SETTING | MEASURING | DISPENSING".

You will find detailed setting instructions in the operating manual for the fixture.

Note: For setting using the radial distance method, see setting instructions for WP twin-bladed reamers on page 424.

MAPAL setting fixtures

Setting with highest precision

To be able to undertake the setting procedures described straightforwardly, quickly and highly accurately, MAPAL has a range of setting fixtures in its programme. From the mechanical to the electronic fixture with tool management, these setting fixtures offer an optimal solution for precisely setting the tools.

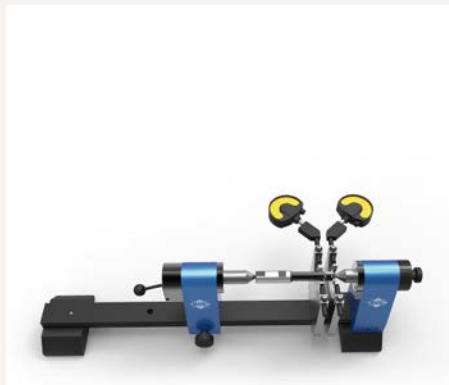


You will find more information in the catalogue
SETTING | MEASURING | DISPENSING



Reliable setting due to accuracy and ease of use

Extract on fixtures



MASTERSET

The MASTERSET is designed for setting tools with guide pads. Due to the modular construction, the basic unit can be supplemented with a large number of optional assemblies. With a few actions the MASTERSET can be changed to an upright unit in a vertical stand. The arrangement has advantages on fitting heavy, long tools as well as due to the possibility of clamping tools directly in the HSK connection.



UNISET-H

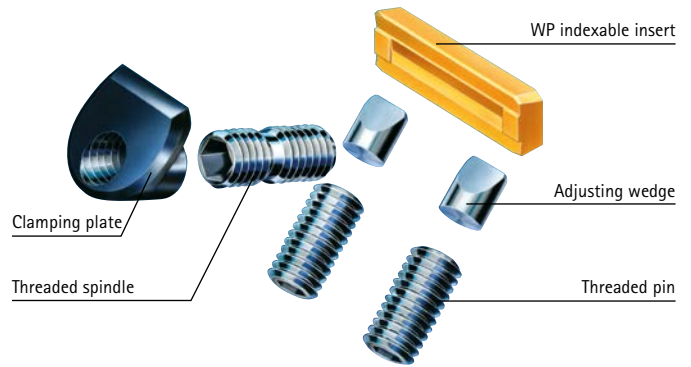
The electronic setting fixture UNISET-H has a horizontal design. As a consequence ergonomic setting processes at a constant working height are possible. Both slender and also long guided tools are particularly suitable for a setting procedure on the UNISET-H. Along with the tactile methods, setting can also be undertaken optically using an optional camera to set tools with high precision.



UNISET-V Standard

The UNISET-V Standard is suitable for setting tools with a length of up to 800 mm and a diameter of 400 mm. The UNISET-V Standard makes it possible to use two different measuring methods. On the one hand tools can be set reliably, quickly, easily and conveniently using an optical measuring method with an accuracy as is common for comparable setting fixtures. In addition, the MAPAL setting fixture also provides a tactile measuring method. With the aid of the measuring probes used during this process it is possible to set guided tools to a very high accuracy. A setting precision of $< 2 \mu\text{m}$ is achieved in this way.

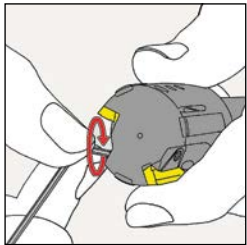
Setting instructions for WP twin-bladed reamers



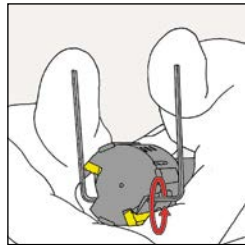
Accessories

Indexable insert	Torx screw/ threaded spindle MN 618	Clamping plate	Threaded pin MN 620	Adjusting wedge MN 619
2 pieces	2 pieces	1 piece	4 pieces	4 pieces

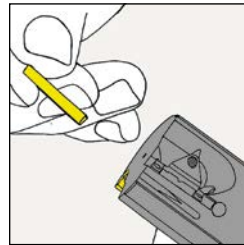
Indexable insert change and setting



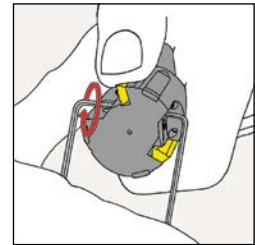
1. Turn the front and rear threaded pin half a turn counter-clockwise.



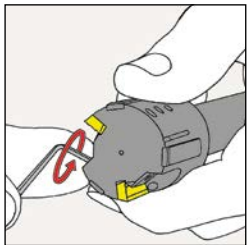
2. **Note:** Two wrenches must be used for undoing. To release the clamping plate turn the TORX® screw or the threaded spindle counter-clockwise from above and clockwise from underneath.



3. Remove the indexable insert. Clean the indexable insert and the indexable insert seat (do not use compressed air, pay attention to adjusting wedge). Rotate the indexable insert or fit a new indexable insert.



4. **Note:** Two wrenches must be used for tightening. Press the indexable insert against the rear stop and the adjusting wedge. Tighten the TORX® screw or the threaded spindle clockwise from above and counter-clockwise from underneath and tighten.

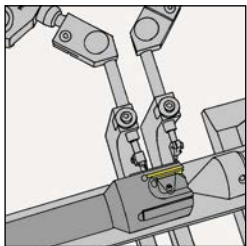


5. For coarse setting, turn the front and rear threaded pin one quarter of a turn clockwise.

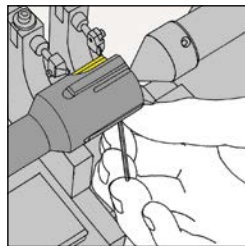
Note:
The procedure (Figure 1 to 5) also applies to the second insert.

You will find detailed setting instructions in the operating manual for the fixture.

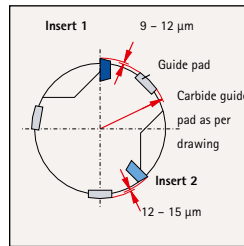
For straightforward handling and guaranteed reliable setting we recommend the usage of a MAPAL setting fixture.



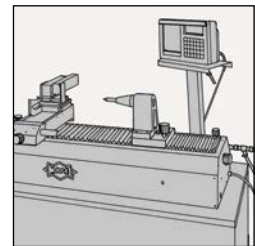
7. The MAPAL MASTERSSET: Set the distance between the measuring probes to the indexable insert length. Zero the dial gauges on the guide pad after the indexable insert.



8. **Set insert 1:** Set front and rear setting dimension alternately using the threaded pins. Setting dimension = radial distance of the indexable insert above the following guide pad as per setting instructions Figure 8b. Back taper is approx. 0.01 to 0.015 mm.
Set insert 2: Set front and rear setting dimension alternately using the threaded pins. Setting dimension = radial distance of the indexable insert below the following guide pad as per setting instructions Figure 8b. Back taper is approx. 0.01 to 0.015 mm.

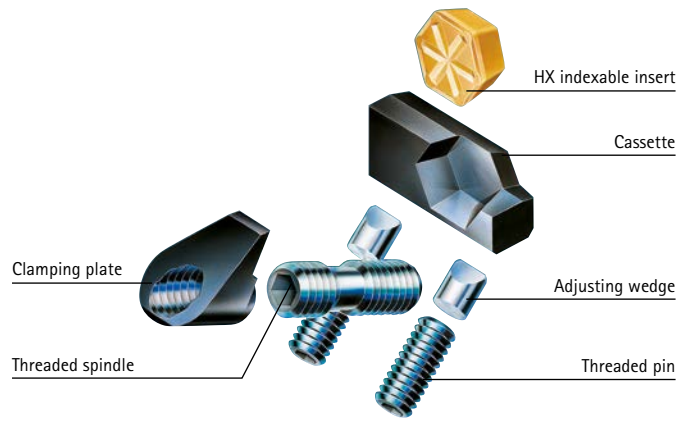


8b



9. MAPAL UNISSET: For conveniently setting the reamers, MAPAL offers electronic setting fixtures of vertical and horizontal design. You will find more information in the catalogue "SETTING | MEASURING | DISPENSING".

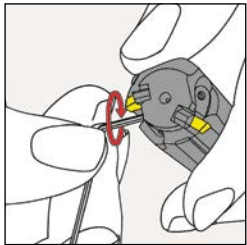
Setting instructions for HX twin-bladed reamers



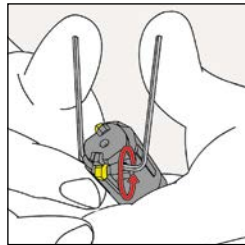
Accessories

Indexable insert	Cassette	Torx screw/ threaded spindle MN 618	Clamping plate	Threaded pin MN 620	Adjusting wedge MN 619
2 pieces	2 pieces	2 pieces	2 pieces	4 pieces	4 pieces

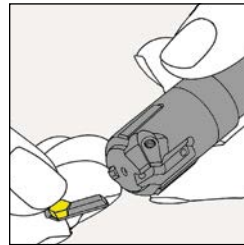
Indexable insert change and setting



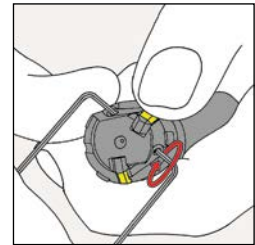
1. Turn the front and rear threaded pin half a turn counter-clockwise.



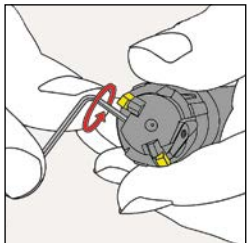
2. **Note:** Two wrenches must be used for undoing. To release the clamping plate and the cassette turn the TORX® screw or the threaded spindle counter-clockwise from above and clockwise from underneath.



3. Remove the indexable insert and the cassette. Clean the indexable insert, the cassette and the indexable insert seat (do not use compressed air, pay attention to adjusting wedge). Rotate the indexable insert by 60° or fit a new indexable insert in the cassette. Re-fit the cassette.



4. **Note:** Two wrenches must be used for tightening. Press the indexable insert and the cassette against the rear stop and the adjusting wedge. Tighten the TORX® screw or the threaded spindle clockwise from above and counter-clockwise from underneath and tighten.

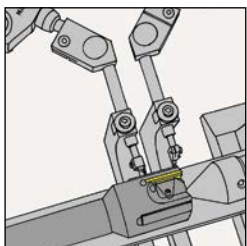


5. For coarse setting, turn the front and rear threaded pin one quarter of a turn clockwise.

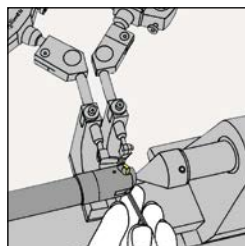
Note:
The procedure (Figure 1 to 5) also applies to the second insert.

You will find detailed setting instructions in the operating manual for the fixture.

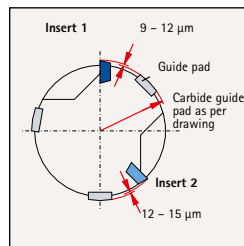
For straightforward handling and guaranteed reliable setting we recommend the usage of a MAPAL setting fixture.



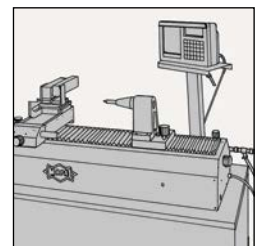
7. The MAPAL MASTERSSET: Set the distance between the measuring probes to the indexable insert length. Zero the dial gauges on the guide pad after the indexable insert.



8. **Set insert 1:** Set front and rear setting dimension alternately using the threaded pins. Setting dimension = radial distance of the indexable insert above the following guide pad as per setting instructions Figure 8b. Back taper is approx. 0.005 to 0.010 mm.
Set insert 2: Set front and rear setting dimension alternately using the threaded pins. Setting dimension = radial distance of the indexable insert below the following guide pad as per setting instructions Figure 8b. Back taper is approx. 0.005 to 0.010 mm.



8b



9. MAPAL UNISET: For conveniently setting the reamers, MAPAL offers electronic setting fixtures of vertical and horizontal design. You will find more information in the catalogue "SETTING | MEASURING | DISPENSING".

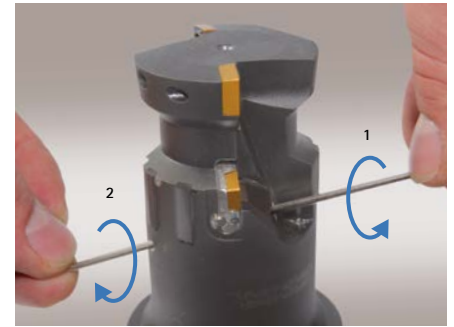
Handling notes for EasyAdjust system

Changing and setting the indexable insert

The EasyAdjust System permits a quick and easy indexable insert change. The indexable inserts are changed and set with μ precision in just a few steps.



1. Loosen the adjusting wedge using a hex-wrench and turn it half a turn counter-clockwise.



2. **Note:** Two hex-wrenches are required for undoing.

To undo the clamping jaw, turn hex-wrench 1 counter-clockwise and hex-wrench 2 clockwise.



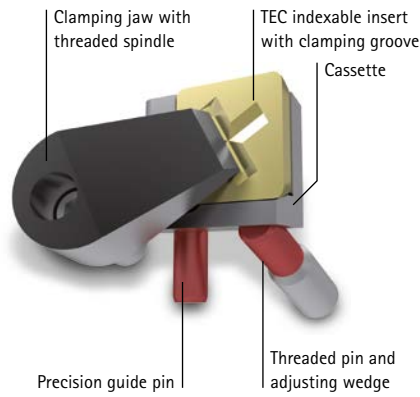
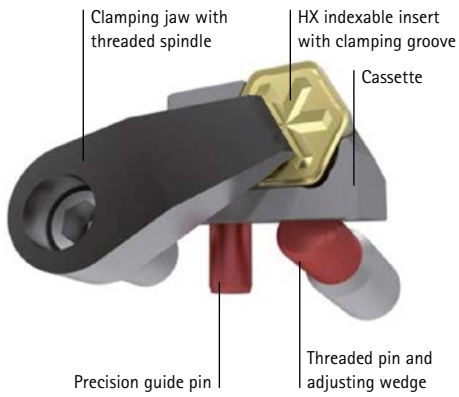
3. Press the cassette and the adjusting wedge forward in the direction of the tool.



4. Remove the indexable insert from the cassette.

Note:

Only to be used by trained personnel.

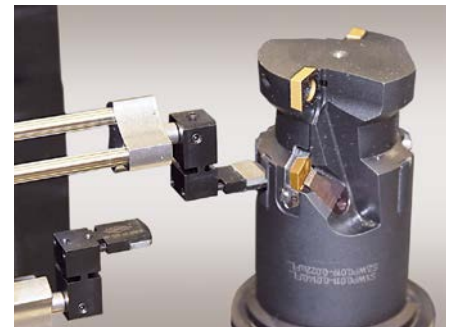


5. Replace or turn the indexable insert.
Then fit the indexable insert in the cassette.



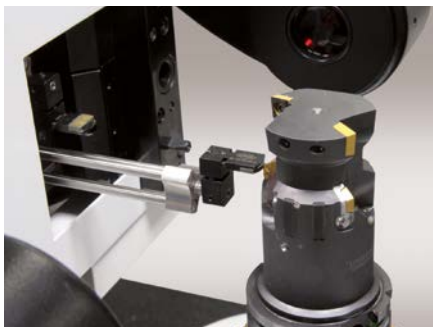
6. **Note:** Two hex-wrenches are required for tightening.

To tighten the clamping jaw, turn hex-wrench 1 clockwise and hex-wrench 2 counter-clockwise.



7. **Note:** Continue with either the radial distance measurement or the absolute measurement.

Clamp the tool in the mount on a setting fixture. Move the measuring probe to the highest point on the guide pad and zero the measurement value at this point.



8. Move the measuring probe to the highest point on the indexable insert.



9. Set the radial distance or absolute dimension for the indexable insert, for this purpose turn the threaded pin clockwise using a hex-wrench.

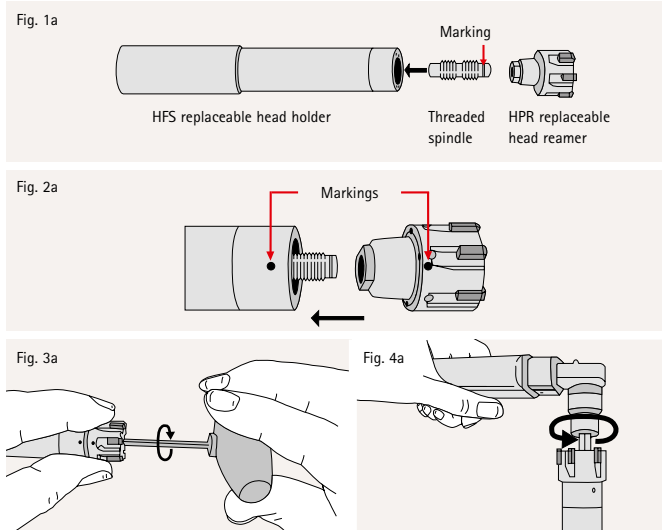
Result:

The desired radial distance or absolute dimension of the indexable insert is set.

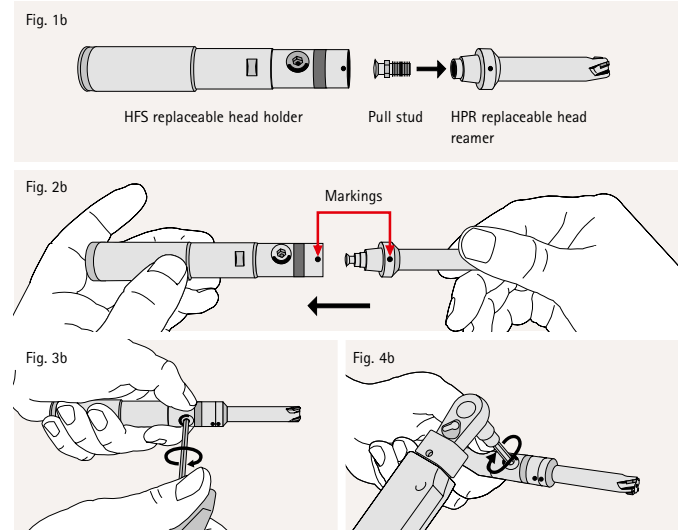


Handling notes for HFS® system

MAPAL HFS® system with axial clamping



MAPAL HFS® system with radial clamping



Cleaning

Clean all individual parts and make sure that the internal and external taper as well as the face surface on the HFS taper are free of foreign bodies (e.g. chips). To clean the internal taper we recommend the special taper wiper (see Accessories page 324).

Clamping

- Fit the end of the threaded spindle without marking into the HFS replaceable head holder, without screwing in the threaded spindle (see Fig. 1a).
- Fit the HPR replaceable head reamer to the threaded spindle. During this process align the markings on the HPR replaceable head reamer and the HFS replaceable head holder: "point to point" (see Fig. 2a). Then fit the HPR replaceable head reamer all the way into the HFS replaceable head holder and hold both parts firmly.
- Screw together the HPR replaceable head reamer and the HFS replaceable head holder using a hex-wrench and tighten firmly. Make sure that the markings are aligned and the face surface is in contact (see Fig. 3a).
Note: HPR 100, 110, 150 are tightened through the reamer (direction of rotation clockwise). HPR 130, 131, 180 are tightened through the holder (direction of rotation counter-clockwise). The directions of rotation are stated on the holder.
- Note:** The HFS replaceable head holders are labelled with the necessary tightening torque. Tighten the HPR replaceable head reamer clockwise using a torque wrench (see Fig. 4a).

Undoing

- Note:** The direction of rotation on undoing the HPR replaceable head reamer is the opposite to the direction of rotation for the clamping process. To undo the HPR replaceable head reamer, turn the threaded spindle using a hex-wrench.
- Remove the HPR replaceable head reamer.

Adjustment of the HPR replaceable head reamer with fine adjustment feature

- Note:** The opposing pair of cutting edges in line with the round marking points on HFS replaceable head holders and HPR replaceable head reamers is used as the reference for the measurement and adjustment of the tool diameter. Fasten the HPR replaceable head reamer in the HFS replaceable head holder.
- Set the required tool diameter using a precision pointer micrometer. Then place the precision micrometer on the reference cutting edges.
- Place the TORX® wrench on the adjusting screw and turn clockwise slowly. Set the HPR replaceable head reamer to the required dimension.



Clamping

- Screw the threaded end of the pull stud into the HPR replaceable head reamer using the left-hand thread (see Fig. 1b).
- Fit the HPR replaceable head reamer all the way into the HFS replaceable head holder. During this process align the markings on the HPR replaceable head reamer and the HFS replaceable head holder: "point to point" (see Fig. 2b). Then hold both parts firmly.
- Turn the clamping stud clockwise using a hex-wrench (see Fig. 3b). The direction of rotation is stated on the HFS replaceable head holder.
- Note:** The HFS replaceable head holders are labelled with the necessary tightening torque. Tighten the HPR replaceable head reamer clockwise using a torque wrench (see Fig. 4b).

Connection size HFS	Tightening torque [Nm]	
	axial	radial
10	4	-
12	6	7
14	6	7
16	15	12
20	15	12
24	20	-

Undoing

- To undo the reamer turn the clamping stud counter-clockwise to the stop using a hex-wrench.
→ The HPR replaceable head reamer is ejected and can be removed.

On HPR variants with adjusting system please note:

On finely adjustable HPR replaceable head reamers up to \varnothing 30 mm and HFS size 12 up to 20, it is only possible to clamp the HPR replaceable head reamer radially. From \varnothing 30 mm and HFS size 24 the HPR replaceable head reamer can also be clamped via the threaded spindle.

Coolant supply for HFS® system

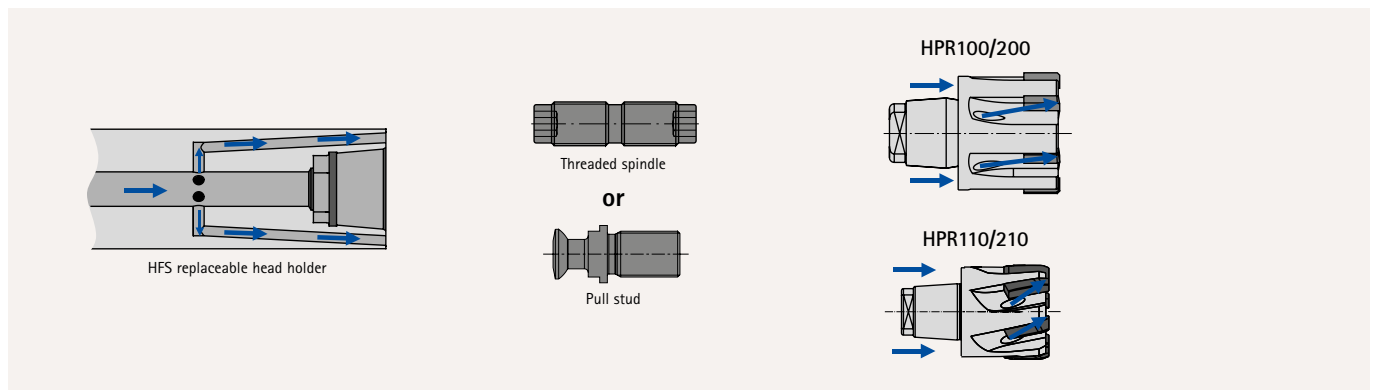
To fully exploit the high performance of the HPR reamers, the various series of the replaceable heads require the related correct coolant supply. The difference between the parts is in the threaded spindle and the pull stud. Depending in the head variant, these are used with a coolant through-bore or without a coolant through-bore so that a direct coolant supply via the connection directly to the cutting edges is ensured.

