



Multi-bladed reamers and counterboring tools



BECK 
Präzisionswerkzeuge



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The tool specialists for the trade.

August BECK GmbH & Co. KG in Winterlingen is a member of the „tool-traders-partner“ association and utilises the benefits of this strong community to the benefit of its customers and the quality of its products. Further information can be found on the last page of this catalogue.

The partner for reaming and countersinking – quick and reliable precision

Founded in 1906 by August Beck as a mechanical workshop for fixed tools, the August BECK Präzisionswerkzeuge GmbH & Co. KG in Winterlingen is today the specialist for the precision machining of bores with multi-bladed reamers. Countersinking tools round out the product range. With this portfolio, the many years of experience and the specialist know-how, BECK has made a name for itself worldwide. Today the name BECK stands for high quality and precision in the products. BECK offers its customers a broad range of tools for reliable and cost effective production.

Starting from standardised reamers to DIN/ISO of HSS-E or carbide metal, through high-performance reamers of solid carbide or with soldered blades, right up to a modern replaceable head system, BECK offers a unique range of standard tools. This complete product range means that the right tool concept can always be found to meet the requirements of the material to be machined, the demanded tolerance and the planned production volume.

This broad assortment of high-quality standard products „Made in Germany“ is available from BECK from stock, and even intermediate sizes and special tolerances can be supplied at short notice.

Furthermore, BECK manufactures a wide range of special tools which offer benefits with respect to cost effectiveness and productivity, particularly for the production of large quantities. New developments constantly complement and modernise the product range in order to meet the growing demands of modern production and to offer solutions for high-performance machining and for new materials.

High-performance, modern products paired with a high availability make BECK your reliable partner for reaming and countersinking.



The August Beck GmbH & Co. KG, Präzisionswerkzeugfabrik in 72474 Winterlingen

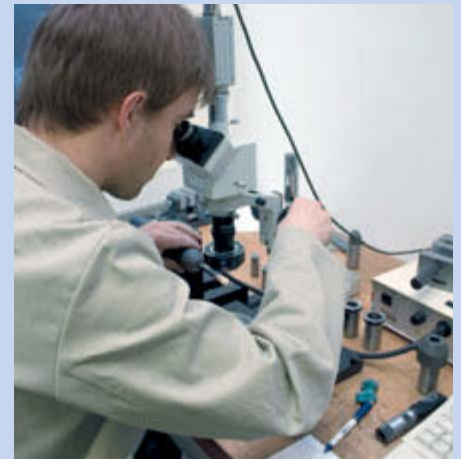
Innovative tools combined with modern production



Modern production facilities for all cutting materials



Efficient production of high quantities



Highest quality standards for constant precision

Modern machine park and qualified personnel

BECK has a modern machine park for the production of multi-bladed reamers and countersinking tools. All cutting materials, from HSS through carbide and Cermet right up to the extremely hard PCD and PcBN can be efficiently machined with high precision. The machines are optimally designed for the respective demands and equipped with the necessary grinding technology. Even large series, for example of standardised tool designs, are produced very efficiently and cost effectively on automated lines. Special machines and equipment are

available for the production of very small tool diameters, allowing all variations in diameter and cutting material to be covered. BECK quality tools are produced by highly qualified personnel on the latest machines. The processes certified to DIN EN ISO 9001:2008 guarantee the highest quality standards and constant high precision.

Innovations

The broad product range is constantly being expanded. The many years of experience and the know-how at BECK paired with creativity regularly result in new tool concepts which make production processes more cost effective and more productive. Whether for steel, cast iron, aluminium or modern fibre composites, the tools from BECK are a match for any task. For the machining of steel, for example, there are special series for stainless and hardened steels in addition to the high-performance carbide and Cermet versions. Special HPC versions increase the cutting values and thus reduce production times in high-performance machining.



Micro reamers of solid carbide from 0.6 mm dia.



XR replaceable reamer heads as a modular system for high-performance reaming

Our product portfolio:

Reamers of HSS, solid carbide, solid Cermet and with soldered blades, countersinks of HSS and solid carbide, counterboring tools of HSS

BECK 
Präzisionswerkzeuge

Simple ordering, reliable delivery, competent service



Stocking and availability

A complete product range and high availability are typical Beck trademarks. A wide range of reamers, boring and countersinking tools are quickly available from stock. Just as varied as the product range are the possibilities for ordering at BECK. Whether the products are ordered by telephone, telefax or e-mail, one thing always remains the same – the fast order handling. In the BECK logistics centre, order picking and packing take place on modern machines so that the shipment is quickly handed over to our logistics partners and on its way to the customer. The materials management systems in the customer's works and at BECK can naturally also be linked via corresponding interfaces and hence regular orders placed directly. Apart from the finished products, BECK also has a wide range of semi-finished reamers which can be used as the basis for intermediate sizes and tolerances. These reamers can thus also be delivered within a few working days.

Regrinding

Particularly with very high-quality tools such as high-performance reamers, the level of utilisation of tools can be improved and costs saved by regrinding. Correct regrinding in OEM quality is the precondition here for consistently good machining results.

Technical support, training and tests

The competent technical support from BECK helps the customer to choose the right tool for his machining operation from the broad product range. Service at BECK also means that customised seminars and trials are possible on the introduction of new tool versions to allow the customer's personnel to take advantage of the know-how of the BECK specialists.



Stores and logistics
– reliable, fast and secure
High availability from stock and fast processes in order handling, order picking and packing ensure that the BECK tools are

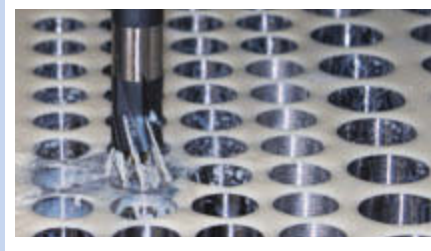
quickly on their way to the customer. BECK works together with various logistics partners for the quick and secure transport.



Fields of application

High-performance reaming with inner coolant supply

High-performance reamers are equipped with internal cooling channels which transport the cooling lubricant directly to the blades, guaranteeing optimum lubrication and cooling of the blades and allowing the highest cutting values to be achieved.



Main fields of application and product features

- on machining centres and special machines
- for high quantities
- for close tolerances
- for the highest surface qualities
- broad choice of cutting materials and coatings
- special versions, such as for HPC, stainless steel, hardened materials, aluminium

Reaming without inner coolant supply (DIN and similar to DIN)

The standardised version of solid carbide and HSS to DIN for the reaming of cylindrical bores are complemented by NC reamers similar to DIN. Taper reamers and hand reamers complete the product range for reaming without internal cooling.



Main fields of application and product features

- for small and medium-sized batches
- high availability from stock
- HSS-E as inexpensive variant for reaming with low cutting data
- hand reamers for repairs and bores with difficult access (jig construction, assembly)

Countersinking, counterboring, deburring

Countersinking and counterboring tools round out the product range for bore machining. Countersinks are available in HSS and solid carbide, with and without coating.



Main fields of application and product features

- for flush and precise screw connections
- for boring before reaming
- HSS boring tools as an inexpensive alternative to drilling tools with intermediate sizes

Special tools and technical notes

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High-performance reaming with inner coolant supply

- MR high-performance reamers

BECK



- VR 01 multi-tooth reamers



- RR 01 Cermet high-performance reamers



■ HNC solid carbide high-performance reamers



■ XR 01 replaceable reamer heads



■ Miniature reamers with PcBN



Of the reamers with internal cooling, the various standardised series are all equipped with cooling lubricant channels running directly to the blades and hence particularly suitable for high-performance machining. The special design paired with modern cutting materials and coatings give the tools from this reamer group a particularly high performance. When used on cutting machines with internal cooling, high cutting values can be used and hence a particularly high productivity achieved. The whole diameter range from 3 to 40 mm is covered by solid carbide or solid Cermet reamers and series with soldered blades.

The way to the right tool

1

Diameter ranges [mm]		1-3		3-4			4-6			6-8			
		NC	HNC	HNC	RR 01	HCS	HNC	RR 01	HCS	VR 01	HNC	RR 01	
										Solid carbide			
Through hole		●	●	●	●	●	●	●	●	●	●	●	
Blind hole		●	●	●	●		●	●			●	●	
P ₁	Steel < 900 N/mm ²			Coated solid carbide	Cermet	Solid Cermet	Coated solid carbide	Cermet	Solid Cermet	Coated solid carbide	Coated solid carbide	Cermet	
	Catalogue page			42,43,52	25,27	53	42,43,52	25,27	53	32	42,43,52	25,27	
P ₂	Steel 900 - 1400 N/mm ²			Coated solid carbide	Cermet	Solid Cermet	Coated solid carbide	Cermet	Solid Cermet	Coated solid carbide	Coated solid carbide	Cermet	
	Catalogue page			42,43,52	25,27	53	42,43,52	25,27	53	32	42,43,52	25,27	
M	rustproof and acid-resistant steel			Solid carbide + BVA			Solid carbide + BVA				Solid carbide + BVA		
	Catalogue page			44,45,52			44,45,52				44,45,52		
K ₁	Grey cast iron, alloyed grey cast iron (GG)	PcBN (**)	PcBN (**)	Coated solid carbide / PcBN (**)			Coated solid carbide / PcBN (**)			Coated solid carbide	Coated solid carbide / PcBN (**)		
	Catalogue page	On request	On request	42,43,52			42,43,52			32	42,43,52		
K ₂	Spheroidal graphite cast iron, vermicular graphite cast iron, malleable cast steel (GGG)			Coated solid carbide	Cermet	Solid Cermet	Coated solid carbide	Cermet	Solid Cermet	Coated solid carbide	Coated solid carbide	Cermet	
	Catalogue page			42,43,52	25,27	53	42,43,52	25,27	53	32	42,43,52	25,27	
K ₃	Spheroidal graphite cast iron, vermicular graphite cast iron, malleable cast steel (> GGG 50)			Coated solid carbide			Coated solid carbide			Coated solid carbide	Coated solid carbide		
	Catalogue page			42,43,52			42,43,52			32	42,43,52		
N ₁	Copper, brass, zinc			Solid carbide			Solid carbide				Solid carbide		
	Catalogue page			40,41			40,41				40,41		
N ₂	Aluminium			Solid carbide + BAL			Solid carbide + BAL				Solid carbide + BAL		
	Catalogue page			48,49			48,49				48,49		
N ₃	Plastics, hard glass fibre / carbon fibre-reinforced (GFRP / CFRP)			Solid carbide + Dia.			Solid carbide + Dia.				Solid carbide + Dia.		
	Catalogue page			50,51			50,51				50,51		
S	High-temperature steels, titanium and nickel alloys			Solid carbide (*)			Solid carbide (*)				Solid carbide (*)		
	Catalogue page			40,41			40,41				40,41		
H	Hardened steel, chilled cast iron	PcBN (**)	PcBN (**)	Solid carbide + BHV / PcBN (**)			Solid carbide + BHV / PcBN (**)				Solid carbide + BHV / PcBN (**)		
	Catalogue page	On request	On request	46,47			46,47				46,47		

(*) special cutting edge geometry (**) upon agreement

Fixed monoblock versions															Adjustable mono-block versions				Fixed modular reamers				
															Expandable			Finely ad-justable					
8-10			10-12					12-20				20-40			8-21		21-40	8-40	8-12		12-40		
HCS	VR 01	MR 01	HNC	RR 01	HCS	VR 01		MR 01	HNC	RR 01	VR 01	MR 01	RR 01	VR 01	MR 01	RR 01	MR 02	MR 02	MR 03	XR 01	XR 01	XR 01	XR 01
	Solid carbide					Solid carbide	soldered				soldered			soldered						straight fluted	left-hand helix	straight fluted	left-hand helix
●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
		●	●	●				●	●	●		●	●		●		●	●	●			●	
Solid Cermet	Coated solid carbide	Cermet	Coated solid carbide	Cermet	Solid Cermet	Coated solid carbide	Cermet	Cermet	Coated solid carbide	Cermet	Cermet	Cermet	Cermet	Cermet	Cermet	Cermet	Cermet	Cermet	Cermet		Cermet	Cermet	Cermet
53	32	22	42,43,52	25,27	53	32	35	22	42,43,52	25,27	35	22	26,28	35	22	29	22	22	22		56	61	56
Solid Cermet	Coated solid carbide	Coated carbide / Cermet	Coated solid carbide	Cermet	Solid Cermet	Coated solid carbide	Coated carbide / Cermet	Coated carbide / Cermet	Coated solid carbide	Cermet	Coated carbide / Cermet	Coated carbide / Cermet	Cermet	Coated carbide / Cermet	Coated carbide / Cermet	Cermet	Coated carbide / Cermet	Coated carbide / Cermet	Coated carbide / Cermet		Coated carbide / Cermet	Coated carbide / Cermet	Coated carbide / Cermet
53	32	21,22	42,43,52	25,27	53	32	34,35	21,22	42,43,52	25,27	34,35	21,22	26,28	34,35	21,22	29	21,22	21,22	21,22		56,58	61,63	56,58
		Coated carbide (*)	Solid carbide + BVA			Coated carbide	Coated carbide (*)	Solid carbide + BVA			Coated carbide	Coated carbide (*)		Coated carbide	Coated carbide (*)		Coated carbide (*)	Coated carbide (*)	Coated carbide (*)		Coated carbide (*)	Coated carbide (*)	Coated carbide (*)
		21	44,45,52			34	21	44,45,52			34	21		34	21		21	21	21		57	62	57
	Coated solid carbide	Coated carbide / Cermet	Coated solid carbide			Coated solid carbide	PcBN (**)/ Coated carbide	Coated carbide / Cermet	Coated solid carbide		PcBN (**)/ Coated carbide	Coated carbide / Cermet		PcBN (**)/ Coated carbide	Coated carbide / Cermet	Cermet	Coated carbide / Cermet	Coated carbide / Cermet	Coated carbide / Cermet		Coated carbide	Coated carbide	Coated carbide
	32	21,22	42,43,52			32	34,36	21,22	42,43,52		34,36	21,22		34,36	21,22	29	21,22	21,22	21,22		58	63	58
Solid Cermet	Coated solid carbide	Cermet	Coated solid carbide	Cermet / Coated carbide	Solid Cermet	Coated solid carbide	Cermet	Cermet / Coated carbide	Coated solid carbide	Cermet	Cermet	Cermet / Coated carbide	Cermet	Cermet	Cermet / Coated carbide	Cermet	Cermet / Coated carbide	Cermet / Coated carbide	Cermet / Coated carbide		Cermet / Coated carbide	Cermet / Coated carbide	Cermet / Coated carbide
53	32	22	42,43,52	25,27	53	32	35	21,22	42,43,52	25,27	35	21,22	26,28	35	21,22	29	21,22	21,22	21,22		56,58	61,63	56/58
	Coated solid carbide	Coated carbide / coated Cermet	Coated solid carbide			Coated solid carbide	Coated carbide	Coated carbide / coated Cermet	Coated solid carbide		Coated carbide	Coated carbide / coated Cermet		Coated carbide / coated Cermet	Coated carbide / coated Cermet	Cermet	Coated carbide / coated Cermet	Coated carbide / coated Cermet	Coated carbide / coated Cermet		Coated carbide	Coated carbide	Coated carbide
	32	21,23	42,43,52			32	34	21,23	42,43,52		34	21,23		34	21,23	29	21,23	21,23	21,23		58	63	58
		Carbide / PCD (**)	Solid carbide			Carbide / PCD (**)	Carbide / PCD (**)	Solid carbide			Carbide / PCD (**)	Carbide / PCD (**)		Carbide / PCD (**)	Carbide / PCD (**)		Carbide / PCD (**)	Carbide / PCD (**)	Carbide / PCD (**)	Carbide / PCD (**)		Carbide / PCD (**)	
		20	40,41			33,38	20	40,41			33,38	20		33,38	20		20	20	20	59, 60		50,60,64,65	
		Carbide / PCD (**)	Solid carbide + BAL			Carbide / PCD (**)	Carbide / PCD (**)	Solid carbide + BAL			Carbide / PCD (**)	Carbide / PCD (**)		Carbide / PCD (**)	Carbide / PCD (**)		Carbide / PCD (**)	Carbide / PCD (**)	Carbide / PCD (**)	Carbide / PCD (**)		Carbide / PCD (**)	
		20	48,49			33,38	20	48,49			33,38	20		33,38	20		20	20	20	59,60		50,60,64,65	
		Carbide coated (*) / PCD (**)	Solid carbide + Dia.				PCD (**)	Solid carbide + Dia.			PCD (**)			PCD (**)			PCD (**)	PCD (**)	PCD (**)	PCD (**)		PCD (**)	
		20	50,51				On request	50, 51			On request			On request			On request	On request	On request	60		60,65	
		Coated carbide (*)	Solid carbide (*)			Coated carbide	Coated carbide (*)	Coated carbide (*)			Coated carbide (*)	Coated carbide (*)		Coated carbide (*)	Coated carbide (*)		Coated carbide (*)	Coated carbide (*)	Coated carbide (*)	Carbide (*)		carbide (*)	
		21	40,41			34	21	40,41			34	21		34	21		21	21	21	59		59,64	
			Solid carbide + BHV			PcBN (**)		Solid carbide + BHV			PcBN (**)			PcBN (**)							Coated carbide (*)	Coated carbide (*)	
			46,47			On request		46,47			On request			On request							58	58,63	

HNC

- Preferred application area: Steel
- Also available at short notice for Alu, CFRP/GFRP, stainless steel and hardened materials with special cutting geometry
- Available in many fitting diameters from stock
- Inexpensive variant in the diameter range 3 - 20 mm
- EU Extremely unequal spacing

HCS

- Preferred application areas: Steel and < GGG50
- Solid Cermet reamer
- Reliable surface quality
- Available in many fitting diameters from stock
- Regrindable
- Extreme unequal spacing

RR 01















- Main application area: Steel and < GGG50
- Available from stock in standard sizes in the diameter range 4 - 40 mm
- Optimum guidance of the cooling lubricant prevents thermal shock at the start of cutting
- Regrindable
- Extreme unequal spacing




VR 01

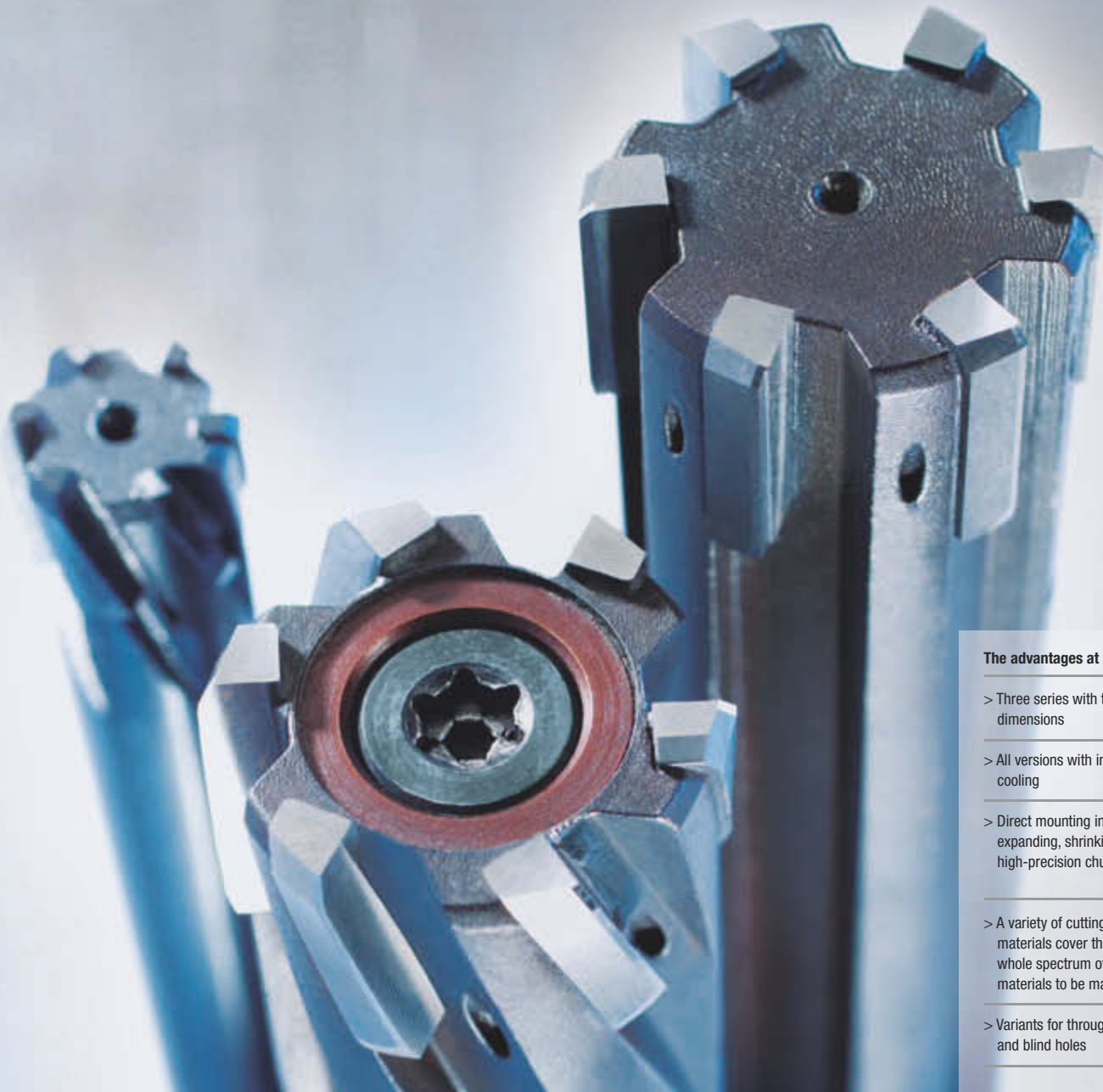
- Application area: Very flexible application thanks to standardised blanks of different cutting materials
- Extremely high feed rates possible
- Reliable chip transport to the front
- High roundness precision in the diameter range 10 - 40 mm
- Tool can be repeatedly refitted, thus always guaranteeing 100% tool life
- Solid carbide variant in the diameter range 6 - 12 mm
- Soldered variant in the diameter range 10 - 40 mm
- Optimum pressure loss-free cooling lubricant transport to the blade

MR

- Application area: Flexible application
- Is preferably used in the diameter range 20 - 40 mm
- Interesting alternative to solid carbide tools from 20 mm diameter
- Variable choice of cutting materials
- Flexible system thanks to possibility of changing to expandable or finely adjustable versions

Standard	Shape	Design	Cutting material	Dia. range	Code	Page
Monoblock reamers - fixed and adjustable						
MR 01		Through holes, Blind holes Fixed version	Carbide	8,0 – 40,0	041xx0	20
MR 02		Through holes, Blind holes Adjustable, with expansion screw	Carbide coated Cermet Cermet coated		041xx1 041xx2 041xx3	21 22 23
MR 03		Through holes, blind holes Finely adjustable				
RR 01		Through holes + Blind holes	Cermet Cermet tipped	4,0 – 20,0 21,0 – 40,0	040325 040326 040340 040341	25 26 27 28
RR 01		Through holes Expandable version	Cermet tipped	8,0 – 40,0	040327	29
VR 01		Through holes Multi-tooth reamer	Solid carbide coated Carbide Carbide coated Cermet CBN for cast iron CBN for hardened materials PCD	6,0 – 12,0 10,0 – 40,0	040390 040370 040382 040372 040376 040378 040374	32 33 34 35 36 37 38
HNC		Through holes Blind holes	Solid carbide	3,0 – 20,0	040260 040261	40 41
HNC-Speed		Through holes Blind holes	Solid carbide + BSP coating	3,0 – 20,0	043260 043261	42 43
HNC-VA		Through holes Blind holes	Solid carbide + BVA coating	3,97 – 20,0	043270 043271	44 45
HNC-HT		Through holes Blind holes	Solid carbide + BHV coating	3,97 – 20,0	043280 043281	46 47
HNC-AL		Through holes Blind holes	Solid carbide + BAL coating	4,0 – 20,0	043250 043251	48 49
HNC-Diamond		Through holes Blind holes	Solid carbide + diamond coating	4,0 – 20,0	043290 043291	50 51
HNC-Short		Blind holes (+ Through holes)	Solid carbide + BSP coating	3,0 – 20,0	043265	52
HCS		Through holes	Solid Cermet	3,97 – 12,03	040360	53

Standard	Shape	Design	Cutting material	Dia. range	Code	Page
Modular reamers - fixed						
XR 01		Through holes left-hand fluted	Carbide	8,0 – 30,0	081610	59
			Carbide-coated for stainless steel		081611	57
		Through holes straight fluted	Carbide-coated for cast iron		081618	58
			Cermet		081612	56
			PCD		081605	60
XR 01		Blind holes straight fluted	Carbide	12,5 – 30,0	081650	64
			Carbide-coated for stainless steel		081659	62
			Carbide-coated for cast iron		081651	63
			Cermet		081652	61
			PCD		081655	65
			XR holders			
short						
long						
extralong						



The advantages at a glance:

- > Three series with the same dimensions
- > All versions with internal cooling
- > Direct mounting in expanding, shrinking and high-precision chucks
- > A variety of cutting materials cover the whole spectrum of materials to be machined
- > Variants for through holes and blind holes

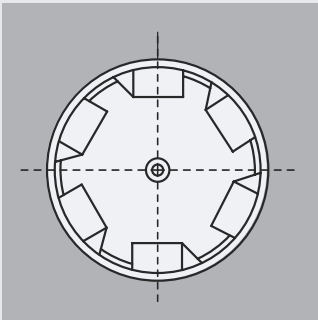
With the newly developed high-performance reamers from the MR series 01, 02 and 03, BECK is providing the first standardised system for multi-bladed reamers. The reduced number of variants in these series covers a large number of possible applications in fine machining with significant rationalisation effects.

The MR reamers in this programme are available as fixed, expandable or finely adjustable variants that have interchangeable primary dimensions and in this way cover a wide spectrum of applications. As straight or left-hand fluted versions they are suitable for through bores or blind bores and can be designed with suitable cutting materials, coatings and cutting leads to suit the material of the part.

Due to the compatibility between the series, it is possible to straightforwardly change to the optimum system reamer for the specific case if general conditions change in production, for example different quantities or bore tolerances. In this way the flexibility of the MR system guarantees the most cost effective solution.

MR

The various MR reamers



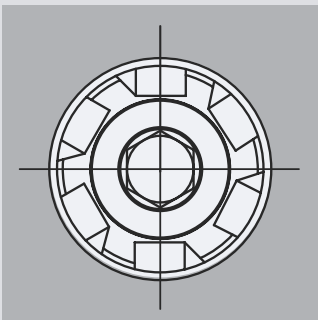
MR 01

Type MR 01 | Fixed reamer

The MR 01 high-performance reamers are fixed, non-adjustable reamers fitted with soldered blades. Their simple design and inexpensive procurement make them an interesting alternative to solid carbide tools in the medium diameter range. Thanks to the different design, straight and left fluted, and the variety of cutting materials, the right tool can be found for every application.

The compatibility with the MR 02 and MR 03 high-performance reamers makes an upgrade easily possible at any time.

- Fixed system with soldered blades
- Inexpensive alternative to solid carbide tools above the medium diameter range
- Plug and ream

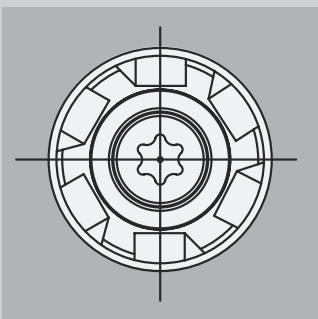


MR 02

Type MR 02 | Expandable reamer

The MR 02 high-performance reamers are used as a fixed tool, but have an integral expansion system with an expansion screw to increase the chucking diameter. This enables optimum regrinding of all the functional surfaces. This optimisation reduces the tool costs and maintains the original high performance.

- Use as for a fixed tool
- Optimised for regrinding with expansion screw
- Reduced tool costs thanks to regrinding



MR 03

Type MR 03 | Finely adjustable reamer

The MR 03 high-performance reamers are equipped with a system for adjustment with μm precision. This easy-to-use system allows very close bore tolerances and optimum utilisation of the cutting material to be achieved. The deviation between the blades in the diameter after adjustment is less than $3 \mu\text{m}$. Adjustment is carried out simply using a commercially available Torx wrench.