Note:

On all tool holders with HFS size 12, both designs are always included. It is therefore necessary to select the system to suit the replaceable head during assembly. (See Fig. below)

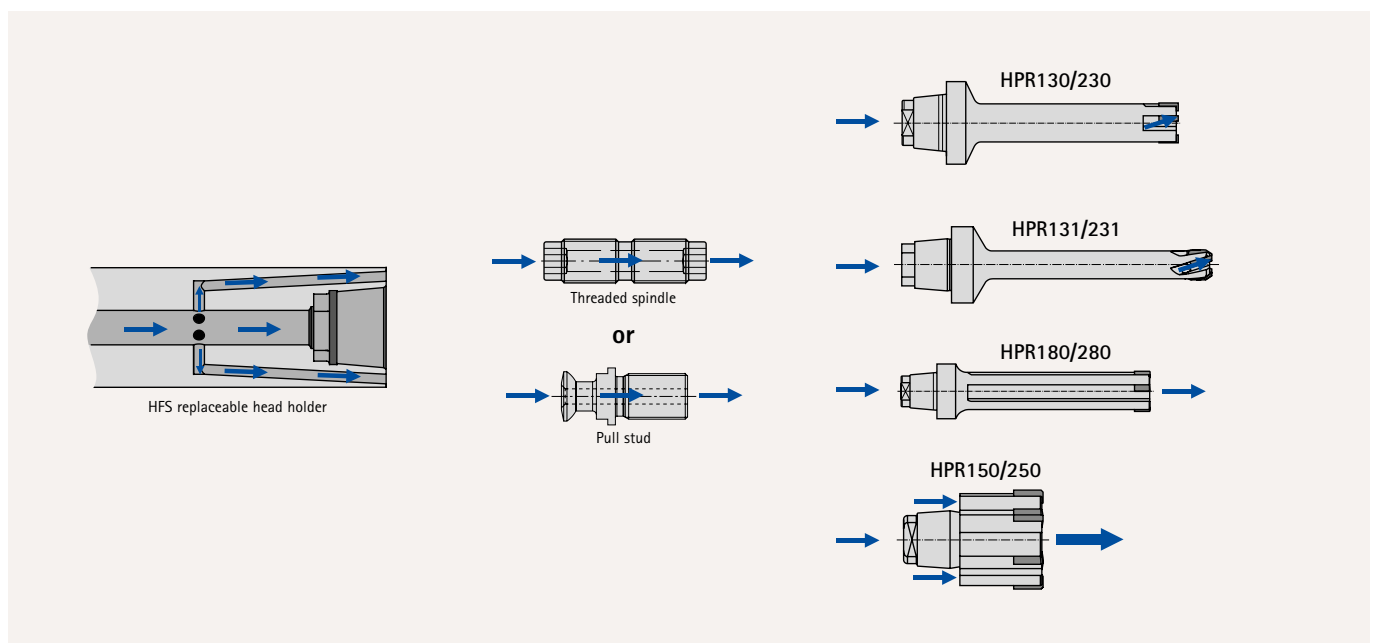
Coolant supply without central through bore

The reamers must be assembled without a central coolant through-bore. The coolant is transferred from the tool holder to the replaceable head via the face surface.



Coolant supply with central through-bore

All reamers listed here must be assembled with a central coolant through-bore. The coolant transfer is central and on the HPR150 and on the HPR250 also via the face surface.



Handling notes for replaceable heads CPream

The universal replaceable heads in the CPream series feature a complete and particularly user-friendly programme. The CFS connection ensures the straightforward, fast changing of the replaceable heads with high accuracy of repetition. At the same time perfect retention with maximum stability and rigidity is achieved.

The replaceable head is tightened to the stipulated tightening torque and produces a joint with force and form fit. The key features of this system are high radial run-out accuracy in conjunction with very good rigidity.

Assembly of the replaceable heads CPream

Note:

To minimise the risk of injuries, it is recommended to wear gloves for the following actions.

Note:

Only for trained personnel.



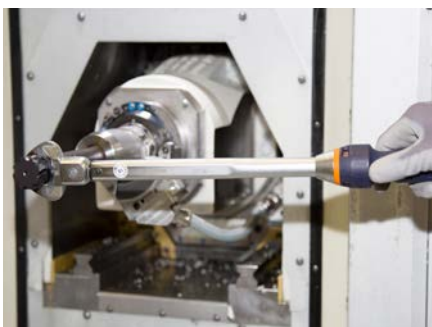
1. Clean the taper, thread and face surface on the replaceable head using compressed air and a cloth.



2. Clean the taper, thread and face surface on the replaceable head holder using compressed air and a cloth.



3. Screw the replaceable head clockwise into the replaceable head holder so it is hand-tight. Then clamp the replaceable head holder with the tool in the machine holder.



4. Place the torque wrench on the replaceable milling head so it is as horizontal as possible; do not tilt the faces on the spanner.



5. Tighten the replaceable head to the stated tightening torque with the aid of the torque wrench and the appropriate open-ended spanner attachment (see table "Tightening torques for the replaceable heads").



Result:

The gap between the replaceable head and replaceable head holder is closed and a joint with a force and form fit is formed. The replaceable head CPream is now ready to use.

Tightening torques for replaceable heads

Connection size CFS	Tightening torque [Nm]
6	5
8	12,5
10	15
12	20
16	25
20	30

Handling notes for HPR400

The HPR400 offers a system in which the tool can be re-tipped quickly and cost-effectively directly by the customer. The replaceable inserts are pushed axially into the insert seat and robustly fixed in the tool body using a TORX® screw. The familiar machining quality to the μ is always provided.

Changing the inserts

Note:

On changing the inserts, all inserts must be changed!

Note:

Only for trained personnel.



1. Clean the HPR400 using compressed air and cloth. Undo the TORX® screw, for this purpose turn the TORX® screw counter-clockwise using a suitable TORX® screwdriver. After undoing, remove the TORX® screw.



2. Carefully push the insert out of the insert seat in the axial direction and remove. Remove the remaining inserts, for this purpose repeat steps 1 and 2.



3. **Note:** Clean the contact faces for the inserts if they are soiled.

Clean insert seats using compressed air. Then clean the insert seats properly using alcohol.



4. Fit the new insert half-way into the insert seat. Then press the insert gently into the insert seat using your thumb and at the same time push the insert axially downward to the final position. To prevent the insert falling out, fix the insert using the TORX® screw.



5. **Note:** Only tighten the TORX® screws using a suitable torque wrench.

Tighten the TORX® screw to a tightening torque of 2.8 Nm.

Result:

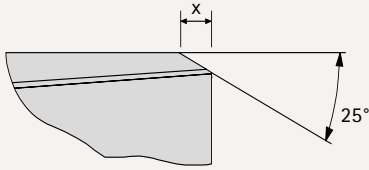
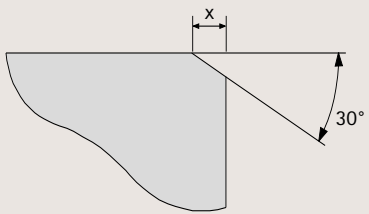
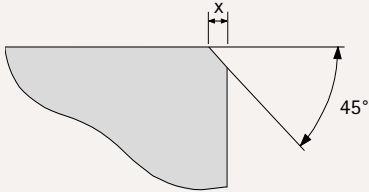
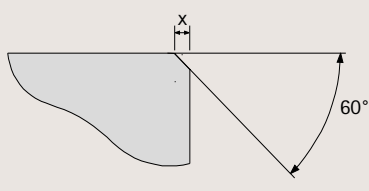
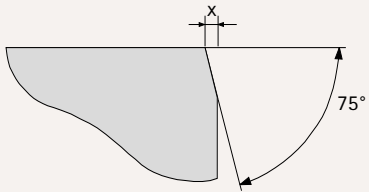
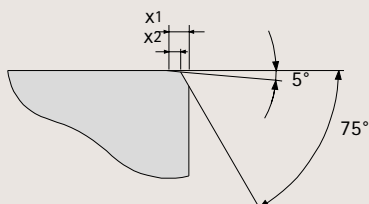
The inserts have been completely changed and the HPR400 is ready for use.

Lead geometries and rake angles

Multi-bladed reamers

Series FXR, MOR, MPR, FPR, HPR and CPR

Lead

Geometry	Lead geometry	
	Description	Geometry
	ML	25°
	ME	30°
	MF	
	MG	
	MY	
	MC	45°
	MH	
	MU	
	MV	60°
	MI	
	MT	
	MM	
	MQ	
	MA	75°
	MW	75°/5°

x = lead length

Chip breaker form/angle

Rake angle	
Description	Angle
0A	0°
1E	4°
1F	5°
1G	6°
1L	10°
1N	12°
1M	13°
2A	0° (for blind bore)
2G	6° (for blind bore)
3F	-5°
3C	-2°
3L	-10°
3Z	Negative variable

Explanation, cutting materials	
Description	Explanation
HU	Carbide
HP	Carbide PVD-coated
HC	Carbide CVD-coated
CU	Cermet
CP	Cermet PVD-coated
PU	PCD
FU	PcBN
SU	HSS
SP	HSS PVD-coated

Overview of series | Diameter range | Lead designation | Lead length

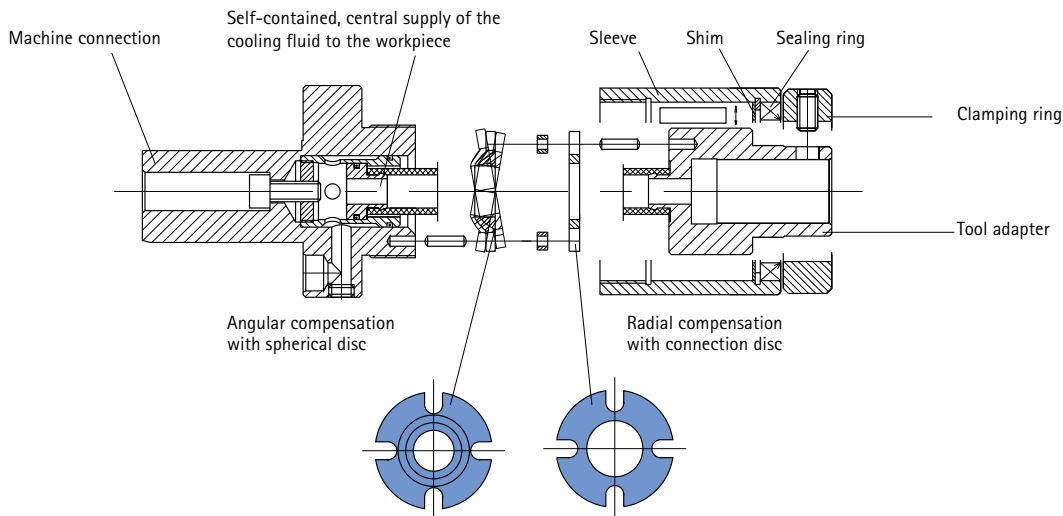
Series	Lead designation	Diameter range	Lead length x
FXR	MC	2,81 - 3,35	0,30
		3,36 - 4,05	0,40
		4,06 - 5,60	0,50
		5,61 - 6,60	0,60
		6,61 - 7,60	0,70
		7,61 - 11,60	0,80
		11,61 - 20,10	1,00
	MF	2,81 - 3,70	0,70
		3,71 - 6,20	0,90
		6,21 - 12,20	1,20
		12,21 - 20,20	1,50
	MV	2,81 - 6,20	0,30
		6,21 - 10,70	0,40
		10,71 - 16,20	0,50
		16,21 - 20,20	0,60
	MT	2,81 - 6,20	0,30
		6,21 - 10,70	0,40
		10,71 - 16,20	0,50
		16,21 - 20,20	0,60
	MH	0,950 - 2,370	0,10
		2,371 - 3,710	0,15
		3,711 - 6,210	0,25
		6,211 - 10,200	0,30
	MI	0,950 - 2,370	0,05
		2,371 - 3,710	0,10
		3,711 - 6,210	0,15
		6,211 - 10,200	0,20
	MG	2,81 - 3,70	0,70
		3,71 - 6,20	0,90
		6,21 - 12,20	1,20
		12,21 - 20,20	1,50

Series	Lead designation	Diameter range	Lead length x
MOR	MY	7,70 - 40,20	1,00
	MU	7,70 - 40,20	0,60
MRP	MG	3,85 - 6,20	0,90
		6,21 - 10,70	1,20
		10,71 - 20,20	1,50
		20,21 - 40,20	1,50
	MV	3,85 - 6,20	0,30
		6,21 - 10,70	0,40
		10,71 - 20,20	0,50
		20,21 - 26,20	0,60
	26,21 - 40,20	0,80	
MRP710	MG	7,70 - 9,70	0,70
		9,71 - 15,20	1,00
		15,21 - 40,20	1,50
FPR	MV	9,76 - 40,25	0,40
		9,76 - 40,25	0,60
	MM	9,76 - 40,25	0,45
		9,76 - 40,25	0,80
	MH	9,76 - 40,25	0,60
		5,71 - 6,20	0,15
	MV	6,21 - 7,70	0,30
		7,71 - 12,20	0,40
HPR	MG	7,00 - 65,00	1,00
	MC	7,00 - 65,00	0,55
	MA	7,00 - 65,00	0,40
	ME	7,00 - 65,00	1,40
	ML	7,00 - 65,00	1,00
	MW	7,00 - 65,00	x ₁ =0,80 x ₂ =0,50
	MV	8,00 - 40,20	0,30
CPR	MC	8,00 - 40,20	0,55
	MY	8,00 - 40,20	1,00
	MF	8,00 - 40,20	1,40
	MT	8,00 - 40,20	0,35
	MA	8,00 - 40,20	0,40

Floating holders

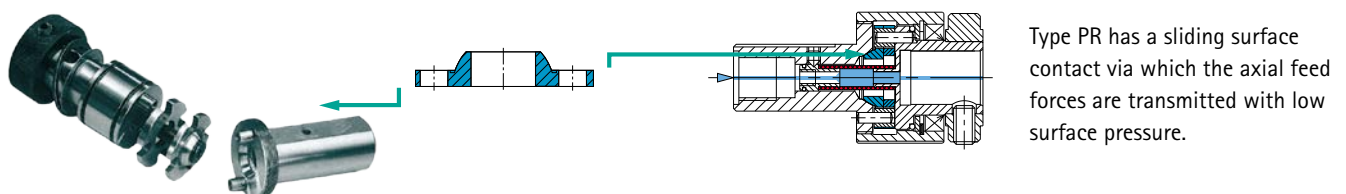
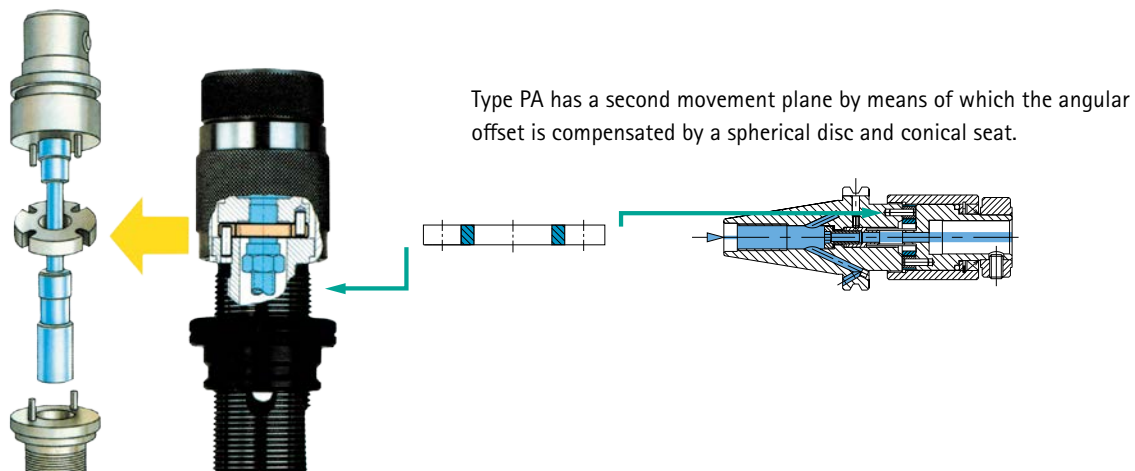
1. Design elements

- Sliding surface contact: flat sliding surfaces transmit the axial feed forces with low surface pressure.
- Reliable function: even at feed rates common today and the related high forces.
- Straightforward radial and angular adjustment of the tool adapter with lasting high accuracy.
- Radial and angular compensation is ensured by pre-defined play in the design.
- The surface contact is a particularly advantageous element of the design compared to conventional point contact.
- Sealed, central supply of the coolant (water, oil, air) to the workpiece via a flexible sealed part that is connected to the tool holder and the tool adapter.



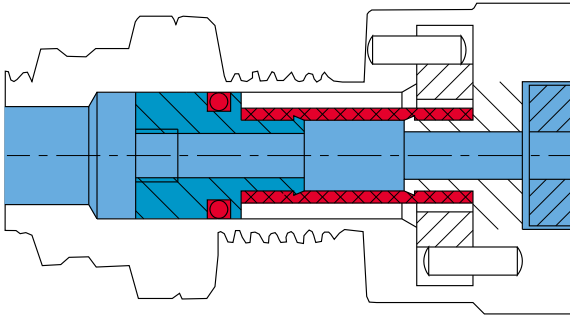
2. Compensation variants

MAPAL floating holders differ in the method of offset compensation:



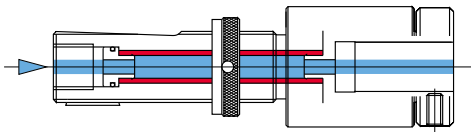
3. Coolant supply

Floating holders feature a sealed, central supply of coolant (water, air, oil) to the workpiece via a flexible, sealed part that is connected to the tool holder and the tool adapter.

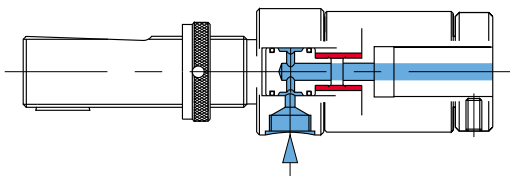


Possible connection variants:

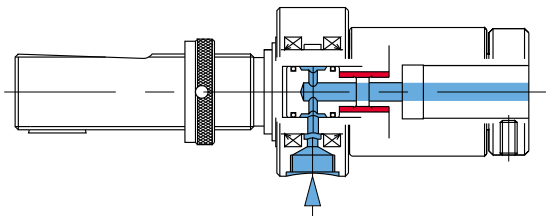
1. Supply at the end of the floating holder
Maximum possible coolant pressure 50 bar.
Model:
Central coolant supply.



2. Supply via side bore
Maximum possible coolant pressure 50 bar.
Model:
Coolant supply via side bore.



3. Supply via rotating ring
Maximum possible coolant pressure 30 bar.
Model:
Central coolant supply via rotating ring.



Cutting data recommendations

Tools with guide pads

WP single-bladed reamers

Insert	Lead	Page
WP	AS	438
WP	AD	440
WP	EK	442
WP	AZ	444
WP	DZ	446

WP twin-bladed reamers

Insert	Lead	Page
WP	AS	448
WP	AD	450
WP	EK	452
WP	AZ	454

HX single-bladed reamers

Insert	Lead	Page
Without clamping groove	R 0.8	456
With clamping groove	R 0.8	458

HX twin-bladed reamers

Insert	Lead	Page
Without clamping groove	R 0.8	460

Fixed multi-bladed reamers

High-performance reamers with cylindrical shank

FixReam

Specification	Lead	Cutting material	Page
FXR510 FXR510G	MG1M	HU612	463
FXR 505 FXR505G	MV0A	HU612	463
FXR510 FXR510G	MG1M	HP145	463
FXR 505 FXR505G	MV0A	HP145	463
FXR510 FXR510G	MF1M	HP145	464
FXR 505 FXR505G	MT0A	HP145	464
FXR510 FXR510G	MF1M	HC614	464
FXR 505 FXR505G	MV0A	HC614	464
FXR510 FXR510G	MF1M	HP613	466
FXR 505 FXR505G	MT0A	HP613	466
FXR500	MG0A	HP622	466
FXR500 FXR500G	MFOA	HP141	468
FXR 505 FXR505G	MT0A	HP141	468
FXR500 PcBN	MH3F	FU840	468
FXR505 PcBN	MI3F	FU840	468
FXR503 short	MC1F	HP145	470
FXR512 FXR512G	MG1M	CU154	470
FXR500 FXR500G	MG1M	SP346	472

MonoReam

Specification	Lead	Cutting material	Page
MOR600 MOR700 MOR800	MY1G	HU612	474
MOR605 MOR705 MOR805	MYU2A	HU612	474
MOR610 MOR710 MOR810	MY1G	HP421	474
MOR605 MOR705 MOR805	MYU2A	HP421	474
MOR610 MOR710 MOR810	MY1G	CU130	476
MOR610 MOR710 MOR810	MY1G	CP136	476
MOR605 MOR705 MOR805	MYU2A	CU130	476
MOR605 MOR705 MOR805	MYU2A	CP136	476

MonoReam Plus

Specification	Lead	Cutting material	Page
MRP510	MG1M	CU178	478
MRP505	MV3C	CU178	478
MRP610	MG1L	CU130	479
MRP605	MV3C	CU130	479
MRP710	MG1F	CU130	479

FeedPlus

Specification	Lead	Cutting material	Page
FPR500	MV0A	HP145	480
FPR610	Mj1E	HP145	480
FPR610	MV3L	FU861	482
FPR610	MM1E	CU178	482
FPR610	MV1E	HU612	482
FPR610	MV1E	PU620	484
FPR610	MQ3Z	FU801	484

Fixed multi-bladed reamers

Replaceable head reamers

HPR replaceable head reamers

Specification	Lead	Cutting material	Page
HPR130 HPR230	MC1G	HP421	486
HPR100 HPR200	MC1G	HP421	486
HPR150 HPR250	MC1G	HP421	486
HPR180 HPR280	MC1G	HP421	486
HPR130	MC1G	HC412	486
HPR100	MC1G	HC412	486
HPR150	MC1G	HC412	488
HPR180 HPR280	MC1G	HC412	488
HPR130 HPR230	MA0A	PU620	488
HPR100 HPR200	MA0A	PU620	488
HPR150 HPR250	MA0A	PU620	488
HPR180 HPR280	MA0A	PU620	488
HPR131 HPR110	MF1G	HP421	490
HPR150 HPR180	MO2G	HP421	490
HPR131 HPR231	ME1G	HP421	492
HPR110 HPR210	ME1G	HP421	492
HPR131	ME1G	CU134	492
HPR131 HPR231	ME1G	CU134	494
HPR110 HPR210	ME1G	CU134	494
HPR131 HPR110	ME1G	CP134	494
HPR180 HPR280	ML2G	CU134	494
HPR150 HPR250	ML2G	CU134	494
HPR180 HPR280	ML2G	HP421	496
HPR150 HPR250	ML2G	HP421	496
HPR150 HPR250	MC1G	CP134	496
HPR180 HPR280	MC1G	CP134	496
HPR150 HPR250	ML2G	CP134	496
HPR180 HPR280	ML2G	CP134	496
HPR110 HPR210	MF1G	HP612	498
HPR131 HPR231	MF1G	HP612	498
HPR150 HPR250	MO2G	HP612	498
HPR180 HPR280	MO2G	HP612	498
HPR130 HPR230	MC1G	CP134	498
HPR100 HPR200	MC1G	CP134	498

CPR replaceable head reamers

Specification	Lead	Cutting material	Page
CPR510	MG1M	HP145	500
CPR505	MV0A	HP145	500
CPR610	MY1G	HP421	500
CPR605	MV0A	HP421	500
CPR600	MC1G	HP421	500
CPR600	MC0A	PU620	502
CPR605	MA0A	PU620	502
CPR600	MC1G	HU612	502
CPR605	MV0A	HU612	502
CPR610	MY1G	CU130	504
CPR605	MV0A	CU130	504
CPR610	MF1G	HP421	504
CPR605	MT0A	HP421	504