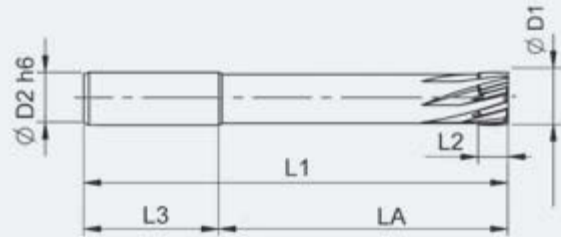
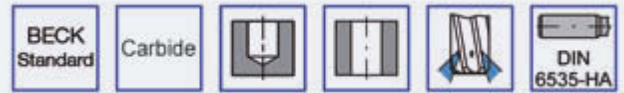
- μm precision of setting and adjustment
- Simple adjustment system
- Very close bore tolerances
- Radial run-out accuracy after adjustment $< 3 \mu\text{m}$

High performance reamers type MR


041xx0


with inner coolant supply, right-hand cutting, with blades

- MR 01 - solid execution
- MR 02 - expandable by head screw
- MR 03 - high accurate adjustment by special design



	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group 9	 vc / f p. 183
	★	★		★	★	★	★	★	▲			

Ø D1 mm		Ø-range mm	L1 mm	L2 mm	LA mm	Ø D2 mm	L3 mm	
8.00	○	7.70 - 8.20	120	8	75	12	45	4
8.50	○	8.21 - 8.70	120	8	75	12	45	4
9.00	○	8.71 - 9.20	120	8	75	12	45	4
9.50	○	9.21 - 9.70	120	8	75	12	45	4
10.00	○	9.71 - 10.20	120	8	75	12	45	6
10.50	○	10.21 - 10.70	120	8	75	12	45	6
11.00	○	10.71 - 11.20	120	8	75	12	45	6
11.50	○	11.21 - 11.70	120	8	75	12	45	6
12.00	○	11.71 - 12.20	140	8	92	16	48	6
12.50	○	12.21 - 12.70	140	8	92	16	48	6
13.00	○	12.71 - 13.20	140	8	92	16	48	6
14.00	○	13.21 - 14.20	140	8	92	16	48	6
15.00	○	14.21 - 15.20	140	8	92	16	48	6
16.00	○	15.21 - 16.20	140	8	92	16	48	6
17.00	○	16.21 - 17.20	140	8	92	16	48	6
18.00	○	17.21 - 18.20	160	12	110	20	50	6
19.00	○	18.21 - 19.20	160	12	110	20	50	6
20.00	○	19.21 - 20.20	160	12	110	20	50	6
21.00	○	20.21 - 21.20	160	12	110	20	50	6

Ø D1 mm		Ø-range mm	L1 mm	L2 mm	LA mm	Ø D2 mm	L3 mm	
22.00	○	21.21 - 22.20	160	12	110	20	50	6
23.00	○	22.21 - 23.20	180	12	130	20	50	6
24.00	○	23.21 - 24.20	180	12	130	20	50	6
25.00	○	24.21 - 25.20	180	12	130	20	50	6
26.00	○	25.21 - 26.20	180	12	130	20	50	6
27.00	○	26.21 - 27.20	180	12	130	20	50	6
28.00	○	27.21 - 28.20	200	12	144	25	56	6
29.00	○	28.21 - 29.20	200	12	144	25	56	6
30.00	○	29.21 - 30.20	200	12	144	25	56	8
31.00	○	30.21 - 31.20	200	12	144	25	56	8
32.00	○	31.21 - 32.20	200	12	144	25	56	8
33.00	○	32.21 - 33.20	200	12	144	25	56	8
34.00	○	33.21 - 34.20	200	12	144	25	56	8
35.00	○	34.21 - 35.20	200	12	144	25	56	8
36.00	○	35.21 - 36.20	200	12	144	25	56	8
37.00	○	36.21 - 37.20	200	12	144	25	56	8
38.00	○	37.21 - 38.20	200	12	144	25	56	8
39.00	○	38.21 - 39.20	200	12	144	25	56	8
40.00	○	39.21 - 40.20	200	12	144	25	56	8

- Ex stock, subject to being unsold
- Delivery on short notice

For special tolerances and intermediate diameters in the above mentioned Ø-ranges also delivery on short notice.

- MR 01-through hole left-hand spiral-order-no. **041610** MR 01-blind hole straight flutes-order.no. **041650**
- MR 02-through hole left-hand spiral-order-no. **041710** MR 02-blind hole straight flutes-order.no. **041750**
- MR 03-through hole left-hand spiral-order-no. **041810** MR 03-blind hole straight flutes-order.no. **041850**

High performance reamers type MR

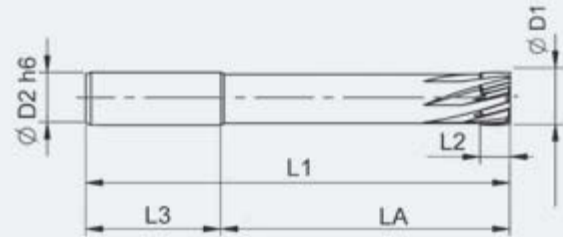
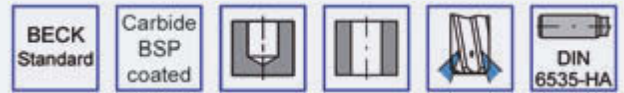
041xx1

with inner coolant supply, right-hand cutting, with blades


MR 01 - solid execution


MR 02 - expandable by head screw

MR 03 - high accurate adjustment by special design



	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group 9	 vc / f p. 183
	★	★	▲	★	★	★				▲		

Ø D1 mm		Ø-range mm	L1 mm	L2 mm	LA mm	Ø D2 mm	L3 mm	
8.00	○	7.70 - 8.20	120	8	75	12	45	4
8.50	○	8.21 - 8.70	120	8	75	12	45	4
9.00	○	8.71 - 9.20	120	8	75	12	45	4
9.50	○	9.21 - 9.70	120	8	75	12	45	4
10.00	○	9.71 - 10.20	120	8	75	12	45	6
10.50	○	10.21 - 10.70	120	8	75	12	45	6
11.00	○	10.71 - 11.20	120	8	75	12	45	6
11.50	○	11.21 - 11.70	120	8	75	12	45	6
12.00	○	11.71 - 12.20	140	8	92	16	48	6
12.50	○	12.21 - 12.70	140	8	92	16	48	6
13.00	○	12.71 - 13.20	140	8	92	16	48	6
14.00	○	13.21 - 14.20	140	8	92	16	48	6
15.00	○	14.21 - 15.20	140	8	92	16	48	6
16.00	○	15.21 - 16.20	140	8	92	16	48	6
17.00	○	16.21 - 17.20	140	8	92	16	48	6
18.00	○	17.21 - 18.20	160	12	110	20	50	6
19.00	○	18.21 - 19.20	160	12	110	20	50	6
20.00	○	19.21 - 20.20	160	12	110	20	50	6
21.00	○	20.21 - 21.20	160	12	110	20	50	6

Ø D1 mm		Ø-range mm	L1 mm	L2 mm	LA mm	Ø D2 mm	L3 mm	
22.00	○	21.21 - 22.20	160	12	110	20	50	6
23.00	○	22.21 - 23.20	180	12	130	20	50	6
24.00	○	23.21 - 24.20	180	12	130	20	50	6
25.00	○	24.21 - 25.20	180	12	130	20	50	6
26.00	○	25.21 - 26.20	180	12	130	20	50	6
27.00	○	26.21 - 27.20	180	12	130	20	50	6
28.00	○	27.21 - 28.20	200	12	144	25	56	6
29.00	○	28.21 - 29.20	200	12	144	25	56	6
30.00	○	29.21 - 30.20	200	12	144	25	56	8
31.00	○	30.21 - 31.20	200	12	144	25	56	8
32.00	○	31.21 - 32.20	200	12	144	25	56	8
33.00	○	32.21 - 33.20	200	12	144	25	56	8
34.00	○	33.21 - 34.20	200	12	144	25	56	8
35.00	○	34.21 - 35.20	200	12	144	25	56	8
36.00	○	35.21 - 36.20	200	12	144	25	56	8
37.00	○	36.21 - 37.20	200	12	144	25	56	8
38.00	○	37.21 - 38.20	200	12	144	25	56	8
39.00	○	38.21 - 39.20	200	12	144	25	56	8
40.00	○	39.21 - 40.20	200	12	144	25	56	8

- Ex stock, subject to being unsold
- Delivery on short notice

For special tolerances and intermediate diameters in the above mentioned Ø-ranges also delivery on short notice.

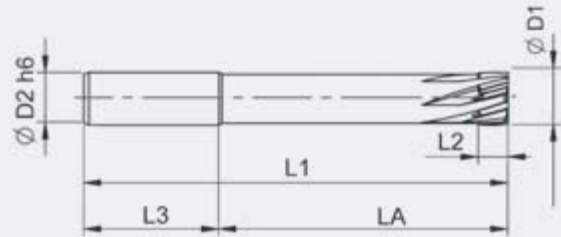
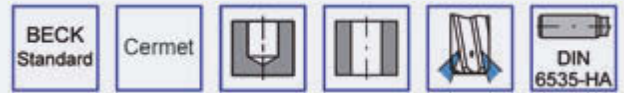
- MR 01-through hole left-hand spiral-order-no. **041611** MR 01-blind hole straight flutes-order.no. **041651**
- MR 02-through hole left-hand spiral-order-no. **041711** MR 02-blind hole straight flutes-order.no. **041751**
- MR 03-through hole left-hand spiral-order-no. **041811** MR 03-blind hole straight flutes-order.no. **041851**

High performance reamers type MR


041xx2


with inner coolant supply, right-hand cutting, with blades

- MR 01 - solid execution
- MR 02 - expandable by head screw
- MR 03 - high accurate adjustment by special design



	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group 9	 vc / f p. 183
	★	★				★						

Ø D1 mm		Ø-range mm	L1 mm	L2 mm	LA mm	Ø D2 mm	L3 mm	
8.00	○	7.70 - 8.20	120	8	75	12	45	4
8.50	○	8.21 - 8.70	120	8	75	12	45	4
9.00	○	8.71 - 9.20	120	8	75	12	45	4
9.50	○	9.21 - 9.70	120	8	75	12	45	4
10.00	○	9.71 - 10.20	120	8	75	12	45	6
10.50	○	10.21 - 10.70	120	8	75	12	45	6
11.00	○	10.71 - 11.20	120	8	75	12	45	6
11.50	○	11.21 - 11.70	120	8	75	12	45	6
12.00	○	11.71 - 12.20	140	8	92	16	48	6
12.50	○	12.21 - 12.70	140	8	92	16	48	6
13.00	○	12.71 - 13.20	140	8	92	16	48	6
14.00	○	13.21 - 14.20	140	8	92	16	48	6
15.00	○	14.21 - 15.20	140	8	92	16	48	6
16.00	○	15.21 - 16.20	140	8	92	16	48	6
17.00	○	16.21 - 17.20	140	8	92	16	48	6
18.00	○	17.21 - 18.20	160	12	110	20	50	6
19.00	○	18.21 - 19.20	160	12	110	20	50	6
20.00	○	19.21 - 20.20	160	12	110	20	50	6
21.00	○	20.21 - 21.20	160	12	110	20	50	6

Ø D1 mm		Ø-range mm	L1 mm	L2 mm	LA mm	Ø D2 mm	L3 mm	
22.00	○	21.21 - 22.20	160	12	110	20	50	6
23.00	○	22.21 - 23.20	180	12	130	20	50	6
24.00	○	23.21 - 24.20	180	12	130	20	50	6
25.00	○	24.21 - 25.20	180	12	130	20	50	6
26.00	○	25.21 - 26.20	180	12	130	20	50	6
27.00	○	26.21 - 27.20	180	12	130	20	50	6
28.00	○	27.21 - 28.20	200	12	144	25	56	6
29.00	○	28.21 - 29.20	200	12	144	25	56	6
30.00	○	29.21 - 30.20	200	12	144	25	56	8
31.00	○	30.21 - 31.20	200	12	144	25	56	8
32.00	○	31.21 - 32.20	200	12	144	25	56	8
33.00	○	32.21 - 33.20	200	12	144	25	56	8
34.00	○	33.21 - 34.20	200	12	144	25	56	8
35.00	○	34.21 - 35.20	200	12	144	25	56	8
36.00	○	35.21 - 36.20	200	12	144	25	56	8
37.00	○	36.21 - 37.20	200	12	144	25	56	8
38.00	○	37.21 - 38.20	200	12	144	25	56	8
39.00	○	38.21 - 39.20	200	12	144	25	56	8
40.00	○	39.21 - 40.20	200	12	144	25	56	8

- Ex stock, subject to being unsold
- Delivery on short notice

For special tolerances and intermediate diameters in the above mentioned Ø-ranges also delivery on short notice.

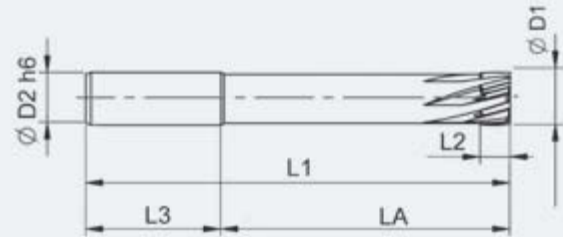
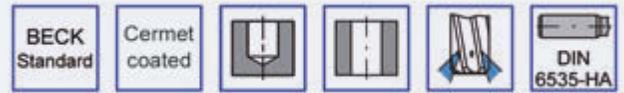
- MR 01-through hole left-hand spiral-order-no. **041612** MR 01-blind hole straight flutes-order.no. **041652**
- MR 02-through hole left-hand spiral-order-no. **041712** MR 02-blind hole straight flutes-order.no. **041752**
- MR 03-through hole left-hand spiral-order-no. **041812** MR 03-blind hole straight flutes-order.no. **041852**

High performance reamers type MR


041xx3


with inner coolant supply, right-hand cutting, with blades

- MR 01 - solid execution
- MR 02 - expandable by head screw
- MR 03 - high accurate adjustment by special design



	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group 9	 vc / f p. 183
	★	★			★	★						

Ø D1 mm		Ø-range mm	L1 mm	L2 mm	LA mm	Ø D2 mm	L3 mm	
8.00	○	7.70 - 8.20	120	8	75	12	45	4
8.50	○	8.21 - 8.70	120	8	75	12	45	4
9.00	○	8.71 - 9.20	120	8	75	12	45	4
9.50	○	9.21 - 9.70	120	8	75	12	45	4
10.00	○	9.71 - 10.20	120	8	75	12	45	6
10.50	○	10.21 - 10.70	120	8	75	12	45	6
11.00	○	10.71 - 11.20	120	8	75	12	45	6
11.50	○	11.21 - 11.70	120	8	75	12	45	6
12.00	○	11.71 - 12.20	140	8	92	16	48	6
12.50	○	12.21 - 12.70	140	8	92	16	48	6
13.00	○	12.71 - 13.20	140	8	92	16	48	6
14.00	○	13.21 - 14.20	140	8	92	16	48	6
15.00	○	14.21 - 15.20	140	8	92	16	48	6
16.00	○	15.21 - 16.20	140	8	92	16	48	6
17.00	○	16.21 - 17.20	140	8	92	16	48	6
18.00	○	17.21 - 18.20	160	12	110	20	50	6
19.00	○	18.21 - 19.20	160	12	110	20	50	6
20.00	○	19.21 - 20.20	160	12	110	20	50	6
21.00	○	20.21 - 21.20	160	12	110	20	50	6

Ø D1 mm		Ø-range mm	L1 mm	L2 mm	LA mm	Ø D2 mm	L3 mm	
22.00	○	21.21 - 22.20	160	12	110	20	50	6
23.00	○	22.21 - 23.20	180	12	130	20	50	6
24.00	○	23.21 - 24.20	180	12	130	20	50	6
25.00	○	24.21 - 25.20	180	12	130	20	50	6
26.00	○	25.21 - 26.20	180	12	130	20	50	6
27.00	○	26.21 - 27.20	180	12	130	20	50	6
28.00	○	27.21 - 28.20	200	12	144	25	56	6
29.00	○	28.21 - 29.20	200	12	144	25	56	6
30.00	○	29.21 - 30.20	200	12	144	25	56	8
31.00	○	30.21 - 31.20	200	12	144	25	56	8
32.00	○	31.21 - 32.20	200	12	144	25	56	8
33.00	○	32.21 - 33.20	200	12	144	25	56	8
34.00	○	33.21 - 34.20	200	12	144	25	56	8
35.00	○	34.21 - 35.20	200	12	144	25	56	8
36.00	○	35.21 - 36.20	200	12	144	25	56	8
37.00	○	36.21 - 37.20	200	12	144	25	56	8
38.00	○	37.21 - 38.20	200	12	144	25	56	8
39.00	○	38.21 - 39.20	200	12	144	25	56	8
40.00	○	39.21 - 40.20	200	12	144	25	56	8

- Ex stock, subject to being unsold
- Delivery on short notice

For special tolerances and intermediate diameters in the above mentioned Ø-ranges also delivery on short notice.

- MR 01-through hole left-hand spiral-order-no. **041613** MR 01-blind hole straight flutes-order.no. **041653**
- MR 02-through hole left-hand spiral-order-no. **041713** MR 02-blind hole straight flutes-order.no. **041753**
- MR 03-through hole left-hand spiral-order-no. **041813** MR 03-blind hole straight flutes-order.no. **041853**



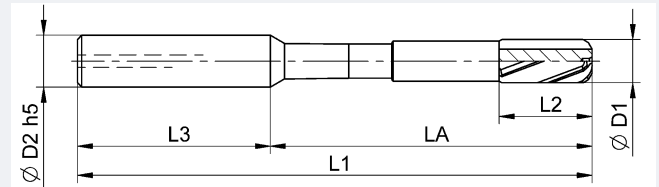
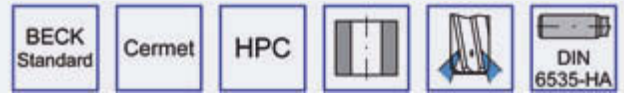
**High machining data –
high process reliability**

In order to meet these demands, Beck has developed the **RR 01** product family. The extensive range of products available from stock with through bore and blind bore variants, as well as expandable version for tough hole allows the cutomers' demands to be quickly satisfied.


High performance reamers RR 01

040325

for through hole, with inner coolant supply and special HPC cutting geometry, solid cermet head, right-hand cutting, spiral flutes, EU-spacing, for direct clamping in hydraulic, shrink and high precision chucks



	Steel <900 N ★	Steel 900-1400N ★	VA Stainless steel	GG	GGG ★	GGG >GGG50 ★	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group 9	 vc / f p. 180
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Ø D1 mm		Tol.	Ø-range mm	L1 mm	L2 mm	LA mm	Ø D2 mm	L3 mm	
4.00	●	H7	3.85 - 4.35	80	14	40	10	40	4
4.50	●	H7	4.36 - 4.90	80	14	40	10	40	4
5.00	●	H7	4.91 - 5.30	85	14	40	12	45	4
5.50	●	H7	5.31 - 5.70	85	14	40	12	45	4
6.00	●	H7	5.71 - 6.20	85	14	40	12	45	4
6.50	●	H7	6.21 - 6.70	105	14	60	12	45	6
7.00	●	H7	6.71 - 7.20	110	18	65	12	45	6
7.50	●	H7	7.21 - 7.70	110	18	65	12	45	6
8.00	●	H7	7.71 - 8.20	110	18	65	12	45	6
8.50	●	H7	8.21 - 8.70	120	18	75	12	45	6
9.00	●	H7	8.71 - 9.20	120	22	75	12	45	6
9.50	●	H7	9.21 - 9.70	120	22	75	12	45	6
10.00	●	H7	9.71 - 10.20	120	22	75	12	45	6
10.50	●	H7	10.21 - 10.70	120	22	75	12	45	6
11.00	●	H7	10.71 - 11.20	120	22	75	12	45	6
11.50	●	H7	11.21 - 11.70	120	22	75	12	45	6
12.00	●	H7	11.71 - 12.20	120	22	75	12	45	6
13.00	●	H7	12.21 - 13.20	130	22	82	16	48	6
14.00	●	H7	13.21 - 14.20	130	23	82	16	48	6
15.00	●	H7	14.21 - 15.20	130	23	82	16	48	6
16.00	●	H7	15.21 - 16.20	130	26	82	16	48	6
17.00	●	H7	16.21 - 17.20	160	26	112	16	48	8
18.00	●	H7	17.21 - 18.20	160	26	112	16	48	8
19.00	●	H7	18.21 - 19.20	160	26	112	16	48	8
20.00	●	H7	19.21 - 20.20	160	26	112	16	48	8

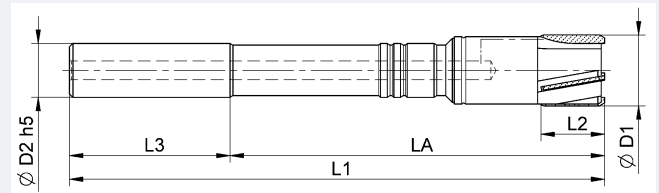
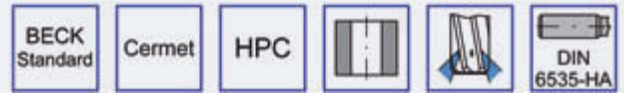
- Ex stock, subject to being unsold
- Delivery on short notice

For special tolerances and intermediate diameters in the above mentioned Ø-ranges also delivery on short notice.


High performance reamers RR 01

040326

for through hole, with inner coolant supply and special HPC cutting geometry, cermet tipped, right-hand cutting, spiral flutes, EU-spacing, for direct clamping in hydraulic, shrink and high precision chucks



	Steel <900 N ★	Steel 900-1400N ★	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group 9	 vc / f p. 180
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Ø D1 mm		Tol.	Ø-range mm	L1 mm	L2 mm	LA mm	Ø D2 mm	L3 mm	
21.00	●	H7	20.21 - 21.20	160	19	112	16	48	6
22.00	●	H7	21.21 - 22.20	160	22	112	16	48	6
23.00	●	H7	22.21 - 23.20	180	22	130	20	50	6
24.00	●	H7	23.21 - 24.20	180	22	130	20	50	6
25.00	●	H7	24.21 - 25.20	180	22	130	20	50	6
26.00	●	H7	25.21 - 26.20	180	22	130	20	50	6
27.00	●	H7	26.21 - 27.20	180	25	130	20	50	6
28.00	●	H7	27.21 - 28.20	180	25	124	25	56	6
29.00	●	H7	28.21 - 29.20	180	25	124	25	56	6
30.00	●	H7	29.21 - 30.20	200	25	144	25	56	8
31.00	●	H7	30.21 - 31.20	200	25	144	25	56	8
32.00	●	H7	31.21 - 32.20	200	25	144	25	56	8
33.00	●	H7	32.21 - 33.20	200	25	144	25	56	8
34.00	●	H7	33.21 - 34.20	200	25	144	25	56	8
35.00	●	H7	34.21 - 35.20	200	25	144	25	56	8
36.00	●	H7	35.21 - 36.20	200	25	144	25	56	8
37.00	●	H7	36.21 - 37.20	200	25	144	25	56	8
38.00	●	H7	37.21 - 38.20	200	25	144	25	56	8
39.00	●	H7	38.21 - 39.20	200	25	144	25	56	8
40.00	●	H7	39.21 - 40.20	200	25	144	25	56	8

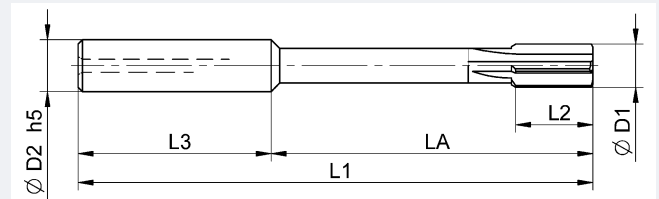
- Ex stock, subject to being unsold
- Delivery on short notice

For special tolerances and intermediate diameters in the above mentioned Ø-ranges also delivery on short notice.


High performance reamers RR 01

040340

for blind hole, with inner coolant supply and special HPC cutting geometry, solid cermet head, right-hand cutting, straight flutes, EU-spacing, for direct clamping in hydraulic, shrink and high precision chucks



	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group 9	 vc / f p. 180
	★	★			★	★						

Ø D1 mm		Tol.	Ø-range mm	L1 mm	L2 mm	LA mm	Ø D2 mm	L3 mm	
4.00	●	H7	3.85 - 4.35	80	12	40	10	40	4
4.50	●	H7	4.36 - 4.90	80	12	40	10	40	4
5.00	●	H7	4.91 - 5.30	85	12	40	12	45	4
5.50	●	H7	5.31 - 5.70	85	12	40	12	45	4
6.00	●	H7	5.71 - 6.20	85	12	40	12	45	4
6.50	●	H7	6.21 - 6.70	105	12	60	12	45	6
7.00	●	H7	6.71 - 7.20	110	16	65	12	45	6
7.50	●	H7	7.21 - 7.70	110	16	65	12	45	6
8.00	●	H7	7.71 - 8.20	110	16	65	12	45	6
8.50	●	H7	8.21 - 8.70	120	19	75	12	45	6
9.00	●	H7	8.71 - 9.20	120	19	75	12	45	6
9.50	●	H7	9.21 - 9.70	120	19	75	12	45	6
10.00	●	H7	9.71 - 10.20	120	19	75	12	45	6
10.50	●	H7	10.21 - 10.70	120	19	75	12	45	6
11.00	●	H7	10.71 - 11.20	120	19	75	12	45	6
11.50	●	H7	11.21 - 11.70	120	19	75	12	45	6
12.00	●	H7	11.71 - 12.20	120	19	75	12	45	6
13.00	●	H7	12.21 - 13.20	130	19	82	16	48	6
14.00	●	H7	13.21 - 14.20	130	19	82	16	48	6
15.00	●	H7	14.21 - 15.20	130	19	82	16	48	6
16.00	●	H7	15.21 - 16.20	130	19	82	16	48	6
17.00	●	H7	16.21 - 17.20	160	22	112	16	48	6
18.00	●	H7	17.21 - 18.20	160	22	112	16	48	6
19.00	●	H7	18.21 - 19.20	160	22	112	16	48	6
20.00	●	H7	19.21 - 20.20	160	22	112	16	48	6

- Ex stock, subject to being unsold
- Delivery on short notice

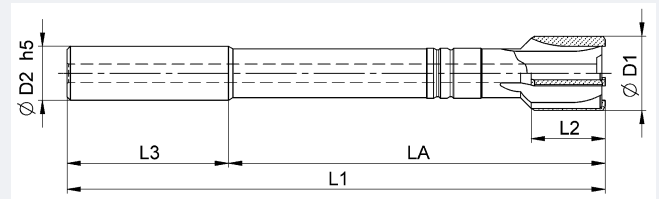
For special tolerances and intermediate diameters in the above mentioned Ø-ranges also delivery on short notice.

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High performance reamers RR 01

040341

for blind hole, with inner coolant supply and special HPC cutting geometry, cermet tipped, right-hand cutting, straight flutes, EU-spacing, for direct clamping in hydraulic, shrink and high precision chucks



	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group 9	 vc / f p. 180
	★	★			★	★						

Ø D1 mm		Tol.	Ø-range mm	L1 mm	L2 mm	LA mm	Ø D2 mm	L3 mm	
21.00	●	H7	20.21 - 21.20	160	19	112	16	48	6
22.00	●	H7	21.21 - 22.20	160	22	112	16	48	6
23.00	●	H7	22.21 - 23.20	180	22	130	20	50	6
24.00	●	H7	23.21 - 24.20	180	22	130	20	50	6
25.00	●	H7	24.21 - 25.20	180	22	130	20	50	6
26.00	●	H7	25.21 - 26.20	180	22	130	20	50	6
27.00	●	H7	26.21 - 27.20	180	25	130	20	50	6
28.00	●	H7	27.21 - 28.20	180	25	124	25	56	6
29.00	●	H7	28.21 - 29.20	180	25	124	25	56	6
30.00	●	H7	29.21 - 30.20	200	25	144	25	56	6
31.00	●	H7	30.21 - 31.20	200	25	144	25	56	6
32.00	●	H7	31.21 - 32.20	200	25	144	25	56	6
33.00	●	H7	32.21 - 33.20	200	25	144	25	56	6
34.00	●	H7	33.21 - 34.20	200	25	144	25	56	6
35.00	●	H7	34.21 - 35.20	200	25	144	25	56	8
36.00	●	H7	35.21 - 36.20	200	25	144	25	56	8
37.00	●	H7	36.21 - 37.20	200	25	144	25	56	8
38.00	●	H7	37.21 - 38.20	200	25	144	25	56	8
39.00	●	H7	38.21 - 39.20	200	25	144	25	56	8
40.00	●	H7	39.21 - 40.20	200	25	144	25	56	8

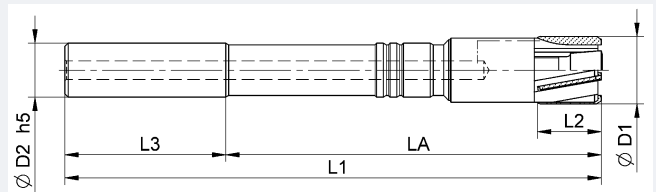
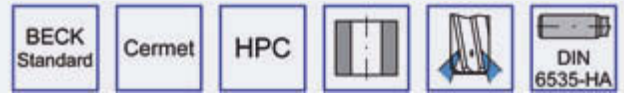
- Ex stock, subject to being unsold
- Delivery on short notice

For special tolerances and intermediate diameters in the above mentioned Ø-ranges also delivery on short notice.


High performance expanding reamers RR 01


040327

for **through hole**, with inner coolant supply and special HPC cutting geometry, cermet tipped, right-hand cutting, spiral flutes, EU-spacing, for direct clamping in hydraulic, shrink and high precision chucks, **expandable of approx. 0,03 mm by means of head screw**



	Steel <900 N ★	Steel 900-1400N ★	VA Stainless steel	GG	GGG	GGG >GGG50 ★	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group 9	 vc / f p. 180
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Ø D1 mm		Tol.	Ø-range mm	L1 mm	L2 mm	LA mm	Ø D2 mm	L3 mm	
8.00	●	H7	7.70 - 8.20	110	12	74	6	36	4
8.50	○	H7	8.21 - 8.70	110	12	74	6	36	4
9.00	●	H7	8.71 - 9.20	110	12	74	6	36	6
9.50	○	H7	9.21 - 9.70	120	12	84	8	36	6
10.00	●	H7	9.71 - 10.20	120	12	84	8	36	6
10.50	○	H7	10.21 - 10.70	120	12	84	8	36	6
11.00	●	H7	10.71 - 11.20	120	12	84	8	36	6
11.50	○	H7	11.21 - 11.70	120	12	84	8	36	6
12.00	●	H7	11.71 - 12.20	140	12	100	10	40	6
12.50	○	H7	12.21 - 12.70	140	12	100	10	40	6
13.00	●	H7	12.71 - 13.20	140	12	100	10	40	6
14.00	●	H7	13.21 - 14.20	140	16	95	12	45	6
15.00	●	H7	14.21 - 15.20	140	16	95	12	45	6
16.00	●	H7	15.21 - 16.20	160	19	115	14	45	6
17.00	●	H7	16.21 - 17.20	160	19	115	14	45	6
18.00	●	H7	17.21 - 18.20	160	19	112	16	48	6
19.00	●	H7	18.21 - 19.20	160	19	112	16	48	6
20.00	●	H7	19.21 - 20.20	160	19	112	16	48	6
21.00	●	H7	20.21 - 21.20	160	19	112	16	48	6

Ø D1 mm		Tol.	Ø-range mm	L1 mm	L2 mm	LA mm	Ø D2 mm	L3 mm	
22.00	●	H7	21.21 - 22.20	160	22	112	16	48	6
23.00	●	H7	22.21 - 23.20	180	22	130	20	50	6
24.00	●	H7	23.21 - 24.20	180	22	130	20	50	6
25.00	●	H7	24.21 - 25.20	180	22	130	20	50	6
26.00	●	H7	25.21 - 26.20	180	22	130	20	50	6
27.00	●	H7	26.21 - 27.20	180	25	130	20	50	6
28.00	●	H7	27.21 - 28.20	180	25	124	25	56	6
29.00	●	H7	28.21 - 29.20	180	25	124	25	56	6
30.00	●	H7	29.21 - 30.20	200	25	144	25	56	6
31.00	●	H7	30.21 - 31.20	200	25	144	25	56	6
32.00	●	H7	31.21 - 32.20	200	25	144	25	56	6
33.00	●	H7	32.21 - 33.20	200	25	144	25	56	6
34.00	●	H7	33.21 - 34.20	200	25	144	25	56	8
35.00	●	H7	34.21 - 35.20	200	25	144	25	56	8
36.00	●	H7	35.21 - 36.20	200	25	144	25	56	8
37.00	●	H7	36.21 - 37.20	200	25	144	25	56	8
38.00	●	H7	37.21 - 38.20	200	25	144	25	56	8
39.00	●	H7	38.21 - 39.20	200	25	144	25	56	8
40.00	●	H7	39.21 - 40.20	200	25	144	25	56	8

- Ex stock, subject to being unsold
- Delivery on short notice

For special tolerances and intermediate diameters in the above mentioned Ø-ranges also delivery on short notice.



More

VR 01 multi-tooth reamers

A crucial criterion for the performance of multi-bladed reamers is the number of blades. A design limit on the number of blades is defined by both the diameter of the reamer and the space required for blades and chip spaces. The VR 01 multi-tooth reamers pushes back the existing limits **by eliminating the chip spaces and creating room for more blades**. At the same time, an effective coolant supply directly to the blades is still assured. The coolant is supplied via a streamlined duct that is formed at the periphery between the blades and the wall of the bore and therefore also ensures cooling and lubrication of the blades for high speed machining.

Further benefits: The blades on the reamer body can be easily replaced and reconditioned several times.

At the same time, the additional blades on the VR 01 create several other positive effects for machining. The machining time is drastically reduced, the tool lives are increased and the bore quality, in particular the circularity of the bore, is improved. The shape of the tool, which is defined by the design, ensures the chip is intentionally discharged forward. In addition, the coolant also ensures reliable chip transport forward. The chips therefore do not come into contact with the part of the bore already reamed.

The strengths of the VR 01 multi-tooth reamer include the machining of steel and castings. Reaming using the multi-tooth reamer is so effective that, for instance, honing during fine machining of bores for hydraulic components is often no longer required. Different cutting materials are used depending on the machining tasks. Mostly the blades are made of carbide or Cermet, modern coatings are also used. Also extremely hard cutting materials such as PCD or PcBN can be used for machining aluminium, for instance for machining castings and for hard machining. The standard programme of the VR 01 covers the diameter range from 6 to 12 mm in the solid carbide-coated version and 10 to 40 mm in the version with different indexable inserts.

VR 01

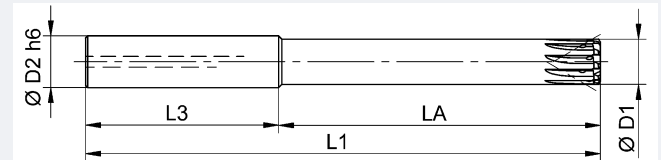
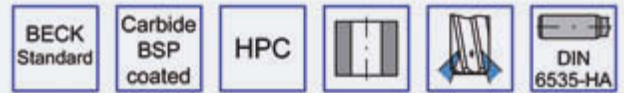
blades for more performance

01


High performance reamers VR 01


040390

-NEW- coated solid carbide, with inner coolant supply, straight flutes, right-hand cutting, tolerance H7, for HPC/HCS machining in through holes, **with maximum number of teeth for high feed rates**



	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GG650	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group 11	 vc / f p. 184
	★	★		★	★	★						

Ø D1 mm		Ø-range mm	L1 mm	LA mm	Ø D2 mm	L3 mm	
6.00	●	5.71 - 6.20	75	39	6	36	6
6.50	○	6.21 - 6.70	100	64	8	36	8
7.00	○	6.71 - 7.20	100	64	8	36	8
7.50	○	7.21 - 7.70	100	64	8	36	8
8.00	●	7.71 - 8.20	100	64	8	36	8
8.50	○	8.21 - 8.70	100	60	10	40	8
9.00	○	8.71 - 9.20	100	60	10	40	8

Ø D1 mm		Ø-range mm	L1 mm	LA mm	Ø D2 mm	L3 mm	
9.50	○	9.21 - 9.70	120	80	10	40	8
10.00	●	9.71 - 10.20	120	80	10	40	8
10.50	○	10.21 - 10.70	120	75	12	45	10
11.00	○	10.71 - 11.20	120	75	12	45	10
11.50	○	11.21 - 11.70	120	75	12	45	10
12.00	●	11.71 - 12.20	120	75	12	45	10

- Ex stock, subject to being unsold
- Delivery on short notice

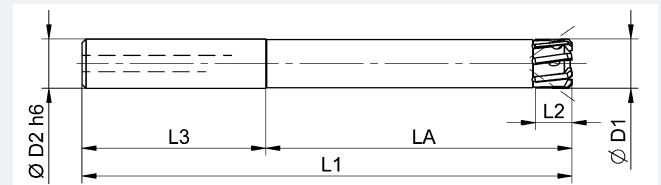
For special tolerances and intermediate diameters in the above mentioned Ø-ranges also delivery on short notice.

High performance reamers VR 01


040370


with carbide blades, inner coolant supply, for HPC/HCS machining in through holes.

Refitting of blades possible.



	Steel <900 N ★	Steel 900-1400N ★	VA Stainless steel	GG ★	GGG ★	GGG >GGG50	Cu/Zn/Mg ★	Alu ★	Ti ★	HRC < 63 HRC	Group 11	 vc / f p. 184
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Ø D1 mm		Ø-range mm	L1 mm	L2 mm	LA mm	Ø D2 mm	L3 mm	
10.00	○	9.76 - 10.25	120	9	75	12	45	6
10.50	○	10.26 - 10.75	120	9	75	12	45	6
11.00	○	10.76 - 11.25	120	9	75	12	45	6
11.50	○	11.26 - 11.75	120	9	75	12	45	6
12.00	○	11.76 - 12.25	120	9	75	12	45	8
12.50	○	12.26 - 12.75	130	9	82	16	48	8
13.00	○	12.76 - 13.25	130	9	82	16	48	8
13.50	○	13.26 - 13.75	130	9	82	16	48	8
14.00	○	13.76 - 14.25	130	9	82	16	48	10
14.50	○	14.26 - 14.75	130	9	82	16	48	10
15.00	○	14.76 - 15.25	130	9	82	16	48	10
15.50	○	15.26 - 15.75	130	9	82	16	48	10
16.00	○	15.76 - 16.25	130	9	82	16	48	10
16.50	○	16.26 - 16.75	160	9	110	20	50	10
17.00	○	16.76 - 17.25	160	9	110	20	50	10
17.50	○	17.26 - 17.75	160	9	110	20	50	10
18.00	○	17.76 - 18.25	160	9	110	20	50	12
18.50	○	18.26 - 18.75	160	9	110	20	50	12
19.00	○	18.76 - 19.25	160	9	110	20	50	12
19.50	○	19.26 - 19.75	160	9	110	20	50	12
20.00	○	19.76 - 20.25	160	9	110	20	50	12
20.50	○	20.26 - 20.75	160	9	110	20	50	12
21.00	○	20.76 - 21.25	160	9	110	20	50	12
21.50	○	21.26 - 21.75	160	9	110	20	50	12
22.00	○	21.76 - 22.25	160	9	110	20	50	14
22.50	○	22.26 - 22.75	180	9	130	20	50	14
23.00	○	22.76 - 23.25	180	9	130	20	50	14
23.50	○	23.26 - 23.75	180	9	130	20	50	14
24.00	○	23.76 - 24.25	180	9	130	20	50	14
24.50	○	24.26 - 24.75	180	9	130	20	50	14
25.00	○	24.76 - 25.25	180	9	130	20	50	16

Ø D1 mm		Ø-range mm	L1 mm	L2 mm	LA mm	Ø D2 mm	L3 mm	
25.50	○	25.26 - 25.75	180	9	130	20	50	16
26.00	○	25.76 - 26.25	180	9	130	20	50	16
26.50	○	26.26 - 26.75	180	9	130	20	50	16
27.00	○	26.76 - 27.25	180	9	130	20	50	16
27.50	○	27.26 - 27.75	180	9	130	20	50	16
28.00	○	27.76 - 28.25	180	9	124	25	56	16
28.50	○	28.26 - 28.75	180	9	124	25	56	16
29.00	○	28.76 - 29.25	180	9	124	25	56	16
29.50	○	29.26 - 29.75	200	9	144	25	56	16
30.00	○	29.76 - 30.25	200	9	144	25	56	16
30.50	○	30.26 - 30.75	200	9	144	25	56	16
31.00	○	30.76 - 31.25	200	9	144	25	56	16
31.50	○	31.26 - 31.75	200	9	144	25	56	16
32.00	○	31.76 - 32.25	200	9	144	25	56	18
32.50	○	32.26 - 32.75	200	9	144	25	56	18
33.00	○	32.76 - 33.25	200	9	144	25	56	18
33.50	○	33.26 - 33.75	200	9	144	25	56	18
34.00	○	33.76 - 34.25	200	9	144	25	56	18
34.50	○	34.26 - 34.75	200	9	144	25	56	18
35.00	○	34.76 - 35.25	200	9	144	25	56	18
35.50	○	35.26 - 35.75	200	9	144	25	56	18
36.00	○	35.76 - 36.25	200	9	140	32	60	18
36.50	○	36.26 - 36.75	200	9	140	32	60	18
37.00	○	36.76 - 37.25	200	9	140	32	60	18
37.50	○	37.26 - 37.75	200	9	140	32	60	18
38.00	○	37.76 - 38.25	200	9	140	32	60	18
38.50	○	38.26 - 38.75	200	9	140	32	60	18
39.00	○	38.76 - 39.25	200	9	140	32	60	18
39.50	○	39.26 - 39.75	200	9	140	32	60	18
40.00	○	39.76 - 40.25	200	9	140	32	60	18

- Ex stock, subject to being unsold
- Delivery on short notice

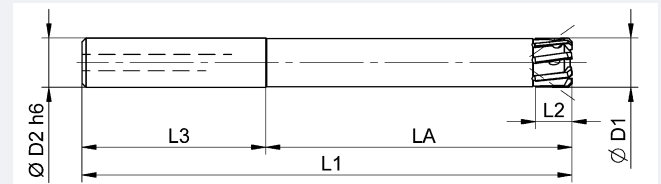
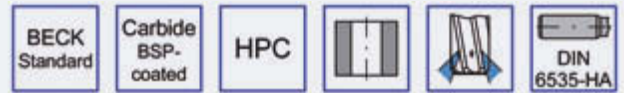
For special tolerances and intermediate diameters in the above mentioned Ø-ranges also delivery on short notice.

High performance reamers VR 01


040382


with coated carbide blades, inner coolant supply, for HPC/HCS machining in through holes.

Refitting of blades possible.



	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GG650	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group 11	 vc / f p. 184
	★	★	★	★	★		★		★			

Ø D1 mm		Ø-range mm	L1 mm	L2 mm	LA mm	Ø D2 mm	L3 mm	
10.00	o	9.76 - 10.25	120	9	75	12	45	6
10.50	o	10.26 - 10.75	120	9	75	12	45	6
11.00	o	10.76 - 11.25	120	9	75	12	45	6
11.50	o	11.26 - 11.75	120	9	75	12	45	6
12.00	o	11.76 - 12.25	120	9	75	12	45	8
12.50	o	12.26 - 12.75	130	9	82	16	48	8
13.00	o	12.76 - 13.25	130	9	82	16	48	8
13.50	o	13.26 - 13.75	130	9	82	16	48	8
14.00	o	13.76 - 14.25	130	9	82	16	48	10
14.50	o	14.26 - 14.75	130	9	82	16	48	10
15.00	o	14.76 - 15.25	130	9	82	16	48	10
15.50	o	15.26 - 15.75	130	9	82	16	48	10
16.00	o	15.76 - 16.25	130	9	82	16	48	10
16.50	o	16.26 - 16.75	160	9	110	20	50	10
17.00	o	16.76 - 17.25	160	9	110	20	50	10
17.50	o	17.26 - 17.75	160	9	110	20	50	10
18.00	o	17.76 - 18.25	160	9	110	20	50	12
18.50	o	18.26 - 18.75	160	9	110	20	50	12
19.00	o	18.76 - 19.25	160	9	110	20	50	12
19.50	o	19.26 - 19.75	160	9	110	20	50	12
20.00	o	19.76 - 20.25	160	9	110	20	50	12
20.50	o	20.26 - 20.75	160	9	110	20	50	12
21.00	o	20.76 - 21.25	160	9	110	20	50	12
21.50	o	21.26 - 21.75	160	9	110	20	50	12
22.00	o	21.76 - 22.25	160	9	110	20	50	14
22.50	o	22.26 - 22.75	180	9	130	20	50	14
23.00	o	22.76 - 23.25	180	9	130	20	50	14
23.50	o	23.26 - 23.75	180	9	130	20	50	14
24.00	o	23.76 - 24.25	180	9	130	20	50	14
24.50	o	24.26 - 24.75	180	9	130	20	50	14
25.00	o	24.76 - 25.25	180	9	130	20	50	16

Ø D1 mm		Ø-range mm	L1 mm	L2 mm	LA mm	Ø D2 mm	L3 mm	
25.50	o	25.26 - 25.75	180	9	130	20	50	16
26.00	o	25.76 - 26.25	180	9	130	20	50	16
26.50	o	26.26 - 26.75	180	9	130	20	50	16
27.00	o	26.76 - 27.25	180	9	130	20	50	16
27.50	o	27.26 - 27.75	180	9	130	20	50	16
28.00	o	27.76 - 28.25	180	9	124	25	56	16
28.50	o	28.26 - 28.75	180	9	124	25	56	16
29.00	o	28.76 - 29.25	180	9	124	25	56	16
29.50	o	29.26 - 29.75	200	9	144	25	56	16
30.00	o	29.76 - 30.25	200	9	144	25	56	16
30.50	o	30.26 - 30.75	200	9	144	25	56	16
31.00	o	30.76 - 31.25	200	9	144	25	56	16
31.50	o	31.26 - 31.75	200	9	144	25	56	16
32.00	o	31.76 - 32.25	200	9	144	25	56	18
32.50	o	32.26 - 32.75	200	9	144	25	56	18
33.00	o	32.76 - 33.25	200	9	144	25	56	18
33.50	o	33.26 - 33.75	200	9	144	25	56	18
34.00	o	33.76 - 34.25	200	9	144	25	56	18
34.50	o	34.26 - 34.75	200	9	144	25	56	18
35.00	o	34.76 - 35.25	200	9	144	25	56	18
35.50	o	35.26 - 35.75	200	9	144	25	56	18
36.00	o	35.76 - 36.25	200	9	140	32	60	18
36.50	o	36.26 - 36.75	200	9	140	32	60	18
37.00	o	36.76 - 37.25	200	9	140	32	60	18
37.50	o	37.26 - 37.75	200	9	140	32	60	18
38.00	o	37.76 - 38.25	200	9	140	32	60	18
38.50	o	38.26 - 38.75	200	9	140	32	60	18
39.00	o	38.76 - 39.25	200	9	140	32	60	18
39.50	o	39.26 - 39.75	200	9	140	32	60	18
40.00	o	39.76 - 40.25	200	9	140	32	60	18

- Ex stock, subject to being unsold
- Delivery on short notice

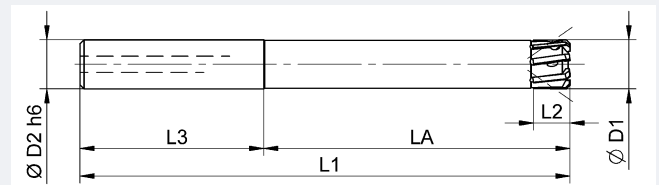
For special tolerances and intermediate diameters in the above mentioned Ø-ranges also delivery on short notice.

High performance reamers VR 01


040372


with Cermet blades, inner coolant supply, for HPC/HCS machining in through holes.

Refitting of blades possible.



	Steel <900 N ★	Steel 900-1400N ★	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group 11	 vc / f p. 184
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Ø D1 mm		Ø-range mm	L1 mm	L2 mm	LA mm	Ø D2 mm	L3 mm	
10.00	○	9.76 - 10.25	120	9	75	12	45	6
10.50	○	10.26 - 10.75	120	9	75	12	45	6
11.00	○	10.76 - 11.25	120	9	75	12	45	6
11.50	○	11.26 - 11.75	120	9	75	12	45	6
12.00	○	11.76 - 12.25	120	9	75	12	45	8
12.50	○	12.26 - 12.75	130	9	82	16	48	8
13.00	○	12.76 - 13.25	130	9	82	16	48	8
13.50	○	13.26 - 13.75	130	9	82	16	48	8
14.00	○	13.76 - 14.25	130	9	82	16	48	10
14.50	○	14.26 - 14.75	130	9	82	16	48	10
15.00	○	14.76 - 15.25	130	9	82	16	48	10
15.50	○	15.26 - 15.75	130	9	82	16	48	10
16.00	○	15.76 - 16.25	130	9	82	16	48	10
16.50	○	16.26 - 16.75	160	9	110	20	50	10
17.00	○	16.76 - 17.25	160	9	110	20	50	10
17.50	○	17.26 - 17.75	160	9	110	20	50	10
18.00	○	17.76 - 18.25	160	9	110	20	50	12
18.50	○	18.26 - 18.75	160	9	110	20	50	12
19.00	○	18.76 - 19.25	160	9	110	20	50	12
19.50	○	19.26 - 19.75	160	9	110	20	50	12
20.00	○	19.76 - 20.25	160	9	110	20	50	12
20.50	○	20.26 - 20.75	160	9	110	20	50	12
21.00	○	20.76 - 21.25	160	9	110	20	50	12
21.50	○	21.26 - 21.75	160	9	110	20	50	12
22.00	○	21.76 - 22.25	160	9	110	20	50	14
22.50	○	22.26 - 22.75	180	9	130	20	50	14
23.00	○	22.76 - 23.25	180	9	130	20	50	14
23.50	○	23.26 - 23.75	180	9	130	20	50	14
24.00	○	23.76 - 24.25	180	9	130	20	50	14
24.50	○	24.26 - 24.75	180	9	130	20	50	14
25.00	○	24.76 - 25.25	180	9	130	20	50	16

Ø D1 mm		Ø-range mm	L1 mm	L2 mm	LA mm	Ø D2 mm	L3 mm	
25.50	○	25.26 - 25.75	180	9	130	20	50	16
26.00	○	25.76 - 26.25	180	9	130	20	50	16
26.50	○	26.26 - 26.75	180	9	130	20	50	16
27.00	○	26.76 - 27.25	180	9	130	20	50	16
27.50	○	27.26 - 27.75	180	9	130	20	50	16
28.00	○	27.76 - 28.25	180	9	124	25	56	16
28.50	○	28.26 - 28.75	180	9	124	25	56	16
29.00	○	28.76 - 29.25	180	9	124	25	56	16
29.50	○	29.26 - 29.75	200	9	144	25	50	16
30.00	○	29.76 - 30.25	200	9	144	25	56	16
30.50	○	30.26 - 30.75	200	9	144	25	56	16
31.00	○	30.76 - 31.25	200	9	144	25	56	16
31.50	○	31.26 - 31.75	200	9	144	25	56	16
32.00	○	31.76 - 32.25	200	9	144	25	56	18
32.50	○	32.26 - 32.75	200	9	144	25	56	18
33.00	○	32.76 - 33.25	200	9	144	25	56	18
33.50	○	33.26 - 33.75	200	9	144	25	56	18
34.00	○	33.76 - 34.25	200	9	144	25	56	18
34.50	○	34.26 - 34.75	200	9	144	25	56	18
35.00	○	34.76 - 35.25	200	9	144	25	56	18
35.50	○	35.26 - 35.75	200	9	144	25	56	18
36.00	○	35.76 - 36.25	200	9	140	32	60	18
36.50	○	36.26 - 36.75	200	9	140	32	60	18
37.00	○	36.76 - 37.25	200	9	140	32	60	18
37.50	○	37.26 - 37.75	200	9	140	32	60	18
38.00	○	37.76 - 38.25	200	9	140	32	60	18
38.50	○	38.26 - 38.75	200	9	140	32	60	18
39.00	○	38.76 - 39.25	200	9	140	32	60	18
39.50	○	39.26 - 39.75	200	9	140	32	60	18
40.00	○	39.76 - 40.25	200	9	140	32	60	18

- Ex stock, subject to being unsold
- Delivery on short notice

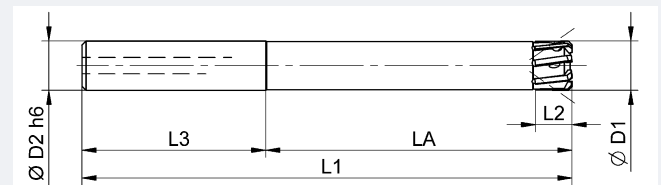
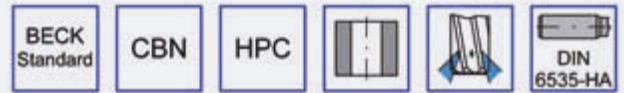
For special tolerances and intermediate diameters in the above mentioned Ø-ranges also delivery on short notice.

High performance reamers VR 01


040376


with CBN-tipped blades for HPC/HCS machining in cast iron, inner coolant supply, for through holes.

Refitting of blades possible.



	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group 11	 vc / f p. 184
				★								

Ø D1 mm		Ø-range mm	L1 mm	L2 mm	LA mm	Ø D2 mm	L3 mm	
10.00	o	9.76 - 10.25	120	9	75	12	45	6
10.50	o	10.26 - 10.75	120	9	75	12	45	6
11.00	o	10.76 - 11.25	120	9	75	12	45	6
11.50	o	11.26 - 11.75	120	9	75	12	45	6
12.00	o	11.76 - 12.25	120	9	75	12	45	8
12.50	o	12.26 - 12.75	130	9	82	16	48	8
13.00	o	12.76 - 13.25	130	9	82	16	48	8
13.50	o	13.26 - 13.75	130	9	82	16	48	8
14.00	o	13.76 - 14.25	130	9	82	16	48	10
14.50	o	14.26 - 14.75	130	9	82	16	48	10
15.00	o	14.76 - 15.25	130	9	82	16	48	10
15.50	o	15.26 - 15.75	130	9	82	16	48	10
16.00	o	15.76 - 16.25	130	9	82	16	48	10
16.50	o	16.26 - 16.75	160	9	110	20	50	10
17.00	o	16.76 - 17.25	160	9	110	20	50	10
17.50	o	17.26 - 17.75	160	9	110	20	50	10
18.00	o	17.76 - 18.25	160	9	110	20	50	12
18.50	o	18.26 - 18.75	160	9	110	20	50	12
19.00	o	18.76 - 19.25	160	9	110	20	50	12
19.50	o	19.26 - 19.75	160	9	110	20	50	12
20.00	o	19.76 - 20.25	160	9	110	20	50	12
20.50	o	20.26 - 20.75	160	9	110	20	50	12
21.00	o	20.76 - 21.25	160	9	110	20	50	12
21.50	o	21.26 - 21.75	160	9	110	20	50	12
22.00	o	21.76 - 22.25	160	9	110	20	50	14
22.50	o	22.26 - 22.75	180	9	130	20	50	14
23.00	o	22.76 - 23.25	180	9	130	20	50	14
23.50	o	23.26 - 23.75	180	9	130	20	50	14
24.00	o	23.76 - 24.25	180	9	130	20	50	14
24.50	o	24.26 - 24.75	180	9	130	20	50	14
25.00	o	24.76 - 25.25	180	9	130	20	50	16

Ø D1 mm		Ø-range mm	L1 mm	L2 mm	LA mm	Ø D2 mm	L3 mm	
25.50	o	25.26 - 25.75	180	9	130	20	50	16
26.00	o	25.76 - 26.25	180	9	130	20	50	16
26.50	o	26.26 - 26.75	180	9	130	20	50	16
27.00	o	26.76 - 27.25	180	9	130	20	50	16
27.50	o	27.26 - 27.75	180	9	130	20	50	16
28.00	o	27.76 - 28.25	180	9	124	25	56	16
28.50	o	28.26 - 28.75	180	9	124	25	56	16
29.00	o	28.76 - 29.25	180	9	124	25	56	16
29.50	o	29.26 - 29.75	200	9	144	25	56	16
30.00	o	29.76 - 30.25	200	9	144	25	56	16
30.50	o	30.26 - 30.75	200	9	144	25	56	16
31.00	o	30.76 - 31.25	200	9	144	25	56	16
31.50	o	31.26 - 31.75	200	9	144	25	56	16
32.00	o	31.76 - 32.25	200	9	144	25	56	18
32.50	o	32.26 - 32.75	200	9	144	25	56	18
33.00	o	32.76 - 33.25	200	9	144	25	56	18
33.50	o	33.26 - 33.75	200	9	144	25	56	18
34.00	o	33.76 - 34.25	200	9	144	25	56	18
34.50	o	34.26 - 34.75	200	9	144	25	56	18
35.00	o	34.76 - 35.25	200	9	144	25	56	18
35.50	o	35.26 - 35.75	200	9	144	25	56	18
36.00	o	35.76 - 36.25	200	9	140	32	60	18
36.50	o	36.26 - 36.75	200	9	140	32	60	18
37.00	o	36.76 - 37.25	200	9	140	32	60	18
37.50	o	37.26 - 37.75	200	9	140	32	60	18
38.00	o	37.76 - 38.25	200	9	140	32	60	18
38.50	o	38.26 - 38.75	200	9	140	32	60	18
39.00	o	38.76 - 39.25	200	9	140	32	60	18
39.50	o	39.26 - 39.75	200	9	140	32	60	18
40.00	o	39.76 - 40.25	200	9	140	32	60	18

- Ex stock, subject to being unsold
- Delivery on short notice

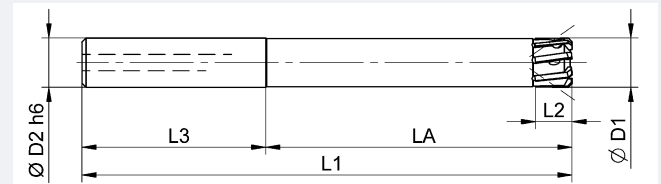
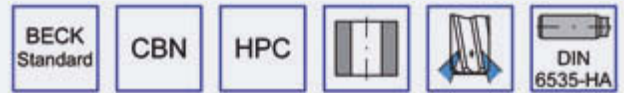
For special tolerances and intermediate diameters in the above mentioned Ø-ranges also delivery on short notice.

High performance reamers VR 01


040378


with **CBN-tipped blades** for HPC/HCS machining in **hard materials**, inner coolant supply, for through holes.

Refitting of blades possible.