Cutting data recommendations for WP single-bladed reamers with AS lead

MMG*		Material	Strength/hardness [N/mm ²] [HRC]	
P	P1	P1.1 Structural, free-cutting, case hardened and heat-treated steels, non-alloy	< 700 N/mm ²	
		P1.2 Structural, free-cutting, case hardened and heat-treated steels, non-alloy	< 1200 N/mm ²	
	P2	P2.1 Nitrided, case hardened and heat-treated steels, alloy	< 900 N/mm ²	
		P2.2 Nitrided, case hardened and heat-treated steels, alloy	< 1400 N/mm ²	
	P3	P3.1 Tool, bearing, spring and high-speed steels	< 900 N/mm ²	
		P3.2 Tool, bearing, spring and high-speed steels	< 1500 N/mm ²	
	P4	P4.1 Stainless steels, ferritic and martensitic		
	P5	P5.1 Cast steel		
P6	P6.1 Stainless cast steel, ferritic and martensitic			
M	M1	M1.1 Stainless steels, austenitic	< 700 N/mm ²	
		M1.2 Stainless steels, ferritic/austenitic (duplex)	< 1000 N/mm ²	
	M2	M2.1 Stainless cast steel, austenitic	< 700 N/mm ²	
	M3	M3.1 Stainless cast steel, ferritic/austenitic (duplex)	< 1000 N/mm ²	
K	K1	K1.1 Cast iron with lamellar graphite (grey cast iron), GJL	< 300 N/mm ²	
		K2.1 Cast iron with spheroidal graphite, GJS	< 500 N/mm ²	
	K2	K2.2 Cast iron with spheroidal graphite, GJS	500-800 N/mm ²	
		K2.3 Cast iron with spheroidal graphite, GJS	> 800 N/mm ²	
	K3	K3.1 Cast iron with spheroidal graphite, GJV; malleable cast iron, GJM	< 500 N/mm ²	
		K3.2 Cast iron with spheroidal graphite, GJV; malleable cast iron, GJM	> 500 N/mm ²	
N	N1	N1.1 Aluminium, non-alloy and alloy < 3 % Si		
		N1.2 Aluminium, alloy ≤ 7 % Si		
		N1.3 Aluminium, alloy > 7-12% Si		
		N1.4 Aluminium, alloy > 12 % Si		
	N2	N2.1 Copper, non-alloy and low-alloy	< 300 N/mm ²	
		N2.2 Copper, alloy	> 300 N/mm ²	
		N2.3 Brass, bronze, gunmetal	< 1200 N/mm ²	
	N3	N3.1 Graphite		
		N4	N4.1 Plastic, thermoplastics	
			N4.2 Plastic, thermosets	
N4.3 Plastic, foams				
S	S1	S1.1 Titanium, titanium alloys	< 400 N/mm ²	
		S2.1 Titanium, titanium alloys	< 1200 N/mm ²	
	S2	S2.2 Titanium, titanium alloys	> 1200 N/mm ²	
		S3	S3.1 Nickel, non-alloy and alloy	< 900 N/mm ²
	S3.2 Nickel, non-alloy and alloy		> 900 N/mm ²	
	S4	S4.1 High-temperature super alloy Ni, Co and Fe-based		
S5	S5.1 Tungsten and molybdenum alloys			
H	H1	H1.1 Hardened steel/cast steel	45-55 HRC	
		H1.2 Hardened steel/cast steel	55-64 HRC	
		H1.3 Hardened steel/cast steel	64-70 HRC	
	H2	H2.3 Wear-resistant cast iron/chilled cast iron, GJN		

* MAPAL machining groups

** Applies for tools with internal cooling. On usage with external cooling, halve v_c .

Cutting data recommendations for WP single-bladed reamers with AD lead

MMG*	Material	Strength/hardness [N/mm ²] [HRC]	
P	P1.1	Structural, free-cutting, case hardened and heat-treated steels, non-alloy	< 700 N/mm ²
	P1.2	Structural, free-cutting, case hardened and heat-treated steels, non-alloy	< 1200 N/mm ²
	P2.1	Nitrided, case hardened and heat-treated steels, alloy	< 900 N/mm ²
	P2.2	Nitrided, case hardened and heat-treated steels, alloy	< 1400 N/mm ²
	P3.1	Tool, bearing, spring and high-speed steels	< 900 N/mm ²
	P3.2	Tool, bearing, spring and high-speed steels	< 1500 N/mm ²
	P4.1	Stainless steels, ferritic and martensitic	
	P5.1	Cast steel	
P6.1	Stainless cast steel, ferritic and martensitic		
M	M1.1	Stainless steels, austenitic	< 700 N/mm ²
	M1.2	Stainless steels, ferritic/austenitic (duplex)	< 1000 N/mm ²
	M2.1	Stainless cast steel, austenitic	< 700 N/mm ²
	M3.1	Stainless cast steel, ferritic/austenitic (duplex)	< 1000 N/mm ²
K	K1.1	Cast iron with lamellar graphite (grey cast iron), GJL	< 300 N/mm ²
	K2.1	Cast iron with spheroidal graphite, GJS	< 500 N/mm ²
	K2.2	Cast iron with spheroidal graphite, GJS	500-800 N/mm ²
	K2.3	Cast iron with spheroidal graphite, GJS	> 800 N/mm ²
	K3.1	Cast iron with spheroidal graphite, GJV; malleable cast iron, GJM	< 500 N/mm ²
	K3.2	Cast iron with spheroidal graphite, GJV; malleable cast iron, GJM	> 500 N/mm ²
N	N1.1	Aluminium, non-alloy and alloy < 3 % Si	
	N1.2	Aluminium, alloy ≤ 7 % Si	
	N1.3	Aluminium, alloy > 7-12% Si	
	N1.4	Aluminium, alloy > 12 % Si	
	N2.1	Copper, non-alloy and low-alloy	< 300 N/mm ²
	N2.2	Copper, alloy	> 300 N/mm ²
	N2.3	Brass, bronze, gunmetal	< 1200 N/mm ²
	N3.1	Graphite	
	N4.1	Plastic, thermoplastics	
	N4.2	Plastic, thermosets	
N4.3	Plastic, foams		

* MAPAL machining groups

** Applies for tools with internal cooling. On usage with external cooling, halve v_c.

Cutting data recommendations for WP single-bladed reamers with EK lead

MMG*	Material	Strength/hardness [N/mm ²] [HRC]	
P	P1.1	Structural, free-cutting, case hardened and heat-treated steels, non-alloy	< 700 N/mm ²
	P1.2	Structural, free-cutting, case hardened and heat-treated steels, non-alloy	< 1200 N/mm ²
	P2.1	Nitrided, case hardened and heat-treated steels, alloy	< 900 N/mm ²
	P2.2	Nitrided, case hardened and heat-treated steels, alloy	< 1400 N/mm ²
	P3.1	Tool, bearing, spring and high-speed steels	< 900 N/mm ²
	P3.2	Tool, bearing, spring and high-speed steels	< 1500 N/mm ²
	P4.1	Stainless steels, ferritic and martensitic	
	P5.1	Cast steel	
P6.1	Stainless cast steel, ferritic and martensitic		
M	M1.1	Stainless steels, austenitic	< 700 N/mm ²
	M1.2	Stainless steels, ferritic/austenitic (duplex)	< 1000 N/mm ²
	M2.1	Stainless cast steel, austenitic	< 700 N/mm ²
	M3.1	Stainless cast steel, ferritic/austenitic (duplex)	< 1000 N/mm ²
K	K1.1	Cast iron with lamellar graphite (grey cast iron), GJL	< 300 N/mm ²
	K2.1	Cast iron with spheroidal graphite, GJS	< 500 N/mm ²
	K2.2	Cast iron with spheroidal graphite, GJS	500-800 N/mm ²
	K2.3	Cast iron with spheroidal graphite, GJS	> 800 N/mm ²
	K3.1	Cast iron with spheroidal graphite, GJV; malleable cast iron, GJM	< 500 N/mm ²
	K3.2	Cast iron with spheroidal graphite, GJV; malleable cast iron, GJM	> 500 N/mm ²
N	N1.1	Aluminium, non-alloy and alloy < 3 % Si	
	N1.2	Aluminium, alloy ≤ 7 % Si	
	N1.3	Aluminium, alloy > 7-12% Si	
	N1.4	Aluminium, alloy > 12 % Si	
	N2.1	Copper, non-alloy and low-alloy	< 300 N/mm ²
	N2.2	Copper, alloy	> 300 N/mm ²
	N2.3	Brass, bronze, gunmetal	< 1200 N/mm ²
	N3.1	Graphite	
	N4.1	Plastic, thermoplastics	
	N4.2	Plastic, thermosets	
N4.3	Plastic, foams		
S	S1.1	Titanium, titanium alloys	< 400 N/mm ²
	S2.1	Titanium, titanium alloys	< 1200 N/mm ²
	S2.2	Titanium, titanium alloys	> 1200 N/mm ²
	S3.1	Nickel, non-alloy and alloy	< 900 N/mm ²
	S3.2	Nickel, non-alloy and alloy	> 900 N/mm ²
	S4.1	High-temperature super alloy Ni, Co and Fe-based	
S5.1	Tungsten and molybdenum alloys		
H	H1.1	Hardened steel/cast steel	45-55 HRC
	H1.2	Hardened steel/cast steel	55-64 HRC
	H1.3	Hardened steel/cast steel	64-70 HRC
	H2.3	Wear-resistant cast iron/chilled cast iron, GJN	

* MAPAL machining groups

** Applies for tools with internal cooling. On usage with external cooling, halve v_c .

Cutting data recommendations for WP single-bladed reamers with AZ lead

MMG*	Material	Strength/hardness [N/mm ²] [HRC]	
P	P1.1	Structural, free-cutting, case hardened and heat-treated steels, non-alloy	< 700 N/mm ²
	P1.2	Structural, free-cutting, case hardened and heat-treated steels, non-alloy	< 1200 N/mm ²
	P2.1	Nitrided, case hardened and heat-treated steels, alloy	< 900 N/mm ²
	P2.2	Nitrided, case hardened and heat-treated steels, alloy	< 1400 N/mm ²
	P3.1	Tool, bearing, spring and high-speed steels	< 900 N/mm ²
	P3.2	Tool, bearing, spring and high-speed steels	< 1500 N/mm ²
	P4.1	Stainless steels, ferritic and martensitic	
	P5.1	Cast steel	
P6.1	Stainless cast steel, ferritic and martensitic		
M	M1.1	Stainless steels, austenitic	< 700 N/mm ²
	M1.2	Stainless steels, ferritic/austenitic (duplex)	< 1000 N/mm ²
	M2.1	Stainless cast steel, austenitic	< 700 N/mm ²
	M3.1	Stainless cast steel, ferritic/austenitic (duplex)	< 1000 N/mm ²
K	K1.1	Cast iron with lamellar graphite (grey cast iron), GJL	< 300 N/mm ²
	K2.1	Cast iron with spheroidal graphite, GJS	< 500 N/mm ²
	K2.2	Cast iron with spheroidal graphite, GJS	500-800 N/mm ²
	K2.3	Cast iron with spheroidal graphite, GJS	> 800 N/mm ²
	K3.1	Cast iron with spheroidal graphite, GJV; malleable cast iron, GJM	< 500 N/mm ²
	K3.2	Cast iron with spheroidal graphite, GJV; malleable cast iron, GJM	> 500 N/mm ²
N	N1.1	Aluminium, non-alloy and alloy < 3 % Si	
	N1.2	Aluminium, alloy ≤ 7 % Si	
	N1.3	Aluminium, alloy > 7-12% Si	
	N1.4	Aluminium, alloy > 12 % Si	
	N2.1	Copper, non-alloy and low-alloy	< 300 N/mm ²
	N2.2	Copper, alloy	> 300 N/mm ²
	N2.3	Brass, bronze, gunmetal	< 1200 N/mm ²
	N3.1	Graphite	
	N4.1	Plastic, thermoplastics	
	N4.2	Plastic, thermosets	
N4.3	Plastic, foams		
S	S1.1	Titanium, titanium alloys	< 400 N/mm ²
	S2.1	Titanium, titanium alloys	< 1200 N/mm ²
	S2.2	Titanium, titanium alloys	> 1200 N/mm ²
	S3.1	Nickel, non-alloy and alloy	< 900 N/mm ²
	S3.2	Nickel, non-alloy and alloy	> 900 N/mm ²
	S4.1	High-temperature super alloy Ni, Co and Fe-based	
S5.1	Tungsten and molybdenum alloys		
H	H1.1	Hardened steel/cast steel	45-55 HRC
	H1.2	Hardened steel/cast steel	55-64 HRC
	H1.3	Hardened steel/cast steel	64-70 HRC
	H2.3	Wear-resistant cast iron/chilled cast iron, GJN	

* MAPAL machining groups

** Applies for tools with internal cooling. On usage with external cooling, halve v_c .

Cutting data recommendations for WP single-bladed reamers with DZ lead

MMG*		Material	Strength/hardness [N/mm ²] [HRC]	
P	P1	P1.1 Structural, free-cutting, case hardened and heat-treated steels, non-alloy	< 700 N/mm ²	
		P1.2 Structural, free-cutting, case hardened and heat-treated steels, non-alloy	< 1200 N/mm ²	
	P2	P2.1 Nitrided, case hardened and heat-treated steels, alloy	< 900 N/mm ²	
		P2.2 Nitrided, case hardened and heat-treated steels, alloy	< 1400 N/mm ²	
	P3	P3.1 Tool, bearing, spring and high-speed steels	< 900 N/mm ²	
		P3.2 Tool, bearing, spring and high-speed steels	< 1500 N/mm ²	
	P4	P4.1 Stainless steels, ferritic and martensitic		
	P5	P5.1 Cast steel		
P6	P6.1 Stainless cast steel, ferritic and martensitic			
M	M1	M1.1 Stainless steels, austenitic	< 700 N/mm ²	
		M1.2 Stainless steels, ferritic/austenitic (duplex)	< 1000 N/mm ²	
	M2	M2.1 Stainless cast steel, austenitic	< 700 N/mm ²	
	M3	M3.1 Stainless cast steel, ferritic/austenitic (duplex)	< 1000 N/mm ²	
K	K1	K1.1 Cast iron with lamellar graphite (grey cast iron), GJL	< 300 N/mm ²	
		K2.1 Cast iron with spheroidal graphite, GJS	< 500 N/mm ²	
	K2	K2.2 Cast iron with spheroidal graphite, GJS	500-800 N/mm ²	
		K2.3 Cast iron with spheroidal graphite, GJS	> 800 N/mm ²	
	K3	K3.1 Cast iron with spheroidal graphite, GJV; malleable cast iron, GJM	< 500 N/mm ²	
		K3.2 Cast iron with spheroidal graphite, GJV; malleable cast iron, GJM	> 500 N/mm ²	
N	N1	N1.1 Aluminium, non-alloy and alloy < 3 % Si		
		N1.2 Aluminium, alloy ≤ 7 % Si		
		N1.3 Aluminium, alloy > 7-12% Si		
		N1.4 Aluminium, alloy > 12 % Si		
	N2	N2.1 Copper, non-alloy and low-alloy	< 300 N/mm ²	
		N2.2 Copper, alloy	> 300 N/mm ²	
		N2.3 Brass, bronze, gunmetal	< 1200 N/mm ²	
	N3	N3.1 Graphite		
		N4	N4.1 Plastic, thermoplastics	
			N4.2 Plastic, thermosets	
N4.3 Plastic, foams				
S	S1	S1.1 Titanium, titanium alloys	< 400 N/mm ²	
		S2.1 Titanium, titanium alloys	< 1200 N/mm ²	
	S2	S2.2 Titanium, titanium alloys	> 1200 N/mm ²	
		S3	S3.1 Nickel, non-alloy and alloy	< 900 N/mm ²
	S3.2 Nickel, non-alloy and alloy		> 900 N/mm ²	
	S4	S4.1 High-temperature super alloy Ni, Co and Fe-based		
S5	S5.1 Tungsten and molybdenum alloys			
H	H1	H1.1 Hardened steel/cast steel	45-55 HRC	
		H1.2 Hardened steel/cast steel	55-64 HRC	
		H1.3 Hardened steel/cast steel	64-70 HRC	
	H2	H2.3 Wear-resistant cast iron/chilled cast iron, GJN		

* MAPAL machining groups

** Applies for tools with internal cooling. On usage with external cooling, halve v_c .

Cutting data recommendations for WP twin-bladed reamers with AS lead

MMG*		Material	Strength/hardness [N/mm ²] [HRC]
P	P1	P1.1 Structural, free-cutting, case hardened and heat-treated steels, non-alloy	< 700 N/mm ²
		P1.2 Structural, free-cutting, case hardened and heat-treated steels, non-alloy	< 1200 N/mm ²
	P2	P2.1 Nitrided, case hardened and heat-treated steels, alloy	< 900 N/mm ²
		P2.2 Nitrided, case hardened and heat-treated steels, alloy	< 1400 N/mm ²
	P3	P3.1 Tool, bearing, spring and high-speed steels	< 900 N/mm ²
		P3.2 Tool, bearing, spring and high-speed steels	< 1500 N/mm ²
	P4	P4.1 Stainless steels, ferritic and martensitic	
	P5	P5.1 Cast steel	
P6	P6.1 Stainless cast steel, ferritic and martensitic		
M	M1	M1.1 Stainless steels, austenitic	< 700 N/mm ²
		M1.2 Stainless steels, ferritic/austenitic (duplex)	< 1000 N/mm ²
	M2	M2.1 Stainless cast steel, austenitic	< 700 N/mm ²
	M3	M3.1 Stainless cast steel, ferritic/austenitic (duplex)	< 1000 N/mm ²
K	K1	K1.1 Cast iron with lamellar graphite (grey cast iron), GJL	< 300 N/mm ²
		K2.1 Cast iron with spheroidal graphite, GJS	< 500 N/mm ²
	K2	K2.2 Cast iron with spheroidal graphite, GJS	500-800 N/mm ²
		K2.3 Cast iron with spheroidal graphite, GJS	> 800 N/mm ²
	K3	K3.1 Cast iron with spheroidal graphite, GJV; malleable cast iron, GJM	< 500 N/mm ²
		K3.2 Cast iron with spheroidal graphite, GJV; malleable cast iron, GJM	> 500 N/mm ²
N	N1	N1.1 Aluminium, non-alloy and alloy < 3 % Si	
		N1.2 Aluminium, alloy ≤ 7 % Si	
		N1.3 Aluminium, alloy > 7-12% Si	
		N1.4 Aluminium, alloy > 12 % Si	
	N2	N2.1 Copper, non-alloy and low-alloy	< 300 N/mm ²
		N2.2 Copper, alloy	> 300 N/mm ²
		N2.3 Brass, bronze, gunmetal	< 1200 N/mm ²
	N3	N3.1 Graphite	
		N4.1 Plastic, thermoplastics	
	N4	N4.2 Plastic, thermosets	
		N4.3 Plastic, foams	
		S	S1
S2.1 Titanium, titanium alloys	< 1200 N/mm ²		
S2	S2.2 Titanium, titanium alloys		> 1200 N/mm ²
	S3.1 Nickel, non-alloy and alloy		< 900 N/mm ²
S3	S3.2 Nickel, non-alloy and alloy		> 900 N/mm ²
	S4		S4.1 High-temperature super alloy Ni, Co and Fe-based
S5	S5.1 Tungsten and molybdenum alloys		
H	H1	H1.1 Hardened steel/cast steel	45-55 HRC
		H1.2 Hardened steel/cast steel	55-64 HRC
		H1.3 Hardened steel/cast steel	64-70 HRC
	H2	H2.3 Wear-resistant cast iron/chilled cast iron, GJN	

* MAPAL machining groups

** Applies for tools with internal cooling. On usage with external cooling, halve v_c .

*** Feed multiplied with factor of 2 compared to WP single-bladed reamers.

Cutting data recommendations for WP twin-bladed reamers with AD lead

MMG*		Material	Strength/hardness [N/mm ²] [HRC]
P	P1	P1.1 Structural, free-cutting, case hardened and heat-treated steels, non-alloy	< 700 N/mm ²
		P1.2 Structural, free-cutting, case hardened and heat-treated steels, non-alloy	< 1200 N/mm ²
	P2	P2.1 Nitrided, case hardened and heat-treated steels, alloy	< 900 N/mm ²
		P2.2 Nitrided, case hardened and heat-treated steels, alloy	< 1400 N/mm ²
	P3	P3.1 Tool, bearing, spring and high-speed steels	< 900 N/mm ²
		P3.2 Tool, bearing, spring and high-speed steels	< 1500 N/mm ²
	P4	P4.1 Stainless steels, ferritic and martensitic	
	P5	P5.1 Cast steel	
P6	P6.1 Stainless cast steel, ferritic and martensitic		
M	M1	M1.1 Stainless steels, austenitic	< 700 N/mm ²
		M1.2 Stainless steels, ferritic/austenitic (duplex)	< 1000 N/mm ²
	M2	M2.1 Stainless cast steel, austenitic	< 700 N/mm ²
	M3	M3.1 Stainless cast steel, ferritic/austenitic (duplex)	< 1000 N/mm ²
K	K1	K1.1 Cast iron with lamellar graphite (grey cast iron), GJL	< 300 N/mm ²
		K2.1 Cast iron with spheroidal graphite, GJS	< 500 N/mm ²
	K2	K2.2 Cast iron with spheroidal graphite, GJS	500-800 N/mm ²
		K2.3 Cast iron with spheroidal graphite, GJS	> 800 N/mm ²
	K3	K3.1 Cast iron with spheroidal graphite, GJV; malleable cast iron, GJM	< 500 N/mm ²
		K3.2 Cast iron with spheroidal graphite, GJV; malleable cast iron, GJM	> 500 N/mm ²
N	N1	N1.1 Aluminium, non-alloy and alloy < 3 % Si	
		N1.2 Aluminium, alloy ≤ 7 % Si	
		N1.3 Aluminium, alloy > 7-12% Si	
		N1.4 Aluminium, alloy > 12 % Si	
	N2	N2.1 Copper, non-alloy and low-alloy	< 300 N/mm ²
		N2.2 Copper, alloy	> 300 N/mm ²
		N2.3 Brass, bronze, gunmetal	< 1200 N/mm ²
	N3	N3.1 Graphite	
	N4	N4.1 Plastic, thermoplastics	
		N4.2 Plastic, thermosets	
N4.3 Plastic, foams			
S	S1	S1.1 Titanium, titanium alloys	< 400 N/mm ²
		S2.1 Titanium, titanium alloys	< 1200 N/mm ²
	S2	S2.2 Titanium, titanium alloys	> 1200 N/mm ²
		S3.1 Nickel, non-alloy and alloy	< 900 N/mm ²
	S3	S3.2 Nickel, non-alloy and alloy	> 900 N/mm ²
		S4	S4.1 High-temperature super alloy Ni, Co and Fe-based
S5	S5.1 Tungsten and molybdenum alloys		
H	H1	H1.1 Hardened steel/cast steel	45-55 HRC
		H1.2 Hardened steel/cast steel	55-64 HRC
		H1.3 Hardened steel/cast steel	64-70 HRC
	H2	H2.3 Wear-resistant cast iron/chilled cast iron, GJN	

* MAPAL machining groups

** Applies for tools with internal cooling. On usage with external cooling, halve v_c.

*** Feed multiplied with factor of 2 compared to WP single-bladed reamers.

Cutting data recommendations for WP twin-bladed reamers with EK lead

MMG*		Material	Strength/hardness [N/mm ²] [HRC]	
P	P1	P1.1 Structural, free-cutting, case hardened and heat-treated steels, non-alloy	< 700 N/mm ²	
		P1.2 Structural, free-cutting, case hardened and heat-treated steels, non-alloy	< 1200 N/mm ²	
	P2	P2.1 Nitrided, case hardened and heat-treated steels, alloy	< 900 N/mm ²	
		P2.2 Nitrided, case hardened and heat-treated steels, alloy	< 1400 N/mm ²	
	P3	P3.1 Tool, bearing, spring and high-speed steels	< 900 N/mm ²	
		P3.2 Tool, bearing, spring and high-speed steels	< 1500 N/mm ²	
	P4	P4.1 Stainless steels, ferritic and martensitic		
	P5	P5.1 Cast steel		
P6	P6.1 Stainless cast steel, ferritic and martensitic			
M	M1	M1.1 Stainless steels, austenitic	< 700 N/mm ²	
		M1.2 Stainless steels, ferritic/austenitic (duplex)	< 1000 N/mm ²	
	M2	M2.1 Stainless cast steel, austenitic	< 700 N/mm ²	
	M3	M3.1 Stainless cast steel, ferritic/austenitic (duplex)	< 1000 N/mm ²	
K	K1	K1.1 Cast iron with lamellar graphite (grey cast iron), GJL	< 300 N/mm ²	
		K2.1 Cast iron with spheroidal graphite, GJS	< 500 N/mm ²	
	K2	K2.2 Cast iron with spheroidal graphite, GJS	500-800 N/mm ²	
		K2.3 Cast iron with spheroidal graphite, GJS	> 800 N/mm ²	
	K3	K3.1 Cast iron with spheroidal graphite, GJV; malleable cast iron, GJM	< 500 N/mm ²	
		K3.2 Cast iron with spheroidal graphite, GJV; malleable cast iron, GJM	> 500 N/mm ²	
N	N1	N1.1 Aluminium, non-alloy and alloy < 3 % Si		
		N1.2 Aluminium, alloy ≤ 7 % Si		
		N1.3 Aluminium, alloy > 7-12% Si		
		N1.4 Aluminium, alloy > 12 % Si		
	N2	N2.1 Copper, non-alloy and low-alloy	< 300 N/mm ²	
		N2.2 Copper, alloy	> 300 N/mm ²	
		N2.3 Brass, bronze, gunmetal	< 1200 N/mm ²	
	N3	N3.1 Graphite		
		N4	N4.1 Plastic, thermoplastics	
			N4.2 Plastic, thermosets	
N4.3 Plastic, foams				
S	S1	S1.1 Titanium, titanium alloys	< 400 N/mm ²	
		S2.1 Titanium, titanium alloys	< 1200 N/mm ²	
	S2	S2.2 Titanium, titanium alloys	> 1200 N/mm ²	
		S3	S3.1 Nickel, non-alloy and alloy	< 900 N/mm ²
	S3.2 Nickel, non-alloy and alloy		> 900 N/mm ²	
	S4	S4.1 High-temperature super alloy Ni, Co and Fe-based		
S5	S5.1 Tungsten and molybdenum alloys			
H	H1	H1.1 Hardened steel/cast steel	45-55 HRC	
		H1.2 Hardened steel/cast steel	55-64 HRC	
		H1.3 Hardened steel/cast steel	64-70 HRC	
	H2	H2.3 Wear-resistant cast iron/chilled cast iron, GJN		

* MAPAL machining groups

** Applies for tools with internal cooling. On usage with external cooling, halve v_c.

*** Feed multiplied with factor of 2 compared to WP single-bladed reamers.

Cutting data recommendations for WP twin-bladed reamers with AZ lead

MMG*		Material	Strength/hardness [N/mm ²] [HRC]	
P	P1	P1.1 Structural, free-cutting, case hardened and heat-treated steels, non-alloy	< 700 N/mm ²	
		P1.2 Structural, free-cutting, case hardened and heat-treated steels, non-alloy	< 1200 N/mm ²	
	P2	P2.1 Nitrided, case hardened and heat-treated steels, alloy	< 900 N/mm ²	
		P2.2 Nitrided, case hardened and heat-treated steels, alloy	< 1400 N/mm ²	
	P3	P3.1 Tool, bearing, spring and high-speed steels	< 900 N/mm ²	
		P3.2 Tool, bearing, spring and high-speed steels	< 1500 N/mm ²	
	P4	P4.1 Stainless steels, ferritic and martensitic		
	P5	P5.1 Cast steel		
P6	P6.1 Stainless cast steel, ferritic and martensitic			
M	M1	M1.1 Stainless steels, austenitic	< 700 N/mm ²	
		M1.2 Stainless steels, ferritic/austenitic (duplex)	< 1000 N/mm ²	
	M2	M2.1 Stainless cast steel, austenitic	< 700 N/mm ²	
	M3	M3.1 Stainless cast steel, ferritic/austenitic (duplex)	< 1000 N/mm ²	
K	K1	K1.1 Cast iron with lamellar graphite (grey cast iron), GJL	< 300 N/mm ²	
		K2.1 Cast iron with spheroidal graphite, GJS	< 500 N/mm ²	
	K2	K2.2 Cast iron with spheroidal graphite, GJS	500-800 N/mm ²	
		K2.3 Cast iron with spheroidal graphite, GJS	> 800 N/mm ²	
	K3	K3.1 Cast iron with spheroidal graphite, GJV; malleable cast iron, GJM	< 500 N/mm ²	
		K3.2 Cast iron with spheroidal graphite, GJV; malleable cast iron, GJM	> 500 N/mm ²	
N	N1	N1.1 Aluminium, non-alloy and alloy < 3 % Si		
		N1.2 Aluminium, alloy ≤ 7 % Si		
		N1.3 Aluminium, alloy > 7-12% Si		
		N1.4 Aluminium, alloy > 12 % Si		
	N2	N2.1 Copper, non-alloy and low-alloy	< 300 N/mm ²	
		N2.2 Copper, alloy	> 300 N/mm ²	
		N2.3 Brass, bronze, gunmetal	< 1200 N/mm ²	
	N3	N3.1 Graphite		
		N4	N4.1 Plastic, thermoplastics	
			N4.2 Plastic, thermosets	
N4.3 Plastic, foams				
S	S1	S1.1 Titanium, titanium alloys	< 400 N/mm ²	
		S2.1 Titanium, titanium alloys	< 1200 N/mm ²	
	S2	S2.2 Titanium, titanium alloys	> 1200 N/mm ²	
		S3	S3.1 Nickel, non-alloy and alloy	< 900 N/mm ²
	S3.2 Nickel, non-alloy and alloy		> 900 N/mm ²	
	S4	S4.1 High-temperature super alloy Ni, Co and Fe-based		
S5	S5.1 Tungsten and molybdenum alloys			
H	H1	H1.1 Hardened steel/cast steel	45-55 HRC	
		H1.2 Hardened steel/cast steel	55-64 HRC	
		H1.3 Hardened steel/cast steel	64-70 HRC	
	H2	H2.3 Wear-resistant cast iron/chilled cast iron, GJN		

* MAPAL machining groups

** Applies for tools with internal cooling. On usage with external cooling, halve v_c.

*** Feed multiplied with factor of 2 compared to WP single-bladed reamers.

Cutting data recommendations for HX single-bladed reamers with R 0.8 lead

HX indexable inserts **without** clamping groove for series with internal coolant supply

MMG*		Material	Strength/hardness [N/mm ²] [HRC]	
P	P1	P1.1 Structural, free-cutting, case hardened and heat-treated steels, non-alloy	< 700 N/mm ²	
		P1.2 Structural, free-cutting, case hardened and heat-treated steels, non-alloy	< 1200 N/mm ²	
	P2	P2.1 Nitrided, case hardened and heat-treated steels, alloy	< 900 N/mm ²	
		P2.2 Nitrided, case hardened and heat-treated steels, alloy	< 1400 N/mm ²	
	P3	P3.1 Tool, bearing, spring and high-speed steels	< 900 N/mm ²	
		P3.2 Tool, bearing, spring and high-speed steels	< 1500 N/mm ²	
	P4	P4.1 Stainless steels, ferritic and martensitic		
	P5	P5.1 Cast steel		
P6	P6.1 Stainless cast steel, ferritic and martensitic			
M	M1	M1.1 Stainless steels, austenitic	< 700 N/mm ²	
		M1.2 Stainless steels, ferritic/austenitic (duplex)	< 1000 N/mm ²	
	M2	M2.1 Stainless cast steel, austenitic	< 700 N/mm ²	
	M3	M3.1 Stainless cast steel, ferritic/austenitic (duplex)	< 1000 N/mm ²	
K	K1	K1.1 Cast iron with lamellar graphite (grey cast iron), GJL	< 300 N/mm ²	
		K2.1 Cast iron with spheroidal graphite, GJS	< 500 N/mm ²	
	K2	K2.2 Cast iron with spheroidal graphite, GJS	500-800 N/mm ²	
		K2.3 Cast iron with spheroidal graphite, GJS	> 800 N/mm ²	
	K3	K3.1 Cast iron with spheroidal graphite, GJV; malleable cast iron, GJM	< 500 N/mm ²	
		K3.2 Cast iron with spheroidal graphite, GJV; malleable cast iron, GJM	> 500 N/mm ²	
N	N1	N1.1 Aluminium, non-alloy and alloy < 3 % Si		
		N1.2 Aluminium, alloy ≤ 7 % Si		
		N1.3 Aluminium, alloy > 7-12% Si		
		N1.4 Aluminium, alloy > 12 % Si		
	N2	N2.1 Copper, non-alloy and low-alloy	< 300 N/mm ²	
		N2.2 Copper, alloy	> 300 N/mm ²	
		N2.3 Brass, bronze, gunmetal	< 1200 N/mm ²	
	N3	N3.1 Graphite		
		N4	N4.1 Plastic, thermoplastics	
			N4.2 Plastic, thermosets	
	N4.3 Plastic, foams			
	S	S1	S1.1 Titanium, titanium alloys	< 400 N/mm ²
			S2.1 Titanium, titanium alloys	< 1200 N/mm ²
S2		S2.2 Titanium, titanium alloys	> 1200 N/mm ²	
		S3	S3.1 Nickel, non-alloy and alloy	< 900 N/mm ²
S3.2 Nickel, non-alloy and alloy			> 900 N/mm ²	
S4		S4.1 High-temperature super alloy Ni, Co and Fe-based		
S5	S5.1 Tungsten and molybdenum alloys			
H	H1	H1.1 Hardened steel/cast steel	45-55 HRC	
		H1.2 Hardened steel/cast steel	55-64 HRC	
		H1.3 Hardened steel/cast steel	64-70 HRC	
	H2	H2.3 Wear-resistant cast iron/chilled cast iron, GJN		

* MAPAL machining groups

Cutting data recommendations for HX twin-bladed reamers with R 0.8 lead

HX indexable inserts **with** clamping groove for series with internal coolant supply

MMG*	Material	Strength/hardness [N/mm ²] [HRC]	
P	P1.1	Structural, free-cutting, case hardened and heat-treated steels, non-alloy	< 700 N/mm ²
	P1.2	Structural, free-cutting, case hardened and heat-treated steels, non-alloy	< 1200 N/mm ²
	P2.1	Nitrided, case hardened and heat-treated steels, alloy	< 900 N/mm ²
	P2.2	Nitrided, case hardened and heat-treated steels, alloy	< 1400 N/mm ²
	P3.1	Tool, bearing, spring and high-speed steels	< 900 N/mm ²
	P3.2	Tool, bearing, spring and high-speed steels	< 1500 N/mm ²
	P4.1	Stainless steels, ferritic and martensitic	
	P5.1	Cast steel	
P6.1	Stainless cast steel, ferritic and martensitic		
M	M1.1	Stainless steels, austenitic	< 700 N/mm ²
	M1.2	Stainless steels, ferritic/austenitic (duplex)	< 1000 N/mm ²
	M2.1	Stainless cast steel, austenitic	< 700 N/mm ²
	M3.1	Stainless cast steel, ferritic/austenitic (duplex)	< 1000 N/mm ²
K	K1.1	Cast iron with lamellar graphite (grey cast iron), GJL	< 300 N/mm ²
	K2.1	Cast iron with spheroidal graphite, GJS	< 500 N/mm ²
	K2.2	Cast iron with spheroidal graphite, GJS	500-800 N/mm ²
	K2.3	Cast iron with spheroidal graphite, GJS	> 800 N/mm ²
	K3.1	Cast iron with spheroidal graphite, GJV; malleable cast iron, GJM	< 500 N/mm ²
	K3.2	Cast iron with spheroidal graphite, GJV; malleable cast iron, GJM	> 500 N/mm ²
N	N1.1	Aluminium, non-alloy and alloy < 3 % Si	
	N1.2	Aluminium, alloy ≤ 7 % Si	
	N1.3	Aluminium, alloy > 7-12% Si	
	N1.4	Aluminium, alloy > 12 % Si	
	N2.1	Copper, non-alloy and low-alloy	< 300 N/mm ²
	N2.2	Copper, alloy	> 300 N/mm ²
	N2.3	Brass, bronze, gunmetal	< 1200 N/mm ²
	N3.1	Graphite	
	N4.1	Plastic, thermoplastics	
	N4.2	Plastic, thermosets	
N4.3	Plastic, foams		
S	S1.1	Titanium, titanium alloys	< 400 N/mm ²
	S2.1	Titanium, titanium alloys	< 1200 N/mm ²
	S2.2	Titanium, titanium alloys	> 1200 N/mm ²
	S3.1	Nickel, non-alloy and alloy	< 900 N/mm ²
	S3.2	Nickel, non-alloy and alloy	> 900 N/mm ²
	S4.1	High-temperature super alloy Ni, Co and Fe-based	
S5.1	Tungsten and molybdenum alloys		
H	H1.1	Hardened steel/cast steel	45-55 HRC
	H1.2	Hardened steel/cast steel	55-64 HRC
	H1.3	Hardened steel/cast steel	64-70 HRC
	H2.3	Wear-resistant cast iron/chilled cast iron, GJN	

* MAPAL machining groups

Cutting data recommendations for HX twin-bladed reamers with R 0.8 lead

HX indexable inserts **without** clamping groove for series with internal coolant supply

MMG*	Material	Strength/hardness [N/mm ²] [HRC]	
P	P1.1	Structural, free-cutting, case hardened and heat-treated steels, non-alloy	< 700 N/mm ²
	P1.2	Structural, free-cutting, case hardened and heat-treated steels, non-alloy	< 1200 N/mm ²
	P2.1	Nitrided, case hardened and heat-treated steels, alloy	< 900 N/mm ²
	P2.2	Nitrided, case hardened and heat-treated steels, alloy	< 1400 N/mm ²
	P3.1	Tool, bearing, spring and high-speed steels	< 900 N/mm ²
	P3.2	Tool, bearing, spring and high-speed steels	< 1500 N/mm ²
	P4.1	Stainless steels, ferritic and martensitic	
	P5.1	Cast steel	
P6.1	Stainless cast steel, ferritic and martensitic		
M	M1.1	Stainless steels, austenitic	< 700 N/mm ²
	M1.2	Stainless steels, ferritic/austenitic (duplex)	< 1000 N/mm ²
	M2.1	Stainless cast steel, austenitic	< 700 N/mm ²
	M3.1	Stainless cast steel, ferritic/austenitic (duplex)	< 1000 N/mm ²
K	K1.1	Cast iron with lamellar graphite (grey cast iron), GJL	< 300 N/mm ²
	K2.1	Cast iron with spheroidal graphite, GJS	< 500 N/mm ²
	K2.2	Cast iron with spheroidal graphite, GJS	500-800 N/mm ²
	K2.3	Cast iron with spheroidal graphite, GJS	> 800 N/mm ²
	K3.1	Cast iron with spheroidal graphite, GJV; malleable cast iron, GJM	< 500 N/mm ²
	K3.2	Cast iron with spheroidal graphite, GJV; malleable cast iron, GJM	> 500 N/mm ²
N	N1.1	Aluminium, non-alloy and alloy < 3 % Si	
	N1.2	Aluminium, alloy ≤ 7 % Si	
	N1.3	Aluminium, alloy > 7-12% Si	
	N1.4	Aluminium, alloy > 12 % Si	
	N2.1	Copper, non-alloy and low-alloy	< 300 N/mm ²
	N2.2	Copper, alloy	> 300 N/mm ²
	N2.3	Brass, bronze, gunmetal	< 1200 N/mm ²
	N3.1	Graphite	
	N4.1	Plastic, thermoplastics	
	N4.2	Plastic, thermosets	
N4.3	Plastic, foams		
S	S1.1	Titanium, titanium alloys	< 400 N/mm ²
	S2.1	Titanium, titanium alloys	< 1200 N/mm ²
	S2.2	Titanium, titanium alloys	> 1200 N/mm ²
	S3.1	Nickel, non-alloy and alloy	< 900 N/mm ²
	S3.2	Nickel, non-alloy and alloy	> 900 N/mm ²
	S4.1	High-temperature super alloy Ni, Co and Fe-based	
S5.1	Tungsten and molybdenum alloys		
H	H1.1	Hardened steel/cast steel	45-55 HRC
	H1.2	Hardened steel/cast steel	55-64 HRC
	H1.3	Hardened steel/cast steel	64-70 HRC
	H2.3	Wear-resistant cast iron/chilled cast iron, GJN	

* MAPAL machining groups

Cutting data recommendations for FixReam FXR

Feed and cutting speed

FXR510 | FXR510G

Cutting material: HU612 | Lead: MG1M

FXR505 | FXR505G

Cutting material: HU612 | Lead: MV0A

MMG*		Material	Strength/hardness [N/mm ²] [HRC]	Application data for ø [mm]					
				< 5			5 - 6.2		
				v _c	f	Stock removal a _p	v _c	f	Stock removal a _p
N1	N1.1	Aluminium, non-alloy and alloy < 3 % Si		50	0,15	0,08	50	0,15	0,08
	N1.2	Aluminium, alloy ≤ 7 % Si		50	0,15	0,08	50	0,15	0,08
	N1.3	Aluminium, alloy > 7-12% Si		30	0,15	0,08	30	0,15	0,08
	N1.4	Aluminium, alloy > 12 % Si		30	0,15	0,08	30	0,15	0,08
N2	N2.1	Copper, non-alloy and low-alloy	< 300 N/mm ²	50	0,15	0,05	50	0,18	0,05
	N2.2	Copper, alloy	> 300 N/mm ²	50	0,15	0,05	50	0,18	0,05
	N2.3	Brass, bronze, gunmetal	< 1200 N/mm ²	50	0,15	0,05	50	0,18	0,05
N3	N3.1	Graphite							
N4	N4.1	Plastic, thermoplastics		40	0,15	0,08	40	0,15	0,08
	N4.2	Plastic, thermosets		40	0,15	0,08	40	0,15	0,08
	N4.3	Plastic, foams		40	0,15	0,08	40	0,15	0,08

FXR510 | FXR510G

Cutting material: HP145 | Lead: MG1M

FXR505 | FXR505G

Cutting material: HP145 | Lead: MV0A

MMG*		Material	Strength/hardness [N/mm ²] [HRC]	Application data for ø [mm]					
				< 5			5 - 6.2		
				v _c	f	Stock removal a _p	v _c	f	Stock removal a _p
P	P1.1	Structural, free-cutting, case hardened and heat-treated steels, non-alloy	< 700 N/mm ²	180	0,20	0,05	180	0,30	0,05
	P1.2	Structural, free-cutting, case hardened and heat-treated steels, non-alloy	< 1200 N/mm ²	140	0,20	0,05	140	0,30	0,05
	P2.1	Nitrided, case hardened and heat-treated steels, alloy	< 900 N/mm ²	180	0,20	0,05	180	0,30	0,05
	P2.2	Nitrided, case hardened and heat-treated steels, alloy	< 1400 N/mm ²	140	0,20	0,05	140	0,30	0,05
	P3.1	Tool, bearing, spring and high-speed steels	< 900 N/mm ²	180	0,20	0,05	180	0,30	0,05
	P3.2	Tool, bearing, spring and high-speed steels	< 1500 N/mm ²	140	0,20	0,05	140	0,30	0,05
	P4.1	Stainless steels, ferritic and martensitic		40	0,10	0,05	40	0,15	0,05
	P5.1	Cast steel		140	0,20	0,05	140	0,30	0,05
P6.1	Stainless cast steel, ferritic and martensitic								
K	K1.1	Cast iron with lamellar graphite (grey cast iron), GJL	< 300 N/mm ²	110	0,30	0,05	110	0,40	0,05
	K2.1	Cast iron with spheroidal graphite, GJS	< 500 N/mm ²	150	0,30	0,05	150	0,40	0,05
	K2.2	Cast iron with spheroidal graphite, GJS	500-800 N/mm ²	90	0,30	0,05	90	0,40	0,05
	K2.3	Cast iron with spheroidal graphite, GJS	> 800 N/mm ²	90	0,30	0,05	90	0,40	0,05
	K3.1	Cast iron with spheroidal graphite, GJV; malleable cast iron, GJM	< 500 N/mm ²	90	0,30	0,05	90	0,40	0,05
	K3.2	Cast iron with spheroidal graphite, GJV; malleable cast iron, GJM	> 500 N/mm ²	90	0,30	0,05	90	0,40	0,05

* MAPAL machining groups

Application data for ϕ [mm]															
> 6.2 - 8			> 8 - 12			> 12 - 16			> 16 - 16.2			> 16.2 - 20.2			
v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	
50	0,15	0,08	50	0,20	0,10	50	0,20	0,10	50	0,30	0,15	50	0,30	0,15	
50	0,15	0,08	50	0,20	0,10	50	0,20	0,10	50	0,30	0,15	50	0,30	0,15	
30	0,15	0,08	30	0,20	0,10	30	0,20	0,10	30	0,30	0,15	30	0,30	0,15	
30	0,15	0,08	30	0,20	0,10	30	0,20	0,10	30	0,30	0,15	30	0,30	0,15	
50	0,18	0,05	50	0,20	0,10	50	0,30	0,10	50	0,35	0,15	50	0,35	0,15	
50	0,18	0,05	50	0,20	0,10	50	0,30	0,10	50	0,35	0,15	50	0,35	0,15	
50	0,18	0,05	50	0,20	0,10	50	0,30	0,10	50	0,35	0,15	50	0,35	0,15	
40	0,15	0,08	40	0,35	0,10	40	0,35	0,10	40	0,40	0,15	40	0,40	0,15	
40	0,15	0,08	40	0,35	0,10	40	0,35	0,10	40	0,40	0,15	40	0,40	0,15	
40	0,15	0,08	40	0,35	0,10	40	0,35	0,10	40	0,40	0,15	40	0,40	0,15	

Application data for ϕ [mm]															
> 6.2 - 8			> 8 - 12			> 12 - 16			> 16 - 16.2			> 16.2 - 20.2			
v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	
180	0,50	0,10	180	0,80	0,15	180	1,10	0,10	180	1,50	0,10	180	1,50	0,10	
140	0,50	0,10	140	0,80	0,15	140	1,10	0,10	140	1,50	0,10	140	1,50	0,10	
180	0,50	0,10	180	0,80	0,15	180	1,10	0,10	180	1,50	0,10	180	1,50	0,10	
140	0,50	0,10	140	0,80	0,15	140	1,10	0,10	140	1,50	0,10	140	1,50	0,10	
180	0,50	0,10	180	0,80	0,15	180	1,10	0,10	180	1,50	0,10	180	1,50	0,10	
140	0,50	0,10	140	0,80	0,15	140	1,10	0,10	140	1,50	0,10	140	1,50	0,10	
40	0,30	0,10	40	0,40	0,10	40	0,50	0,10	40	0,60	0,10	40	0,60	0,10	
140	0,50	0,10	140	0,80	0,15	140	1,10	0,10	140	1,50	0,10	140	1,50	0,10	
110	0,60	0,10	110	1,00	0,20	110	1,30	0,10	110	1,80	0,15	110	1,80	0,15	
150	0,60	0,15	150	1,00	0,20	150	1,30	0,10	150	1,80	0,15	150	1,80	0,15	
90	0,60	0,15	90	1,00	0,20	90	1,30	0,10	90	1,80	0,15	90	1,80	0,15	
90	0,60	0,15	90	1,00	0,20	90	1,30	0,10	90	1,80	0,15	90	1,80	0,15	
90	0,60	0,15	90	1,00	0,20	90	1,30	0,10	90	1,80	0,15	90	1,80	0,15	
90	0,60	0,15	90	1,00	0,20	90	1,30	0,10	90	1,80	0,15	90	1,80	0,15	

Units:
 v_c in [m/min] | [f in mm/rev]

The machining values shown are guideline values.
 The optimum data for a particular machining process may vary slightly.