	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GG650	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group 11	 vc / f p. 184
										*		

Ø D1 mm		Ø-range mm	L1 mm	L2 mm	LA mm	Ø D2 mm	L3 mm	
10.00	o	9.76 - 10.25	120	9	75	12	45	6
10.50	o	10.26 - 10.75	120	9	75	12	45	6
11.00	o	10.76 - 11.25	120	9	75	12	45	6
11.50	o	11.26 - 11.75	120	9	75	12	45	6
12.00	o	11.76 - 12.25	120	9	75	12	45	8
12.50	o	12.26 - 12.75	130	9	82	16	48	8
13.00	o	12.76 - 13.25	130	9	82	16	48	8
13.50	o	13.26 - 13.75	130	9	82	16	48	8
14.00	o	13.76 - 14.25	130	9	82	16	48	10
14.50	o	14.26 - 14.75	130	9	82	16	48	10
15.00	o	14.76 - 15.25	130	9	82	16	48	10
15.50	o	15.26 - 15.75	130	9	82	16	48	10
16.00	o	15.76 - 16.25	130	9	82	16	48	10
16.50	o	16.26 - 16.75	160	9	110	20	50	10
17.00	o	16.76 - 17.25	160	9	110	20	50	10
17.50	o	17.26 - 17.75	160	9	110	20	50	10
18.00	o	17.76 - 18.25	160	9	110	20	50	12
18.50	o	18.26 - 18.75	160	9	110	20	50	12
19.00	o	18.76 - 19.25	160	9	110	20	50	12
19.50	o	19.26 - 19.75	160	9	110	20	50	12
20.00	o	19.76 - 20.25	160	9	110	20	50	12
20.50	o	20.26 - 20.75	160	9	110	20	50	12
21.00	o	20.76 - 21.25	160	9	110	20	50	12
21.50	o	21.26 - 21.75	160	9	110	20	50	12
22.00	o	21.76 - 22.25	160	9	110	20	50	14
22.50	o	22.26 - 22.75	180	9	130	20	50	14
23.00	o	22.76 - 23.25	180	9	130	20	50	14
23.50	o	23.26 - 23.75	180	9	130	20	50	14
24.00	o	23.76 - 24.25	180	9	130	20	50	14
24.50	o	24.26 - 24.75	180	9	130	20	50	14
25.00	o	24.76 - 25.25	180	9	130	20	50	16

Ø D1 mm		Ø-range mm	L1 mm	L2 mm	LA mm	Ø D2 mm	L3 mm	
25.50	o	25.26 - 25.75	180	9	130	20	50	16
26.00	o	25.76 - 26.25	180	9	130	20	50	16
26.50	o	26.26 - 26.75	180	9	130	20	50	16
27.00	o	26.76 - 27.25	180	9	130	20	50	16
27.50	o	27.26 - 27.75	180	9	130	20	50	16
28.00	o	27.76 - 28.25	180	9	124	25	56	16
28.50	o	28.26 - 28.75	180	9	124	25	56	16
29.00	o	28.76 - 29.25	180	9	124	25	56	16
29.50	o	29.26 - 29.75	200	9	144	25	56	16
30.00	o	29.76 - 30.25	200	9	144	25	56	16
30.50	o	30.26 - 30.75	200	9	144	25	56	16
31.00	o	30.76 - 31.25	200	9	144	25	56	16
31.50	o	31.26 - 31.75	200	9	144	25	56	16
32.00	o	31.76 - 32.25	200	9	144	25	56	18
32.50	o	32.26 - 32.75	200	9	144	25	56	18
33.00	o	32.76 - 33.25	200	9	144	25	56	18
33.50	o	33.26 - 33.75	200	9	144	25	56	18
34.00	o	33.76 - 34.25	200	9	144	25	56	18
34.50	o	34.26 - 34.75	200	9	144	25	56	18
35.00	o	34.76 - 35.25	200	9	144	25	56	18
35.50	o	35.26 - 35.75	200	9	144	25	56	18
36.00	o	35.76 - 36.25	200	9	140	32	60	18
36.50	o	36.26 - 36.75	200	9	140	32	60	18
37.00	o	36.76 - 37.25	200	9	140	32	60	18
37.50	o	37.26 - 37.75	200	9	140	32	60	18
38.00	o	37.76 - 38.25	200	9	140	32	60	18
38.50	o	38.26 - 38.75	200	9	140	32	60	18
39.00	o	38.76 - 39.25	200	9	140	32	60	18
39.50	o	39.26 - 39.75	200	9	140	32	60	18
40.00	o	39.76 - 40.25	200	9	140	32	60	18

- Ex stock, subject to being unsold
- Delivery on short notice

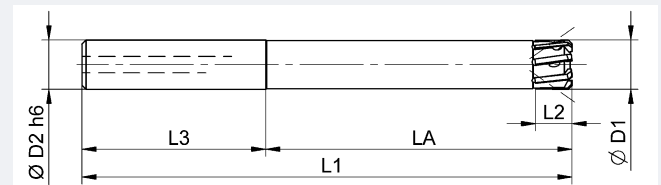
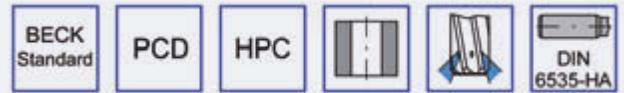
For special tolerances and intermediate diameters in the above mentioned Ø-ranges also delivery on short notice.

High performance reamers VR 01


040374


with PCD-tipped blades, inner coolant supply, for HPC/HCS machining in through holes.

Refitting of blades possible.



	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg *	Alu *	Ti	HRC < 63 HRC	Group 11	 vc / f p. 184
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Ø D1 mm		Ø-range mm	L1 mm	L2 mm	LA mm	Ø D2 mm	L3 mm	
10.00	o	9.76 - 10.25	120	9	75	12	45	6
10.50	o	10.26 - 10.75	120	9	75	12	45	6
11.00	o	10.76 - 11.25	120	9	75	12	45	6
11.50	o	11.26 - 11.75	120	9	75	12	45	6
12.00	o	11.76 - 12.25	120	9	75	12	45	8
12.50	o	12.26 - 12.75	130	9	82	16	48	8
13.00	o	12.76 - 13.25	130	9	82	16	48	8
13.50	o	13.26 - 13.75	130	9	82	16	48	8
14.00	o	13.76 - 14.25	130	9	82	16	48	10
14.50	o	14.26 - 14.75	130	9	82	16	48	10
15.00	o	14.76 - 15.25	130	9	82	16	48	10
15.50	o	15.26 - 15.75	130	9	82	16	48	10
16.00	o	15.76 - 16.25	130	9	82	16	48	10
16.50	o	16.26 - 16.75	160	9	110	20	50	10
17.00	o	16.76 - 17.25	160	9	110	20	50	10
17.50	o	17.26 - 17.75	160	9	110	20	50	10
18.00	o	17.76 - 18.25	160	9	110	20	50	12
18.50	o	18.26 - 18.75	160	9	110	20	50	12
19.00	o	18.76 - 19.25	160	9	110	20	50	12
19.50	o	19.26 - 19.75	160	9	110	20	50	12
20.00	o	19.76 - 20.25	160	9	110	20	50	12
20.50	o	20.26 - 20.75	160	9	110	20	50	12
21.00	o	20.76 - 21.25	160	9	110	20	50	12
21.50	o	21.26 - 21.75	160	9	110	20	50	12
22.00	o	21.76 - 22.25	160	9	110	20	50	14
22.50	o	22.26 - 22.75	180	9	130	20	50	14
23.00	o	22.76 - 23.25	180	9	130	20	50	14
23.50	o	23.26 - 23.75	180	9	130	20	50	14
24.00	o	23.76 - 24.25	180	9	130	20	50	14
24.50	o	24.26 - 24.75	180	9	130	20	50	14
25.00	o	24.76 - 25.25	180	9	130	20	50	16

Ø D1 mm		Ø-range mm	L1 mm	L2 mm	LA mm	Ø D2 mm	L3 mm	
25.50	o	25.26 - 25.75	180	9	130	20	50	16
26.00	o	25.76 - 26.25	180	9	130	20	50	16
26.50	o	26.26 - 26.75	180	9	130	20	50	16
27.00	o	26.76 - 27.25	180	9	130	20	50	16
27.50	o	27.26 - 27.75	180	9	130	20	50	16
28.00	o	27.76 - 28.25	180	9	124	25	56	16
28.50	o	28.26 - 28.75	180	9	124	25	56	16
29.00	o	28.76 - 29.25	180	9	124	25	56	16
29.50	o	29.26 - 29.75	200	9	144	25	56	16
30.00	o	29.76 - 30.25	200	9	144	25	56	16
30.50	o	30.26 - 30.75	200	9	144	25	56	16
31.00	o	30.76 - 31.25	200	9	144	25	56	16
31.50	o	31.26 - 31.75	200	9	144	25	56	16
32.00	o	31.76 - 32.25	200	9	144	25	56	18
32.50	o	32.26 - 32.75	200	9	144	25	56	18
33.00	o	32.76 - 33.25	200	9	144	25	56	18
33.50	o	33.26 - 33.75	200	9	144	25	56	18
34.00	o	33.76 - 34.25	200	9	144	25	56	18
34.50	o	34.26 - 34.75	200	9	144	25	56	18
35.00	o	34.76 - 35.25	200	9	144	25	56	18
35.50	o	35.26 - 35.75	200	9	144	25	56	18
36.00	o	35.76 - 36.25	200	9	140	32	60	18
36.50	o	36.26 - 36.75	200	9	140	32	60	18
37.00	o	36.76 - 37.25	200	9	140	32	60	18
37.50	o	37.26 - 37.75	200	9	140	32	60	18
38.00	o	37.76 - 38.25	200	9	140	32	60	18
38.50	o	38.26 - 38.75	200	9	140	32	60	18
39.00	o	38.76 - 39.25	200	9	140	32	60	18
39.50	o	39.26 - 39.75	200	9	140	32	60	18
40.00	o	39.76 - 40.25	200	9	140	32	60	18

- Ex stock, subject to being unsold
- o Delivery on short notice

For special tolerances and intermediate diameters in the above mentioned Ø-ranges also delivery on short notice.



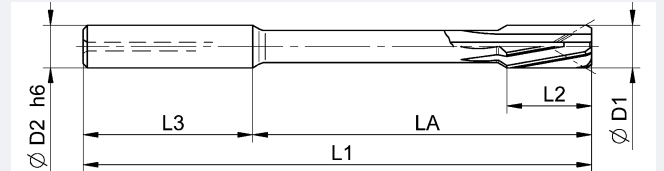
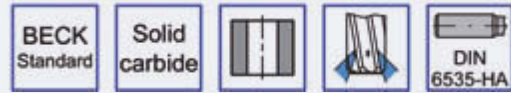
Special versions such as this **VR step reamer** for machining the main bore in a brake caliper of GGG 40 are also possible. With a tool diameter of 39 or 40 mm, this reamer has 16 blades. 10,000 bores can be machined with this tool before regrinding is necessary.

High performance reamer HNC


040260


NEW - starting from Ø 3 mm!

for **through holes**, with inner coolant supply and special HPC cutting geometry, right-hand cutting, spiral flutes, EU-spacing, for direct clamping in hydraulic, shrink, and high precision chucks



	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group 10	 vc / f p. 182
	★	★		★	★	★	★	★	▲			

Ø D1 mm		Tol.	Ø-range mm	L1 mm	L2 mm	LA mm	Ø D2 mm	L3 mm	
3.00	○	H7	2.81 - 3.03	65	12	37	4	28	4
3.20	○	H7	3.04 - 3.35	65	12	37	4	28	4
3.50	○	H7	3.36 - 3.70	65	12	37	4	28	4
3.97	●	+0,004		75	12	39	6	36	4
3.98	●	+0,004		75	12	39	6	36	4
3.99	●	+0,004		75	12	39	6	36	4
4.00	●	H7	3.71 - 4.20	75	12	39	6	36	4
4.01	●	+0,004		75	12	39	6	36	4
4.02	●	+0,004		75	12	39	6	36	4
4.03	●	+0,004		75	12	39	6	36	4
4.50	●	H7	4.21 - 4.70	75	12	39	6	36	4
4.97	●	+0,004		75	12	39	6	36	4
4.98	●	+0,004		75	12	39	6	36	4
4.99	●	+0,004		75	12	39	6	36	4
5.00	●	H7	4.71 - 5.20	75	12	39	6	36	4
5.01	●	+0,004		75	12	39	6	36	4
5.02	●	+0,004		75	12	39	6	36	4
5.03	●	+0,004		75	12	39	6	36	4
5.50	●	H7	5.21 - 5.70	75	12	39	6	36	4
5.97	●	+0,004		75	12	39	6	36	4
5.98	●	+0,004		75	12	39	6	36	4
5.99	●	+0,004		75	12	39	6	36	4
6.00	●	H7	5.71 - 6.20	75	12	39	6	36	4
6.01	●	+0,004		75	12	39	6	36	4
6.02	●	+0,004		75	12	39	6	36	4
6.03	●	+0,004		75	12	39	6	36	4
6.50	●	H7	6.21 - 6.70	100	16	64	8	36	6
7.00	●	H7	6.71 - 7.20	100	16	64	8	36	6
7.50	●	H7	7.21 - 7.70	100	16	64	8	36	6
7.97	●	+0,004		100	16	64	8	36	6
7.98	●	+0,004		100	16	64	8	36	6
7.99	●	+0,004		100	16	64	8	36	6

Ø D1 mm		Tol.	Ø-range mm	L1 mm	L2 mm	LA mm	Ø D2 mm	L3 mm	
8.00	●	H7	7.71 - 8.20	100	16	64	8	36	6
8.01	●	+0,004		100	16	64	8	36	6
8.02	●	+0,004		100	16	64	8	36	6
8.03	●	+0,004		100	16	64	8	36	6
8.50	●	H7	8.21 - 8.70	100	20	60	10	40	6
9.00	●	H7	8.71 - 9.20	100	20	60	10	40	6
9.50	●	H7	9.21 - 9.70	120	20	80	10	40	6
9.97	●	+0,004		120	20	80	10	40	6
9.98	●	+0,004		120	20	80	10	40	6
9.99	●	+0,004		120	20	80	10	40	6
10.00	●	H7	9.71 - 10.20	120	20	80	10	40	6
10.01	●	+0,004		120	20	80	10	40	6
10.02	●	+0,004		120	20	80	10	40	6
10.03	●	+0,004		120	20	80	10	40	6
10.50	●	H7	10.21 - 10.70	120	20	75	12	45	6
11.00	●	H7	10.71 - 11.20	120	20	75	12	45	6
11.50	●	H7	11.21 - 11.70	120	20	75	12	45	6
11.97	●	+0,004		120	20	75	12	45	6
11.98	●	+0,004		120	20	75	12	45	6
11.99	●	+0,004		120	20	75	12	45	6
12.00	●	H7	11.71 - 12.20	120	20	75	12	45	6
12.01	●	+0,004		120	20	75	12	45	6
12.02	●	+0,004		120	20	75	12	45	6
12.03	●	+0,004		120	20	75	12	45	6
13.00	●	H7	12.21 - 13.20	130	22	85	14	45	6
14.00	●	H7	13.21 - 14.20	130	22	85	14	45	6
15.00	●	H7	14.21 - 15.20	130	22	82	16	48	6
16.00	●	H7	15.21 - 16.20	150	25	102	16	48	6
17.00	●	H7	16.21 - 17.20	150	25	102	18	48	8
18.00	●	H7	17.21 - 18.20	150	25	102	18	48	8
19.00	●	H7	18.21 - 19.20	150	25	100	20	50	8
20.00	●	H7	19.21 - 20.20	150	25	100	20	50	8

- Ex stock, subject to being unsold
- Delivery on short notice

For special tolerances and intermediate diameters in the above mentioned Ø-ranges also delivery on short notice.

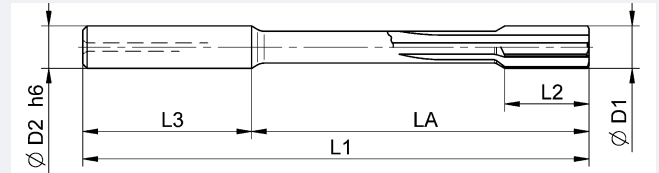
Please note: Reduction of tolerance by 1µm to +0,004/0 for all tools increasing by 0.01 mm. Adaptation of stock will be made successively.

High performance reamer HNC


040261


NEW - starting from Ø 3 mm!

for blind holes, with inner coolant supply and special HPC cutting geometry, right-hand cutting, straight flutes, EU-spacing, for direct clamping in hydraulic, shrink, and high precision chucks



	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group	 vc / f p. 182
	★	★		★	★	★	★	★	▲			

Ø D1 mm		Tol.	Ø-range mm	L1 mm	L2 mm	LA mm	Ø D2 mm	L3 mm	
3.00	○	H7	2.81 - 3.03	65	12	37	4	28	4
3.20	○	H7	3.04 - 3.35	65	12	37	4	28	4
3.50	○	H7	3.36 - 3.70	65	12	37	4	28	4
3.97	●	+0,004		75	12	39	6	36	4
3.98	●	+0,004		75	12	39	6	36	4
3.99	●	+0,004		75	12	39	6	36	4
4.00	●	H7	3.70 - 4.20	75	12	39	6	36	4
4.01	●	+0,004		75	12	39	6	36	4
4.02	●	+0,004		75	12	39	6	36	4
4.03	●	+0,004		75	12	39	6	36	4
4.50	●	H7	4.21 - 4.70	75	12	39	6	36	4
4.97	●	+0,004		75	12	39	6	36	4
4.98	●	+0,004		75	12	39	6	36	4
4.99	●	+0,004		75	12	39	6	36	4
5.00	●	H7	4.71 - 5.20	75	12	39	6	36	4
5.01	●	+0,004		75	12	39	6	36	4
5.02	●	+0,004		75	12	39	6	36	4
5.03	●	+0,004		75	12	39	6	36	4
5.50	●	H7	5.21 - 5.70	75	12	39	6	36	4
5.97	●	+0,004		75	12	39	6	36	4
5.98	●	+0,004		75	12	39	6	36	4
5.99	●	+0,004		75	12	39	6	36	4
6.00	●	H7	5.71 - 6.20	75	12	39	6	36	4
6.01	●	+0,004		75	12	39	6	36	4
6.02	●	+0,004		75	12	39	6	36	4
6.03	●	+0,004		75	12	39	6	36	4
6.50	●	H7	6.21 - 6.70	100	16	64	8	36	6
7.00	●	H7	6.71 - 7.20	100	16	64	8	36	6
7.50	●	H7	7.21 - 7.70	100	16	64	8	36	6
7.97	●	+0,004		100	16	64	8	36	6
7.98	●	+0,004		100	16	64	8	36	6
7.99	●	+0,004		100	16	64	8	36	6

Ø D1 mm		Tol.	Ø-range mm	L1 mm	L2 mm	LA mm	Ø D2 mm	L3 mm	
8.00	●	H7	7.71 - 8.20	100	16	64	8	36	6
8.01	●	+0,004		100	16	64	8	36	6
8.02	●	+0,004		100	16	64	8	36	6
8.03	●	+0,004		100	16	64	8	36	6
8.50	●	H7	8.21 - 8.70	100	20	60	10	40	6
9.00	●	H7	8.71 - 9.20	100	20	60	10	40	6
9.50	●	H7	9.21 - 9.70	120	20	80	10	40	6
9.97	●	+0,004		120	20	80	10	40	6
9.98	●	+0,004		120	20	80	10	40	6
9.99	●	+0,004		120	20	80	10	40	6
10.00	●	H7	9.71 - 10.20	120	20	80	10	40	6
10.01	●	+0,004		120	20	80	10	40	6
10.02	●	+0,004		120	20	80	10	40	6
10.03	●	+0,004		120	20	80	10	40	6
10.50	●	H7	10.21 - 10.70	120	20	75	12	45	6
11.00	●	H7	10.71 - 11.20	120	20	75	12	45	6
11.50	●	H7	11.21 - 11.70	120	20	75	12	45	6
11.97	●	+0,004		120	20	75	12	45	6
11.98	●	+0,004		120	20	75	12	45	6
11.99	●	+0,004		120	20	75	12	45	6
12.00	●	H7	11.71 - 12.20	120	20	75	12	45	6
12.01	●	+0,004		120	20	75	12	45	6
12.02	●	+0,004		120	20	75	12	45	6
12.03	●	+0,004		120	20	75	12	45	6
13.00	●	H7	12.21 - 13.20	130	22	85	14	45	6
14.00	●	H7	13.21 - 14.20	130	22	85	14	45	6
15.00	●	H7	14.21 - 15.20	130	22	82	16	48	6
16.00	●	H7	15.21 - 16.20	150	25	102	16	48	6
17.00	●	H7	16.21 - 17.20	150	25	102	18	48	6
18.00	●	H7	17.21 - 18.20	150	25	102	18	48	6
19.00	●	H7	18.21 - 19.20	150	25	100	20	50	6
20.00	●	H7	19.21 - 20.20	150	25	100	20	50	6

- Ex stock, subject to being unsold
- Delivery on short notice

For special tolerances and intermediate diameters in the above mentioned Ø-ranges also delivery on short notice.

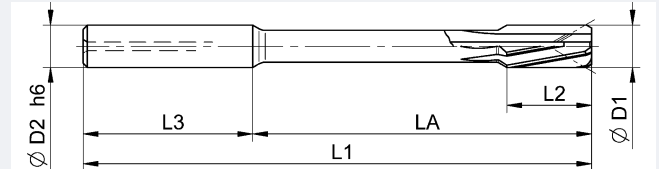
Please note: Reduction of tolerance by 1µm to +0,004/0 for all tools increasing by 0.01 mm. Adaptation of stock will be made successively.

High performance reamer HNC-Speed


043260


NEW - starting from Ø 3 mm!

for **through holes**, with inner coolant supply, special HPC cutting geometry and coating, right-hand cutting, spiral flutes, EU-spacing, for direct clamping in hydraulic, shrink, and high precision chucks



	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GG650	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group 10	 vc / f p. 181
	★	★		★	★	★						

Ø D1 mm		Tol.	Ø-range mm	L1 mm	L2 mm	LA mm	Ø D2 mm	L3 mm	
3.00	○	H7	2.81 - 3.03	65	12	37	4	28	4
3.20	○	H7	3.04 - 3.35	65	12	37	4	28	4
3.50	○	H7	3.36 - 3.70	65	12	37	4	28	4
3.97	●	+0,004		75	12	39	6	36	4
3.98	●	+0,004		75	12	39	6	36	4
3.99	●	+0,004		75	12	39	6	36	4
4.00	●	H7	3.70 - 4.20	75	12	39	6	36	4
4.01	●	+0,004		75	12	39	6	36	4
4.02	●	+0,004		75	12	39	6	36	4
4.03	●	+0,004		75	12	39	6	36	4
4.50	●	H7	4.21 - 4.70	75	12	39	6	36	4
4.97	●	+0,004		75	12	39	6	36	4
4.98	●	+0,004		75	12	39	6	36	4
4.99	●	+0,004		75	12	39	6	36	4
5.00	●	H7	4.71 - 5.20	75	12	39	6	36	4
5.01	●	+0,004		75	12	39	6	36	4
5.02	●	+0,004		75	12	39	6	36	4
5.03	●	+0,004		75	12	39	6	36	4
5.50	●	H7	5.21 - 5.70	75	12	39	6	36	4
5.97	●	+0,004		75	12	39	6	36	4
5.98	●	+0,004		75	12	39	6	36	4
5.99	●	+0,004		75	12	39	6	36	4
6.00	●	H7	5.71 - 6.20	75	12	39	6	36	4
6.01	●	+0,004		75	12	39	6	36	4
6.02	●	+0,004		75	12	39	6	36	4
6.03	●	+0,004		75	12	39	6	36	4
6.50	●	H7	6.21 - 6.70	100	16	64	8	36	6
7.00	●	H7	6.71 - 7.20	100	16	64	8	36	6
7.50	●	H7	7.21 - 7.70	100	16	64	8	36	6
7.97	●	+0,004		100	16	64	8	36	6
7.98	●	+0,004		100	16	64	8	36	6
7.99	●	+0,004		100	16	64	8	36	6

Ø D1 mm		Tol.	Ø-range mm	L1 mm	L2 mm	LA mm	Ø D2 mm	L3 mm	
8.00	●	H7	7.71 - 8.20	100	16	64	8	36	6
8.01	●	+0,004		100	16	64	8	36	6
8.02	●	+0,004		100	16	64	8	36	6
8.03	●	+0,004		100	16	64	8	36	6
8.50	●	H7	8.21 - 8.70	100	20	60	10	40	6
9.00	●	H7	8.71 - 9.20	100	20	60	10	40	6
9.50	●	H7	9.21 - 9.70	120	20	80	10	40	6
9.97	●	+0,004		120	20	80	10	40	6
9.98	●	+0,004		120	20	80	10	40	6
9.99	●	+0,004		120	20	80	10	40	6
10.00	●	H7	9.71 - 10.20	120	20	80	10	40	6
10.01	●	+0,004		120	20	80	10	40	6
10.02	●	+0,004		120	20	80	10	40	6
10.03	●	+0,004		120	20	80	10	40	6
10.50	●	H7	10.21 - 10.70	120	20	75	12	45	6
11.00	●	H7	10.71 - 11.20	120	20	75	12	45	6
11.50	●	H7	11.21 - 11.70	120	20	75	12	45	6
11.97	●	+0,004		120	20	75	12	45	6
11.98	●	+0,004		120	20	75	12	45	6
11.99	●	+0,004		120	20	75	12	45	6
12.00	●	H7	11.71 - 12.20	120	20	75	12	45	6
12.01	●	+0,004		120	20	75	12	45	6
12.02	●	+0,004		120	20	75	12	45	6
12.03	●	+0,004		120	20	75	12	45	6
13.00	●	H7	12.21 - 13.20	130	22	85	14	45	6
14.00	●	H7	13.21 - 14.20	130	22	85	14	45	6
15.00	●	H7	14.21 - 15.20	130	22	82	16	48	6
16.00	●	H7	15.21 - 16.20	150	25	102	16	48	6
17.00	●	H7	16.21 - 17.20	150	25	102	18	48	8
18.00	●	H7	17.21 - 18.20	150	25	102	18	48	8
19.00	●	H7	18.21 - 19.20	150	25	100	20	50	8
20.00	●	H7	19.21 - 20.20	150	25	100	20	50	8

- Ex stock, subject to being unsold
- Delivery on short notice

For special tolerances and intermediate diameters in the above mentioned Ø-ranges also delivery on short notice.

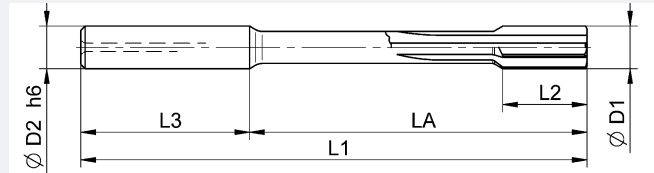
Please note: Reduction of tolerance by 1µm to +0,004/0 for all tools increasing by 0.01 mm. Adaptation of stock will be made successively.

High performance reamer HNC-Speed


043261


NEW - starting from Ø 3 mm!

for blind holes, with inner coolant supply, special HPC cutting geometry and coating, right-hand cutting, straight flutes, EU-spacing, for direct clamping in hydraulic, shrink, and high precision chucks



	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group	 vc / f p. 181
	★	★		★	★	★						

Ø D1 mm		Tol.	Ø-range mm	L1 mm	L2 mm	LA mm	Ø D2 mm	L3 mm	
3.00	○	H7	2.81 - 3.03	65	12	37	4	28	4
3.20	○	H7	3.04 - 3.35	65	12	37	4	28	4
3.50	○	H7	3.36 - 3.70	65	12	37	4	28	4
3.97	●	+0,004		75	12	39	6	36	4
3.98	●	+0,004		75	12	39	6	36	4
3.99	●	+0,004		75	12	39	6	36	4
4.00	●	H7	3.70 - 4.20	75	12	39	6	36	4
4.01	●	+0,004		75	12	39	6	36	4
4.02	●	+0,004		75	12	39	6	36	4
4.03	●	+0,004		75	12	39	6	36	4
4.50	●	H7	4.21 - 4.70	75	12	39	6	36	4
4.97	●	+0,004		75	12	39	6	36	4
4.98	●	+0,004		75	12	39	6	36	4
4.99	●	+0,004		75	12	39	6	36	4
5.00	●	H7	4.71 - 5.20	75	12	39	6	36	4
5.01	●	+0,004		75	12	39	6	36	4
5.02	●	+0,004		75	12	39	6	36	4
5.03	●	+0,004		75	12	39	6	36	4
5.50	●	H7	5.21 - 5.70	75	12	39	6	36	4
5.97	●	+0,004		75	12	39	6	36	4
5.98	●	+0,004		75	12	39	6	36	4
5.99	●	+0,004		75	12	39	6	36	4
6.00	●	H7	5.71 - 6.20	75	12	39	6	36	4
6.01	●	+0,004		75	12	39	6	36	4
6.02	●	+0,004		75	12	39	6	36	4
6.03	●	+0,004		75	12	39	6	36	4
6.50	●	H7	6.21 - 6.70	100	16	64	8	36	6
7.00	●	H7	6.71 - 7.20	100	16	64	8	36	6
7.50	●	H7	7.21 - 7.70	100	16	64	8	36	6
7.97	●	+0,004		100	16	64	8	36	6
7.98	●	+0,004		100	16	64	8	36	6
7.99	●	+0,004		100	16	64	8	36	6

Ø D1 mm		Tol.	Ø-range mm	L1 mm	L2 mm	LA mm	Ø D2 mm	L3 mm	
8.00	●	H7	7.71 - 8.20	100	16	64	8	36	6
8.01	●	+0,004		100	16	64	8	36	6
8.02	●	+0,004		100	16	64	8	36	6
8.03	●	+0,004		100	16	64	8	36	6
8.50	●	H7	8.21 - 8.70	100	20	60	10	40	6
9.00	●	H7	8.71 - 9.20	100	20	60	10	40	6
9.50	●	H7	9.21 - 9.70	120	20	80	10	40	6
9.97	●	+0,004		120	20	80	10	40	6
9.98	●	+0,004		120	20	80	10	40	6
9.99	●	+0,004		120	20	80	10	40	6
10.00	●	H7	9.71 - 10.20	120	20	80	10	40	6
10.01	●	+0,004		120	20	80	10	40	6
10.02	●	+0,004		120	20	80	10	40	6
10.03	●	+0,004		120	20	80	10	40	6
10.50	●	H7	10.21 - 10.70	120	20	75	12	45	6
11.00	●	H7	10.71 - 11.20	120	20	75	12	45	6
11.50	●	H7	11.21 - 11.70	120	20	75	12	45	6
11.97	●	+0,004		120	20	75	12	45	6
11.98	●	+0,004		120	20	75	12	45	6
11.99	●	+0,004		120	20	75	12	45	6
12.00	●	H7	11.71 - 12.20	120	20	75	12	45	6
12.01	●	+0,004		120	20	75	12	45	6
12.02	●	+0,004		120	20	75	12	45	6
12.03	●	+0,004		120	20	75	12	45	6
13.00	●	H7	12.21 - 13.20	130	22	85	14	45	6
14.00	●	H7	13.21 - 14.20	130	22	85	14	45	6
15.00	●	H7	14.21 - 15.20	130	22	82	16	48	6
16.00	●	H7	15.21 - 16.20	150	25	102	16	48	6
17.00	●	H7	16.21 - 17.20	150	25	102	18	48	6
18.00	●	H7	17.21 - 18.20	150	25	102	18	48	6
19.00	●	H7	18.21 - 19.20	150	25	100	20	50	6
20.00	●	H7	19.21 - 20.20	150	25	100	20	50	6

- Ex stock, subject to being unsold
- Delivery on short notice

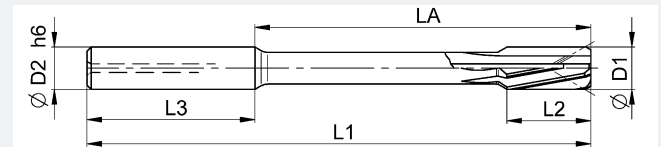
For special tolerances and intermediate diameters in the above mentioned Ø-ranges also delivery on short notice.