Cutting data recommendations for FixReam FXR

Feed and cutting speed

FXR510 | FXR510G

Cutting material: HP145 | Lead: MF1M

FXR505 | FXR505G

Cutting material: HP145 | Lead: MTOA

MMG*		Material	Strength/hardness [N/mm ²] [HRC]	Application data for ϕ [mm]						
				< 5			5 - 6.2			
				v _c	f	Stock removal a _p	v _c	f	Stock removal a _p	
P	P1	P1.1	Structural, free-cutting, case hardened and heat-treated steels, non-alloy	< 700 N/mm ²						
		P1.2	Structural, free-cutting, case hardened and heat-treated steels, non-alloy	< 1200 N/mm ²						
	P2	P2.1	Nitrided, case hardened and heat-treated steels, alloy	< 900 N/mm ²						
		P2.2	Nitrided, case hardened and heat-treated steels, alloy	< 1400 N/mm ²						
	P3	P3.1	Tool, bearing, spring and high-speed steels	< 900 N/mm ²						
		P3.2	Tool, bearing, spring and high-speed steels	< 1500 N/mm ²						
P4	P4.1	Stainless steels, ferritic and martensitic								
P5	P5.1	Cast steel								
P6	P6.1	Stainless cast steel, ferritic and martensitic		40	0,10	0,05	40	0,15	0,05	
M	M1	M1.1	Stainless steels, austenitic	< 700 N/mm ²	40	0,10	0,05	40	0,15	0,05
		M1.2	Stainless steels, ferritic/austenitic (duplex)	< 1000 N/mm ²	30	0,10	0,05	30	0,15	0,05
	M2	M2.1	Stainless cast steel, austenitic	< 700 N/mm ²	40	0,10	0,05	40	0,15	0,05
	M3	M3.1	Stainless cast steel, ferritic/austenitic (duplex)	< 1000 N/mm ²	30	0,10	0,05	30	0,15	0,05

FXR510

Cutting material: HC614 | Lead: MF1M

FXR505

Cutting material: HC614 | Lead: MV0A

MMG*		Material	Application data for ϕ [mm]						
			< 5			5 - 6.2			
			v _c	f	Stock removal a _p	v _c	f	Stock removal a _p	
C	C1	C1.1	Plastic matrix, aramide fibre-reinforced (AFRP)	50	0,25	0,10	50	0,25	0,10
		C1.2	Plastic matrix (thermosetting), CFRP/GFRP	50	0,25	0,10	50	0,25	0,10
		C1.3	Plastic matrix (thermoplastic), CFRP/GFRP	50	0,25	0,10	50	0,25	0,10
	C2	C2.1	Carbon matrix, carbon fibre-reinforced (CFC)						
		C3	C3.1	Metal matrix (MMC)					
	C4	C4.1	Sandwich construction, honeycomb core made of paper						
		C4.2	Sandwich construction, honeycomb core made of aluminium						
		C4.3	Sandwich construction, honeycomb core made of plastic and fibre composite material						
		C4.4	Sandwich construction, core made of rigid foam panels						
	C5	C5.1	Stack (hybrid structure), CFRP aluminium						
		C5.2	Stack (hybrid structure), CFRP titanium/stainless steel						

Application data for ϕ [mm]															
> 6.2 - 8			> 8 - 12			> 12 - 16			16 - 16.2			> 16.2 - 20.2			
v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	
40	0,30	0,05	40	0,40	0,10	40	0,50	0,10	40	0,60	0,10	40	0,60	0,10	
40	0,30	0,05	40	0,40	0,10	40	0,50	0,10	40	0,60	0,10	40	0,60	0,10	
30	0,30	0,05	30	0,40	0,10	30	0,50	0,10	30	0,60	0,10	30	0,60	0,10	
40	0,30	0,05	40	0,40	0,10	40	0,50	0,10	40	0,60	0,10	40	0,60	0,10	
30	0,30	0,05	30	0,40	0,10	30	0,50	0,10	30	0,60	0,10	30	0,60	0,10	

Application data for ϕ [mm]															
> 6.2 - 8			> 8 - 12			> 12 - 16			16 - 16.2			> 16.2 - 20.2			
v_c [m/min]	f [mm/rev]	Stock removal a_p	v_c [m/min]	f [mm/rev]	Stock removal a_p	v_c [m/min]	f [mm/rev]	Stock removal a_p	v_c [m/min]	f [mm/rev]	Stock removal a_p	v_c [m/min]	f [mm/rev]	Stock removal a_p	
50	0,40	0,10	50	0,40	0,10	50	0,40	0,10	50	0,40	0,10	50	0,40	0,10	
50	0,40	0,10	50	0,40	0,10	50	0,40	0,10	50	0,40	0,10	50	0,40	0,10	
50	0,40	0,10	50	0,40	0,10	50	0,40	0,10	50	0,40	0,10	50	0,40	0,10	

Units:
 v_c in [m/min] | [f in mm/rev]

The machining values shown are guideline values.
 The optimum data for a particular machining process may vary slightly.

Cutting data recommendations for FixReam FXR

Feed and cutting speed

FXR510 | FXR510G

Cutting material: HP613 | Lead: MF1M

FXR505 | FXR505G

Cutting material: HP613 | Lead: MTOA

MMG*	Material	Strength/hardness [N/mm ²] [HRC]	Application data for ø [mm]						
			< 5			5 - 6.2			
			v _c	f	Stock removal a _p	v _c	f	Stock removal a _p	
S	S1 S1.1	Titanium, titanium alloys	< 400 N/mm ²	15	0,08	0,05	15	0,12	0,05
	S2 S2.1	Titanium, titanium alloys	< 1200 N/mm ²	15	0,08	0,05	15	0,12	0,05
	S2 S2.2	Titanium, titanium alloys	> 1200 N/mm ²	15	0,08	0,05	15	0,12	0,05
	S3 S3.1	Nickel, non-alloy and alloy	< 900 N/mm ²	15	0,08	0,05	15	0,12	0,05
	S3 S3.2	Nickel, non-alloy and alloy	> 900 N/mm ²	15	0,08	0,05	15	0,12	0,05
	S4 S4.1	High-temperature super alloy Ni, Co and Fe-based		15	0,08	0,05	15	0,12	0,05
	S5 S5.1	Tungsten and molybdenum alloys		15	0,08	0,05	15	0,12	0,05

FXR500

Cutting material: HP622 | Lead: MGOA

MMG*	Material	Strength/hardness [N/mm ²] [HRC]	Application data for ø [mm]					
			< 5			5 - 6.2		
			v _c	f	Stock removal a _p	v _c	f	Stock removal a _p
N1	N1.1	Aluminium, non-alloy and alloy < 3 % Si	250	0,50	0,10	250	0,60	0,10
	N1.2	Aluminium, alloy ≤ 7 % Si	250	0,50	0,10	250	0,60	0,10
	N1.3	Aluminium, alloy > 7-12% Si	250	0,50	0,10	250	0,60	0,10
	N1.4	Aluminium, alloy > 12 % Si	250	0,50	0,10	250	0,60	0,10
N2	N2.1	Copper, non-alloy and low-alloy	< 300 N/mm ²					
	N2.2	Copper, alloy	> 300 N/mm ²					
	N2.3	Brass, bronze, gunmetal	< 1200 N/mm ²					
N3	N3.1	Graphite						
N4	N4.1	Plastic, thermoplastics						
	N4.2	Plastic, thermosets						
	N4.3	Plastic, foams						

	> 6.2 - 8			> 8 - 12			> 12 - 16.2			> 16.2 - 20.2		
	v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	v_c	f	Stock removal a_p
	15	0,15	0,05	15	0,10	0,05	15	0,20	0,08	15	0,25	0,10
	15	0,16	0,05	15	0,10	0,05	15	0,20	0,08	15	0,25	0,10
	15	0,17	0,05	15	0,10	0,05	15	0,20	0,08	15	0,25	0,10
	15	0,18	0,05	15	0,10	0,05	15	0,20	0,08	15	0,25	0,10
	15	0,19	0,05	15	0,10	0,05	15	0,20	0,08	15	0,25	0,10
	15	0,20	0,05	15	0,10	0,05	15	0,20	0,08	15	0,25	0,10
	15	0,21	0,05	15	0,10	0,05	15	0,20	0,08	15	0,25	0,10

	Application data for \varnothing [mm]											
	> 6.2 - 8			> 8 - 12			16.2 - 16.2			> 16.2 - 20		
	v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	v_c	f	Stock removal a_p
	250	0,80	0,10	250	1,30	0,10	250	1,50	0,15	250	1,80	0,15
	250	0,80	0,10	250	1,30	0,10	250	1,50	0,15	250	1,80	0,15
	250	0,80	0,10	250	1,30	0,10	250	1,50	0,15	250	1,80	0,15
	250	0,80	0,10	250	1,30	0,10	250	1,50	0,15	250	1,80	0,15

Units:
 v_c in [m/min] | [f in mm/rev]

The machining values shown are guideline values.
 The optimum data for a particular machining process may vary slightly.

Cutting data recommendations for FixReam FXR

Feed and cutting speed

FXR500 | FXR500G

Cutting material: HP141 | Lead: MFOA

FXR505 | FXR505G

Cutting material: HP141 | Lead: MTOA

MMG*	Material		Strength/hardness [N/mm ²] [HRC]	Application data for ϕ [mm]					
				< 5			5 - 6.2		
				v _c	f	Stock removal a _p	v _c	f	Stock removal a _p
H	H1.1	Hardened steel/cast steel	45-55 HRC	10	0,06	0,05	10	0,10	0,05
	H1.2	Hardened steel/cast steel	55-64 HRC						
	H1.3	Hardened steel/cast steel	64-70 HRC						
	H2	N2.3	Wear-resistant cast iron/chilled cast iron, GJN						

FXR500 PcBN

Cutting material: FU840 | Lead: MH3F

FXR505 PcBN

Cutting material: FU840 | Lead: MI3F

MMG*	Material		Strength/hardness [N/mm ²] [HRC]	
K	K1	K1.1	Cast iron with lamellar graphite (grey cast iron), GJL	< 300 N/mm ²
	K2	K2.1	Cast iron with spheroidal graphite, GJS	< 500 N/mm ²
		K2.2	Cast iron with spheroidal graphite, GJS	500-800 N/mm ²
		K2.3	Cast iron with spheroidal graphite, GJS	> 800 N/mm ²
	K3	K3.1	Cast iron with spheroidal graphite, GJV; malleable cast iron, GJM	< 500 N/mm ²
		K3.2	Cast iron with spheroidal graphite, GJV; malleable cast iron, GJM	> 500 N/mm ²
H	H1	H1.1	Hardened steel/cast steel	45-55 HRC
	H1.2	Hardened steel/cast steel	55-64 HRC	
	H1.3	Hardened steel/cast steel	64-70 HRC	
	H2	N2.3	Wear-resistant cast iron/chilled cast iron, GJN	

Application data for \varnothing [mm]															
> 6.2 - 8			> 8 - 12			> 12 - 16			> 16 - 16.2			> 16.2 - 20.2			
v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	
10	0,12	0,05	10	0,12	0,10	10	0,18	0,10	10	0,18	0,10	10	0,18	0,10	

Application data for \varnothing [mm]												
3 - 3.7			> 3.7 - 5.7			> 5.7 - 7.2			> 7.2 - 10.2			
v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	
200	0,16	0,05	200	0,24	0,10	200	0,50	0,10	200	0,80	0,10	
200	0,16	0,05	200	0,24	0,10	200	0,50	0,10	200	0,80	0,10	
200	0,16	0,05	200	0,24	0,10	200	0,50	0,10	200	0,80	0,10	
200	0,16	0,05	200	0,24	0,10	200	0,50	0,10	200	0,80	0,10	
80	0,10	0,05	80	0,22	0,05	80	0,22	0,05	80	0,30	0,05	
80	0,08	0,05	80	0,15	0,05	80	0,15	0,05	80	0,25	0,05	

Units:
 v_c in [m/min] | [f in mm/rev]

The machining values shown are guideline values.
 The optimum data for a particular machining process may vary slightly.

Cutting data recommendations for FixReam FXR

Feed and cutting speed

FXR503 short

Cutting material: HP145 | Lead: MC1F

MMG*		Material	Strength/hardness [N/mm ²] [HRC]	Application data for ø [mm]						
				< 5			5 - 6.1			
				v _c	f	Stock removal a _p	v _c	f	Stock removal a _p	
P	P1	P1.1	Structural, free-cutting, case hardened and heat-treated steels, non-alloy	< 700 N/mm ²	180	0,20	0,05	180	0,30	0,05
		P1.2	Structural, free-cutting, case hardened and heat-treated steels, non-alloy	< 1200 N/mm ²	140	0,20	0,05	140	0,30	0,05
	P2	P2.1	Nitrided, case hardened and heat-treated steels, alloy	< 900 N/mm ²	180	0,20	0,05	180	0,30	0,05
		P2.2	Nitrided, case hardened and heat-treated steels, alloy	< 1400 N/mm ²	140	0,20	0,05	140	0,30	0,05
	P3	P3.1	Tool, bearing, spring and high-speed steels	< 900 N/mm ²	180	0,20	0,05	180	0,30	0,05
		P3.2	Tool, bearing, spring and high-speed steels	< 1500 N/mm ²	140	0,20	0,05	140	0,30	0,05
	P4	P4.1	Stainless steels, ferritic and martensitic		40	0,10	0,05	40	0,15	0,05
	P5	P5.1	Cast steel		140	0,20	0,05	140	0,30	0,05
	P6	P6.1	Stainless cast steel, ferritic and martensitic							
	K	K1	K1.1	Cast iron with lamellar graphite (grey cast iron), GJL	< 300 N/mm ²	110	0,30	0,05	110	0,40
K2.1			Cast iron with spheroidal graphite, GJS	< 500 N/mm ²	150	0,30	0,05	150	0,40	0,05
K2		K2.2	Cast iron with spheroidal graphite, GJS	500-800 N/mm ²	90	0,30	0,05	90	0,40	0,05
		K2.3	Cast iron with spheroidal graphite, GJS	> 800 N/mm ²	90	0,30	0,05	90	0,40	0,05
K3		K3.1	Cast iron with spheroidal graphite, GJV; malleable cast iron, GJM	< 500 N/mm ²	90	0,30	0,05	90	0,40	0,05
		K3.2	Cast iron with spheroidal graphite, GJV; malleable cast iron, GJM	> 500 N/mm ²	90	0,30	0,05	90	0,40	0,05

FXR512 | FXR512G

Cutting material: CU154 | Lead: MG1M

MMG*		Material	Strength/hardness [N/mm ²] [HRC]	
P	P1	P1.1	Structural, free-cutting, case hardened and heat-treated steels, non-alloy	< 700 N/mm ²
		P1.2	Structural, free-cutting, case hardened and heat-treated steels, non-alloy	< 1200 N/mm ²
	P2	P2.1	Nitrided, case hardened and heat-treated steels, alloy	< 900 N/mm ²
		P2.2	Nitrided, case hardened and heat-treated steels, alloy	< 1400 N/mm ²
	P3	P3.1	Tool, bearing, spring and high-speed steels	< 900 N/mm ²
		P3.2	Tool, bearing, spring and high-speed steels	< 1500 N/mm ²
	P4	P4.1	Stainless steels, ferritic and martensitic	
	P5	P5.1	Cast steel	
	P6	P6.1	Stainless cast steel, ferritic and martensitic	
	K	K1	K1.1	Cast iron with lamellar graphite (grey cast iron), GJL
K2.1			Cast iron with spheroidal graphite, GJS	< 500 N/mm ²
K2		K2.2	Cast iron with spheroidal graphite, GJS	500-800 N/mm ²
		K2.3	Cast iron with spheroidal graphite, GJS	> 800 N/mm ²
K3		K3.1	Cast iron with spheroidal graphite, GJV; malleable cast iron, GJM	< 500 N/mm ²
		K3.2	Cast iron with spheroidal graphite, GJV; malleable cast iron, GJM	> 500 N/mm ²

* MAPAL machining groups

Application data for ϕ [mm]															
> 6.1 - 8			> 8 - 12			> 12 - 15.1			> 15.1 - 16			> 16 - 20.1			
v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	
180	0,50	0,10	180	0,80	0,15	180	1,10	0,15	180	1,50	0,10	180	1,50	0,10	
140	0,50	0,10	140	0,80	0,15	140	1,10	0,15	140	1,50	0,10	140	1,50	0,10	
180	0,50	0,10	180	0,80	0,15	180	1,10	0,15	180	1,50	0,10	180	1,50	0,10	
140	0,50	0,10	140	0,80	0,15	140	1,10	0,15	140	1,50	0,10	140	1,50	0,10	
180	0,50	0,10	180	0,80	0,15	180	1,10	0,15	180	1,50	0,10	180	1,50	0,10	
140	0,50	0,10	140	0,80	0,15	140	1,10	0,15	140	1,50	0,10	140	1,50	0,10	
40	0,30	0,10	40	0,40	0,10	40	0,50	0,15	40	0,60	0,10	40	0,60	0,10	
140	0,50	0,10	140	0,80	0,15	140	1,10	0,15	140	1,50	0,10	140	1,50	0,10	
110	0,60	0,10	110	1,00	0,15	110	1,30	0,15	110	1,80	0,15	110	1,80	0,15	
150	0,60	0,15	150	1,00	0,15	150	1,30	0,15	150	1,80	0,15	150	1,80	0,15	
90	0,60	0,15	90	1,00	0,15	90	1,30	0,15	90	1,80	0,15	90	1,80	0,15	
90	0,60	0,15	90	1,00	0,15	90	1,30	0,15	90	1,80	0,15	90	1,80	0,15	
90	0,60	0,15	90	1,00	0,15	90	1,30	0,15	90	1,80	0,15	90	1,80	0,15	
90	0,60	0,15	90	1,00	0,15	90	1,30	0,15	90	1,80	0,15	90	1,80	0,15	

Application data for ϕ [mm]												
< 5			5 - 5.7			> 5.7 - 8			> 8 - 12.1			
v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	
140	0,10	0,05	140	0,15	0,05	140	0,40	0,05	140	0,60	0,10	
90	0,10	0,05	90	0,12	0,05	90	0,40	0,05	90	0,60	0,10	
140	0,10	0,05	140	0,15	0,05	140	0,40	0,05	140	0,60	0,10	
90	0,10	0,05	90	0,12	0,05	90	0,40	0,05	90	0,60	0,10	
120	0,10	0,05	120	0,12	0,05	120	0,40	0,05	120	0,60	0,10	
90	0,10	0,05	90	0,12	0,05	90	0,40	0,05	90	0,60	0,10	
90	0,10	0,05	90	0,12	0,05	90	0,40	0,05	90	0,60	0,10	
90	0,10	0,05	90	0,12	0,05	90	0,40	0,05	90	0,60	0,10	
120	0,20	0,05	120	0,40	0,05	120	0,50	0,05	120	0,70	0,10	
90	0,20	0,05	90	0,40	0,05	90	0,50	0,05	90	0,70	0,10	
90	0,20	0,05	90	0,40	0,05	90	0,50	0,05	90	0,70	0,10	

Units:
 v_c in [m/min] | [f in mm/rev]

The machining values shown are guideline values.
 The optimum data for a particular machining process may vary slightly.

Cutting data recommendations for FixReam FXR

Feed and cutting speed

FXR500 | FXR500G

Cutting material: SP346 | Lead: MG1M

FXR505 | FXR505G

Cutting material: SP346 | Lead: MVOA

MMG*		Material	Strength/hardness [N/mm ²] [HRC]	Application data for ϕ [mm]						
				6 - 8			> 8 - 10			
				v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	
P	P1	P1.1	Structural, free-cutting, case hardened and heat-treated steels, non-alloy	< 700 N/mm ²	45	0,12	0,05	45	0,15	0,05
		P1.2	Structural, free-cutting, case hardened and heat-treated steels, non-alloy	< 1200 N/mm ²	35	0,12	0,05	35	0,15	0,05
	P2	P2.1	Nitrided, case hardened and heat-treated steels, alloy	< 900 N/mm ²	45	0,12	0,05	45	0,15	0,05
		P2.2	Nitrided, case hardened and heat-treated steels, alloy	< 1400 N/mm ²	35	0,12	0,05	35	0,15	0,05
	P3	P3.1	Tool, bearing, spring and high-speed steels	< 900 N/mm ²	30	0,12	0,05	30	0,15	0,05
		P3.2	Tool, bearing, spring and high-speed steels	< 1500 N/mm ²	20	0,12	0,05	20	0,15	0,05
	P4	P4.1	Stainless steels, ferritic and martensitic		15	0,12	0,05	15	0,15	0,05
	P5	P5.1	Cast steel		15	0,12	0,05	15	0,15	0,05
P6	P6.1	Stainless cast steel, ferritic and martensitic								
K	K1	K1.1	Cast iron with lamellar graphite (grey cast iron), GJL	< 300 N/mm ²	35	0,15	0,08	35	0,20	0,08
		K2.1	Cast iron with spheroidal graphite, GJS	< 500 N/mm ²	30	0,15	0,08	30	0,20	0,08
	K2	K2.2	Cast iron with spheroidal graphite, GJS	500-800 N/mm ²	20	0,15	0,08	20	0,20	0,08
		K2.3	Cast iron with spheroidal graphite, GJS	> 800 N/mm ²	20	0,15	0,08	20	0,20	0,08
	K3	K3.1	Cast iron with spheroidal graphite, GJV; malleable cast iron, GJM	< 500 N/mm ²	15	0,15	0,08	15	0,20	0,08
		K3.2	Cast iron with spheroidal graphite, GJV; malleable cast iron, GJM	> 500 N/mm ²						

Application data for \varnothing [mm]															
> 10 - 14			> 14 - 20			> 20 - 25			> 25 - 30			> 30 - 40			
v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	
45	0,18	0,08	45	0,25	0,10	45	0,30	0,15	45	0,40	0,15	45	0,45	0,15	
35	0,18	0,08	35	0,25	0,10	35	0,30	0,15	35	0,40	0,15	35	0,45	0,15	
45	0,18	0,08	45	0,25	0,10	45	0,30	0,15	45	0,40	0,15	45	0,45	0,15	
35	0,18	0,08	35	0,25	0,10	35	0,30	0,15	35	0,40	0,15	35	0,45	0,15	
30	0,18	0,08	30	0,25	0,10	30	0,30	0,15	30	0,40	0,15	30	0,45	0,15	
20	0,18	0,08	20	0,25	0,10	20	0,30	0,15	20	0,40	0,15	20	0,45	0,15	
15	0,18	0,08	15	0,25	0,10	15	0,30	0,15	15	0,40	0,15	15	0,45	0,15	
15	0,18	0,08	15	0,25	0,10	15	0,30	0,15	15	0,40	0,15	15	0,45	0,15	
35	0,25	0,10	35	0,30	0,10	35	0,40	0,15	35	0,50	0,15	35	0,60	0,15	
30	0,25	0,10	30	0,30	0,10	30	0,40	0,15	30	0,50	0,15	30	0,60	0,15	
20	0,25	0,10	20	0,30	0,10	20	0,40	0,15	20	0,50	0,15	20	0,60	0,15	
20	0,25	0,10	20	0,30	0,10	20	0,40	0,15	20	0,50	0,15	20	0,60	0,15	
15	0,25	0,10	15	0,30	0,10	15	0,40	0,15	15	0,50	0,15	15	0,60	0,15	

Units:
 v_c in [m/min] | [f in mm/rev]

The machining values shown are guideline values.
 The optimum data for a particular machining process may vary slightly.

Cutting data recommendations for MonoReam MOR

Feed and cutting speed

MOR600 | MOR700 | MOR800

Cutting material: HU612 | Lead: MY1G

MOR605 | MOR705 | MOR805

Cutting material: HU612 | Lead: MU2A

MMG*	Material	Strength/hardness [N/mm ²] [HRC]	
N	N1	N1.1 Aluminium, non-alloy and alloy < 3 % Si	
		N1.2 Aluminium, alloy ≤ 7 % Si	
		N1.3 Aluminium, alloy > 7-12% Si	
		N1.4 Aluminium, alloy > 12 % Si	
	N2	N2.1 Copper, non-alloy and low-alloy	< 300 N/mm ²
		N2.2 Copper, alloy	> 300 N/mm ²
		N2.3 Brass, bronze, gunmetal	< 1200 N/mm ²
	N3	N3.1 Graphite	
	N4	N4.1 Plastic, thermoplastics	
		N4.2 Plastic, thermosets	
		N4.3 Plastic, foams	

MOR610 | MOR710 | MOR810

Cutting material: HP421 | Lead: MY1G

MOR605 | MOR705 | MOR805

Cutting material: HP421 | Lead: MU2A

MMG*	Material	Strength/hardness [N/mm ²] [HRC]		
P	P1	P1.1 Structural, free-cutting, case hardened and heat-treated steels, non-alloy	< 700 N/mm ²	
		P1.2 Structural, free-cutting, case hardened and heat-treated steels, non-alloy	< 1200 N/mm ²	
	P2	P2.1 Nitrided, case hardened and heat-treated steels, alloy	< 900 N/mm ²	
		P2.2 Nitrided, case hardened and heat-treated steels, alloy	< 1400 N/mm ²	
	P3	P3.1 Tool, bearing, spring and high-speed steels	< 900 N/mm ²	
		P3.2 Tool, bearing, spring and high-speed steels	< 1500 N/mm ²	
	P4	P4.1 Stainless steels, ferritic and martensitic		
	P5	P5.1 Cast steel		
	P6	P6.1 Stainless cast steel, ferritic and martensitic		
	K	K1	K1.1 Cast iron with lamellar graphite (grey cast iron), GJL	< 300 N/mm ²
			K2.1 Cast iron with spheroidal graphite, GJS	< 500 N/mm ²
		K2	K2.2 Cast iron with spheroidal graphite, GJS	500-800 N/mm ²
K2.3 Cast iron with spheroidal graphite, GJS			> 800 N/mm ²	
K3		K3.1 Cast iron with spheroidal graphite, GJV; malleable cast iron, GJM	< 500 N/mm ²	
		K3.2 Cast iron with spheroidal graphite, GJV; malleable cast iron, GJM	> 500 N/mm ²	

* MAPAL machining groups

Application data for \varnothing [mm]												
8 - 9.7			> 9.7 - 16			> 16 - 29.2			> 29.2 - 40.2			
v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	
50	0,20	0,10	50	0,40	0,10	50	0,50	0,15	50	0,60	0,15	
50	0,20	0,10	50	0,40	0,10	50	0,50	0,15	50	0,60	0,15	
30	0,20	0,10	30	0,40	0,10	30	0,50	0,15	30	0,60	0,15	
30	0,20	0,10	30	0,40	0,10	30	0,50	0,15	30	0,60	0,15	
50	0,20	0,10	50	0,40	0,10	50	0,50	0,15	50	0,60	0,15	
50	0,20	0,10	50	0,40	0,10	50	0,50	0,15	50	0,60	0,15	
50	0,20	0,10	50	0,40	0,10	50	0,50	0,15	50	0,60	0,15	

Application data for \varnothing [mm]												
8 - 9.7			> 9.7 - 16			> 16 - 29.2			> 29.2 - 40.2			
v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	
120	0,40	0,10	120	1,00	0,10	120	1,50	0,15	120	2,00	0,15	
120	0,40	0,10	120	1,00	0,10	120	1,50	0,15	120	2,00	0,15	
120	0,40	0,10	120	1,00	0,10	120	1,50	0,15	120	2,00	0,15	
120	0,40	0,10	120	1,00	0,10	120	1,50	0,15	120	2,00	0,15	
120	0,40	0,10	120	1,00	0,10	120	1,50	0,15	120	2,00	0,15	
120	0,40	0,10	120	1,00	0,10	120	1,50	0,15	120	2,00	0,15	
40	0,30	0,10	40	0,40	0,10	40	0,50	0,10	40	1,20	0,15	
120	0,60	0,10	120	1,00	0,10	120	1,50	0,15	120	2,00	0,15	
110	0,20	0,10	110	1,50	0,10	110	1,80	0,15	110	2,50	0,15	
110	0,20	0,10	110	1,50	0,10	110	1,80	0,15	110	2,50	0,15	
90	0,60	0,10	90	1,50	0,10	90	1,80	0,15	90	2,50	0,15	
90	0,60	0,10	90	1,50	0,10	90	1,80	0,15	90	2,50	0,15	
90	0,60	0,10	90	1,50	0,10	90	1,80	0,15	90	2,50	0,15	
90	0,60	0,10	90	1,50	0,10	90	1,80	0,15	90	2,50	0,15	

Units:
 v_c in [m/min] | [f in mm/rev]

The machining values shown are guideline values.
 The optimum data for a particular machining process may vary slightly.

Cutting data recommendations for MonoReam MOR

Feed and cutting speed

MOR610 | MOR710 | MOR810

Cutting material: CU130 / CP136 | Lead: MY1G

MOR605 | MOR705 | MOR805

Cutting material: CU130 / CP136 | Lead: MU2A

MMG*		Material	Strength/hardness [N/mm ²] [HRC]		
P	P1	P1.1	Structural, free-cutting, case hardened and heat-treated steels, non-alloy	< 700 N/mm ²	
		P1.2	Structural, free-cutting, case hardened and heat-treated steels, non-alloy	< 1200 N/mm ²	
	P2	P2.1	Nitrided, case hardened and heat-treated steels, alloy	< 900 N/mm ²	
		P2.2	Nitrided, case hardened and heat-treated steels, alloy	< 1400 N/mm ²	
	P3	P3.1	Tool, bearing, spring and high-speed steels	< 900 N/mm ²	
		P3.2	Tool, bearing, spring and high-speed steels	< 1500 N/mm ²	
	P4	P4.1	Stainless steels, ferritic and martensitic		
	P5	P5.1	Cast steel		
	P6	P6.1	Stainless cast steel, ferritic and martensitic		
	K	K1	K1.1	Cast iron with lamellar graphite (grey cast iron), GJL	< 300 N/mm ²
			K2.1	Cast iron with spheroidal graphite, GJS	< 500 N/mm ²
		K2	K2.2	Cast iron with spheroidal graphite, GJS	500–800 N/mm ²
K2.3			Cast iron with spheroidal graphite, GJS	> 800 N/mm ²	
K3		K3.1	Cast iron with spheroidal graphite, GJV; malleable cast iron, GJM	< 500 N/mm ²	
		K3.2	Cast iron with spheroidal graphite, GJV; malleable cast iron, GJM	> 500 N/mm ²	

Application data for \varnothing [mm]												
8 - 9.7			> 9.7 - 16			> 16 - 29.2			> 29.2 - 40.2			
v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	
150	0,40	0,10	150	1,00	0,10	150	1,50	0,15	150	2,00	0,15	
130	0,40	0,10	130	1,00	0,10	130	1,50	0,15	130	2,00	0,15	
130	0,40	0,10	130	1,00	0,10	130	1,50	0,15	130	2,00	0,15	
120	0,60	0,10	120	1,50	0,10	120	1,80	0,15	120	2,50	0,15	
120	0,60	0,10	120	1,50	0,10	120	1,80	0,15	120	2,50	0,15	

Units:
 v_c in [m/min] | [f in mm/rev]

The machining values shown are guideline values.
 The optimum data for a particular machining process may vary slightly.

Cutting data recommendations for MonoReam Plus MRP

Feed and cutting speed

MRP510

Cutting material: CU178 | Lead: MG1M

MRP505

Cutting material: CU178 | Lead: MV3C

MMG*	Material	Strength/hardness [N/mm ²] [HRC]	
P	P1.1 Structural, free-cutting, case hardened and heat-treated steels, non-alloy	< 700 N/mm ²	
	P1.2 Structural, free-cutting, case hardened and heat-treated steels, non-alloy	< 1200 N/mm ²	
	P2.1 Nitrided, case hardened and heat-treated steels, alloy	< 900 N/mm ²	
	P2.2 Nitrided, case hardened and heat-treated steels, alloy	< 1400 N/mm ²	
	P3.1 Tool, bearing, spring and high-speed steels	< 900 N/mm ²	
	P3.2 Tool, bearing, spring and high-speed steels	< 1500 N/mm ²	
	P4.1 Stainless steels, ferritic and martensitic		
	P5.1 Cast steel		
	P6.1 Stainless cast steel, ferritic and martensitic		
	K	K1.1 Cast iron with lamellar graphite (grey cast iron), GJL	< 300 N/mm ²
		K2.1 Cast iron with spheroidal graphite, GJS	< 500 N/mm ²
		K2.2 Cast iron with spheroidal graphite, GJS	500-800 N/mm ²
K2.3 Cast iron with spheroidal graphite, GJS		> 800 N/mm ²	
K3.1 Cast iron with spheroidal graphite, GJV; malleable cast iron, GJM		< 500 N/mm ²	
K3.2 Cast iron with spheroidal graphite, GJV; malleable cast iron, GJM		> 500 N/mm ²	

MRP610

Cutting material: CU130 | Lead: MG1L

MRP605

Cutting material: CU130 | Lead: MV3C

MRP710

Cutting material: CU130 | Lead: MG1F

MMG*	Material	Strength/hardness [N/mm ²] [HRC]	
P	P1.1 Structural, free-cutting, case hardened and heat-treated steels, non-alloy	< 700 N/mm ²	
	P1.2 Structural, free-cutting, case hardened and heat-treated steels, non-alloy	< 1200 N/mm ²	
	P2.1 Nitrided, case hardened and heat-treated steels, alloy	< 900 N/mm ²	
	P2.2 Nitrided, case hardened and heat-treated steels, alloy	< 1400 N/mm ²	
	P3.1 Tool, bearing, spring and high-speed steels	< 900 N/mm ²	
	P3.2 Tool, bearing, spring and high-speed steels	< 1500 N/mm ²	
	P4.1 Stainless steels, ferritic and martensitic		
	P5.1 Cast steel		
	P6.1 Stainless cast steel, ferritic and martensitic		
	K	K1.1 Cast iron with lamellar graphite (grey cast iron), GJL	< 300 N/mm ²
		K2.1 Cast iron with spheroidal graphite, GJS	< 500 N/mm ²
		K2.2 Cast iron with spheroidal graphite, GJS	500-800 N/mm ²
K2.3 Cast iron with spheroidal graphite, GJS		> 800 N/mm ²	
K3.1 Cast iron with spheroidal graphite, GJV; malleable cast iron, GJM		< 500 N/mm ²	
K3.2 Cast iron with spheroidal graphite, GJV; malleable cast iron, GJM		> 500 N/mm ²	

* MAPAL machining groups

Application data for \varnothing [mm]																		
< 5			5 - 6.2			> 6.2 - 8			> 8 - 12			> 12 - 16.2			16.2 - 20.2			
v_c	f	Stock re- moval a_p	v_c	f	Stock re- moval a_p	v_c	f	Stock re- moval a_p	v_c	f	Stock re- moval a_p	v_c	f	Stock re- moval a_p	v_c	f	Stock re- moval a_p	
140	0,10	0,05	140	0,15	0,05	140	0,40	0,05	140	0,60	0,10	140	0,80	0,10	140	1,00	0,10	
90	0,10	0,05	90	0,12	0,05	90	0,40	0,05	90	0,60	0,10	90	0,80	0,10	90	1,00	0,10	
140	0,10	0,05	140	0,15	0,05	140	0,40	0,05	140	0,60	0,10	140	0,80	0,10	140	1,00	0,10	
90	0,10	0,05	90	0,12	0,05	90	0,40	0,05	90	0,60	0,10	90	0,80	0,10	90	1,00	0,10	
120	0,10	0,05	120	0,12	0,05	120	0,40	0,05	120	0,60	0,10	120	0,80	0,10	120	1,00	0,10	
90	0,10	0,05	90	0,12	0,05	90	0,40	0,05	90	0,60	0,10	90	0,80	0,10	90	1,00	0,10	
90	0,10	0,05	90	0,12	0,05	90	0,40	0,05	90	0,60	0,10	90	0,80	0,10	90	1,00	0,10	
120	0,20	0,05	120	0,40	0,05	120	0,50	0,05	120	0,70	0,10	120	1,20	0,10	120	1,60	0,10	
90	0,20	0,05	90	0,40	0,05	90	0,50	0,05	90	0,70	0,10	90	1,20	0,10	90	1,60	0,10	
90	0,20	0,05	90	0,40	0,05	90	0,50	0,05	90	0,70	0,10	90	1,20	0,10	90	1,60	0,10	
90	0,20	0,05	90	0,40	0,05	90	0,50	0,05	90	0,70	0,10	90	1,20	0,10	90	1,60	0,10	
90	0,20	0,05	90	0,40	0,05	90	0,50	0,05	90	0,70	0,10	90	1,20	0,10	90	1,60	0,10	

Application data for \varnothing [mm]																		
												> 20.2 - 29.2			> 29.2 - 40.2			
												v_c	f	Stock re- moval a_p	v_c	f	Stock re- moval a_p	
												140	1,00	0,10	140	1,40	0,15	
												90	1,00	0,10	90	1,40	0,15	
												140	1,00	0,10	140	1,40	0,15	
												90	1,00	0,10	90	1,40	0,15	
												120	1,00	0,10	120	1,40	0,15	
												90	1,00	0,10	90	1,40	0,15	
												90	1,00	0,10	90	1,40	0,15	
												120	1,60	0,10	120	2,00	0,15	
												90	1,60	0,10	90	2,00	0,15	
												90	1,60	0,10	90	2,00	0,15	
												90	1,60	0,10	90	2,00	0,15	
												90	1,60	0,10	90	2,00	0,15	

Units:
 v_c in [m/min] | [f in mm/rev]

The machining values shown are guideline values.
 The optimum data for a particular machining process may vary slightly.

Cutting data recommendations for FeedPlus FPR

Feed and cutting speed

FPR500

Cutting material: HP145 | Lead: MV0A

MMG*	Material	Strength/hardness [N/mm ²] [HRC]	
P	P1.1	Structural, free-cutting, case hardened and heat-treated steels, non-alloy	< 700 N/mm ²
	P1.2	Structural, free-cutting, case hardened and heat-treated steels, non-alloy	< 1200 N/mm ²
	P2.1	Nitrided, case hardened and heat-treated steels, alloy	< 900 N/mm ²
	P2.2	Nitrided, case hardened and heat-treated steels, alloy	< 1400 N/mm ²
	P3.1	Tool, bearing, spring and high-speed steels	< 900 N/mm ²
	P3.2	Tool, bearing, spring and high-speed steels	< 1500 N/mm ²
	P4.1	Stainless steels, ferritic and martensitic	
	P5.1	Cast steel	
	P6.1	Stainless cast steel, ferritic and martensitic	

FPR610

Cutting material: HP145 | Lead: MJ1E

MMG*	Material	Strength/hardness [N/mm ²] [HRC]	Application data for ø [mm]							
			9.76 - 11.75			> 11.75 - 13.75				
			v _c	f	Stock removal a _p	v _c	f	Stock removal a _p		
P	P1.1	Structural, free-cutting, case hardened and heat-treated steels, non-alloy	< 700 N/mm ²	180	0,60	0,05	180	0,80	0,10	
	P1.2	Structural, free-cutting, case hardened and heat-treated steels, non-alloy	< 1200 N/mm ²	120	0,60	0,05	120	0,80	0,10	
	P2.1	Nitrided, case hardened and heat-treated steels, alloy	< 900 N/mm ²	150	0,60	0,05	150	0,80	0,10	
	P2.2	Nitrided, case hardened and heat-treated steels, alloy	< 1400 N/mm ²	120	0,60	0,05	120	0,80	0,10	
	P3.1	Tool, bearing, spring and high-speed steels	< 900 N/mm ²	150	0,60	0,05	150	0,80	0,10	
	P3.2	Tool, bearing, spring and high-speed steels	< 1500 N/mm ²	120	0,60	0,05	120	0,80	0,10	
	P4.1	Stainless steels, ferritic and martensitic		40	0,40	0,05	40	0,50	0,10	
	P5.1	Cast steel		150	0,60	0,05	150	0,80	0,10	
	P6.1	Stainless cast steel, ferritic and martensitic								
	K	K1.1	Cast iron with lamellar graphite (grey cast iron), GJL	< 300 N/mm ²	110	1,00	0,05	110	1,40	0,10
		K2.1	Cast iron with spheroidal graphite, GJS	< 500 N/mm ²	150	1,00	0,05	150	1,40	0,10
		K2.2	Cast iron with spheroidal graphite, GJS	500-800 N/mm ²	90	1,00	0,05	90	1,40	0,10
K2.3		Cast iron with spheroidal graphite, GJS	> 800 N/mm ²	90	1,00	0,05	90	1,40	0,10	
K3.1		Cast iron with spheroidal graphite, GJV; malleable cast iron, GJM	< 500 N/mm ²	90	1,00	0,05	90	1,40	0,10	
K3.2		Cast iron with spheroidal graphite, GJV; malleable cast iron, GJM	> 500 N/mm ²	90	1,00	0,05	90	1,40	0,10	

* MAPAL machining groups

Application data for \varnothing [mm]														
5.7 - 6.2			> 6.2 - 10.2			> 10.2 - 12.2								
v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	v_c	f	Stock removal a_p						
180	0,60	0,05	180	0,80	0,05	180	1,00	0,10						
120	0,60	0,05	120	0,80	0,05	120	1,00	0,10						
150	0,60	0,05	150	0,80	0,05	150	1,00	0,10						
120	0,60	0,05	120	0,80	0,05	120	1,00	0,10						
150	0,60	0,05	150	0,80	0,05	150	1,00	0,10						
120	0,60	0,05	120	0,80	0,05	120	1,00	0,10						
120	0,60	0,05	120	0,80	0,05	120	1,00	0,10						

Application data for \varnothing [mm]														
> 13.75 - 17.75			> 17.75 - 21.75			> 21.75 - 24.75			> 24.75 - 31.75			> 31.75 - 40.25		
v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	v_c	f	Stock removal a_p
180	1,00	0,10	180	1,10	0,10	180	1,20	0,10	180	1,40	0,10	180	1,50	0,10
120	1,00	0,10	120	1,10	0,10	120	1,20	0,10	120	1,40	0,10	120	1,50	0,10
150	1,00	0,10	150	1,10	0,10	150	1,20	0,10	150	1,40	0,10	150	1,50	0,10
120	1,00	0,10	120	1,10	0,10	120	1,20	0,10	120	1,40	0,10	120	1,50	0,10
150	1,00	0,10	150	1,10	0,10	150	1,20	0,10	150	1,40	0,10	150	1,50	0,10
120	1,00	0,10	120	1,10	0,10	120	1,20	0,10	120	1,40	0,10	120	1,50	0,10
40	0,60	0,08	40	0,70	0,10	40	0,80	0,10	40	1,00	0,10	40	1,10	0,10
150	1,00	0,10	150	1,10	0,10	150	1,20	0,10	150	1,40	0,10	150	1,50	0,10
110	1,80	0,10	110	2,00	0,10	110	2,50	0,10	110	3,00	0,10	110	3,50	0,10
150	1,80	0,10	150	2,00	0,10	150	2,50	0,10	150	3,00	0,10	150	3,50	0,10
90	1,80	0,10	90	2,00	0,10	90	2,50	0,10	90	3,00	0,10	90	3,50	0,10
90	1,80	0,10	90	2,00	0,10	90	2,50	0,10	90	3,00	0,10	90	3,50	0,10
90	1,80	0,10	90	2,00	0,10	90	2,50	0,10	90	3,00	0,10	90	3,50	0,10
90	1,80	0,10	90	2,00	0,10	90	2,50	0,10	90	3,00	0,10	90	3,50	0,10

Units:
 v_c in [m/min] | [f in mm/rev]

The machining values shown are guideline values.
 The optimum data for a particular machining process may vary slightly.

Cutting data recommendations for FeedPlus FPR

Feed and cutting speed

FPR610

Cutting material: FU861 | Lead: MV3L

MMG*	Material	Strength/hardness [N/mm ²] [HRC]	Application data for ϕ [mm]						
			9.76 - 11.75			> 11.75 - 13.75			
			v _c	f	Stock removal a _p	v _c	f	Stock removal a _p	
K	K1.1	Cast iron with lamellar graphite (grey cast iron), GJL	< 300 N/mm ²	200	1,00	0,05	200	1,60	0,10
	K2.1	Cast iron with spheroidal graphite, GJS	< 500 N/mm ²	180	1,00	0,05	180	1,60	0,10
	K2.2	Cast iron with spheroidal graphite, GJS	500-800 N/mm ²	160	1,00	0,05	160	1,60	0,10
	K2.3	Cast iron with spheroidal graphite, GJS	> 800 N/mm ²	150	1,00	0,05	150	1,60	0,10
	K3.1	Cast iron with spheroidal graphite, GJV; malleable cast iron, GJM	< 500 N/mm ²	130	1,00	0,05	130	1,60	0,10
	K3.2	Cast iron with spheroidal graphite, GJV; malleable cast iron, GJM	> 500 N/mm ²	120	1,00	0,05	120	1,60	0,10

FPR610

Cutting material: CU178 | Lead: MM1E

MMG*	Material	Strength/hardness [N/mm ²] [HRC]	Application data for ϕ [mm]						
			9.76 - 11.75			> 11.75 - 13.75			
			v _c	f	Stock removal a _p	v _c	f	Stock removal a _p	
K	K1.1	Cast iron with lamellar graphite (grey cast iron), GJL	< 300 N/mm ²	100	1,00	0,05	100	1,30	0,10
	K2.1	Cast iron with spheroidal graphite, GJS	< 500 N/mm ²	100	1,00	0,05	100	1,30	0,10
	K2.2	Cast iron with spheroidal graphite, GJS	500-800 N/mm ²	90	1,00	0,05	90	1,30	0,10
	K2.3	Cast iron with spheroidal graphite, GJS	> 800 N/mm ²	80	1,00	0,05	80	1,30	0,10
	K3.1	Cast iron with spheroidal graphite, GJV; malleable cast iron, GJM	< 500 N/mm ²						
	K3.2	Cast iron with spheroidal graphite, GJV; malleable cast iron, GJM	> 500 N/mm ²						

FPR610

Cutting material: HU612 | Lead: MV1E

MMG*	Material	Strength/hardness [N/mm ²] [HRC]	Application data for ϕ [mm]						
			9.76 - 11.75			> 11.75 - 13.75			
			v _c	f	Stock removal a _p	v _c	f	Stock removal a _p	
N1	N1.1	Aluminium, non-alloy and alloy < 3 % Si							
	N1.2	Aluminium, alloy ≤ 7 % Si							
	N1.3	Aluminium, alloy > 7-12% Si							
	N1.4	Aluminium, alloy > 12 % Si							
N2	N2.1	Copper, non-alloy and low-alloy	< 300 N/mm ²	60	0,30	0,05	60	0,40	0,10
	N2.2	Copper, alloy	> 300 N/mm ²	60	0,30	0,05	60	0,40	0,10
	N2.3	Brass, bronze, gunmetal	< 1200 N/mm ²	60	0,30	0,05	60	0,40	0,10
N3	N3.1	Graphite							
N4	N4.1	Plastic, thermoplastics							
	N4.2	Plastic, thermosets							
	N4.3	Plastic, foams							

Application data for \varnothing [mm]															
> 13.75 - 17.75			> 17.75 - 21.75			> 21.75 - 24.75			> 24.75 - 31.75			> 31.75 - 40.25			
v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	
200	2,00	0,10	200	2,40	0,10	200	2,80	0,10	200	3,20	0,10	200	3,60	0,10	
180	2,00	0,10	180	2,40	0,10	180	2,80	0,10	180	3,20	0,10	180	3,60	0,10	
160	2,00	0,10	160	2,40	0,10	160	2,80	0,10	160	3,20	0,10	160	3,60	0,10	
150	2,00	0,10	150	2,40	0,10	150	2,80	0,10	150	3,20	0,10	150	3,60	0,10	
130	2,00	0,10	130	2,40	0,10	130	2,80	0,10	130	3,20	0,10	130	3,60	0,10	
120	2,00	0,10	120	2,40	0,10	120	2,80	0,10	120	3,20	0,10	120	3,60	0,10	

Application data for \varnothing [mm]															
> 13.75 - 17.75			> 17.75 - 21.75			> 21.75 - 24.75			> 24.75 - 31.75			> 31.75 - 40.25			
v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	
100	1,50	0,10	100	1,80	0,10	100	2,10	0,10	100	2,40	0,10	100	2,70	0,10	
100	1,50	0,10	100	1,80	0,10	100	2,10	0,10	100	2,40	0,10	100	2,70	0,10	
90	1,50	0,10	90	1,80	0,10	90	2,10	0,10	90	2,40	0,10	90	2,70	0,10	
80	1,50	0,10	80	1,80	0,10	80	2,10	0,10	80	2,40	0,10	80	2,70	0,10	

Application data for \varnothing [mm]															
> 13.75 - 17.75			> 17.75 - 21.75			> 21.75 - 24.75			> 24.75 - 31.75			> 31.75 - 40.25			
v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	
60	0,50	0,10	60	0,60	0,10	60	0,70	0,10	60	0,80	0,10	60	0,80	0,10	
60	0,50	0,10	60	0,60	0,10	60	0,70	0,10	60	0,80	0,10	60	0,80	0,10	
60	0,50	0,10	60	0,60	0,10	60	0,70	0,10	60	0,80	0,10	60	0,80	0,10	

Units:
 v_c in [m/min] | [f in mm/rev]

The machining values shown are guideline values.
 The optimum data for a particular machining process may vary slightly.