Please note: Reduction of tolerance by 1µm to +0,004/0 for all tools increasing by 0.01 mm. Adaptation of stock will be made successively.


High performance reamers HNC-VA


043270

for through holes, with inner coolant supply, special HPC cutting geometry and coating for the machining of CrNi-materials, right-hand cutting, spiral flutes, EU-spacing, for direct clamping in hydraulic, shrink and high precision chucks



	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group 10C	 vc / f p. 181
			★									

Ø D1 mm		Tol.	Ø-range mm	L1 mm	L2 mm	LA mm	Ø D2 mm	L3 mm	
3.97	○	+0,004		75	12	39	6	36	4
3.98	○	+0,004		75	12	39	6	36	4
3.99	○	+0,004		75	12	39	6	36	4
4.00	○	H7	3.70 - 4.20	75	12	39	6	36	4
4.01	○	+0,004		75	12	39	6	36	4
4.02	○	+0,004		75	12	39	6	36	4
4.03	○	+0,004		75	12	39	6	36	4
4.50	○	H7	4.21 - 4.70	75	12	39	6	36	4
4.97	○	+0,004		75	12	39	6	36	4
4.98	○	+0,004		75	12	39	6	36	4
4.99	○	+0,004		75	12	39	6	36	4
5.00	○	H7	4.71 - 5.20	75	12	39	6	36	4
5.01	○	+0,004		75	12	39	6	36	4
5.02	○	+0,004		75	12	39	6	36	4
5.03	○	+0,004		75	12	39	6	36	4
5.50	○	H7	5.21 - 5.70	75	12	39	6	36	4
5.97	○	+0,004		75	12	39	6	36	4
5.98	○	+0,004		75	12	39	6	36	4
5.99	○	+0,004		75	12	39	6	36	4
6.00	○	H7	5.71 - 6.20	75	12	39	6	36	4
6.01	○	+0,004		75	12	39	6	36	4
6.02	○	+0,004		75	12	39	6	36	4
6.03	○	+0,004		75	12	39	6	36	4
6.50	○	H7	6.21 - 6.70	100	16	64	8	36	6
7.00	○	H7	6.71 - 7.20	100	16	64	8	36	6
7.50	○	H7	7.21 - 7.70	100	16	64	8	36	6
7.97	○	+0,004		100	16	64	8	36	6
7.98	○	+0,004		100	16	64	8	36	6
7.99	○	+0,004		100	16	64	8	36	6
8.00	○	H7	7.71 - 8.20	100	16	64	8	36	6
8.01	○	+0,004		100	16	64	8	36	6

Ø D1 mm		Tol.	Ø-range mm	L1 mm	L2 mm	LA mm	Ø D2 mm	L3 mm	
8.02	○	+0,004		100	16	64	8	36	6
8.03	○	+0,004		100	16	64	8	36	6
8.50	○	H7	8.21 - 8.70	100	20	60	10	40	6
9.00	○	H7	8.71 - 9.20	100	20	60	10	40	6
9.50	○	H7	9.21 - 9.70	120	20	80	10	40	6
9.97	○	+0,004		120	20	80	10	40	6
9.98	○	+0,004		120	20	80	10	40	6
9.99	○	+0,004		120	20	80	10	40	6
10.00	○	H7	9.71 - 10.20	120	20	80	10	40	6
10.01	○	+0,004		120	20	80	10	40	6
10.02	○	+0,004		120	20	80	10	40	6
10.03	○	+0,004		120	20	80	10	40	6
10.50	○	H7	10.21 - 10.70	120	20	75	12	45	6
11.00	○	H7	10.71 - 11.20	120	20	75	12	45	6
11.50	○	H7	11.21 - 11.70	120	20	75	12	45	6
11.97	○	+0,004		120	20	75	12	45	6
11.98	○	+0,004		120	20	75	12	45	6
11.99	○	+0,004		120	20	75	12	45	6
12.00	○	H7	11.71 - 12.20	120	20	75	12	45	6
12.01	○	+0,004		120	20	75	12	45	6
12.02	○	+0,004		120	20	75	12	45	6
12.03	○	+0,004		120	20	75	12	45	6
13.00	○	H7	12.21 - 13.20	130	22	85	14	45	6
14.00	○	H7	13.21 - 14.20	130	22	85	14	45	6
15.00	○	H7	14.21 - 15.20	130	22	82	16	48	6
16.00	○	H7	15.21 - 16.20	150	25	102	16	48	6
17.00	○	H7	16.21 - 17.20	150	25	102	18	48	8
18.00	○	H7	17.21 - 18.20	150	25	102	18	48	8
19.00	○	H7	18.21 - 19.20	150	25	100	20	50	8
20.00	○	H7	19.21 - 20.20	150	25	100	20	50	8

- Ex stock, subject to being unsold
- Delivery on short notice

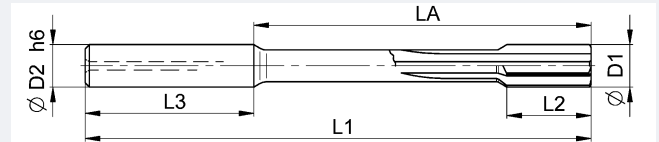
For special tolerances and intermediate diameters in the above mentioned Ø-ranges also delivery on short notice.

Please note: Reduction of tolerance by 1µm to +0,004/0 for all tools increasing by 0.01 mm.


High performance reamers HNC-VA


043271

for blind holes, with inner coolant supply, special HPC cutting geometry and coating
 for the machining of CrNi-materials, right-hand cutting, straight flutes, EU-spacing,
 for direct clamping in hydraulic, shrink and high precision chucks



	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group 10	 vc / f p. 181
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Ø D1 mm		Tol.	Ø-range mm	L1 mm	L2 mm	LA mm	Ø D2 mm	L3 mm	
3.97	o	+0,004		75	12	39	6	36	4
3.98	o	+0,004		75	12	39	6	36	4
3.99	o	+0,004		75	12	39	6	36	4
4.00	o	H7	3.70 - 4.20	75	12	39	6	36	4
4.01	o	+0,004		75	12	39	6	36	4
4.02	o	+0,004		75	12	39	6	36	4
4.03	o	+0,004		75	12	39	6	36	4
4.50	o	H7	4.21 - 4.70	75	12	39	6	36	4
4.97	o	+0,004		75	12	39	6	36	4
4.98	o	+0,004		75	12	39	6	36	4
4.99	o	+0,004		75	12	39	6	36	4
5.00	o	H7	4.71 - 5.20	75	12	39	6	36	4
5.01	o	+0,004		75	12	39	6	36	4
5.02	o	+0,004		75	12	39	6	36	4
5.03	o	+0,004		75	12	39	6	36	4
5.50	o	H7	5.21 - 5.70	75	12	39	6	36	4
5.97	o	+0,004		75	12	39	6	36	4
5.98	o	+0,004		75	12	39	6	36	4
5.99	o	+0,004		75	12	39	6	36	4
6.00	o	H7	5.71 - 6.20	75	12	39	6	36	4
6.01	o	+0,004		75	12	39	6	36	4
6.02	o	+0,004		75	12	39	6	36	4
6.03	o	+0,004		75	12	39	6	36	4
6.50	o	H7	6.21 - 6.70	100	16	64	8	36	6
7.00	o	H7	6.71 - 7.20	100	16	64	8	36	6
7.50	o	H7	7.21 - 7.70	100	16	64	8	36	6
7.97	o	+0,004		100	16	64	8	36	6
7.98	o	+0,004		100	16	64	8	36	6
7.99	o	+0,004		100	16	64	8	36	6
8.00	o	H7	7.71 - 8.20	100	16	64	8	36	6
8.01	o	+0,004		100	16	64	8	36	6

Ø D1 mm		Tol.	Ø-range mm	L1 mm	L2 mm	LA mm	Ø D2 mm	L3 mm	
8.02	o	+0,004		100	16	64	8	36	6
8.03	o	+0,004		100	16	64	8	36	6
8.50	o	H7	8.21 - 8.70	100	20	60	10	40	6
9.00	o	H7	8.71 - 9.20	100	20	60	10	40	6
9.50	o	H7	9.21 - 9.70	120	20	80	10	40	6
9.97	o	+0,004		120	20	80	10	40	6
9.98	o	+0,004		120	20	80	10	40	6
9.99	o	+0,004		120	20	80	10	40	6
10.00	o	H7	9.71 - 10.20	120	20	80	10	40	6
10.01	o	+0,004		120	20	80	10	40	6
10.02	o	+0,004		120	20	80	10	40	6
10.03	o	+0,004		120	20	80	10	40	6
10.50	o	H7	10.21 - 10.70	120	20	75	12	45	6
11.00	o	H7	10.71 - 11.20	120	20	75	12	45	6
11.50	o	H7	11.21 - 11.70	120	20	75	12	45	6
11.97	o	+0,004		120	20	75	12	45	6
11.98	o	+0,004		120	20	75	12	45	6
11.99	o	+0,004		120	20	75	12	45	6
12.00	o	H7	11.71 - 12.20	120	20	75	12	45	6
12.01	o	+0,004		120	20	75	12	45	6
12.02	o	+0,004		120	20	75	12	45	6
12.03	o	+0,004		120	20	75	12	45	6
13.00	o	H7	12.21 - 13.20	130	22	85	14	45	6
14.00	o	H7	13.21 - 14.20	130	22	85	14	45	6
15.00	o	H7	14.21 - 15.20	130	22	82	16	48	6
16.00	o	H7	15.21 - 16.20	150	25	102	16	48	6
17.00	o	H7	16.21 - 17.20	150	25	102	18	48	6
18.00	o	H7	17.21 - 18.20	150	25	102	18	48	6
19.00	o	H7	18.21 - 19.20	150	25	100	20	50	6
20.00	o	H7	19.21 - 20.20	150	25	100	20	50	6

- Ex stock, subject to being unsold
- Delivery on short notice

For special tolerances and intermediate diameters in the above mentioned Ø-ranges also delivery on short notice.

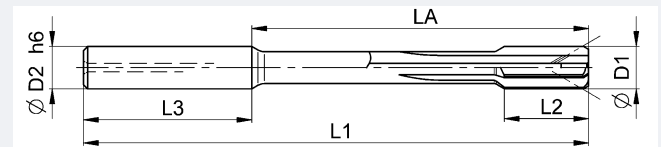
Please note: Reduction of tolerance by 1µm to +0,004/0 for all tools increasing by 0.01 mm.

1


High performance reamers HNC-HT


043280

for through holes, with inner coolant supply, special cutting geometry and coating for the machining of hard materials, right-hand cutting, straight flutes, EU-spacing, for direct clamping in hydraulic, shrink and high precision chucks



	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group 10	 vc / f p. 181
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Ø D1 mm		Tol.	Ø-range mm	L1 mm	L2 mm	LA mm	Ø D2 mm	L3 mm	
3.97	o	+0,004		75	12	39	6	36	4
3.98	o	+0,004		75	12	39	6	36	4
3.99	o	+0,004		75	12	39	6	36	4
4.00	o	H7	3.70 - 4.20	75	12	39	6	36	4
4.01	o	+0,004		75	12	39	6	36	4
4.02	o	+0,004		75	12	39	6	36	4
4.03	o	+0,004		75	12	39	6	36	4
4.50	o	H7	4.21 - 4.70	75	12	39	6	36	4
4.97	o	+0,004		75	12	39	6	36	4
4.98	o	+0,004		75	12	39	6	36	4
4.99	o	+0,004		75	12	39	6	36	4
5.00	o	H7	4.71 - 5.20	75	12	39	6	36	4
5.01	o	+0,004		75	12	39	6	36	4
5.02	o	+0,004		75	12	39	6	36	4
5.03	o	+0,004		75	12	39	6	36	4
5.50	o	H7	5.21 - 5.70	75	12	39	6	36	4
5.97	o	+0,004		75	12	39	6	36	4
5.98	o	+0,004		75	12	39	6	36	4
5.99	o	+0,004		75	12	39	6	36	4
6.00	o	H7	5.71 - 6.20	75	12	39	6	36	4
6.01	o	+0,004		75	12	39	6	36	4
6.02	o	+0,004		75	12	39	6	36	4
6.03	o	+0,004		75	12	39	6	36	4
6.50	o	H7	6.21 - 6.70	100	16	64	8	36	6
7.00	o	H7	6.71 - 7.20	100	16	64	8	36	6
7.50	o	H7	7.21 - 7.70	100	16	64	8	36	6
7.97	o	+0,004		100	16	64	8	36	6
7.98	o	+0,004		100	16	64	8	36	6
7.99	o	+0,004		100	16	64	8	36	6
8.00	o	H7	7.71 - 8.20	100	16	64	8	36	6
8.01	o	+0,004		100	16	64	8	36	6

Ø D1 mm		Tol.	Ø-range mm	L1 mm	L2 mm	LA mm	Ø D2 mm	L3 mm	
8.02	o	+0,004		100	16	64	8	36	6
8.03	o	+0,004		100	16	64	8	36	6
8.50	o	H7	8.21 - 8.70	100	20	60	10	40	6
9.00	o	H7	8.71 - 9.20	100	20	60	10	40	6
9.50	o	H7	9.21 - 9.70	120	20	80	10	40	6
9.97	o	+0,004		120	20	80	10	40	6
9.98	o	+0,004		120	20	80	10	40	6
9.99	o	+0,004		120	20	80	10	40	6
10.00	o	H7	9.71 - 10.20	120	20	80	10	40	6
10.01	o	+0,004		120	20	80	10	40	6
10.02	o	+0,004		120	20	80	10	40	6
10.03	o	+0,004		120	20	80	10	40	6
10.50	o	H7	10.21 - 10.70	120	20	75	12	45	6
11.00	o	H7	10.71 - 11.20	120	20	75	12	45	6
11.50	o	H7	11.21 - 11.70	120	20	75	12	45	6
11.97	o	+0,004		120	20	75	12	45	6
11.98	o	+0,004		120	20	75	12	45	6
11.99	o	+0,004		120	20	75	12	45	6
12.00	o	H7	11.71 - 12.20	120	20	75	12	45	6
12.01	o	+0,004		120	20	75	12	45	6
12.02	o	+0,004		120	20	75	12	45	6
12.03	o	+0,004		120	20	75	12	45	6
13.00	o	H7	12.21 - 13.20	130	22	85	14	45	6
14.00	o	H7	13.21 - 14.20	130	22	85	14	45	6
15.00	o	H7	14.21 - 15.20	130	22	82	16	48	6
16.00	o	H7	15.21 - 16.20	150	25	102	16	48	6
17.00	o	H7	16.21 - 17.20	150	25	102	18	48	6
18.00	o	H7	17.21 - 18.20	150	25	102	18	48	6
19.00	o	H7	18.21 - 19.20	150	25	100	20	50	6
20.00	o	H7	19.21 - 20.20	150	25	100	20	50	6

- Ex stock, subject to being unsold
- Delivery on short notice

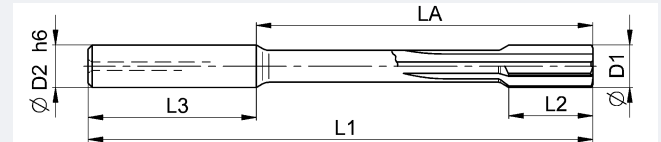
For special tolerances and intermediate diameters in the above mentioned Ø-ranges also delivery on short notice.

Please note: Reduction of tolerance by 1µm to +0,004/0 for all tools increasing by 0.01 mm.


High performance reamers HNC-HT


043281

for blind holes, with inner coolant supply, special cutting geometry and coating
 for the machining of hard materials, right-hand cutting, straight flutes, EU-spacing,
 for direct clamping in hydraulic, shrink and high precision chucks



	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group 10	 vc / f p. 181
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Ø D1 mm		Tol.	Ø-range mm	L1 mm	L2 mm	LA mm	Ø D2 mm	L3 mm	
3.97	o	+0,004		75	12	39	6	36	4
3.98	o	+0,004		75	12	39	6	36	4
3.99	o	+0,004		75	12	39	6	36	4
4.00	o	H7	3.70 - 4.20	75	12	39	6	36	4
4.01	o	+0,004		75	12	39	6	36	4
4.02	o	+0,004		75	12	39	6	36	4
4.03	o	+0,004		75	12	39	6	36	4
4.50	o	H7	4.21 - 4.70	75	12	39	6	36	4
4.97	o	+0,004		75	12	39	6	36	4
4.98	o	+0,004		75	12	39	6	36	4
4.99	o	+0,004		75	12	39	6	36	4
5.00	o	H7	4.71 - 5.20	75	12	39	6	36	4
5.01	o	+0,004		75	12	39	6	36	4
5.02	o	+0,004		75	12	39	6	36	4
5.03	o	+0,004		75	12	39	6	36	4
5.50	o	H7	5.21 - 5.70	75	12	39	6	36	4
5.97	o	+0,004		75	12	39	6	36	4
5.98	o	+0,004		75	12	39	6	36	4
5.99	o	+0,004		75	12	39	6	36	4
6.00	o	H7	5.71 - 6.20	75	12	39	6	36	4
6.01	o	+0,004		75	12	39	6	36	4
6.02	o	+0,004		75	12	39	6	36	4
6.03	o	+0,004		75	12	39	6	36	4
6.50	o	H7	6.21 - 6.70	100	16	64	8	36	6
7.00	o	H7	6.71 - 7.20	100	16	64	8	36	6
7.50	o	H7	7.21 - 7.70	100	16	64	8	36	6
7.97	o	+0,004		100	16	64	8	36	6
7.98	o	+0,004		100	16	64	8	36	6
7.99	o	+0,004		100	16	64	8	36	6
8.00	o	H7	7.71 - 8.20	100	16	64	8	36	6
8.01	o	+0,004		100	16	64	8	36	6

Ø D1 mm		Tol.	Ø-range mm	L1 mm	L2 mm	LA mm	Ø D2 mm	L3 mm	
8.02	o	+0,004		100	16	64	8	36	6
8.03	o	+0,004		100	16	64	8	36	6
8.50	o	H7	8.21 - 8.70	100	20	60	10	40	6
9.00	o	H7	8.71 - 9.20	100	20	60	10	40	6
9.50	o	H7	9.21 - 9.70	120	20	80	10	40	6
9.97	o	+0,004		120	20	80	10	40	6
9.98	o	+0,004		120	20	80	10	40	6
9.99	o	+0,004		120	20	80	10	40	6
10.00	o	H7	9.71 - 10.20	120	20	80	10	40	6
10.01	o	+0,004		120	20	80	10	40	6
10.02	o	+0,004		120	20	80	10	40	6
10.03	o	+0,004		120	20	80	10	40	6
10.50	o	H7	10.21 - 10.70	120	20	75	12	45	6
11.00	o	H7	10.71 - 11.20	120	20	75	12	45	6
11.50	o	H7	11.21 - 11.70	120	20	75	12	45	6
11.97	o	+0,004		120	20	75	12	45	6
11.98	o	+0,004		120	20	75	12	45	6
11.99	o	+0,004		120	20	75	12	45	6
12.00	o	H7	11.71 - 12.20	120	20	75	12	45	6
12.01	o	+0,004		120	20	75	12	45	6
12.02	o	+0,004		120	20	75	12	45	6
12.03	o	+0,004		120	20	75	12	45	6
13.00	o	H7	12.21 - 13.20	130	22	85	14	45	6
14.00	o	H7	13.21 - 14.20	130	22	85	14	45	6
15.00	o	H7	14.21 - 15.20	130	22	82	16	48	6
16.00	o	H7	15.21 - 16.20	150	25	102	16	48	6
17.00	o	H7	16.21 - 17.20	150	25	102	18	48	6
18.00	o	H7	17.21 - 18.20	150	25	102	18	48	6
19.00	o	H7	18.21 - 19.20	150	25	100	20	50	6
20.00	o	H7	19.21 - 20.20	150	25	100	20	50	6

- Ex stock, subject to being unsold
- Delivery on short notice

For special tolerances and intermediate diameters in the above mentioned Ø-ranges also delivery on short notice.

Please note: Reduction of tolerance by 1µm to +0,004/0 for all tools increasing by 0.01 mm.

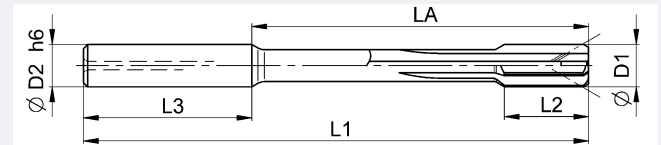
High performance reamers HNC-AL

043250


for through holes, with inner coolant supply, special cutting geometry for the machining of aluminium, right-hand cutting, straight flutes, EU-spacing, for direct clamping in hydraulic, shrink and high precision chucks.




Without statement of particulars the tools are supplied with tolerance H7.



	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GG650	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group 10	 vc / f p. 181
								*				

Ø D1 mm	Ø-range mm	L1 mm	L2 mm	LA mm	Ø D2 mm	L3 mm	
4.00	3.70 - 4.20	75	12	39	6	36	4
4.50	4.21 - 4.70	75	12	39	6	36	4
5.00	4.71 - 5.20	75	12	39	6	36	4
5.50	5.21 - 5.70	75	12	39	6	36	4
6.00	5.71 - 6.20	75	12	39	6	36	4
6.50	6.21 - 6.70	100	16	64	8	36	6
7.00	6.71 - 7.20	100	16	64	8	36	6
7.50	7.21 - 7.70	100	16	64	8	36	6
8.00	7.71 - 8.20	100	16	64	8	36	6
8.50	8.21 - 8.70	100	20	60	10	40	6
9.00	8.71 - 9.20	100	20	60	10	40	6
9.50	9.21 - 9.70	120	20	80	10	40	6
10.00	9.71 - 10.20	120	20	80	10	40	6

Ø D1 mm	Ø-range mm	L1 mm	L2 mm	LA mm	Ø D2 mm	L3 mm	
10.50	10.21 - 10.70	120	20	75	12	45	6
11.00	10.71 - 11.20	120	20	75	12	45	6
11.50	11.21 - 11.70	120	20	75	12	45	6
12.00	11.71 - 12.20	120	20	75	12	45	6
13.00	12.21 - 13.20	130	22	85	14	45	6
14.00	13.21 - 14.20	130	22	85	14	45	6
15.00	14.21 - 15.20	130	22	82	16	48	6
16.00	15.21 - 16.20	150	25	102	16	48	6
17.00	16.21 - 17.20	150	25	102	18	48	6
18.00	17.21 - 18.20	150	25	102	18	48	6
19.00	18.21 - 19.20	150	25	100	20	50	6
20.00	19.21 - 20.20	150	25	100	20	50	6

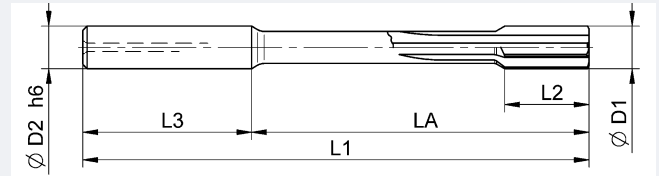
Delivery time on request

High performance reamers HNC-AL


043251


for blind holes, with inner coolant supply, special cutting geometry for the machining of aluminium, right-hand cutting, straight flutes, EU-spacing, for direct clamping in hydraulic, shrink and high precision chucks.

Without statement of particulars the tools are supplied with tolerance H7.



	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu ★	Ti	HRC < 63 HRC	Group 10	 vc / f p. 181
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Ø D1 mm	Ø-range mm	L1 mm	L2 mm	LA mm	Ø D2 mm	L3 mm	
4.00	3.70 - 4.20	75	12	39	6	36	4
4.50	4.21 - 4.70	75	12	39	6	36	4
5.00	4.71 - 5.20	75	12	39	6	36	4
5.50	5.21 - 5.70	75	12	39	6	36	4
6.00	5.71 - 6.20	75	12	39	6	36	4
6.50	6.21 - 6.70	100	16	64	8	36	6
7.00	6.71 - 7.20	100	16	64	8	36	6
7.50	7.21 - 7.70	100	16	64	8	36	6
8.00	7.71 - 8.20	100	16	64	8	36	6
8.50	8.21 - 8.70	100	20	60	10	40	6
9.00	8.71 - 9.20	100	20	60	10	40	6
9.50	9.21 - 9.70	120	20	80	10	40	6
10.00	9.71 - 10.20	120	20	80	10	40	6

Ø D1 mm	Ø-range mm	L1 mm	L2 mm	LA mm	Ø D2 mm	L3 mm	
10.50	10.21 - 10.70	120	20	75	12	45	6
11.00	10.71 - 11.20	120	20	75	12	45	6
11.50	11.21 - 11.70	120	20	75	12	45	6
12.00	11.71 - 12.20	120	20	75	12	45	6
13.00	12.21 - 13.20	130	22	85	14	45	6
14.00	13.21 - 14.20	130	22	85	14	45	6
15.00	14.21 - 15.20	130	22	82	16	48	6
16.00	15.21 - 16.20	150	25	102	16	48	6
17.00	16.21 - 17.20	150	25	102	18	48	6
18.00	17.21 - 18.20	150	25	102	18	48	6
19.00	18.21 - 19.20	150	25	100	20	50	6
20.00	19.21 - 20.20	150	25	100	20	50	6

Delivery time on request

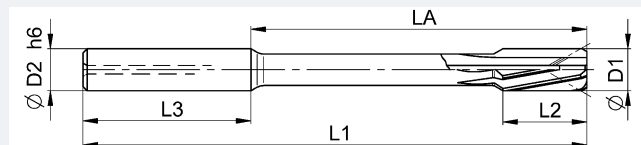
High performance reamers HNC-Diamond

043290


for through holes, with inner coolant supply, special HPC cutting geometry and coating for the machining of CFRP/GFRP, right-hand cutting, spiral flutes, EU-spacing, for direct clamping in hydraulic, shrink and high precision chucks




Without statement of particulars the tools will be supplied with tolerance H7.



	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	CFRP/GFRP	Ti	HRC < 63 HRC	Group 10C	 vc / f
							*				

Ø D1 mm	Ø-range mm	L1 mm	L2 mm	LA mm	Ø D2 mm	L3 mm	
4.00	3.70 - 4.20	75	12	39	6	36	4
4.50	4.21 - 4.70	75	12	39	6	36	4
5.00	4.71 - 5.20	75	12	39	6	36	4
5.50	5.21 - 5.70	75	12	39	6	36	4
6.00	5.71 - 6.20	75	12	39	6	36	4
6.50	6.21 - 6.70	100	16	64	8	36	6
7.00	6.71 - 7.20	100	16	64	8	36	6
7.50	7.21 - 7.70	100	16	64	8	36	6
8.00	7.71 - 8.20	100	16	64	8	36	6
8.50	8.21 - 8.70	100	20	60	10	40	6
9.00	8.71 - 9.20	100	20	60	10	40	6
9.50	9.21 - 9.70	120	20	80	10	40	6
10.00	9.71 - 10.20	120	20	80	10	40	6

Ø D1 mm	Ø-range mm	L1 mm	L2 mm	LA mm	Ø D2 mm	L3 mm	
10.50	10.21 - 10.70	120	20	75	12	45	6
11.00	10.71 - 11.20	120	20	75	12	45	6
11.50	11.21 - 11.70	120	20	75	12	45	6
12.00	11.71 - 12.20	120	20	75	12	45	6
13.00	12.21 - 13.20	130	22	85	14	45	6
14.00	13.21 - 14.20	130	22	85	14	45	6
15.00	14.21 - 15.20	130	22	82	16	48	6
16.00	15.21 - 16.20	150	25	102	16	48	6
17.00	16.21 - 17.20	150	25	102	18	48	8
18.00	17.21 - 18.20	150	25	102	18	48	8
19.00	18.21 - 19.20	150	25	100	20	50	8
20.00	19.21 - 20.20	150	25	100	20	50	8

Delivery time on request

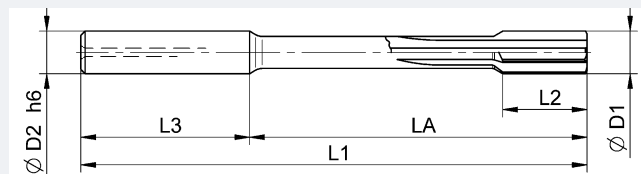
High performance reamers HNC-Diamond

043291


for blind holes, with inner coolant supply, special HPC cutting geometry and coating
for the machining of CFRP/GFRP, right-hand cutting, straight flutes, EU-spacing, for direct clamping in hydraulic, shrink and high precision chucks




Without statement of particulars the tools will be supplied with tolerance H7.