Cutting data recommendations for FeedPlus FPR

Feed and cutting speed

FPR610

Cutting material: PU620 | Lead: MV1E

MMG*		Material	Strength/hardness [N/mm ²] [HRC]	Application data for ø [mm]					
				9.76 - 11.75			> 11.75 - 13.75		
				v _c	f	Stock removal a _p	v _c	f	Stock removal a _p
N1	N1.1	Aluminium, non-alloy and alloy < 3 % Si		250	1,60	0,10	250	2,00	0,10
	N1.2	Aluminium, alloy ≤ 7 % Si		250	1,60	0,10	250	2,00	0,10
	N1.3	Aluminium, alloy > 7-12% Si		250	1,60	0,10	250	2,00	0,10
	N1.4	Aluminium, alloy > 12 % Si		250	1,60	0,10	250	2,00	0,10
N2	N2.1	Copper, non-alloy and low-alloy	< 300 N/mm ²						
	N2.2	Copper, alloy	> 300 N/mm ²						
	N2.3	Brass, bronze, gunmetal	< 1200 N/mm ²						
N3	N3.1	Graphite							
N4	N4.1	Plastic, thermoplastics							
	N4.2	Plastic, thermosets							
	N4.3	Plastic, foams							

FPR610

Cutting material: FU801 | Lead: MQ3Z

MMG*		Material	Strength/hardness [N/mm ²] [HRC]	Application data for ø [mm]						
				9.76 - 11.75			> 11.75 - 13.75			
				v _c	f	Stock removal a _p	v _c	f	Stock removal a _p	
H	H1	H1.1	Hardened steel/cast steel	45-55 HRC	80	0,10	0,05	80	0,16	0,05
		H1.2	Hardened steel/cast steel	55-64 HRC						
		H1.3	Hardened steel/cast steel	64-70 HRC						
	H2	N2.3	Wear-resistant cast iron/chilled cast iron, GJN							

* MAPAL machining groups

Application data for \varnothing [mm]															
> 13.75 - 17.75			> 17.75 - 21.75			> 21.75 - 24.75			> 24.75 - 31.75			> 31.75 - 40.25			
v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	
250	2,20	0,10	250	2,50	0,10	250	3,00	0,10	250	3,20	0,10	250	3,50	0,10	
250	2,20	0,10	250	2,50	0,10	250	3,00	0,10	250	3,20	0,10	250	3,50	0,10	
250	2,20	0,10	250	2,50	0,10	250	3,00	0,10	250	3,20	0,10	250	3,50	0,10	
250	2,20	0,10	250	2,50	0,10	250	3,00	0,10	250	3,20	0,10	250	3,50	0,10	

Application data for \varnothing [mm]															
> 13.75 - 17.75			> 17.75 - 21.75			> 21.75 - 24.75			> 24.75 - 31.75			> 31.75 - 40.25			
v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	
80	0,20	0,05	80	0,24	0,05	80	0,28	0,05	80	0,32	0,05	80	0,36	0,05	

Units:
 v_c in [m/min] | [f in mm/rev]

The machining values shown are guideline values.
 The optimum data for a particular machining process may vary slightly.

Cutting data recommendations for replaceable head reamers HPR

Feed and cutting speed

HPR130 | HPR100 | HPR230 | HPR200

Cutting material: HP421 | Lead: MC1G

MMG*		Material	Strength/hardness [N/mm ²] [HRC]
K	K1	K1.1 Cast iron with lamellar graphite (grey cast iron), GJL	< 300 N/mm ²
		K2.1 Cast iron with spheroidal graphite, GJS	< 500 N/mm ²
	K2	K2.2 Cast iron with spheroidal graphite, GJS	500–800 N/mm ²
		K2.3 Cast iron with spheroidal graphite, GJS	> 800 N/mm ²
		K3.1 Cast iron with spheroidal graphite, GJV; malleable cast iron, GJM	< 500 N/mm ²
	K3	K3.2 Cast iron with spheroidal graphite, GJV; malleable cast iron, GJM	> 500 N/mm ²

HPR150 | HPR180 | HPR250 | HPR280

Cutting material: HP421 | Lead: MC1G

MMG*		Material	Strength/hardness [N/mm ²] [HRC]
K	K1	K1.1 Cast iron with lamellar graphite (grey cast iron), GJL	< 300 N/mm ²
		K2.1 Cast iron with spheroidal graphite, GJS	< 500 N/mm ²
	K2	K2.2 Cast iron with spheroidal graphite, GJS	500–800 N/mm ²
		K2.3 Cast iron with spheroidal graphite, GJS	> 800 N/mm ²
		K3.1 Cast iron with spheroidal graphite, GJV; malleable cast iron, GJM	< 500 N/mm ²
	K3	K3.2 Cast iron with spheroidal graphite, GJV; malleable cast iron, GJM	> 500 N/mm ²

HPR130 | HPR100

Cutting material: HC412 | Lead: MC1G

MMG*		Material	Strength/hardness [N/mm ²] [HRC]
K	K1	K1.1 Cast iron with lamellar graphite (grey cast iron), GJL	< 300 N/mm ²
		K2.1 Cast iron with spheroidal graphite, GJS	< 500 N/mm ²
	K2	K2.2 Cast iron with spheroidal graphite, GJS	500–800 N/mm ²
		K2.3 Cast iron with spheroidal graphite, GJS	> 800 N/mm ²
		K3.1 Cast iron with spheroidal graphite, GJV; malleable cast iron, GJM	< 500 N/mm ²
	K3	K3.2 Cast iron with spheroidal graphite, GJV; malleable cast iron, GJM	> 500 N/mm ²

Application data for \varnothing [mm]									
7 - 9.59			9.6 - 29.99			30 - 65			
v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	
120	0,60	0,10	120	1,40	0,15	120	1,80	0,15	
120	0,60	0,10	120	1,40	0,15	120	1,80	0,15	
100	0,40	0,10	100	1,20	0,15	100	1,60	0,15	
100	0,40	0,10	100	1,20	0,15	100	1,60	0,15	
100	0,40	0,10	100	1,20	0,15	100	1,60	0,15	
100	0,40	0,10	100	1,20	0,15	100	1,60	0,15	

Application data for \varnothing [mm]									
7 - 14.59			14.6 - 29.99			30 - 65			
v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	
120	0,60	0,10	120	1,40	0,15	120	1,80	0,15	
120	0,60	0,10	120	1,40	0,15	120	1,80	0,15	
100	0,40	0,10	100	1,20	0,15	100	1,60	0,15	
100	0,40	0,10	100	1,20	0,15	100	1,60	0,15	
100	0,40	0,10	100	1,20	0,15	100	1,60	0,15	
100	0,40	0,10	100	1,20	0,15	100	1,60	0,15	

Application data for \varnothing [mm]									
7 - 9.59			9.6 - 29.99			30 - 65			
v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	
120	0,60	0,10	120	1,40	0,15	120	1,80	0,15	

Units:
 v_c in [m/min] | [f in mm/rev]

The machining values shown are guideline values.
 The optimum data for a particular machining process may vary slightly.

Cutting data recommendations for replaceable head reamers HPR

Feed and cutting speed

HPR150 | HPR180

Cutting material: HC412 | Lead: MC1G

MMG*		Material	Strength/hardness [N/mm ²] [HRC]
K	K1	K1.1 Cast iron with lamellar graphite (grey cast iron), GJL	< 300 N/mm ²
		K2.1 Cast iron with spheroidal graphite, GJS	< 500 N/mm ²
	K2	K2.2 Cast iron with spheroidal graphite, GJS	500–800 N/mm ²
		K2.3 Cast iron with spheroidal graphite, GJS	> 800 N/mm ²
	K3	K3.1 Cast iron with spheroidal graphite, GJV; malleable cast iron, GJM	< 500 N/mm ²
		K3.2 Cast iron with spheroidal graphite, GJV; malleable cast iron, GJM	> 500 N/mm ²

HPR130 | HPR100 | HPR230 | HPR200

Cutting material: PU620 | Lead: MA0A

MMG*		Material	Strength/hardness [N/mm ²] [HRC]
N1	N1	N1.1 Aluminium, non-alloy and alloy < 3 % Si	
		N1.2 Aluminium, alloy ≤ 7 % Si	
		N1.3 Aluminium, alloy > 7–12% Si	
		N1.4 Aluminium, alloy > 12 % Si	
N2	N2	N2.1 Copper, non-alloy and low-alloy	< 300 N/mm ²
		N2.2 Copper, alloy	> 300 N/mm ²
		N2.3 Brass, bronze, gunmetal	< 1200 N/mm ²
N3	N3.1 Graphite		
N4	N4	N4.1 Plastic, thermoplastics	
		N4.2 Plastic, thermosets	
		N4.3 Plastic, foams	

HPR150 | HPR180 | HPR250 | HPR280

Cutting material: PU620 | Lead: MA0A

MMG*		Material	Strength/hardness [N/mm ²] [HRC]
N1	N1	N1.1 Aluminium, non-alloy and alloy < 3 % Si	
		N1.2 Aluminium, alloy ≤ 7 % Si	
		N1.3 Aluminium, alloy > 7–12% Si	
		N1.4 Aluminium, alloy > 12 % Si	
N2	N2	N2.1 Copper, non-alloy and low-alloy	< 300 N/mm ²
		N2.2 Copper, alloy	> 300 N/mm ²
		N2.3 Brass, bronze, gunmetal	< 1200 N/mm ²
N3	N3.1 Graphite		
N4	N4	N4.1 Plastic, thermoplastics	
		N4.2 Plastic, thermosets	
		N4.3 Plastic, foams	

Application data for \varnothing [mm]									
7 - 14.59			14.6 - 29.99			30 - 65			
v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	
120	0,60	0,10	120	1,32	0,15	120	1,76	0,15	

Application data for \varnothing [mm]									
7 - 9.59			9.6 - 29.99			30 - 65			
v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	
200	0,60	0,10	200	1,50	0,15	200	2,00	0,15	
200	0,60	0,10	200	1,50	0,15	200	2,00	0,15	
200	0,60	0,10	200	1,50	0,15	200	2,00	0,15	
200	0,60	0,10	200	1,50	0,15	200	2,00	0,15	
200	0,60	0,10	200	1,5	0,15	200	2,00	0,15	
200	0,60	0,10	200	1,50	0,15	200	2,00	0,15	
200	0,60	0,10	200	1,50	0,15	200	2,00	0,15	

Application data for \varnothing [mm]									
7 - 14.59			14.6 - 29.99			30 - 65			
v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	
200	0,60	0,10	200	1,50	0,15	200	2,00	0,15	
200	0,60	0,10	200	1,50	0,15	200	2,00	0,15	
200	0,60	0,10	200	1,50	0,15	200	2,00	0,15	
200	0,60	0,10	200	1,50	0,15	200	2,00	0,15	
200	0,60	0,10	200	1,50	0,15	200	2,00	0,15	
200	0,60	0,10	200	1,50	0,15	200	2,00	0,15	
200	0,60	0,10	200	1,50	0,15	200	2,00	0,15	

Units:
 v_c in [m/min] | [f in mm/rev]

The machining values shown are guideline values.
 The optimum data for a particular machining process may vary slightly.

Cutting data recommendations for replaceable head reamers HPR

Feed and cutting speed

HPR131 | HPR110

Cutting material: HP421 | Lead: MF1G

MMG*	Material	Strength/hardness [N/mm ²] [HRC]	
P	P1.1	Structural, free-cutting, case hardened and heat-treated steels, non-alloy	< 700 N/mm ²
	P1.2	Structural, free-cutting, case hardened and heat-treated steels, non-alloy	< 1200 N/mm ²
	P2.1	Nitrided, case hardened and heat-treated steels, alloy	< 900 N/mm ²
	P2.2	Nitrided, case hardened and heat-treated steels, alloy	< 1400 N/mm ²
	P3.1	Tool, bearing, spring and high-speed steels	< 900 N/mm ²
	P3.2	Tool, bearing, spring and high-speed steels	< 1500 N/mm ²
	P4.1	Stainless steels, ferritic and martensitic	
	P5.1	Cast steel	
	P6.1	Stainless cast steel, ferritic and martensitic	
	M	M1.1	Stainless steels, austenitic
M1.2		Stainless steels, ferritic/austenitic (duplex)	< 1000 N/mm ²
M2.1		Stainless cast steel, austenitic	< 700 N/mm ²
M3.1		Stainless cast steel, ferritic/austenitic (duplex)	< 1000 N/mm ²

HPR150 | HPR180

Cutting material: HP421 | Lead: MO2G

MMG*	Material	Strength/hardness [N/mm ²] [HRC]	
P	P1.1	Structural, free-cutting, case hardened and heat-treated steels, non-alloy	< 700 N/mm ²
	P1.2	Structural, free-cutting, case hardened and heat-treated steels, non-alloy	< 1200 N/mm ²
	P2.1	Nitrided, case hardened and heat-treated steels, alloy	< 900 N/mm ²
	P2.2	Nitrided, case hardened and heat-treated steels, alloy	< 1400 N/mm ²
	P3.1	Tool, bearing, spring and high-speed steels	< 900 N/mm ²
	P3.2	Tool, bearing, spring and high-speed steels	< 1500 N/mm ²
	P4.1	Stainless steels, ferritic and martensitic	
	P5.1	Cast steel	
	P6.1	Stainless cast steel, ferritic and martensitic	
	M	M1.1	Stainless steels, austenitic
M1.2		Stainless steels, ferritic/austenitic (duplex)	< 1000 N/mm ²
M2.1		Stainless cast steel, austenitic	< 700 N/mm ²
M3.1		Stainless cast steel, ferritic/austenitic (duplex)	< 1000 N/mm ²

Cutting data recommendations for replaceable head reamers HPR

Feed and cutting speed

HPR131 | HPR110 | HPR231 | HPR210

Cutting material: HP421 | Lead: ME1G

MMG*	Material	Strength/hardness [N/mm ²] [HRC]
P	P1.1 Structural, free-cutting, case hardened and heat-treated steels, non-alloy	< 700 N/mm ²
	P1.2 Structural, free-cutting, case hardened and heat-treated steels, non-alloy	< 1200 N/mm ²
	P2.1 Nitrided, case hardened and heat-treated steels, alloy	< 900 N/mm ²
	P2.2 Nitrided, case hardened and heat-treated steels, alloy	< 1400 N/mm ²
	P3.1 Tool, bearing, spring and high-speed steels	< 900 N/mm ²
	P3.2 Tool, bearing, spring and high-speed steels	< 1500 N/mm ²
	P4.1 Stainless steels, ferritic and martensitic	
	P5.1 Cast steel	
	P6.1 Stainless cast steel, ferritic and martensitic	
	K	K1.1 Cast iron with lamellar graphite (grey cast iron), GJL
K2.1 Cast iron with spheroidal graphite, GJS		< 500 N/mm ²
K2.2 Cast iron with spheroidal graphite, GJS		500-800 N/mm ²
K2.3 Cast iron with spheroidal graphite, GJS		> 800 N/mm ²
K3.1 Cast iron with spheroidal graphite, GJV; malleable cast iron, GJM		< 500 N/mm ²
K3.2 Cast iron with spheroidal graphite, GJV; malleable cast iron, GJM		> 500 N/mm ²

HPR131

Cutting material: CU134 | Lead: ME1G

MMG*	Material	Strength/hardness [N/mm ²] [HRC]
P	P1.1 Structural, free-cutting, case hardened and heat-treated steels, non-alloy	< 700 N/mm ²
	P1.2 Structural, free-cutting, case hardened and heat-treated steels, non-alloy	< 1200 N/mm ²
	P2.1 Nitrided, case hardened and heat-treated steels, alloy	< 900 N/mm ²
	P2.2 Nitrided, case hardened and heat-treated steels, alloy	< 1400 N/mm ²
	P3.1 Tool, bearing, spring and high-speed steels	< 900 N/mm ²
	P3.2 Tool, bearing, spring and high-speed steels	< 1500 N/mm ²
	P4.1 Stainless steels, ferritic and martensitic	
	P5.1 Cast steel	
	P6.1 Stainless cast steel, ferritic and martensitic	

* MAPAL machining groups

Application data for \varnothing [mm]												
7 - 12			12 - 18.6			18.6 - 30			30 - 65			
v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	
120	0,50	0,10	120	1,20	0,15	120	1,40	0,15	120	1,80	0,15	
120	0,50	0,10	120	1,20	0,15	120	1,40	0,15	120	1,80	0,15	
120	0,50	0,10	120	1,20	0,15	120	1,40	0,15	120	1,80	0,15	
120	0,50	0,10	120	1,20	0,15	120	1,40	0,15	120	1,80	0,15	
120	0,50	0,10	120	1,20	0,15	120	1,40	0,15	120	1,80	0,15	
120	0,50	0,10	120	1,20	0,15	120	1,40	0,15	120	1,80	0,15	
55	0,30	0,10	55	0,90	0,15	55	0,90	0,15	55	1,20	0,15	
55	0,30	0,10	55	0,90	0,15	55	0,90	0,15	55	1,20	0,15	
120	0,60	0,10	120	1,20	0,15	120	1,40	0,15	120	1,40	0,15	
120	0,60	0,10	120	1,20	0,15	120	1,40	0,15	120	1,40	0,15	
100	0,40	0,10	100	1,00	0,15	100	1,20	0,15	100	1,20	0,15	
100	0,40	0,10	100	1,00	0,15	100	1,20	0,15	100	1,20	0,15	
100	0,40	0,10	100	1,00	0,15	100	1,20	0,15	100	1,20	0,15	
100	0,40	0,10	100	1,00	0,15	100	1,20	0,15	100	1,20	0,15	

Application data for \varnothing [mm]									
7 - 14.59			14.6 - 29.99			30 - 65			
v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	
120	0,50	0,10	120	1,40	0,15	120	1,80	0,15	
120	0,50	0,10	120	1,40	0,15	120	1,80	0,15	
120	0,50	0,10	120	1,40	0,15	120	1,80	0,15	
120	0,50	0,10	120	1,40	0,15	120	1,80	0,15	
120	0,50	0,10	120	1,40	0,15	120	1,80	0,15	
120	0,50	0,10	120	1,40	0,15	120	1,80	0,15	
120	0,50	0,10	120	1,40	0,15	120	1,80	0,15	

Units:
 v_c in [m/min] | [f in mm/rev]

The machining values shown are guideline values.
 The optimum data for a particular machining process may vary slightly.

Cutting data recommendations for replaceable head reamers HPR

Feed and cutting speed

HPR131 | HPR110 | HPR231 | HPR210

Cutting material: CU134 | Lead: ME1G

HPR131 | HPR110

Cutting material: CP134 | Lead: ME1G

MMG*	Material	Strength/hardness [N/mm ²] [HRC]	
P	P1.1 Structural, free-cutting, case hardened and heat-treated steels, non-alloy	< 700 N/mm ²	
	P1.2 Structural, free-cutting, case hardened and heat-treated steels, non-alloy	< 1200 N/mm ²	
	P2.1 Nitrided, case hardened and heat-treated steels, alloy	< 900 N/mm ²	
	P2.2 Nitrided, case hardened and heat-treated steels, alloy	< 1400 N/mm ²	
	P3.1 Tool, bearing, spring and high-speed steels	< 900 N/mm ²	
	P3.2 Tool, bearing, spring and high-speed steels	< 1500 N/mm ²	
	P4.1 Stainless steels, ferritic and martensitic		
	P5.1 Cast steel		
	P6.1 Stainless cast steel, ferritic and martensitic		
	K	K1.1 Cast iron with lamellar graphite (grey cast iron), GJL	< 300 N/mm ²
		K2.1 Cast iron with spheroidal graphite, GJS	< 500 N/mm ²
		K2.2 Cast iron with spheroidal graphite, GJS	500-800 N/mm ²
K2.3 Cast iron with spheroidal graphite, GJS		> 800 N/mm ²	
K3.1 Cast iron with spheroidal graphite, GJV; malleable cast iron, GJM		< 500 N/mm ²	
K3.2 Cast iron with spheroidal graphite, GJV; malleable cast iron, GJM		> 500 N/mm ²	

HPR180 | HPR150 | HPR280 | HPR250

Cutting material: CU134 | Lead: ML2G

MMG*	Material	Strength/hardness [N/mm ²] [HRC]
P	P1.1 Structural, free-cutting, case hardened and heat-treated steels, non-alloy	< 700 N/mm ²
	P1.2 Structural, free-cutting, case hardened and heat-treated steels, non-alloy	< 1200 N/mm ²
	P2.1 Nitrided, case hardened and heat-treated steels, alloy	< 900 N/mm ²
	P2.2 Nitrided, case hardened and heat-treated steels, alloy	< 1400 N/mm ²
	P3.1 Tool, bearing, spring and high-speed steels	< 900 N/mm ²
	P3.2 Tool, bearing, spring and high-speed steels	< 1500 N/mm ²
	P4.1 Stainless steels, ferritic and martensitic	
	P5.1 Cast steel	
	P6.1 Stainless cast steel, ferritic and martensitic	

* MAPAL machining groups

	Application data for \varnothing [mm]								
	7 - 9.59			9.6 - 29.99			30 - 65		
	v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	v_c	f	Stock removal a_p
	160	0,50	0,10	160	1,30	0,15	160	1,80	0,15
	160	0,50	0,10	160	1,30	0,15	160	1,80	0,15
	160	0,50	0,10	160	1,30	0,15	160	1,80	0,15
	160	0,50	0,10	160	1,30	0,15	160	1,80	0,15
	160	0,50	0,10	160	1,30	0,15	160	1,80	0,15
	160	0,50	0,10	160	1,30	0,15	160	1,80	0,15
	180	0,60	0,10	180	2,40	0,10	180	3,20	0,15
	160	0,60	0,10	160	1,80	0,10	160	2,40	0,15

	Application data for \varnothing [mm]								
	7 - 9.59			9.6 - 29.99			30 - 65		
	v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	v_c	f	Stock removal a_p
	160	0,50	0,10	160	1,30	0,15	160	1,80	0,15
	160	0,50	0,10	160	1,30	0,15	160	1,80	0,15
	160	0,50	0,10	160	1,30	0,15	160	1,80	0,15
	160	0,50	0,10	160	1,30	0,15	160	1,80	0,15
	160	0,50	0,10	160	1,30	0,15	160	1,80	0,15
	160	0,50	0,10	160	1,30	0,15	160	1,80	0,15

Units:
 v_c in [m/min] | [f in mm/rev]

The machining values shown are guideline values.
 The optimum data for a particular machining process may vary slightly.

Cutting data recommendations for replaceable head reamers HPR

Feed and cutting speed

HPR180 | HPR150 | HPR280 | HPR250

Cutting material: HP421 | Lead: ML2G

MMG*	Material	Strength/hardness [N/mm ²] [HRC]	
P	P1.1	Structural, free-cutting, case hardened and heat-treated steels, non-alloy	< 700 N/mm ²
	P1.2	Structural, free-cutting, case hardened and heat-treated steels, non-alloy	< 1200 N/mm ²
	P2.1	Nitrided, case hardened and heat-treated steels, alloy	< 900 N/mm ²
	P2.2	Nitrided, case hardened and heat-treated steels, alloy	< 1400 N/mm ²
	P3.1	Tool, bearing, spring and high-speed steels	< 900 N/mm ²
	P3.2	Tool, bearing, spring and high-speed steels	< 1500 N/mm ²
	P4.1	Stainless steels, ferritic and martensitic	
	P5.1	Cast steel	
	P6.1	Stainless cast steel, ferritic and martensitic	

HPR150 | HPR180 | HPR280 | HPR250

Cutting material: CP134 | Lead: MC1G

MMG*	Material	Strength/hardness [N/mm ²] [HRC]	
K	K1.1	Cast iron with lamellar graphite (grey cast iron), GJL	< 300 N/mm ²
	K2.1	Cast iron with spheroidal graphite, GJS	< 500 N/mm ²
	K2.2	Cast iron with spheroidal graphite, GJS	500-800 N/mm ²
	K2.3	Cast iron with spheroidal graphite, GJS	> 800 N/mm ²
	K3.1	Cast iron with spheroidal graphite, GJV; malleable cast iron, GJM	< 500 N/mm ²
	K3.2	Cast iron with spheroidal graphite, GJV; malleable cast iron, GJM	> 500 N/mm ²

HPR150 | HPR250

Cutting material: CP134 | Lead: ML2G

HPR180 | HPR280

Cutting material: CP134 | Lead: ML2G

MMG*	Material	Strength/hardness [N/mm ²] [HRC]	
P	P1.1	Structural, free-cutting, case hardened and heat-treated steels, non-alloy	< 700 N/mm ²
	P1.2	Structural, free-cutting, case hardened and heat-treated steels, non-alloy	< 1200 N/mm ²
	P2.1	Nitrided, case hardened and heat-treated steels, alloy	< 900 N/mm ²
	P2.2	Nitrided, case hardened and heat-treated steels, alloy	< 1400 N/mm ²
	P3.1	Tool, bearing, spring and high-speed steels	< 900 N/mm ²
	P3.2	Tool, bearing, spring and high-speed steels	< 1500 N/mm ²
	P4.1	Stainless steels, ferritic and martensitic	
	P5.1	Cast steel	
	P6.1	Stainless cast steel, ferritic and martensitic	

Application data for \varnothing [mm]									
7 - 9.59			9.6 - 29.99			30 - 65			
v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	
120	0,48	0,10	120	1,32	0,15	120	1,76	0,15	
120	0,48	0,10	120	1,32	0,15	120	1,76	0,15	
120	0,48	0,10	120	1,32	0,15	120	1,76	0,15	
120	0,48	0,10	120	1,32	0,15	120	1,76	0,15	
120	0,48	0,10	120	1,32	0,15	120	1,76	0,15	
120	0,48	0,10	120	1,32	0,15	120	1,76	0,15	
120	0,48	0,10	120	1,32	0,15	120	1,76	0,15	
55	0,30	0,10	55	0,90	0,15	55	1,20	0,15	
55	0,30	0,10	55	0,90	0,15	55	1,20	0,15	

Application data for \varnothing [mm]									
7 - 14.59			14.6 - 29.99			30 - 65			
v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	
180	0,80	0,10	180	2,40	0,15	180	3,20	0,15	
160	0,80	0,10	160	1,80	0,15	160	2,40	0,15	

Application data for \varnothing [mm]									
7 - 9.59			9.6 - 29.99			30 - 65			
v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	
160	0,50	0,10	160	1,30	0,15	160	1,80	0,15	
160	0,50	0,10	160	1,30	0,15	160	1,80	0,15	
160	0,50	0,10	160	1,30	0,15	160	1,80	0,15	
160	0,50	0,10	160	1,30	0,15	160	1,80	0,15	
160	0,50	0,10	160	1,30	0,15	160	1,80	0,15	
160	0,50	0,10	160	1,30	0,15	160	1,80	0,15	

Units:
 v_c in [m/min] | [f in mm/rev]

The machining values shown are guideline values.
 The optimum data for a particular machining process may vary slightly.

Cutting data recommendations for replaceable head reamers HPR

Feed and cutting speed

HPR110 | HPR131 | HPR210 | HPR231

Cutting material: HP612 | Lead: MF1G

MMG*		Material	Strength/hardness [N/mm ²] [HRC]
S	S1	S1.1 Titanium, titanium alloys	< 400 N/mm ²
	S2	S2.1 Titanium, titanium alloys	< 1200 N/mm ²
		S2.2 Titanium, titanium alloys	> 1200 N/mm ²
	S3	S3.1 Nickel, non-alloy and alloy	< 900 N/mm ²
		S3.2 Nickel, non-alloy and alloy	> 900 N/mm ²
	S4	S4.1 High-temperature super alloy Ni, Co and Fe-based	
	S5	S5.1 Tungsten and molybdenum alloys	

HPR150 | HPR180 | HPR250 | HPR280

Cutting material: HP612 | Lead: MO2G

MMG*		Material	Strength/hardness [N/mm ²] [HRC]
S	S1	S1.1 Titanium, titanium alloys	< 400 N/mm ²
	S2	S2.1 Titanium, titanium alloys	< 1200 N/mm ²
		S2.2 Titanium, titanium alloys	> 1200 N/mm ²
	S3	S3.1 Nickel, non-alloy and alloy	< 900 N/mm ²
		S3.2 Nickel, non-alloy and alloy	> 900 N/mm ²
	S4	S4.1 High-temperature super alloy Ni, Co and Fe-based	
	S5	S5.1 Tungsten and molybdenum alloys	

HPR130 | HPR100 | HPR230 | HPR200

Cutting material: CP134 | Lead: MC1G

MMG*		Material	Strength/hardness [N/mm ²] [HRC]
K	K1	K1.1 Cast iron with lamellar graphite (grey cast iron), GJL	< 300 N/mm ²
		K2.1 Cast iron with spheroidal graphite, GJS	< 500 N/mm ²
	K2	K2.2 Cast iron with spheroidal graphite, GJS	500-800 N/mm ²
		K2.3 Cast iron with spheroidal graphite, GJS	> 800 N/mm ²
	K3	K3.1 Cast iron with spheroidal graphite, GJV; malleable cast iron, GJM	< 500 N/mm ²
		K3.2 Cast iron with spheroidal graphite, GJV; malleable cast iron, GJM	> 500 N/mm ²

Application data for \varnothing [mm]									
7 - 9.59			9.6 - 29.99			30 - 65			
v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	
35	0,24	0,10	35	0,70	0,10	35	1,00	0,10	
35	0,24	0,10	35	0,70	0,10	35	1,00	0,10	
35	0,24	0,10	35	0,70	0,10	35	1,00	0,10	
30	0,24	0,10	30	0,60	0,10	30	0,80	0,10	
30	0,24	0,10	30	0,60	0,10	30	0,80	0,10	
25	0,24	0,10	25	0,70	0,10	25	1,00	0,10	
25	0,24	0,10	25	0,70	0,10	25	1,00	0,10	

Application data for \varnothing [mm]									
7 - 14.59			14.6 - 29.99			30 - 65			
v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	
35	0,24	0,10	35	0,70	0,10	35	1,00	0,10	
35	0,24	0,10	35	0,70	0,10	35	1,00	0,10	
35	0,24	0,10	35	0,70	0,10	35	1,00	0,10	
30	0,24	0,10	30	0,60	0,10	30	0,80	0,10	
30	0,24	0,10	30	0,60	0,10	30	0,80	0,10	
25	0,24	0,10	25	0,70	0,10	25	1,00	0,10	
25	0,24	0,10	25	0,70	0,10	25	1,00	0,10	

Application data for \varnothing [mm]									
7 - 9.59			9.6 - 29.99			30 - 65			
v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	
180	0,60	0,10	180	1,40	0,15	180	1,80	0,15	
160	0,60	0,10	160	1,40	0,15	160	1,80	0,15	

Units:
 v_c in [m/min] | [f in mm/rev]

The machining values shown are guideline values.
 The optimum data for a particular machining process may vary slightly.

Cutting data recommendations for replaceable head reamers CPR

Feed and cutting speed

CPR510

Cutting material: HP145 | Lead: MG1M

CPR505

Cutting material: HP145 | Lead: MV0A

CPR610

Cutting material: HP421 | Lead: MY1G

MMG*		Material	Strength/hardness [N/mm ²] [HRC]	
P	P1	P1.1 Structural, free-cutting, case hardened and heat-treated steels, non-alloy	< 700 N/mm ²	
		P1.2 Structural, free-cutting, case hardened and heat-treated steels, non-alloy	< 1200 N/mm ²	
	P2	P2.1 Nitrided, case hardened and heat-treated steels, alloy	< 900 N/mm ²	
		P2.2 Nitrided, case hardened and heat-treated steels, alloy	< 1400 N/mm ²	
	P3	P3.1 Tool, bearing, spring and high-speed steels	< 900 N/mm ²	
		P3.2 Tool, bearing, spring and high-speed steels	< 1500 N/mm ²	
	P4	P4.1 Stainless steels, ferritic and martensitic		
	P5	P5.1 Cast steel		
	P6	P6.1 Stainless cast steel, ferritic and martensitic		
	K	K1	K1.1 Cast iron with lamellar graphite (grey cast iron), GJL	< 300 N/mm ²
			K2.1 Cast iron with spheroidal graphite, GJS	< 500 N/mm ²
		K2	K2.2 Cast iron with spheroidal graphite, GJS	500–800 N/mm ²
K2.3 Cast iron with spheroidal graphite, GJS			> 800 N/mm ²	
K3		K3.1 Cast iron with spheroidal graphite, GJV; malleable cast iron, GJM	< 500 N/mm ²	
		K3.2 Cast iron with spheroidal graphite, GJV; malleable cast iron, GJM	> 500 N/mm ²	

CPR600

Cutting material: HP421 | Lead: MC1G

MMG*		Material	Strength/hardness [N/mm ²] [HRC]
K	K1	K1.1 Cast iron with lamellar graphite (grey cast iron), GJL	< 300 N/mm ²
		K2.1 Cast iron with spheroidal graphite, GJS	< 500 N/mm ²
	K2	K2.2 Cast iron with spheroidal graphite, GJS	500–800 N/mm ²
		K2.3 Cast iron with spheroidal graphite, GJS	> 800 N/mm ²
	K3	K3.1 Cast iron with spheroidal graphite, GJV; malleable cast iron, GJM	< 500 N/mm ²
		K3.2 Cast iron with spheroidal graphite, GJV; malleable cast iron, GJM	> 500 N/mm ²

CPR605

Cutting material: HP421 | Lead: MV0A

Application data for \varnothing [mm]												
8 - 12			12 - 16			16 - 30			30 - 40			
v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	
160	0,70	0,10	160	1,00	0,10	160	1,50	0,15	160	2,00	0,15	
160	0,70	0,10	160	1,00	0,10	160	1,50	0,15	160	2,00	0,15	
160	0,70	0,10	160	1,00	0,10	160	1,50	0,15	160	2,00	0,15	
160	0,70	0,10	160	1,00	0,10	160	1,50	0,15	160	2,00	0,15	
160	0,70	0,10	160	1,00	0,10	160	1,50	0,15	160	2,00	0,15	
160	0,70	0,10	160	1,00	0,10	160	1,50	0,15	160	2,00	0,15	
80	0,50	0,10	80	0,80	0,10	80	1,50	0,15	80	1,50	0,15	
80	0,50	0,10	80	0,80	0,10	80	1,50	0,15	80	1,50	0,15	

Application data for \varnothing [mm]									
8 - 14.59			14.6 - 29.99			30 - 40.2			
v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	
120	0,60	0,10	120	1,32	0,15	120	1,76	0,15	
120	0,60	0,10	120	1,32	0,15	120	1,76	0,15	
100	0,40	0,10	100	1,20	0,15	100	1,60	0,15	
100	0,40	0,10	100	1,20	0,15	100	1,60	0,15	
100	0,40	0,10	100	1,20	0,15	100	1,60	0,15	
100	0,40	0,10	100	1,20	0,15	100	1,60	0,15	

Units:
 v_c in [m/min] | [f in mm/rev]

The machining values shown are guideline values.
 The optimum data for a particular machining process may vary slightly.

Cutting data recommendations for replaceable head reamers CPR

Feed and cutting speed

CPR600

Cutting material: PU620 | Lead: MCOA

CPR605

Cutting material: PU620 | Lead: MA0A

MMG*		Material	Strength/hardness [N/mm ²] [HRC]
N	N1	N1.1 Aluminium, non-alloy and alloy < 3 % Si	
		N1.2 Aluminium, alloy ≤ 7 % Si	
		N1.3 Aluminium, alloy > 7-12% Si	
		N1.4 Aluminium, alloy > 12 % Si	
	N2	N2.1 Copper, non-alloy and low-alloy	< 300 N/mm ²
		N2.2 Copper, alloy	> 300 N/mm ²
		N2.3 Brass, bronze, gunmetal	< 1200 N/mm ²
	N3	N3.1 Graphite	
	N4	N4.1 Plastic, thermoplastics	
		N4.2 Plastic, thermosets	
		N4.3 Plastic, foams	

CPR600

Cutting material: HU612 | Lead: MC1G

CPR605

Cutting material: HU612 | Lead: MV0A

MMG*		Material	Strength/hardness [N/mm ²] [HRC]
N	N1	N1.1 Aluminium, non-alloy and alloy < 3 % Si	
		N1.2 Aluminium, alloy ≤ 7 % Si	
		N1.3 Aluminium, alloy > 7-12% Si	
		N1.4 Aluminium, alloy > 12 % Si	
	N2	N2.1 Copper, non-alloy and low-alloy	< 300 N/mm ²
		N2.2 Copper, alloy	> 300 N/mm ²
		N2.3 Brass, bronze, gunmetal	< 1200 N/mm ²
	N3	N3.1 Graphite	
	N4	N4.1 Plastic, thermoplastics	
		N4.2 Plastic, thermosets	
		N4.3 Plastic, foams	

* MAPAL machining groups

Application data for \varnothing [mm]									
8 - 14.59			14.6 - 29.99			30 - 40.2			
v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	
200	0,60	0,10	200	1,50	0,15	200	2,00	0,15	
200	0,60	0,10	200	1,50	0,15	200	2,00	0,15	
200	0,60	0,10	200	1,50	0,15	200	2,00	0,15	
200	0,60	0,10	200	1,50	0,15	200	2,00	0,15	
200	0,60	0,10	200	1,50	0,15	200	2,00	0,15	
200	0,60	0,10	200	1,50	0,15	200	2,00	0,15	
200	0,60	0,10	200	1,50	0,15	200	2,00	0,15	
200	0,60	0,10	200	1,50	0,15	200	2,00	0,15	

Application data for \varnothing [mm]											
8 - 12			12 - 16			16 - 30			30 - 40.2		
v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	v_c	f	Stock removal a_p	v_c	f	Stock removal a_p
30	0,60	0,10	30	0,40	0,15	30	0,50	0,15	30	0,60	0,15
30	0,60	0,10	30	0,40	0,15	30	0,50	0,15	30	0,60	0,15
30	0,60	0,10	30	0,40	0,15	30	0,50	0,15	30	0,60	0,15
30	0,60	0,10	30	0,40	0,15	30	0,50	0,15	30	0,60	0,15
30	0,60	0,10	30	0,40	0,15	30	0,50	0,15	30	0,60	0,15
30	0,60	0,10	30	0,40	0,15	30	0,50	0,15	30	0,60	0,15
30	0,60	0,10	30	0,40	0,15	30	0,50	0,15	30	0,60	0,15
30	0,60	0,10	30	0,40	0,15	30	0,50	0,15	30	0,60	0,15

Units:
 v_c in [m/min] | [f in mm/rev]

The machining values shown are guideline values.
 The optimum data for a particular machining process may vary slightly.

Cutting data recommendations for replaceable head reamers CPR

Feed and cutting speed

CPR610

Cutting material: CU130 | Lead: MY1G

CPR605

Cutting material: CU130 | Lead: MV0A

MMG*	Material	Strength/hardness [N/mm ²] [HRC]	
P	P1.1 Structural, free-cutting, case hardened and heat-treated steels, non-alloy	< 700 N/mm ²	
	P1.2 Structural, free-cutting, case hardened and heat-treated steels, non-alloy	< 1200 N/mm ²	
	P2.1 Nitrided, case hardened and heat-treated steels, alloy	< 900 N/mm ²	
	P2.2 Nitrided, case hardened and heat-treated steels, alloy	< 1400 N/mm ²	
	P3.1 Tool, bearing, spring and high-speed steels	< 900 N/mm ²	
	P3.2 Tool, bearing, spring and high-speed steels	< 1500 N/mm ²	
	P4.1 Stainless steels, ferritic and martensitic		
	P5.1 Cast steel		
	P6.1 Stainless cast steel, ferritic and martensitic		
	K	K1.1 Cast iron with lamellar graphite (grey cast iron), GJL	< 300 N/mm ²
		K2.1 Cast iron with spheroidal graphite, GJS	< 500 N/mm ²
		K2.2 Cast iron with spheroidal graphite, GJS	500-800 N/mm ²
K2.3 Cast iron with spheroidal graphite, GJS		> 800 N/mm ²	
K3.1 Cast iron with spheroidal graphite, GJV; malleable cast iron, GJM		< 500 N/mm ²	
K3.2 Cast iron with spheroidal graphite, GJV; malleable cast iron, GJM		> 500 N/mm ²	

CPR610

Cutting material: HP421 | Lead: MF1G

CPR605

Cutting material: HP421 | Lead: MTOA

MMG*	Material	Strength/hardness [N/mm ²] [HRC]	
P	P1.1 Structural, free-cutting, case hardened and heat-treated steels, non-alloy	< 700 N/mm ²	
	P1.2 Structural, free-cutting, case hardened and heat-treated steels, non-alloy	< 1200 N/mm ²	
	P2.1 Nitrided, case hardened and heat-treated steels, alloy	< 900 N/mm ²	
	P2.2 Nitrided, case hardened and heat-treated steels, alloy	< 1400 N/mm ²	
	P3.1 Tool, bearing, spring and high-speed steels	< 900 N/mm ²	
	P3.2 Tool, bearing, spring and high-speed steels	< 1500 N/mm ²	
	P4.1 Stainless steels, ferritic and martensitic		
	P5.1 Cast steel		
	P6.1 Stainless cast steel, ferritic and martensitic		
	M	M1.1 Stainless steels, austenitic	< 700 N/mm ²
		M1.2 Stainless steels, ferritic/austenitic (duplex)	< 1000 N/mm ²
		M2.1 Stainless cast steel, austenitic	< 700 N/mm ²
M3.1 Stainless cast steel, ferritic/austenitic (duplex)		< 1000 N/mm ²	

* MAPAL machining groups

Pictograms

Design

	1 Single-bladed reamer		2 Twin-bladed reamer		WP WP indexable insert		HX HX indexable insert
	Internal coolant supply		External coolant supply		HA Cylindrical shank in accordance with DIN 6535		Cylindrical shank with clamping surface
	HE Cylindrical shank in accordance with DIN 6535		MK Morse taper shank (MK)		HSK-A		HSK-C
	Module		+4 μm Grinding tolerance				

Design

	Monolithic		Connection CFS		Connection HFS		HFS axial clamping system
	HFS radial clamping system		Cutting ring				

Bore

	Through bore		Blind bore		Face shoulder bore		Interrupted cut
	≤ IT7 Achievable bore tolerance		Ra < 2 Achievable surface finish				

Product class

	Basic Line: Universal tools, broad application area, low procurement costs		Performance Line: High-performance tools, broad application area, high productivity in series production manufacturing
	Expert Line: Specialist tools for selected applications, maximum precision and productivity		

Material suitability

Highly suitable
 Suitable in some situations

Example standard material suitability table

P	1	2	3	4	5	6	M	1	2	3	K	1	2	3	N	1	2	3	4	S	1	2	3	4	5	H	1	2	
■	■	■	■				■				■	■			■						■						■		

Example material suitability table for non-ferrous metals and lightweight materials

N	1.1	1.2	1.3	1.4	2.1	2.2	2.3	3.1	4.1	4.2	4.3	C	1.1	1.2	1.3	2.1	3.1	4.1	4.2	4.3	4.4	5.1	5.2
■						■	■	■				■	■	■	■	■	■	■	■	■	■		

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MAPAL machining groups

The MAPAL machining groups make it possible to provide precise information on the suitability of a tool for certain workpiece materials. Crucial for the categorisation of the groups is the machinability in relation to the cutting data (cutting speed and feed) for a material. It is necessary to sub-divide certain workpiece material groups based on the strength/hardness of the related workpiece material.

Machining group		Material	Tensile strength - hardness [N/mm ² - HRC]	Frequently machined workpiece materials
P	P1	P1.1 Structural, free-cutting, case hardened and heat-treated steels, non-alloy	< 700 N/mm ²	1.0122 (S235/St 37), 1.0401 (C15), 1.0503 (C45), 1.0570 (S355/St 52), 1.1213 (Cf53)
		P1.2 Structural, free-cutting, case hardened and heat-treated steels, non-alloy	< 1200 N/mm ²	1.1249 (Cf70)
	P2	P2.1 Nitrided, case hardened and heat-treated steels, alloy	< 900 N/mm ²	1.7131 (16MnCr5)
		P2.2 Nitrided, case hardened and heat-treated steels, alloy	< 1400 N/mm ²	1.7227 (42CrMo54)
	P3	P3.1 Tool, bearing, spring and high-speed steels	< 900 N/mm ²	1.2343 (X38CrMoV5-1)
		P3.2 Tool, bearing, spring and high-speed steels	< 1500 N/mm ²	1.3505 (100Cr6)
P4	P4.1 Stainless steels, ferritic and martensitic		1.4510 (X3CrTi17), 1.4589 (X5CrNiMoTi15-2)	
P5	P5.1 Cast steel		1.7231 (G42CrMo4)	
M	M1	M1.1 Stainless steels, austenitic	< 700 N/mm ²	1.4301 (V2A), 1.4571 (V4A)
		M1.2 Stainless steels, ferritic/austenitic (duplex)	< 1000 N/mm ²	1.4362 (Alloy 2304), 1.4501, 1.4662 (LDX 2404)
	M2	M2.1 Stainless cast steel, austenitic	< 700 N/mm ²	
K	K1	K1.1 Cast iron with lamellar graphite (grey cast iron), GJL	< 300 N/mm ²	GJL-250 (GG-25), GJL-260 (GG-26 Cr)
		K2.1 Cast iron with spheroidal graphite, GJS	< 500 N/mm ²	GJS-400 (GGG-40), GJS-450 (GGG-45)
	K2	K2.2 Cast iron with spheroidal graphite, GJS	500-800 N/mm ²	GJS-600 (GGG-60), GJS-800-2 (GGG-80), GJS-800-8 (ADI 800)
		K2.3 Cast iron with spheroidal graphite, GJS	> 800 N/mm ²	GJS-900-2 (GGG-90), GJS-1000-5 (ADI 1000), GJS-1200-2 (ADI 1200), GJS-1400-1 (ADI 1400)
	K3	K3.1 Cast iron with spheroidal graphite, GJV; malleable cast iron, GJM	< 500 N/mm ²	GJV-300, GJV-400, GJMW-400-5 (GTW-40)
		K3.2 Cast iron with spheroidal graphite, GJV; malleable cast iron, GJM	> 500 N/mm ²	GJV-500
N	N1	N1.1 Aluminium, non-alloy and alloy < 3 % Si		Alloy 2024, Alloy 7075, Al99
		N1.2 Aluminium, alloy ≤ 7 % Si		AlSi7
		N1.3 Aluminium, alloy > 7-12 % Si		AlSi9, AlSi9Cu
		N1.4 Aluminium, alloy > 12 % Si		AlSi12, AlSi17
	N2	N2.1 Copper, non-alloy and low-alloy	< 300 N/mm ²	SE-Cu
		N2.2 Copper, alloy	> 300 N/mm ²	CuSn6
		N2.3 Brass, bronze, gunmetal	< 1200 N/mm ²	CuZn33, CuAl9Mn3
	N3	N3.1 Graphite		
	N4	N4.1 Plastic, thermoplastics		PA, PE, PC, PS, PVC, PP, PTFE, POM, PMMA
		N4.2 Plastic, thermosets		PU, PF, EP, UP, VE, CR
N4.3 Plastic, foams			EPS, PUR, PVC-E, PS-E, PP-E	
C	C1	C1.1 Plastic matrix, aramide fibre-reinforced (AFRP)		Nomex, Kevlar, Twaron, KOREX
		C1.2 Plastic matrix (thermosetting), CFRP/GFRP		IMS, HTA
		C1.3 Plastic matrix (thermoplastic), CFRP/GFRP		GMT-PP, PEEK
	C2	C2.1 Carbon matrix, carbon fibre-reinforced (CFC)		CF222, CF225, CF226, CF227, CF260
	C3	C3.1 Metal matrix (MMC)		CeramTec AD-403 (AlSi9MgMn-Al2O3), Al/Cu/Mg-SiO2/Al2O3/AlN/TiC/SiC/BN/TiB2
C4	C4.1 Sandwich construction, honeycomb core made of paper			
	C4.2 Sandwich construction, honeycomb core made of aluminium		PLASCORE PAMG-XR1 5052, PCGA-XR1 3003, PAMG-XR1 5056, Micro-Cell (Kern aus Alloy 5052/5056)	
	C4.3 Sandwich construction, honeycomb core made of plastic and fibre composite material		CORMASTER, TUBUS, KOREX, HFT-G, TPU, HFT, HRH (HRH-10, HRH-310, HRH-78, HRH-49, HRH-327), HDC-F	
	C4.4 Sandwich construction, core made of rigid foam panels		AIREX R63, AIREX C70, ROHACELL IG-F	
C5	C5.1 Stack (hybrid structure), CFRP aluminium		IMS/HTA + Alloy 2024/6061/7075	
	C5.2 Stack (hybrid structure), CFRP titanium/stainless steel		IMS/HTA + TiAl6V4/AMS4905	
S	S1	S1.1 Titanium, titanium alloys	< 400 N/mm ²	
		S2.1 Titanium, titanium alloys	< 1200 N/mm ²	TiAl6V4
	S2	S2.2 Titanium, titanium alloys	> 1200 N/mm ²	
		S3.1 Nickel, non-alloy and alloy	< 900 N/mm ²	1.3912 (Invar, N36)
	S3	S3.2 Nickel, non-alloy and alloy	> 900 N/mm ²	
S4	S4.1 High-temperature super alloy Ni, Co and Fe-based		Hardox, Hastelloy, Incoloy, Inconel, NIMONIC, Stellite, Waspaloy	
H	S5	S5.1 Tungsten and molybdenum alloys		
		H1.1 Hardened steel/cast steel	45-55 HRC	
		H1.2 Hardened steel/cast steel	55-64 HRC	
	H1.3 Hardened steel/cast steel	64-70 HRC		
H2	H2.1 Wear-resistant cast iron/chilled cast iron, GJN			



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