	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	CFRP/GFRP	Ti	HRC < 63 HRC	Group 1C	 vc / f
							*				

Ø D1 mm	Ø-range mm	L1 mm	L2 mm	LA mm	Ø D2 mm	L3 mm	
4.00	3.70 - 4.20	75	12	39	6	36	4
4.50	4.21 - 4.70	75	12	39	6	36	4
5.00	4.71 - 5.20	75	12	39	6	36	4
5.50	5.21 - 5.70	75	12	39	6	36	4
6.00	5.71 - 6.20	75	12	39	6	36	4
6.50	6.21 - 6.70	100	16	64	8	36	6
7.00	6.71 - 7.20	100	16	64	8	36	6
7.50	7.21 - 7.70	100	16	64	8	36	6
8.00	7.71 - 8.20	100	16	64	8	36	6
8.50	8.21 - 8.70	100	20	60	10	40	6
9.00	8.71 - 9.20	100	20	60	10	40	6
9.50	9.21 - 9.70	120	20	80	10	40	6
10.00	9.71 - 10.20	120	20	80	10	40	6

Ø D1 mm	Ø-range mm	L1 mm	L2 mm	LA mm	Ø D2 mm	L3 mm	
10.50	10.21 - 10.70	120	20	75	12	45	6
11.00	10.71 - 11.20	120	20	75	12	45	6
11.50	11.21 - 11.70	120	20	75	12	45	6
12.00	11.71 - 12.20	120	20	75	12	45	6
13.00	12.21 - 13.20	130	22	85	14	45	6
14.00	13.21 - 14.20	130	22	85	14	45	6
15.00	14.21 - 15.20	130	22	82	16	48	6
16.00	15.21 - 16.20	150	25	102	16	48	6
17.00	16.21 - 17.20	150	25	102	18	48	6
18.00	17.21 - 18.20	150	25	102	18	48	6
19.00	18.21 - 19.20	150	25	100	20	50	6
20.00	19.21 - 20.20	150	25	100	20	50	6

Delivery time on request

High performance reamers HNC-Short

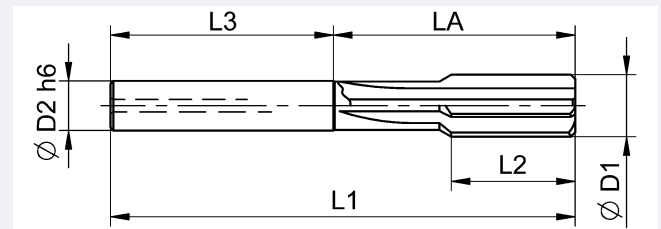
043265

for blind holes and through holes (*), with inner coolant supply, special HPC cutting geometry and coating, right-hand cutting, straight flutes, short version, for direct clamping in hydraulic, shrink, and high precision chucks, **especially suitable for automatic lathes, for short boreholes**





(*) for through hole external coolant supply required

Without statement of particulars the tools will be supplied with tolerance H7.



	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group 10	 vc / f p. 181
	★	★	▲	★	★	★						

Ø D1 mm	Ø-range mm	L1 mm	L2 mm	LA mm	Ø D2 mm	L3 mm	
3.00	2.81 - 3.10	56	12	28	4	28	4
3.20	3.11 - 3.35	56	12	28	4	28	4
3.50	3.36 - 3.70	56	12	28	4	28	4
4.00	3.71 - 4.05	56	12	28	4	28	4
4.50	4.06 - 4.60	64	12	28	6	36	4
5.00	4.61 - 5.10	64	12	28	6	36	4
5.50	5.11 - 5.60	64	12	28	6	36	4
6.00	5.61 - 6.10	64	12	28	6	36	4
6.50	6.11 - 6.60	75	16	39	8	36	6
7.00	6.61 - 7.10	75	16	39	8	36	6
7.50	7.11 - 7.60	75	16	39	8	36	6
8.00	7.61 - 8.10	75	16	39	8	36	6
8.50	8.11 - 8.60	75	20	39	8	36	6
9.00	8.61 - 9.10	75	20	39	8	36	6

Ø D1 mm	Ø-range mm	L1 mm	L2 mm	LA mm	Ø D2 mm	L3 mm	
9.50	9.11 - 9.60	75	20	39	8	36	6
10.00	9.61 - 10.10	75	20	39	8	36	6
10.50	10.11 - 10.60	80	20	40	10	40	6
11.00	10.61 - 11.10	80	20	40	10	40	6
11.50	11.11 - 11.60	80	20	40	10	40	6
12.00	11.61 - 12.10	90	22	45	12	45	6
13.00	12.11 - 13.10	90	22	45	12	45	6
14.00	13.11 - 14.10	90	22	45	14	45	6
15.00	14.11 - 15.10	90	22	45	14	45	6
16.00	15.11 - 16.10	100	25	52	16	48	8
17.00	16.11 - 17.10	100	25	52	16	48	8
18.00	17.11 - 18.10	100	25	52	16	48	8
19.00	18.11 - 19.10	100	25	52	18	48	8
20.00	19.11 - 20.10	100	25	52	18	48	8

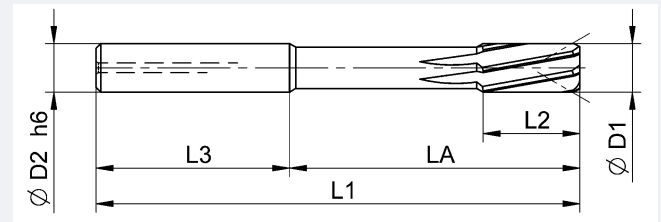
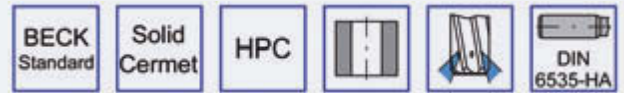
- Ex stock, subject to being unsold
- Delivery on short notice

For special tolerances and intermediate diameters in the above mentioned Ø-ranges also delivery on short notice.


High performance reamers HCS


040360

for through holes, with inner coolant supply, special HPC cutting geometry, right-hand cutting, spiral flutes, EU-spacing, for direct clamping in hydraulic, shrink and high precision chucks



	Steel <900 N ★	Steel 900-1400N ★	VA Stainless steel	GG	GGG ★	GGG >GGG50 ★	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group 10	 vc / f p. 180
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Ø D1 mm	Tol.	Ø-range mm	L1 mm	L2 mm	LA mm	Ø D2 mm	L3 mm	
3.97	• +0,004		70	10	34	6	36	4
3.98	• +0,004		70	10	34	6	36	4
3.99	• +0,004		70	10	34	6	36	4
4.00	• H7	3.70 - 4.20	70	10	34	6	36	4
4.01	• +0,004		70	10	34	6	36	4
4.02	• +0,004		70	10	34	6	36	4
4.03	• +0,004		70	10	34	6	36	4
4.50	• H7	4.21 - 4.70	70	10	34	6	36	4
4.97	• +0,004		70	10	34	6	36	4
4.98	• +0,004		70	10	34	6	36	4
4.99	• +0,004		70	10	34	6	36	4
5.00	• H7	4.71 - 5.20	70	10	34	6	36	4
5.01	• +0,004		70	10	34	6	36	4
5.02	• +0,004		70	10	34	6	36	4
5.03	• +0,004		70	10	34	6	36	4
5.50	• H7	5.21 - 5.70	70	10	34	6	36	4
5.97	• +0,004		70	10	34	6	36	6
5.98	• +0,004		70	10	34	6	36	6
5.99	• +0,004		70	10	34	6	36	6
6.00	• H7	5.71 - 6.20	70	10	34	6	36	6
6.01	• +0,004		70	10	34	6	36	6
6.02	• +0,004		70	10	34	6	36	6
6.03	• +0,004		70	10	34	6	36	6
6.50	• H7	6.21 - 6.70	75	15	39	8	36	6
7.00	• H7	6.71 - 7.20	75	15	39	8	36	6
7.50	• H7	7.21 - 7.70	75	15	39	8	36	6
7.97	• +0,004		75	15	39	8	36	6

Ø D1 mm	Tol.	Ø-range mm	L1 mm	L2 mm	LA mm	Ø D2 mm	L3 mm	
7.98	• +0,004		75	15	39	8	36	6
7.99	• +0,004		75	15	39	8	36	6
8.00	• H7	7.71 - 8.20	75	15	39	8	36	6
8.01	• +0,004		75	15	39	8	36	6
8.02	• +0,004		75	15	39	8	36	6
8.03	• +0,004		75	15	39	8	36	6
8.50	• H7	8.21 - 8.70	75	15	35	10	40	6
9.00	• H7	8.71 - 9.20	75	15	35	10	40	6
9.50	• H7	9.21 - 9.70	75	15	35	10	40	6
9.97	• +0,004		100	20	60	10	40	6
9.98	• +0,004		100	20	60	10	40	6
9.99	• +0,004		100	20	60	10	40	6
10.00	• H7	9.71 - 10.20	100	20	60	10	40	6
10.01	• +0,004		100	20	60	10	40	6
10.02	• +0,004		100	20	60	10	40	6
10.03	• +0,004		100	20	60	10	40	6
10.50	• H7	10.21 - 10.70	100	20	55	12	45	6
11.00	• H7	10.71 - 11.20	100	20	55	12	45	6
11.50	• H7	11.21 - 11.70	100	20	55	12	45	6
11.97	• +0,004		100	20	55	12	45	6
11.98	• +0,004		100	20	55	12	45	6
11.99	• +0,004		100	20	55	12	45	6
12.00	• H7	11.71 - 12.10	100	20	55	12	45	6
12.01	• +0,004		100	20	55	12	45	6
12.02	• +0,004		100	20	55	12	45	6
12.03	• +0,004		100	20	55	12	45	6

- Ex stock, subject to being unsold
- Delivery on short notice

Delivery on short notice: intermediate diameters, special tolerances, execution for blind holes (straight flutes or right-hand spiral).

Please note: Reduction of tolerance by 1µm to +0,004/0 for all tools increasing by 0.01 mm. Adaptation of stock will be made successively.

High precision and simple handling



Precision and stability are crucial for a modern, high-performance replaceable head system for reaming. The new XR replaceable reamer heads from BECK satisfy all these demands to the letter. The connection is designed such that the best possible stability and rigidity are 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 μm . Thanks to the simple and safe handling,

the reaming heads can be replaced in the machine tool quickly and easily. That saves setup costs. The range of XR replaceable reamer heads covers three different series of replaceable heads in the diameter range from 8 to 40 mm for through bores and blind bores.

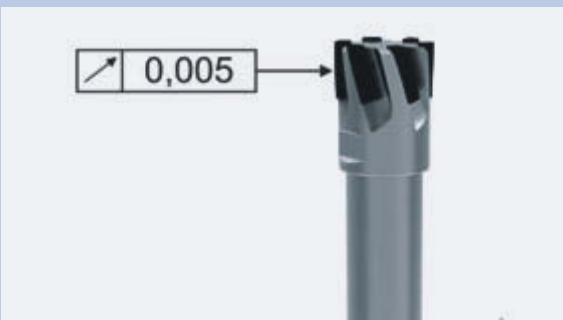
Carbide and Cermet in coated and non-coated versions are available as standard

cutting materials. On request, XR heads can also be produced with PCD or PcBN as cutting material. For optimum use of the cutting material, the replaceable heads can also be supplied in an expandable or finely adjustable version as special heads.

XR



XR replaceable reamer heads



The most important elements of the new connection are the taper and plane face. The exact interplay of these elements ensures maximum stability and rigidity. Taper and plane face are complemented by a threaded journal directly adjoining the taper and connected to the taper in one piece. These three characteristics coordinated perfectly with one another ensure the highest changeover accuracy, high clamping force and very simple handling at the new connection.

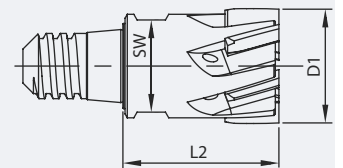
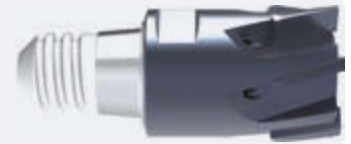
Modern production facilities allow plane face and taper to be manufactured with the highest accuracy, and hence to reliably achieve a radial run-out of $\leq 5 \mu\text{m}$. The high stability of the system results from the pretension of the taper. When tightening completely, the taper expands slightly in the holder and the plane face has a perfect contact.


-NEW- Replaceable reamer heads XR 01


081612


for through hole

cutting geometry left-hand fluted
 rake angle 6°
 lead angle 30°
 wrench size (SW) please see below



	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group 12	 vc / f p. 183
	★	★	□	□	★	□	□	□	□	□		

Ø D1 mm		Tol.	Ø-range mm	Connection size	L2 mm	SW mm	
8.00	●	H7	8.00 - 8.70	6	18	6	4
9.00	○		8.71 - 9.20	6	18	6	4
9.50	○		9.21 - 9.70	6	18	6	4
10.00	●	H7	9.71 - 10.20	6	18	8	6
10.50	○		10.21 - 10.70	6	18	8	6
11.00	○		10.71 - 11.20	8	20	8	6
11.50	○		11.21 - 11.70	8	20	8	6
12.00	●	H7	11.71 - 12.20	8	20	8	6
12.50	○		12.21 - 12.70	8	20	8	6
13.00	○		12.71 - 13.20	10	22	10	6
14.00	●	H7	13.21 - 14.20	10	22	10	6
15.00	○		14.21 - 15.20	10	22	10	6
16.00	●	H7	15.21 - 16.20	10	22	10	6
17.00	○		16.21 - 17.20	10	22	13	6
18.00	●	H7	17.21 - 18.20	12	26	13	6
19.00	○		18.21 - 19.20	12	26	13	6
20.00	●	H7	19.21 - 20.20	12	26	16	6
21.00	○		20.21 - 21.20	12	26	16	6
22.00	●	H7	21.21 - 22.20	16	26	16	6

Ø D1 mm		Tol.	Ø-range mm	Connection size	L2 mm	SW mm	
23.00	○		22.21 - 23.20	16	26	16	6
24.00	●	H7	23.21 - 24.20	16	26	16	6
25.00	●	H7	24.21 - 25.20	16	26	19	6
26.00	●	H7	25.21 - 26.20	16	26	19	6
27.00	○		26.21 - 27.20	16	26	21	6
28.00	●	H7	27.21 - 28.20	16	26	21	6
29.00	○		28.21 - 29.20	16	26	24	6
30.00	●	H7	29.21 - 30.20	16	26	24	8
31.00	○		30.21 - 31.20	24	30	24	8
32.00	●	H7	31.21 - 32.20	24	30	24	8
33.00	○		32.21 - 33.20	24	30	27	8
34.00	●	H7	33.21 - 34.20	24	30	27	8
35.00	○		34.21 - 35.20	24	30	30	8
36.00	●	H7	35.21 - 36.20	24	30	30	8
37.00	○		36.21 - 37.20	24	30	30	8
38.00	●	H7	37.21 - 38.20	24	30	30	8
39.00	○		38.21 - 39.20	24	30	30	8
40.00	●	H7	39.21 - 40.20	24	30	30	8

- Ex stock, subject to being unsold
- Delivery on short notice

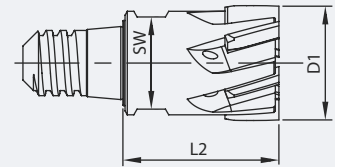
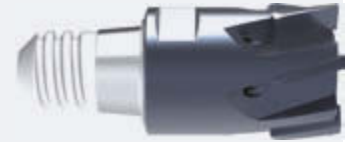
For special tolerances and intermediate diameters in the above mentioned Ø-ranges also delivery on short notice.

-NEW- Replaceable reamer heads XR 01


081611


for through hole

cutting geometry left-hand fluted
 rake angle 6°
 lead angle 30°
 wrench size (SW) please see below



	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group 12	 vc / f p. 183
	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		

Ø D1 mm		Tol.	Ø-range mm	Connection size	L2 mm	SW mm	
8.00	○	H7	8.00 - 8.70	6	18	6	4
9.00	○		8.71 - 9.20	6	18	6	4
9.50	○		9.21 - 9.70	6	18	6	4
10.00	○	H7	9.71 - 10.20	6	18	8	6
10.50	○		10.21 - 10.70	6	18	8	6
11.00	○		10.71 - 11.20	8	20	8	6
11.50	○		11.21 - 11.70	8	20	8	6
12.00	○	H7	11.71 - 12.20	8	20	8	6
12.50	○		12.21 - 12.70	8	20	8	6
13.00	○		12.71 - 13.20	10	22	10	6
14.00	○	H7	13.21 - 14.20	10	22	10	6
15.00	○		14.21 - 15.20	10	22	10	6
16.00	○	H7	15.21 - 16.20	10	22	10	6
17.00	○		16.21 - 17.20	10	22	13	6
18.00	○	H7	17.21 - 18.20	12	26	13	6
19.00	○		18.21 - 19.20	12	26	13	6
20.00	○	H7	19.21 - 20.20	12	26	16	6
21.00	○		20.21 - 21.20	12	26	16	6
22.00	○	H7	21.21 - 22.20	16	26	16	6

Ø D1 mm		Tol.	Ø-range mm	Connection size	L2 mm	SW mm	
23.00	○		22.21 - 23.20	16	26	16	6
24.00	○	H7	23.21 - 24.20	16	26	16	6
25.00	○	H7	24.21 - 25.20	16	26	19	6
26.00	○	H7	25.21 - 26.20	16	26	19	6
27.00	○		26.21 - 27.20	16	26	21	6
28.00	○	H7	27.21 - 28.20	16	26	21	6
29.00	○		28.21 - 29.20	16	26	24	6
30.00	○	H7	29.21 - 30.20	16	26	24	8
31.00	○		30.21 - 31.20	24	30	24	8
32.00	○	H7	31.21 - 32.20	24	30	24	8
33.00	○		32.21 - 33.20	24	30	27	8
34.00	○	H7	33.21 - 34.20	24	30	27	8
35.00	○		34.21 - 35.20	24	30	30	8
36.00	○	H7	35.21 - 36.20	24	30	30	8
37.00	○		36.21 - 37.20	24	30	30	8
38.00	○	H7	37.21 - 38.20	24	30	30	8
39.00	○		38.21 - 39.20	24	30	30	8
40.00	○	H7	39.21 - 40.20	24	30	30	8

- Ex stock, subject to being unsold
- Delivery on short notice

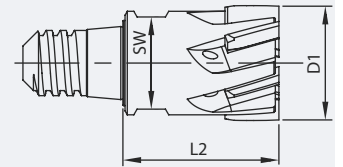
For special tolerances and intermediate diameters in the above mentioned Ø-ranges also delivery on short notice.

-NEW- Replaceable reamer heads XR 01


081618


for through hole

cutting geometry left-hand fluted
 rake angle 6°
 lead angle 30°
 wrench size (SW) please see below



	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GG650	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group 12	 vc / f p. 183
	★	★	□	★	★	★	□	□	□	▲		

Ø D1 mm		Tol.	Ø-range mm	Connection size	L2 mm	SW mm	
8.00	●	H7	8.00 - 8.70	6	18	6	4
9.00	○		8.71 - 9.20	6	18	6	4
9.50	○		9.21 - 9.70	6	18	6	4
10.00	●	H7	9.71 - 10.20	6	18	8	6
10.50	○		10.21 - 10.70	6	18	8	6
11.00	○		10.71 - 11.20	8	20	8	6
11.50	○		11.21 - 11.70	8	20	8	6
12.00	●	H7	11.71 - 12.20	8	20	8	6
12.50	○		12.21 - 12.70	8	20	8	6
13.00	○		12.71 - 13.20	10	22	10	6
14.00	●	H7	13.21 - 14.20	10	22	10	6
15.00	○		14.21 - 15.20	10	22	10	6
16.00	●	H7	15.21 - 16.20	10	22	10	6
17.00	○		16.21 - 17.20	10	22	13	6
18.00	●	H7	17.21 - 18.20	12	26	13	6
19.00	○		18.21 - 19.20	12	26	13	6
20.00	●	H7	19.21 - 20.20	12	26	16	6
21.00	○		20.21 - 21.20	12	26	16	6
22.00	●	H7	21.21 - 22.20	16	26	16	6

Ø D1 mm		Tol.	Ø-range mm	Connection size	L2 mm	SW mm	
23.00	○		22.21 - 23.20	16	26	16	6
24.00	●	H7	23.21 - 24.20	16	26	16	6
25.00	●	H7	24.21 - 25.20	16	26	19	6
26.00	●	H7	25.21 - 26.20	16	26	19	6
27.00	○		26.21 - 27.20	16	26	21	6
28.00	●	H7	27.21 - 28.20	16	26	21	6
29.00	○		28.21 - 29.20	16	26	24	6
30.00	●	H7	29.21 - 30.20	16	26	24	8
31.00	○		30.21 - 31.20	24	30	24	8
32.00	●	H7	31.21 - 32.20	24	30	24	8
33.00	○		32.21 - 33.20	24	30	27	8
34.00	●	H7	33.21 - 34.20	24	30	27	8
35.00	○		34.21 - 35.20	24	30	30	8
36.00	●	H7	35.21 - 36.20	24	30	30	8
37.00	○		36.21 - 37.20	24	30	30	8
38.00	●	H7	37.21 - 38.20	24	30	30	8
39.00	○		38.21 - 39.20	24	30	30	8
40.00	●	H7	39.21 - 40.20	24	30	30	8

- Ex stock, subject to being unsold
- Delivery on short notice

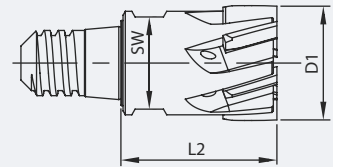
For special tolerances and intermediate diameters in the above mentioned Ø-ranges also delivery on short notice.

-NEW- Replaceable reamer heads XR 01


081610


for through hole

cutting geometry left-hand fluted
 rake angle 6°
 lead angle 30°
 wrench size (SW) please see below



	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GG650	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group 12	 vc / f p. 183
	★	★	□	★	★	★	★	★	▲	□	12	

Ø D1 mm		Tol.	Ø-range mm	Connection size	L2 mm	SW mm	
8.00	○	H7	8.00 - 8.70	6	18	6	4
9.00	○		8.71 - 9.20	6	18	6	4
9.50	○		9.21 - 9.70	6	18	6	4
10.00	○	H7	9.71 - 10.20	6	18	8	6
10.50	○		10.21 - 10.70	6	18	8	6
11.00	○		10.71 - 11.20	8	20	8	6
11.50	○		11.21 - 11.70	8	20	8	6
12.00	○	H7	11.71 - 12.20	8	20	8	6
12.50	○		12.21 - 12.70	8	20	8	6
13.00	○		12.71 - 13.20	10	22	10	6
14.00	○	H7	13.21 - 14.20	10	22	10	6
15.00	○		14.21 - 15.20	10	22	10	6
16.00	○	H7	15.21 - 16.20	10	22	10	6
17.00	○		16.21 - 17.20	10	22	13	6
18.00	○	H7	17.21 - 18.20	12	26	13	6
19.00	○		18.21 - 19.20	12	26	13	6
20.00	○	H7	19.21 - 20.20	12	26	16	6
21.00	○		20.21 - 21.20	12	26	16	6
22.00	○	H7	21.21 - 22.20	16	26	16	6

Ø D1 mm		Tol.	Ø-range mm	Connection size	L2 mm	SW mm	
23.00	○		22.21 - 23.20	16	26	16	6
24.00	○	H7	23.21 - 24.20	16	26	16	6
25.00	○	H7	24.21 - 25.20	16	26	19	6
26.00	○	H7	25.21 - 26.20	16	26	19	6
27.00	○		26.21 - 27.20	16	26	21	6
28.00	○	H7	27.21 - 28.20	16	26	21	6
29.00	○		28.21 - 29.20	16	26	24	6
30.00	○	H7	29.21 - 30.20	16	26	24	8
31.00	○		30.21 - 31.20	24	30	24	8
32.00	○	H7	31.21 - 32.20	24	30	24	8
33.00	○		32.21 - 33.20	24	30	27	8
34.00	○	H7	33.21 - 34.20	24	30	27	8
35.00	○		34.21 - 35.20	24	30	30	8
36.00	○	H7	35.21 - 36.20	24	30	30	8
37.00	○		36.21 - 37.20	24	30	30	8
38.00	○	H7	37.21 - 38.20	24	30	30	8
39.00	○		38.21 - 39.20	24	30	30	8
40.00	○	H7	39.21 - 40.20	24	30	30	8

- Ex stock, subject to being unsold
- Delivery on short notice

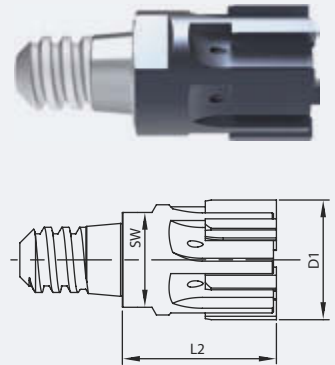
For special tolerances and intermediate diameters in the above mentioned Ø-ranges also delivery on short notice.

-NEW- Replaceable reamer heads XR 01


081605


for through hole

cutting geometry straight fluted
 rake angle 0°
 lead angle 45°
 wrench size (SW) please see below



	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GG650	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group 12	 vc / f p. 183
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Ø D1 mm		Tol.	Ø-range mm	Connection size	L2 mm	SW mm	
8.00	o	H7	8.00 - 8.70	6	18	6	4
9.00	o		8.71 - 9.20	6	18	6	4
9.50	o		9.21 - 9.70	6	18	6	4
10.00	o	H7	9.71 - 10.20	6	18	8	6
10.50	o		10.21 - 10.70	6	18	8	6
11.00	o		10.71 - 11.20	8	20	8	6
11.50	o		11.21 - 11.70	8	20	8	6
12.00	o	H7	11.71 - 12.20	8	20	8	6
12.50	o		12.21 - 12.70	8	20	8	6
13.00	o		12.71 - 13.20	10	22	10	6
14.00	o	H7	13.21 - 14.20	10	22	10	6
15.00	o		14.21 - 15.20	10	22	10	6
16.00	o	H7	15.21 - 16.20	10	22	10	6
17.00	o		16.21 - 17.20	10	22	13	6
18.00	o	H7	17.21 - 18.20	12	26	13	6
19.00	o		18.21 - 19.20	12	26	13	6
20.00	o	H7	19.21 - 20.20	12	26	16	6
21.00	o		20.21 - 21.20	12	26	16	6
22.00	o	H7	21.21 - 22.20	16	26	16	6

Ø D1 mm		Tol.	Ø-range mm	Connection size	L2 mm	SW mm	
23.00	o		22.21 - 23.20	16	26	16	6
24.00	o	H7	23.21 - 24.20	16	26	16	6
25.00	o	H7	24.21 - 25.20	16	26	19	6
26.00	o	H7	25.21 - 26.20	16	26	19	6
27.00	o		26.21 - 27.20	16	26	21	6
28.00	o	H7	27.21 - 28.20	16	26	21	6
29.00	o		28.21 - 29.20	16	26	24	6
30.00	o	H7	29.21 - 30.20	16	26	24	8
31.00	o		30.21 - 31.20	24	30	24	8
32.00	o	H7	31.21 - 32.20	24	30	24	8
33.00	o		32.21 - 33.20	24	30	27	8
34.00	o	H7	33.21 - 34.20	24	30	27	8
35.00	o		34.21 - 35.20	24	30	30	8
36.00	o	H7	35.21 - 36.20	24	30	30	8
37.00	o		36.21 - 37.20	24	30	30	8
38.00	o	H7	37.21 - 38.20	24	30	30	8
39.00	o		38.21 - 39.20	24	30	30	8
40.00	o	H7	39.21 - 40.20	24	30	30	8

- Ex stock, subject to being unsold
- Delivery on short notice

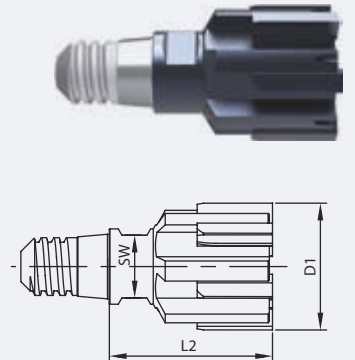
For special tolerances and intermediate diameters in the above mentioned Ø-ranges also delivery on short notice.

-NEW- Replaceable reamer heads XR 01

081652


for blind hole


cutting geometry straight fluted
 rake angle 0°
 lead angle 60°
 wrench size (SW) please see below



1

	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group	 vc / f
	★	★	□	□	★	□	□	□	□	□	12	p. 183

Ø D1 mm		Tol.	Ø-range mm	Connection size	L2 mm	SW mm	
12.50	○		12.21 - 12.70	6	20	6	6
13.00	○		12.71 - 13.20	6	22	6	6
14.00	●	H7	13.21 - 14.20	6	22	6	6
15.00	○		14.21 - 15.20	8	22	8	6
16.00	●	H7	15.21 - 16.20	8	22	8	6
17.00	○		16.21 - 17.20	10	22	10	6
18.00	●	H7	17.21 - 18.20	10	26	10	6
19.00	○		18.21 - 19.20	10	26	10	6
20.00	●	H7	19.21 - 20.20	10	26	10	6
21.00	○		20.21 - 21.20	12	26	13	6
22.00	●	H7	21.21 - 22.20	12	26	13	6
23.00	○		22.21 - 23.20	12	26	13	6
24.00	●	H7	23.21 - 24.20	12	26	13	6
25.00	●	H7	24.21 - 25.20	16	26	16	6
26.00	●	H7	25.21 - 26.20	16	26	16	6

Ø D1 mm		Tol.	Ø-range mm	Connection size	L2 mm	SW mm	
27.00	○		26.21 - 27.20	16	26	16	6
28.00	●	H7	27.21 - 28.20	16	26	16	6
29.00	○		28.21 - 29.20	16	26	16	6
30.00	●	H7	29.21 - 30.20	16	26	16	8
31.00	○		30.21 - 31.20	16	30	16	8
32.00	●	H7	31.21 - 32.20	16	30	16	8
33.00	○		32.21 - 33.20	24	30	24	8
34.00	●	H7	33.21 - 34.20	24	30	24	8
35.00	○		34.21 - 35.20	24	30	24	8
36.00	●	H7	35.21 - 36.20	24	30	24	8
37.00	○		36.21 - 37.20	24	30	24	8
38.00	●	H7	37.21 - 38.20	24	30	24	8
39.00	○		38.21 - 39.20	24	30	24	8
40.00	●	H7	39.21 - 40.20	24	30	24	8

- Ex stock, subject to being unsold
- Delivery on short notice

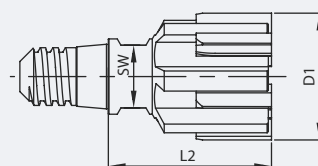
For special tolerances and intermediate diameters in the above mentioned Ø-ranges also delivery on short notice.



-NEW- Replaceable reamer heads XR 01


081659


for blind hole

cutting geometry straight fluted
 rake angle 0°
 lead angle 60°
 wrench size (SW) please see below



	Steel	Steel	VA	GG	GGG	GGG	Cu/Zn/Mg	Alu	Ti	HRC	Group	
	<900 N	900-1400N	Stainless steel			>GGG50				< 63 HRC		vc / f
	<input type="checkbox"/>	<input type="checkbox"/>	★	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	12	p. 183

Ø D1 mm		Tol.	Ø-range mm	Connection size	L2 mm	SW mm	
12.50	o		12.21 - 12.70	6	20	6	6
13.00	o		12.71 - 13.20	6	22	6	6
14.00	o	H7	13.21 - 14.20	6	22	6	6
15.00	o		14.21 - 15.20	8	22	8	6
16.00	o	H7	15.21 - 16.20	8	22	8	6
17.00	o		16.21 - 17.20	10	22	10	6
18.00	o	H7	17.21 - 18.20	10	26	10	6
19.00	o		18.21 - 19.20	10	26	10	6
20.00	o	H7	19.21 - 20.20	10	26	10	6
21.00	o		20.21 - 21.20	12	26	13	6
22.00	o	H7	21.21 - 22.20	12	26	13	6
23.00	o		22.21 - 23.20	12	26	13	6
24.00	o	H7	23.21 - 24.20	12	26	13	6
25.00	o	H7	24.21 - 25.20	16	26	16	6
26.00	o	H7	25.21 - 26.20	16	26	16	6

Ø D1 mm		Tol.	Ø-range mm	Connection size	L2 mm	SW mm	
27.00	o		26.21 - 27.20	16	26	16	6
28.00	o	H7	27.21 - 28.20	16	26	16	6
29.00	o		28.21 - 29.20	16	26	16	6
30.00	o	H7	29.21 - 30.20	16	26	16	8
31.00	o		30.21 - 31.20	16	30	16	8
32.00	o	H7	31.21 - 32.20	16	30	16	8
33.00	o		32.21 - 33.20	24	30	24	8
34.00	o	H7	33.21 - 34.20	24	30	24	8
35.00	o		34.21 - 35.20	24	30	24	8
36.00	o	H7	35.21 - 36.20	24	30	24	8
37.00	o		36.21 - 37.20	24	30	24	8
38.00	o	H7	37.21 - 38.20	24	30	24	8
39.00	o		38.21 - 39.20	24	30	24	8
40.00	o	H7	39.21 - 40.20	24	30	24	8

- Ex stock, subject to being unsold
- Delivery on short notice

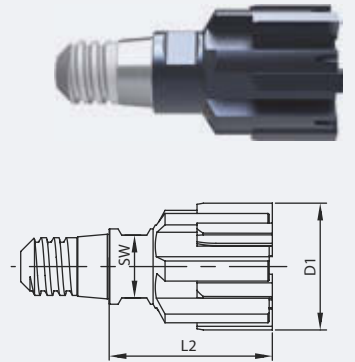
For special tolerances and intermediate diameters in the above mentioned Ø-ranges also delivery on short notice.

-NEW- Replaceable reamer heads XR 01

081651


for blind hole


cutting geometry straight fluted
 rake angle 0°
 lead angle 60°
 wrench size (SW) please see below



1

	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group	 vc / f
	★	★	□	★	★	★	□	□	□	▲	12	p. 183

Ø D1 mm	Tol.	Ø-range mm	Connection size	L2 mm	SW mm	
12.50	○	12.21 - 12.70	6	20	6	6
13.00	○	12.71 - 13.20	6	22	6	6
14.00	●	13.21 - 14.20	6	22	6	6
15.00	○	14.21 - 15.20	8	22	8	6
16.00	●	15.21 - 16.20	8	22	8	6
17.00	○	16.21 - 17.20	10	22	10	6
18.00	●	17.21 - 18.20	10	26	10	6
19.00	○	18.21 - 19.20	10	26	10	6
20.00	●	19.21 - 20.20	10	26	10	6
21.00	○	20.21 - 21.20	12	26	13	6
22.00	●	21.21 - 22.20	12	26	13	6
23.00	○	22.21 - 23.20	12	26	13	6
24.00	●	23.21 - 24.20	12	26	13	6
25.00	●	24.21 - 25.20	16	26	16	6
26.00	●	25.21 - 26.20	16	26	16	6

Ø D1 mm	Tol.	Ø-range mm	Connection size	L2 mm	SW mm	
27.00	○	26.21 - 27.20	16	26	16	6
28.00	●	27.21 - 28.20	16	26	16	6
29.00	○	28.21 - 29.20	16	26	16	6
30.00	●	29.21 - 30.20	16	26	16	8
31.00	○	30.21 - 31.20	16	30	16	8
32.00	●	31.21 - 32.20	16	30	16	8
33.00	○	32.21 - 33.20	24	30	24	8
34.00	●	33.21 - 34.20	24	30	24	8
35.00	○	34.21 - 35.20	24	30	24	8
36.00	●	35.21 - 36.20	24	30	24	8
37.00	○	36.21 - 37.20	24	30	24	8
38.00	●	37.21 - 38.20	24	30	24	8
39.00	○	38.21 - 39.20	24	30	24	8
40.00	●	39.21 - 40.20	24	30	24	8

- Ex stock, subject to being unsold
- Delivery on short notice

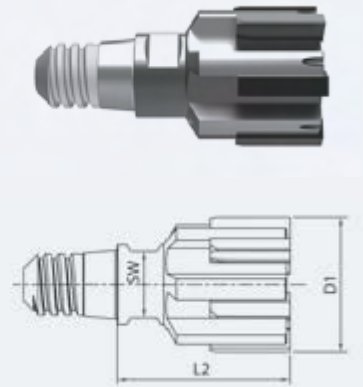
For special tolerances and intermediate diameters in the above mentioned Ø-ranges also delivery on short notice.


-NEW- Replaceable reamer heads XR 01


081650


for blind hole

cutting geometry straight fluted
 rake angle 0°
 lead angle 60°
 wrench size (SW) please see below



	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group 12	 vc / f p. 183
	✳	✳	□	✳	✳	✳	✳	✳	⚠	□		

Ø D1 mm	Tol.	Ø-range mm	Connection size	L2 mm	SW mm	
12.50	○	12.21 - 12.70	6	20	6	6
13.00	○	12.71 - 13.20	6	22	6	6
14.00	○ H7	13.21 - 14.20	6	22	6	6
15.00	○	14.21 - 15.20	8	22	8	6
16.00	○ H7	15.21 - 16.20	8	22	8	6
17.00	○	16.21 - 17.20	10	22	10	6
18.00	○ H7	17.21 - 18.20	10	26	10	6
19.00	○	18.21 - 19.20	10	26	10	6
20.00	○ H7	19.21 - 20.20	10	26	10	6
21.00	○	20.21 - 21.20	12	26	13	6
22.00	○ H7	21.21 - 22.20	12	26	13	6
23.00	○	22.21 - 23.20	12	26	13	6
24.00	○ H7	23.21 - 24.20	12	26	13	6
25.00	○ H7	24.21 - 25.20	16	26	16	6
26.00	○ H7	25.21 - 26.20	16	26	16	6

Ø D1 mm	Tol.	Ø-range mm	Connection size	L2 mm	SW mm	
27.00	○	26.21 - 27.20	16	26	16	6
28.00	○ H7	27.21 - 28.20	16	26	16	6
29.00	○	28.21 - 29.20	16	26	16	6
30.00	○ H7	29.21 - 30.20	16	26	16	8
31.00	○	30.21 - 31.20	16	30	16	8
32.00	○ H7	31.21 - 32.20	16	30	16	8
33.00	○	32.21 - 33.20	24	30	24	8
34.00	○ H7	33.21 - 34.20	24	30	24	8
35.00	○	34.21 - 35.20	24	30	24	8
36.00	○ H7	35.21 - 36.20	24	30	24	8
37.00	○	36.21 - 37.20	24	30	24	8
38.00	○ H7	37.21 - 38.20	24	30	24	8
39.00	○	38.21 - 39.20	24	30	24	8
40.00	○ H7	39.21 - 40.20	24	30	24	8

- Ex stock, subject to being unsold
- Delivery on short notice

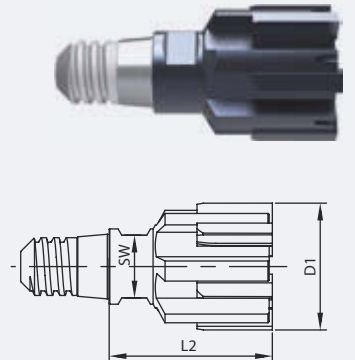
For special tolerances and intermediate diameters in the above mentioned Ø-ranges also delivery on short notice.

-NEW- Replaceable reamer heads XR 01

081655


for blind hole


cutting geometry straight fluted
 rake angle 0°
 lead angle 75°
 wrench size (SW) please see below



1

	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group 12	 vc / f p. 183
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Ø D1 mm	Tol.	Ø-range mm	Connection size	L2 mm	SW mm	
12.50	o	12.21 - 12.70	6	20	6	6
13.00	o	12.71 - 13.20	6	22	6	6
14.00	o	13.21 - 14.20	6	22	6	6
15.00	o	14.21 - 15.20	8	22	8	6
16.00	o	15.21 - 16.20	8	22	8	6
17.00	o	16.21 - 17.20	10	22	10	6
18.00	o	17.21 - 18.20	10	26	10	6
19.00	o	18.21 - 19.20	10	26	10	6
20.00	o	19.21 - 20.20	10	26	10	6
21.00	o	20.21 - 21.20	12	26	13	6
22.00	o	21.21 - 22.20	12	26	13	6
23.00	o	22.21 - 23.20	12	26	13	6
24.00	o	23.21 - 24.20	12	26	13	6
25.00	o	24.21 - 25.20	16	26	16	6
26.00	o	25.21 - 26.20	16	26	16	6

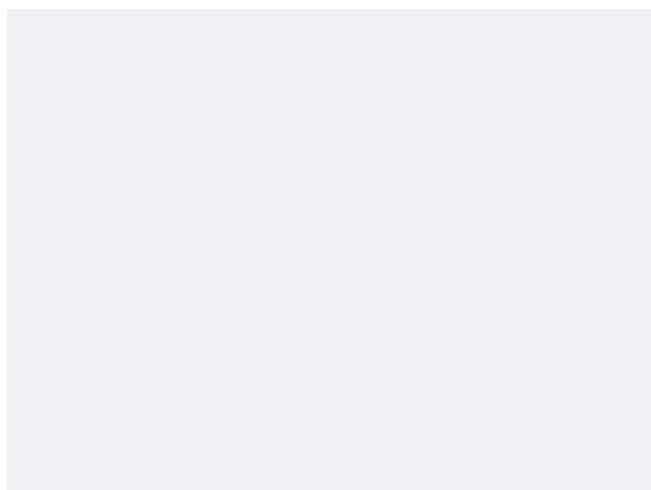
Ø D1 mm	Tol.	Ø-range mm	Connection size	L2 mm	SW mm	
27.00	o	26.21 - 27.20	16	26	16	6
28.00	o	27.21 - 28.20	16	26	16	6
29.00	o	28.21 - 29.20	16	26	16	6
30.00	o	29.21 - 30.20	16	26	16	8
31.00	o	30.21 - 31.20	16	30	16	8
32.00	o	31.21 - 32.20	16	30	16	8
33.00	o	32.21 - 33.20	24	30	24	8
34.00	o	33.21 - 34.20	24	30	24	8
35.00	o	34.21 - 35.20	24	30	24	8
36.00	o	35.21 - 36.20	24	30	24	8
37.00	o	36.21 - 37.20	24	30	24	8
38.00	o	37.21 - 38.20	24	30	24	8
39.00	o	38.21 - 39.20	24	30	24	8
40.00	o	39.21 - 40.20	24	30	24	8

- Ex stock, subject to being unsold
- Delivery on short notice

For special tolerances and intermediate diameters in the above mentioned Ø-ranges also delivery on short notice.

1 Holders for XR-reamers - standard

085101

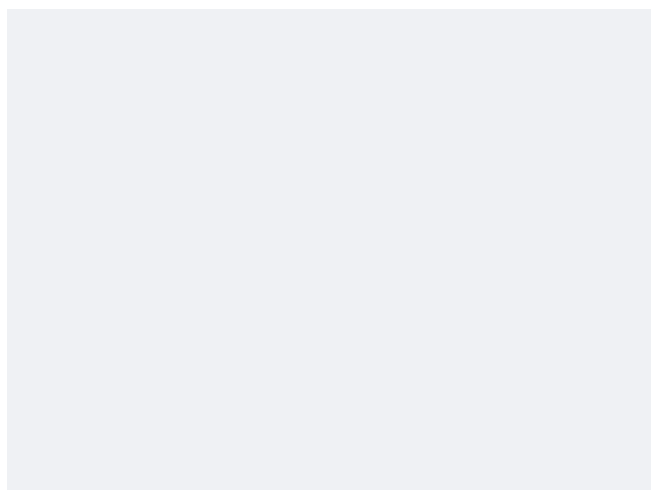


	Connection size	L1 mm	LA mm	Ø D2 mm	L3 mm	Specification	Order number
•	6	85	45	10	40	B085101-XS06-045	30350737
•	8	90	45	12	45	B085101-XS08-045	30350743
•	10	90	42	16	48	B085101-XS10-042	30350748
•	12	105	57	16	48	B085101-XS12-057	30350753
•	16	120	64	25	56	B085101-XS16-064	30350759
•	24	120	60	32	60	B085101-XS24-060	30371464

- Ex stock, subject to being unsold
- Delivery on short notice

2 Holders for XR-reamers - short

085101

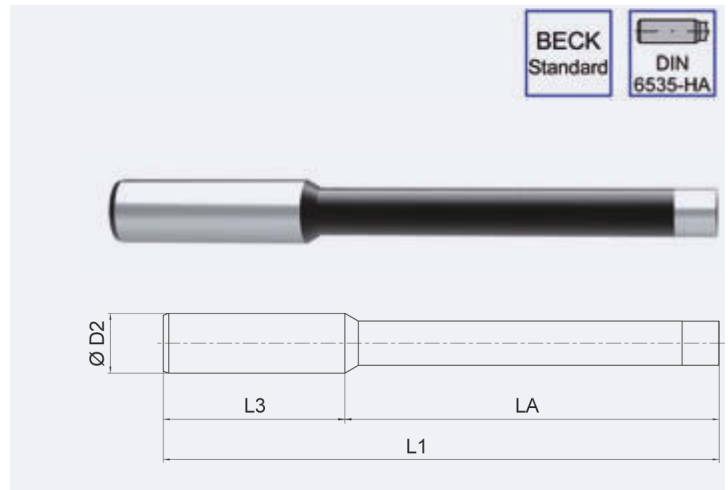
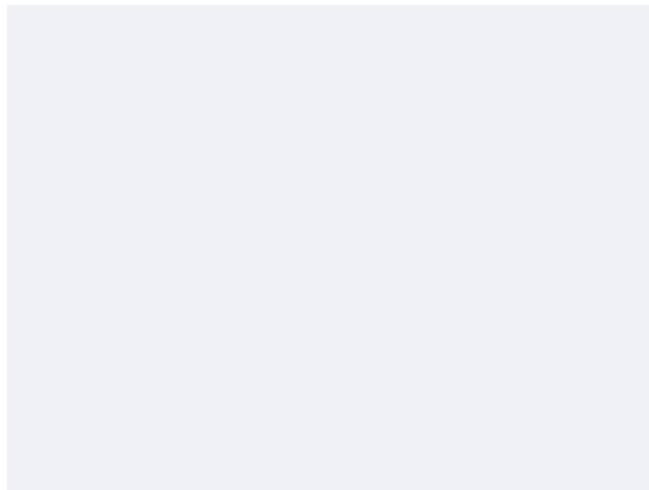


	Connection size	L1 mm	LA mm	Ø D2 mm	L3 mm	Specification	Order number
•	6	60	20	10	40	B085101-XS06-020	30350736
•	8	70	25	12	45	B085101-XS08-025	30350742
•	10	70	22	16	48	B085101-XS10-022	30350747
•	12	80	32	16	48	B085101-XS12-032	30350752
•	16	90	34	25	56	B085101-XS16-034	30350758
•	24	90	30	32	60	B085101-XS24-030	30371461

- Ex stock, subject to being unsold
- Delivery on short notice

Holders for XR-reamers - long

085101

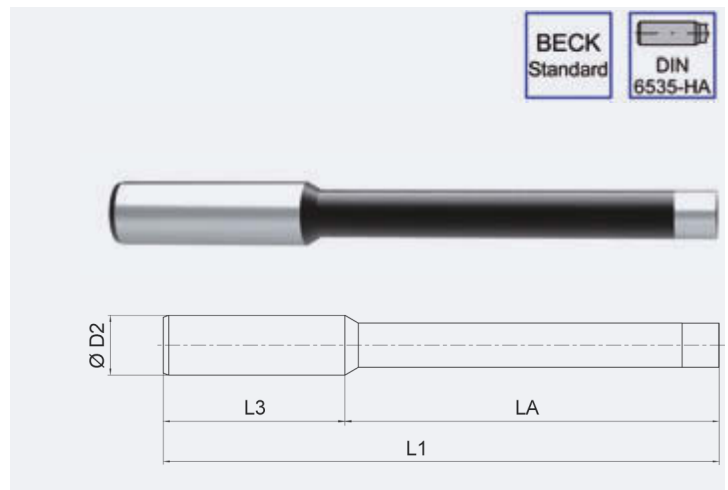
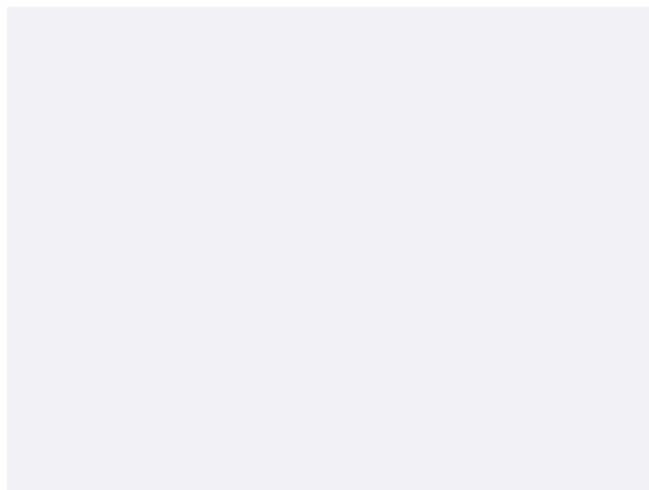


	Connection size	L1 mm	LA mm	Ø D2 mm	L3 mm	Specification	Order number
•	6	150	110	10	40	B085101-XS06-110	30350738
•	8	150	105	12	45	B085101-XS08-105	30350744
•	10	150	102	16	48	B085101-XS10-102	30350749
•	12	150	102	16	48	B085101-XS12-102	30350754
•	16	200	144	25	56	B085101-XS16-144	30350760
•	24	200	140	32	60	B085101-XS24-140	30371467

- Ex stock, subject to being unsold
- Delivery on short notice

Holders for XR-reamers - extra long

085101



	Connection size	L1 mm	LA mm	Ø D2 mm	L3 mm	Specification	Order number
•	12	200	152	16	48	B085101-XS12-152	30350755
•	16	250	194	25	56	B085101-XS16-194	30350761

- Ex stock, subject to being unsold
- Delivery on short notice

Reaming without inner coolant supply

- Reamers similar to DIN of solid carbide and HSS



- Hand reamers, quickly adjustable reamers



- Bridge reamers, helical reamers, shell reamers





■ DIN reamers of solid carbide and HSS



■ Micro reamers from dia. 0.6 mm















■ Reamers with soldered blades



















With its broad range of standardised reamers to DIN, BECK offers a good complement to the high-performance reamers with internal cooling. With small lot sizes or when machining on older machines without internal cooling lubricant supply, the advantages of the high cutting values of the high-performance reamers cannot be utilised, so that an inexpensive DIN reamer can be the more profitable solution for these machining operations. A further benefit of the DIN versions is the particularly high availability from stock, so that a reaming solution can be offered even at very short notice. Apart from the DIN versions, BECK also offers NC reamers similar to DIN. On these reamers, certain features have been modified, such as the chucking diameter to full diameter, in order that standard expanding chucks or shrink chucks can be used. Micro reamers above 0.6 mm diameter complete the BECK product range.

Reamers to DIN and DIN-like versions of carbide and HSS-E without inner cooling lubricant supply are suitable for a wide range of operations and offer a very wide spectrum of applications. The high hardness and good heat resistance of carbide allow higher machining data and longer tool lives than for reamers of HSS-E. Machine reamers of HSS-E are a particularly inexpensive variant for the production of precision bores. They are characterised by their ease of handling and can be used even under difficult machine and cutting conditions.

Hand reamers are frequently the best choice for repair applications. The cylindrical shank with square drive allows a bore to be post-reamed using a tap wrench. But these tools are often also the only alternative at points inaccessible to machine tools. Hand reamers have a very flat and long cutting lead so that the start of bore cutting is easier. Hand reamers should not be used on machine tools as this cutting lead form can lead to dimensional and surface problems even at low spindle speeds.

Standard	Shape	Design	Cutting material	Dia. range	Code	Page
Carbide machine reamers						
Similar DIN 8093 A		NC reamers, straight fluted	Solid carbide / solid carbide head	4,0 – 20,0	040244	72-73
Similar DIN 8093 B		NC reamers, spiral fluted	Solid carbide / carbide- tipped	1,0 – 30,0 0,60 – 12,05	040245 040240	74-77 78-80
Similar DIN 8093 B		NC reamers, spiral fluted	Solid carbide + TiAlN coating	1,0 – 20,0	043245	81-83
DIN 8093 A		straight fluted	Solid carbide / carbide tipped	1,0 – 20,0	040112 040110 040219 040222	84 84 85 85
DIN 8093 B		spiral fluted	Solid carbide / carbide tipped	1,0 – 20,0	040113 040111 040220 040223	86 86 87 88
DIN 8094 A		straight fluted	Solid carbide / carbide tipped	5,0 – 40,0	040420 040421	90 91
DIN 8094 B		spiral fluted	Solid carbide / carbide tipped	5,0 – 40,0	040422 040423	92 93
Similar DIN 8050		Straight fluted expandable reamer	Carbide tipped	8,0 – 20,0	040311	94
Similar DIN 8051		Straight fluted expandable reamer	Carbide tipped	8,0 – 40,0	040511	95
DIN 8090		spiral fluted	Solid carbide	3,0 – 12,0	040230	89
WN 280		spiral fluted, with pre-cutter	Carbide tipped	5,0 – 40,0	040512	96
DIN 8054		Straight fluted, shell reamer	Carbide tipped	25,0 – 75,0	040910	97

Machine reamers of HSS-E						
DIN 212- 3		NC reamers, spiral fluted	HSS-E	0,95 – 20,0	030505	98-100
DIN 212- 3		NC reamers, spiral fluted, with 0.01 mm increments	HSS-E	0,95 – 12,0	030506	101-102
DIN 212- 3		Set of NC reamers, spiral fluted	HSS-E	1,5 – 12,0	030507	103
DIN 212- 1 DIN 212- 2		straight fluted	HSS-E	0,95 – 20,0	030510	104-105
DIN 212- 1 DIN 212- 2		spiral fluted	HSS-E	0,95 – 20,0	030511	106-109
DIN 212- 2		spiral fluted	HSS-E + TiN- coated	4,0 – 20,0	033511	112
DIN 212- 1 DIN 212- 2		spiral fluted, with 0.01 mm increments	HSS-E	0,95 – 12,05	030513	110-111
DIN 212- 1 DIN 212- 2		helical reamer	HSS-E	1,0 – 20,0	030610	113-114
DIN 8089 B		spiral fluted	HSS-E	3,75 – 20,20	030716	115
DIN 208 B		spiral fluted	HSS-E	3,0 – 50,0	030111	116
DIN 208 B		spiral fluted	HSS-E + TiN- coated	10,0 – 20,0	033111	117
DIN 208 C		helical reamer	HSS-E	5,0 – 32,0	030310	118

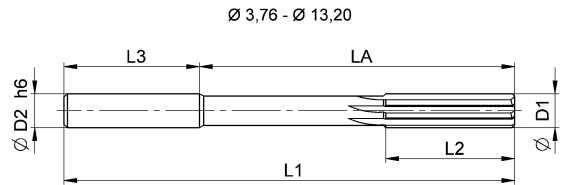
Standard	Shape	Design	Cutting material	Dia. range	Code	Page
Machine reamers of HSS-E						
WN 141		Facing reamer	HSS-E	2,5 – 12,0	030810	120
WN 142		Facing reamer	HSS-E	3,0 – 32,0	030811	121
DIN 311		Bridge reamer	HSS	6,4 – 40,0	030010	119
DIN 219 A		Straight fluted, push-on reamer	HSS-E	25,0 – 100,0	031210	124
DIN 219 B		Spiral fluted, shell reamer	HSS-E	25,0 – 100,0	031211	122-123
DIN 219 C		shell helical reamers	HSS-E	25,0 – 100,0	031310	125
DIN 217		shell reamers holders		13,0 – 50,0	031610	126
Hand reamers						
DIN 206 A		straight fluted	HSS	1,0 – 60,0	010010	127
DIN 206 B		spiral fluted	HSS	1,0 – 60,0	010011	128
DIN 859		adjustable, spiral fluted, (straight fluted up to dia. 6 mm)	HSS	4,0 – 5,5 6,0 – 60,0	011010 011011	129 130
WN 50		quick adjustment	HSS	6,4 – 80,0	012011	131
Sets WN 50		11-piece set 13-piece set	HSS	8,0 – 31,5 8,0 – 45,0	012015 012016	132
WN 50		Spare blades	HSS	6,4 – 80,0	012013	133
WN 50		Adjusting nuts			012014	133
Taper reamers						
DIN 2179		helical reamer, taper 1 : 50	HSS-E	1,0 – 12,0	021010	134
DIN 2180		helical reamer, taper 1 : 50	HSS-E	5,0 – 50,0	021011	135
DIN 9 B		spiral fluted, taper 1 : 50	HSS	3,0 – 50,0	020011	136
DIN 204 C		MK finishing reamer	HSS	MK0 – MK6	024011	137


NC-reamers

040244


right-hand cutting, straight flutes, extremely unequal spacing, with straight shank diameters for direct clamping in hydraulic, shrink, and high precision chucks

DIN 8093 sim.	Type A	Solid carbide	H7	 DIN 6535-HA
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	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group 4	 vc / f p. 186
	★	★	▲	★	★	★	★	★	▲			

2

Ø D1 mm		Ø-range mm	L1 mm	L2 mm	LA mm	Ø D2 mm	L3 mm	
4.00	●	3.76 - 4.25	75	19	47	4	28	6
4.50	●	4.26 - 4.75	80	21	44	6	36	6
5.00	●	4.76 - 5.30	86	23	50	6	36	6
5.50	●	5.31 - 5.70	93	26	57	6	36	6
6.00	●	5.71 - 6.11	93	26	57	6	36	6
6.50	●	6.12 - 6.70	101	28	65	6	36	6
7.00	●	6.71 - 7.20	109	31	73	8	36	6
7.50	●	7.21 - 7.70	109	31	73	8	36	6
8.00	●	7.71 - 8.20	117	33	81	8	36	6
8.50	●	8.21 - 8.70	117	33	81	8	36	6
9.00	●	8.71 - 9.20	125	36	85	10	40	6
9.50	●	9.21 - 9.70	125	36	85	10	40	6
10.00	●	9.71 - 10.20	133	38	93	10	40	6
10.50	●	10.21 - 10.70	133	38	93	10	40	6
11.00	●	10.71 - 11.20	142	41	97	12	45	6
11.50	○	11.21 - 11.70	142	41	97	12	45	6
12.00	●	11.71 - 12.20	151	44	106	12	45	6
13.00	●	12.21 - 13.20	151	44	106	12	45	6

- Ex stock, subject to being unsold
- Delivery on short notice

For special tolerances and intermediate diameters in the above mentioned Ø-ranges also delivery on short notice.

NC-reamers

040244

right-hand cutting, straight flutes, extremely unequal spacing, with straight shank diameters for direct clamping in hydraulic, shrink(*), and high precision chucks

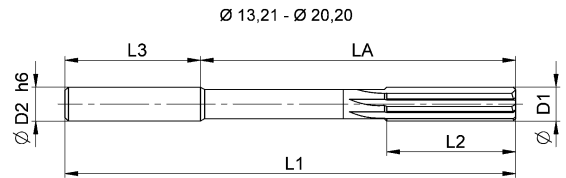
DIN
8093
sim.


Type
A


Solid
carbide
head

H7


DIN
6535-HA



	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group 4	 vc / f p. 186
	★	★	▲	★	★	★	★	★	▲			

Ø D1 mm		Ø-range mm	L1 mm	L2 mm	LA mm	Ø D2 mm	L3 mm	
14.00	●	13.21 - 14.20	160	47	112	16	48	8
15.00	●	14.21 - 15.20	162	50	114	16	48	8
16.00	●	15.21 - 16.20	170	52	122	16	48	8
17.00	●	16.21 - 17.20	175	52	127	18	48	8
18.00	●	17.21 - 18.20	182	52	134	18	48	8
19.00	●	18.21 - 19.20	189	52	139	20	50	8
20.00	●	19.21 - 20.20	195	52	145	20	50	8

- Ex stock, subject to being unsold
- Delivery on short notice

For special tolerances and intermediate diameters in the above mentioned Ø-ranges also delivery on short notice.

(*) The tool shank is made of steel (hardened). Therefore please only use shrinking devices with inductive action which are suitable for steel!

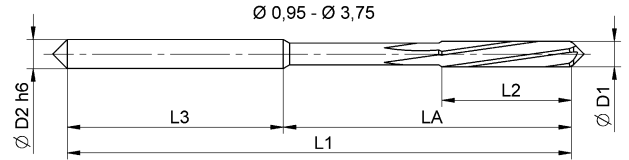
2



NC-reamers

040245


modified execution, right-hand cutting, spiral flutes, unequal / extremely unequal spacing, with straight shank diameters for direct clamping in hydraulic, shrink, and high precision chucks

DIN 8093 sim.	Type B	Solid carbide	H7	 DIN 6535-HA
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	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group	 vc / f
	★	★	▲	★	★	★	★	★	▲		4	p. 186

2

Ø D1 mm		Ø-range mm	L1 mm	L2 mm	LA mm	Ø D2 mm	L3 mm	
1.00	○	0.95 - 1.02	49.5	6	21.5	4	28	3
1.20	○	1.03 - 1.20	49.5	9	21.5	4	28	3
1.40	○	1.21 - 1.42	49.5	9	21.5	4	28	3
1.50	○	1.43 - 1.53	49	9	21	4	28	3
1.60	○	1.54 - 1.60	49	10	21	4	28	3
1.80	○	1.61 - 1.90	49	11	21	4	28	4
2.00	●	1.91 - 2.12	49	12	21	4	28	4
2.20	○	2.13 - 2.36	49	12	21	4	28	4
2.50	●	2.37 - 2.65	59	16	31	4	28	4
2.80	○	2.66 - 2.80	62.5	17	35	4	28	6
3.00	●	2.81 - 3.03	62.5	17	35	4	28	6
3.20	●	3.04 - 3.35	65	18	37	4	28	6
3.50	●	3.36 - 3.75	70	18	42	4	28	6

- Ex stock, subject to being unsold
- Delivery on short notice


For special tolerances and intermediate diameters in the above mentioned Ø-ranges also delivery on short notice.

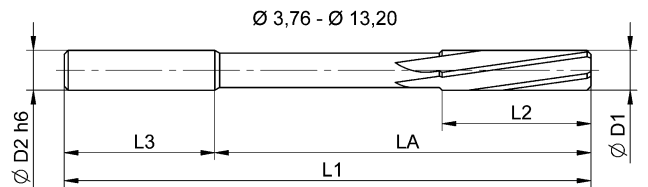
Subject to technical alterations (deviations of shank and cutting length).


NC-reamers


040245

modified execution, right-hand cutting, spiral flutes, extremely unequal spacing, with straight shank diameters for direct clamping in hydraulic, shrink, and high precision chucks

DIN 8093 sim.	Type B	Solid carbide	H7	 DIN 6535-HA
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	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group 4	 vc / f p. 186
	★	★	▲	★	★	★	★	★	▲			

Ø D1 mm		Ø-range mm	L1 mm	L2 mm	LA mm	Ø D2 mm	L3 mm	
4.00	●	3.76 - 4.25	75	19	47	4	28	6
4.50	●	4.26 - 4.75	80	21	44	6	36	6
5.00	●	4.76 - 5.30	86	23	50	6	36	6
5.50	●	5.31 - 5.70	93	26	57	6	36	6
6.00	●	5.71 - 6.11	93	26	57	6	36	6
6.50	●	6.12 - 6.70	101	28	65	6	36	6
7.00	●	6.71 - 7.20	109	31	73	8	36	6
7.50	●	7.21 - 7.70	109	31	73	8	36	6
8.00	●	7.71 - 8.20	117	33	81	8	36	6
8.50	●	8.21 - 8.70	117	33	81	8	36	6
9.00	●	8.71 - 9.20	125	36	85	10	40	6
9.50	●	9.21 - 9.70	125	36	85	10	40	6
10.00	●	9.71 - 10.20	133	38	93	10	40	6
10.50	●	10.21 - 10.70	133	38	93	10	40	6
11.00	●	10.71 - 11.20	142	41	97	12	45	6
11.50	○	11.21 - 11.70	142	41	97	12	45	6
12.00	●	11.71 - 12.20	151	44	106	12	45	6
13.00	●	12.21 - 13.20	151	44	106	12	45	6

- Ex stock, subject to being unsold
- Delivery on short notice

For special tolerances and intermediate diameters in the above mentioned Ø-ranges also delivery on short notice.

Subject to technical alterations (deviations of shank and cutting length).

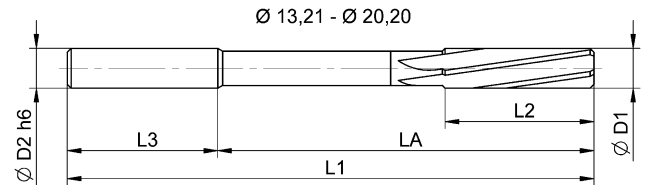
2



NC-reamers


040245

modified execution, right-hand cutting, spiral flutes, extremely unequal spacing, with straight shank diameters for direct clamping in hydraulic, shrink(*), and high precision chucks

DIN 8093 sim.	Type B	Solid carbide head	H7	 DIN 6535-HA
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	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group	 vc / f
	★	★	▲	★	★	★	★	★	▲		4	p. 186

Ø D1 mm		Ø-range mm	L1 mm	L2 mm	LA mm	Ø D2 mm	L3 mm	
14.00	●	13.21 - 14.20	160	47	112	16	48	8
15.00	●	14.21 - 15.20	162	50	114	16	48	8
16.00	●	15.21 - 16.20	170	52	122	16	48	8
17.00	●	16.21 - 17.20	175	52	127	18	48	8
18.00	●	17.21 - 18.20	182	52	134	18	48	8
19.00	●	18.21 - 19.20	189	52	139	20	50	8
20.00	●	19.21 - 20.20	195	52	145	20	50	8

- Ex stock, subject to being unsold
- Delivery on short notice

For special tolerances and intermediate diameters in the above mentioned Ø-ranges also delivery on short notice.

Subject to technical alterations (deviations of shank and cutting length).

(*) The tool shank is made of steel (hardened). Therefore please only use shrinking devices with inductive action which are suitable for steel!

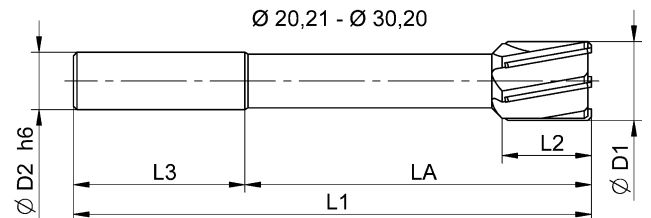
2

NC-reamers


040245

right-hand cutting, spiral flutes, extremely unequal spacing, with straight shank diameters for direct clamping in hydraulic, shrink(*), and high precision chucks

DIN 8093 sim.	Type B	Carbide tipped	H7	 DIN 6535-HA
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	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group 4	 vc / f p. 186
	★	★	▲	★	★	★	★	★	▲			

Ø D1 mm		Ø-range mm	L1 mm	L2 mm	LA mm	Ø D2 mm	L3 mm	
21.00	○	20.21 - 21.20	160	25	110	20	50	6
22.00	●	21.21 - 22.20	160	25	110	20	50	6
23.00	○	22.21 - 23.20	180	25	130	20	50	6
24.00	●	23.21 - 24.20	180	25	130	20	50	8
25.00	●	24.21 - 25.20	180	25	130	20	50	8
26.00	●	25.21 - 26.20	180	25	130	20	50	8
27.00	○	26.21 - 27.20	180	25	130	20	50	8
28.00	●	27.21 - 28.20	180	25	124	25	56	8
29.00	○	28.21 - 29.20	180	25	124	25	56	8
30.00	●	29.21 - 30.20	200	25	144	25	56	8

- Ex stock, subject to being unsold
- Delivery on short notice

For special tolerances and intermediate diameters in the above mentioned Ø-ranges also delivery on short notice.

Subject to technical alterations (deviations of shank and cutting length).

(*) The tool shank is made of steel (hardened). Therefore please only use shrinking devices with inductive action which are suitable for steel!

2

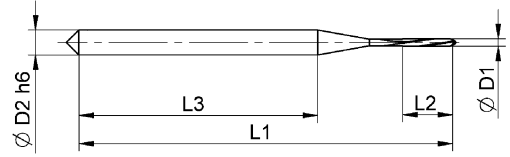
-NEW- Micro-NC-reamers



040240


starting from 0,6 mm diameter

right-hand cutting, spiral flutes, with straight shank diameters for direct clamping in hydraulic, shrink, and high precision chucks

DIN 8093 sim.	Type B	Solid carbide	 DIN 6535-HA
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	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group 4	 vc / f
	★	★	▲	★	★	★	★	★	▲			

Ø D1 mm		Tol.	Ø-range mm	L1 mm	L2 mm	Ø D2 mm	L3 mm	
0.60	•	+0,004	0.59 - 0.64	45	5	3	28	4
0.70	•	+0,004	0.65 - 0.74	45	5	3	28	4
0.80	•	+0,004	0.75 - 0.84	45	6	3	28	4
0.90	•	+0,004	0.85 - 0.94	45	6	3	28	4

- Ex stock, subject to being unsold
- Delivery on short notice

Intermediate sizes and special tolerances on request, minimum order quantity 10 pcs. per diameter.

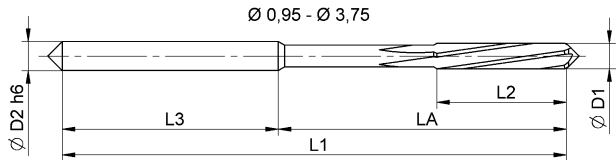
2

NC-reamers increasing by 0,01 mm


040240

modified execution, right-hand cutting, spiral flutes, unequal / extremely unequal spacing, with straight shank diameters for direct clamping in hydraulic, shrink, and high precision chucks

DIN 8093 sim.	Type B	Solid carbide	DIN 6535-HA
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	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group 4	 vc / f p. 186
	★	★	▲	★	★	★	★	★	▲			

Ø D1 mm		Tol.	L1 mm	L2 mm	LA mm	Ø D2 mm	L3 mm	
0.98	●	+0,004	49.5	6	21.5	4	28	3
0.99	●	+0,004	49.5	6	21.5	4	28	3
1.00	●	+0,004	49.5	6	21.5	4	28	3
1.01	●	+0,004	49.5	6	21.5	4	28	3
1.02	●	+0,004	49.5	6	21.5	4	28	3
1.03	●	+0,004	49.5	9	21.5	4	28	3
1.48	●	+0,004	49	9	21	4	28	3
1.49	●	+0,004	49	9	21	4	28	3
1.50	●	+0,004	49	9	21	4	28	3
1.51	●	+0,004	49	9	21	4	28	3
1.52	●	+0,004	49	9	21	4	28	3
1.53	●	+0,004	49	9	21	4	28	3
1.98	●	+0,004	49	12	21	4	28	4
1.99	●	+0,004	49	12	21	4	28	4
2.00	●	+0,004	49	12	21	4	28	4
2.01	●	+0,004	49	12	21	4	28	4
2.02	●	+0,004	49	12	21	4	28	4
2.03	●	+0,004	49	12	21	4	28	4
2.48	●	+0,004	59	16	31	4	28	4
2.49	●	+0,004	59	16	31	4	28	4
2.50	●	+0,004	59	16	31	4	28	4
2.51	●	+0,004	59	16	31	4	28	4
2.52	●	+0,004	59	16	31	4	28	4
2.53	●	+0,004	59	16	31	4	28	4
2.97	●	+0,004	62.5	17	35	4	28	6
2.98	●	+0,004	62.5	17	35	4	28	6
2.99	●	+0,004	62.5	17	35	4	28	6
3.00	●	+0,004	62.5	17	35	4	28	6
3.01	●	+0,004	62.5	17	35	4	28	6
3.02	●	+0,004	62.5	17	35	4	28	6
3.03	●	+0,004	62.5	17	35	4	28	6

- Ex stock, subject to being unsold
- Delivery on short notice

Subject to technical alterations (deviations of shank and cutting length).

2

NC-reamers increasing by 0,01 mm

040240

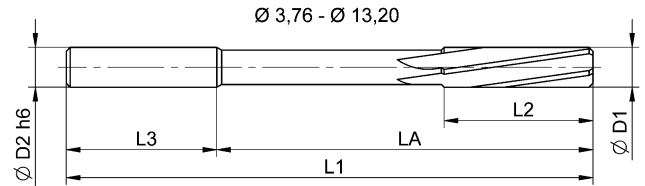
modified execution, right-hand cutting, spiral flutes, extremely unequal spacing, with straight shank diameters for direct clamping in hydraulic, shrink, and high precision chucks



DIN
8093
sim.

Type
B


Solid
carbide



DIN
6535-HA



	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group 4	 vc / f p. 186
	★	★	▲	★	★	★	★	★	▲			

2

Ø D1 mm		Tol.	L1 mm	L2 mm	LA mm	Ø D2 mm	L3 mm	
3.97	●	+0,004	75	19	47	4	28	6
3.98	●	+0,004	75	19	47	4	28	6
3.99	●	+0,004	75	19	47	4	28	6
4.00	●	+0,004	75	19	47	4	28	6
4.01	●	+0,004	75	19	47	4	28	6
4.02	●	+0,004	75	19	47	4	28	6
4.03	●	+0,004	75	19	47	4	28	6
4.97	●	+0,004	86	23	50	6	36	6
4.98	●	+0,004	86	23	50	6	36	6
4.99	●	+0,004	86	23	50	6	36	6
5.00	●	+0,004	86	23	50	6	36	6
5.01	●	+0,004	86	23	50	6	36	6
5.02	●	+0,004	86	23	50	6	36	6
5.03	●	+0,004	86	23	50	6	36	6
5.97	●	+0,004	93	26	57	6	36	6
5.98	●	+0,004	93	26	57	6	36	6
5.99	●	+0,004	93	26	57	6	36	6
6.00	●	+0,004	93	26	57	6	36	6
6.01	●	+0,004	93	26	57	6	36	6
6.02	●	+0,004	93	26	57	6	36	6
6.03	●	+0,004	93	26	57	6	36	6
7.97	●	+0,004	117	33	81	8	36	6
7.98	●	+0,004	117	33	81	8	36	6
7.99	●	+0,004	117	33	81	8	36	6

Ø D1 mm		Tol.	L1 mm	L2 mm	LA mm	Ø D2 mm	L3 mm	
8.00	●	+0,004	117	33	81	8	36	6
8.01	●	+0,004	117	33	81	8	36	6
8.02	●	+0,004	117	33	81	8	36	6
8.03	●	+0,004	117	33	81	8	36	6
8.04	●	+0,004	117	33	81	8	36	6
9.97	●	+0,004	133	38	93	10	40	6
9.98	●	+0,004	133	38	93	10	40	6
9.99	●	+0,004	133	38	93	10	40	6
10.00	●	+0,004	133	38	93	10	40	6
10.01	●	+0,004	133	38	93	10	40	6
10.02	●	+0,004	133	38	93	10	40	6
10.03	●	+0,004	133	38	93	10	40	6
10.04	●	+0,004	133	38	93	10	40	6
10.05	●	+0,004	133	38	93	10	40	6
11.97	●	+0,004	151	44	106	12	45	6
11.98	●	+0,004	151	44	106	12	45	6
11.99	●	+0,004	151	44	106	12	45	6
12.00	●	+0,004	151	44	106	12	45	6
12.01	●	+0,004	151	44	106	12	45	6
12.02	●	+0,004	151	44	106	12	45	6
12.03	●	+0,004	151	44	106	12	45	6
12.04	●	+0,004	151	44	106	12	45	6
12.05	●	+0,004	151	44	106	12	45	6

- Ex stock, subject to being unsold
- Delivery on short notice

Subject to technical alterations (deviations of shank and cutting length).

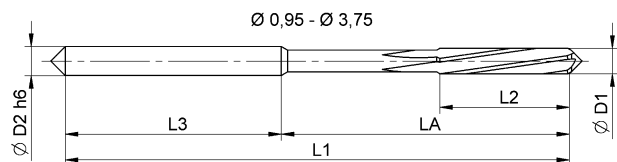
Please note: Reduction of tolerance by 1µm to +0,004/0 for all tools increasing by 0.01 mm. Adaptation of stock will be made successively.

NC-reamers with coating


043245

right-hand cutting, spiral flutes, unequal / extremely unequal spacing, with straight shank diameters for direct clamping in hydraulic, shrink, and high precision chucks

DIN 8093 sim.	Type B	Solid carbide	TiAlN	H7	 DIN 6535-HA
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	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group 4	 vc / f p. 185
	★	★	▲	★	★	★			▲			

Ø D1 mm		Ø-range mm	L1 mm	L2 mm	LA mm	Ø D2 mm	L3 mm	
1.00	○	0.95 - 1.02	49.5	6	21.5	4	28	3
1.20	○	1.03 - 1.20	49.5	9	21.5	4	28	3
1.40	○	1.21 - 1.42	49.5	9	21.5	4	28	3
1.50	○	1.43 - 1.53	49	9	21	4	28	3
1.60	○	1.54 - 1.60	49	10	21	4	28	3
1.80	○	1.61 - 1.90	49	11	21	4	28	4
2.00	●	1.91 - 2.12	49	12	21	4	28	4
2.20	○	2.13 - 2.36	49	12	21	4	28	4
2.50	○	2.37 - 2.65	59	16	31	4	28	4
2.80	○	2.66 - 2.80	62.5	17	35	4	28	6
3.00	●	2.81 - 3.03	62.5	17	35	4	28	6
3.20	○	3.04 - 3.35	65	16	37	4	28	6
3.50	○	3.36 - 3.75	70	18	42	4	28	6

- Ex stock, subject to being unsold
- Delivery on short notice

For special tolerances and intermediate diameters in the above mentioned Ø-ranges also delivery on short notice.

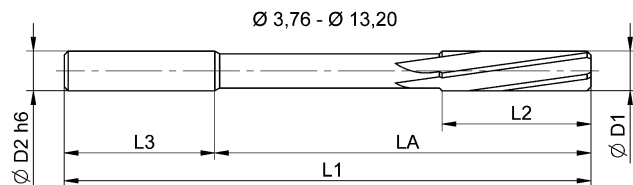
2

NC-reamers with coating


043245

right-hand cutting, spiral flutes, extremely unequal spacing, with straight shank diameters for direct clamping in hydraulic, shrink, and high precision chucks

DIN 8093 sim.	Type B	Solid carbide	TiAlN	H7	 DIN 6535-HA
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	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group 4	 vc / f p. 185
	★	★	▲	★	★	★			▲			

Ø D1 mm		Ø-range mm	L1 mm	L2 mm	LA mm	Ø D2 mm	L3 mm	
4.00	●	3.76 - 4.25	75	19	47	4	28	6
4.50	○	4.26 - 4.75	80	21	44	6	36	6
5.00	●	4.76 - 5.30	86	23	50	6	36	6
5.50	○	5.31 - 5.70	93	26	57	6	36	6
6.00	●	5.71 - 6.11	93	26	57	6	36	6
6.50	○	6.12 - 6.70	101	28	65	6	36	6
7.00	○	6.71 - 7.20	109	31	73	8	36	6
7.50	○	7.21 - 7.70	109	31	73	8	36	6
8.00	●	7.71 - 8.20	117	33	81	8	36	6
8.50	○	8.21 - 8.70	117	33	81	8	36	6
9.00	○	8.71 - 9.20	125	36	85	10	40	6
9.50	○	9.21 - 9.70	125	36	85	10	40	6
10.00	●	9.71 - 10.20	133	38	93	10	40	6
10.50	○	10.21 - 10.70	133	38	93	10	40	6
11.00	○	10.71 - 11.20	142	41	97	12	45	6
11.50	○	11.21 - 11.70	142	41	97	12	45	6
12.00	●	11.71 - 12.20	151	44	106	12	45	6
13.00	○	12.21 - 13.20	151	44	106	12	45	6

- Ex stock, subject to being unsold
- Delivery on short notice

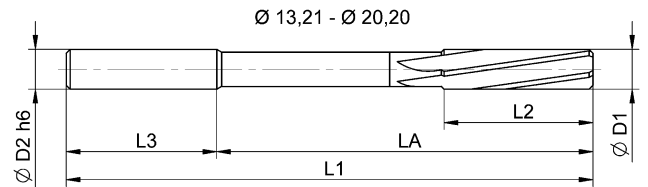
For special tolerances and intermediate diameters in the above mentioned Ø-ranges also delivery on short notice.



NC-reamers with coating


043245

right-hand cutting, spiral flutes, extremely unequal spacing, with straight shank diameters for direct clamping in hydraulic, shrink(*), and high precision chucks

DIN 8093 sim.	Type B	Solid carbide head	TiAlN	H7	 DIN 6535-HA
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	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group 4	 vc / f p. 185
	★	★	▲	★	★	★			▲			

Ø D1 mm		Ø-range mm	L1 mm	L2 mm	LA mm	Ø D2 mm	L3 mm	
14.00	●	13.21 - 14.20	160	47	112	16	48	8
15.00	○	14.21 - 15.20	162	50	114	16	48	8
16.00	●	15.21 - 16.20	170	52	122	16	48	8
17.00	○	16.21 - 17.20	175	52	127	18	48	8
18.00	○	17.21 - 18.20	182	52	134	18	48	8
19.00	○	18.21 - 19.20	189	52	139	20	50	8
20.00	○	19.21 - 20.20	195	52	145	20	50	8

- Ex stock, subject to being unsold
- Delivery on short notice

For special tolerances and intermediate diameters in the above mentioned Ø-ranges also delivery on short notice.

(*) The tool shank is made of steel (hardened). Therefore please only use shrinking devices with inductive action which are suitable for steel!

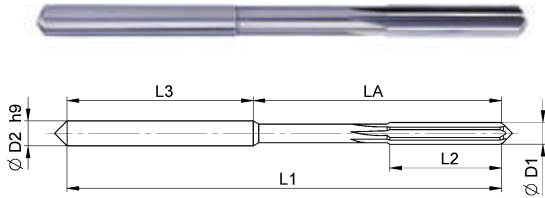
2

Machine reamers


040112


right-hand cutting, straight flutes, unequal spacing

DIN 8093 Type A Solid carbide H7



	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group 4	 vc / f p. 186
	★	★	▲	★	★	★	★	★	▲			

Ø D1 mm		Ø-range mm	L1 mm	L2 mm	LA mm	Ø D2 mm	L3 mm	
1.00	●	0.95 - 1.06	34	6	15	1	19	3
1.10	○	1.07 - 1.12	34	6	15	1	19	3
1.20	●		38	8	16.5	1.2	21.5	3
1.30	○	1.13 - 1.32	38	8	16.5	1.2	21.5	3
1.40	●		40	8	18	1.4	22	3
1.50	●	1.33 - 1.51	40	8	18	1.5	22	3

Ø D1 mm		Ø-range mm	L1 mm	L2 mm	LA mm	Ø D2 mm	L3 mm	
1.60	●	1.52 - 1.71	49	11	26	1.6	23	3
1.80	●	1.72 - 1.91	49	11	25	1.8	24	4
2.00	●	1.92 - 2.13	49	11	24	2	25	4
2.20	●	2.14 - 2.37	57	15	30	2.2	27	4
2.50	●	2.38 - 2.66	57	15	28	2.5	29	4
2.80	●	2.67 - 2.89	61	15	32	2.8	29	4

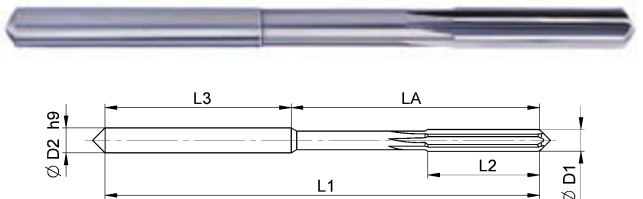
- Ex stock, subject to being unsold
- Delivery on short notice


Machine reamers


040110

right-hand cutting, straight flutes, extremely unequal spacing

DIN 8093 Type A Solid carbide H7



Ø D1 mm		Ø-range mm	L1 mm	L2 mm	LA mm	Ø D2 mm	L3 mm	
3.00	●	2.89 - 3.10	61	15	30	3	31	6
3.20	●	3.11 - 3.35	70	18	33	3.2	37	6
3.50	●	3.36 - 3.75	70	18	33	3.5	37	6
4.00	●	3.76 - 4.25	75	19	44	4	31	6

Ø D1 mm		Ø-range mm	L1 mm	L2 mm	LA mm	Ø D2 mm	L3 mm	
4.50	●	4.26 - 4.75	80	21	46	4.5	34	6
5.00	●	4.76 - 5.30	86	23	53	5	33	6
5.50	●	5.31 - 5.70	93	26	56	5.6	37	6
6.00	●	5.71 - 6.11	93	26	56	5.6	37	6

- Ex stock, subject to being unsold
- Delivery on short notice

For special tolerances and intermediate diameters in the above mentioned Ø-ranges also delivery on short notice.

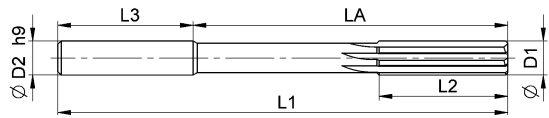
Subject to technical alterations!



Machine reamers


040219


right-hand cutting, straight flutes, extremely unequal spacing, long cutting section

DIN 8093 Type A Solid carbide head H7



	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group 4	 vc / f p. 186
	★	★	▲	★	★	★	★	★	▲			

Ø D1 mm		Ø-range mm	L1 mm	L2 mm	LA mm	Ø D2 mm	L3 mm	
6.50	•	6.11 - 6.70	101	28	63	6.3	38	6
7.00	•	6.71 - 7.10	109	31	69	7.1	40	6
7.50	•	7.11 - 7.70	109	31	69	7.1	40	6
8.00	•	7.71 - 8.10	117	33	75	8	42	6
8.50	•	8.11 - 8.60	117	33	75	8	42	6
9.00	•	8.61 - 9.10	125	36	81	9	44	6
9.50	•	9.11 - 9.60	125	36	81	9	44	6
10.00	•	9.61 - 10.10	133	38	87	10	46	6

Ø D1 mm		Ø-range mm	L1 mm	L2 mm	LA mm	Ø D2 mm	L3 mm	
10.50	•	10.11 - 10.60	133	38	87	10	46	6
11.00	•	10.61 - 11.10	142	41	96	10	46	6
12.00	•	11.11 - 12.10	151	44	105	10	46	6
13.00	•	12.11 - 13.10	151	44	105	10	46	6
14.00	•	13.11 - 14.10	160	47	110	12.5	50	8
15.00	•	14.11 - 15.10	162	50	112	12.5	50	8
16.00	•	15.11 - 16.10	170	52	120	12.5	50	8

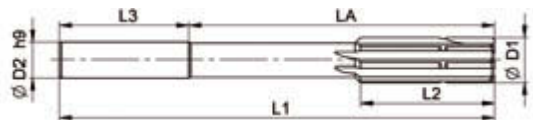
- Ex stock, subject to being unsold
- Delivery on short notice


Machine reamers


040222

right-hand cutting, straight flutes, extremely unequal spacing, long cutting section

DIN 8093 Type A Carbide tipped H7



Ø D1 mm		Ø-range mm	L1 mm	L2 mm	LA mm	Ø D2 mm	L3 mm	
17.00	•	16.15 - 17.14	175	54	123	14	52	6
18.00	•	17.15 - 18.14	182	56	130	14	52	6

Ø D1 mm		Ø-range mm	L1 mm	L2 mm	LA mm	Ø D2 mm	L3 mm	
19.00	•	18.15 - 19.16	189	58	131	16	58	6
20.00	•	19.17 - 20.16	195	60	137	16	58	6

- Ex stock, subject to being unsold
- Delivery on short notice

For special tolerances and intermediate diameters in the above mentioned Ø-ranges also delivery on short notice.

Subject to technical alterations!

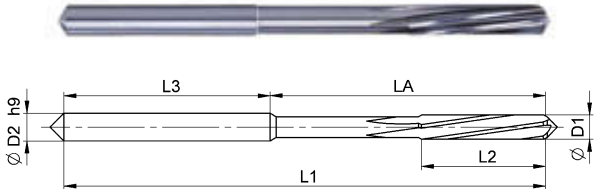
2

Machine reamers


040113


right-hand cutting, spiral flutes, unequal spacing

DIN 8093 Type B Solid carbide H7



	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group 4	 vc / f p. 186
	★	★	▲	★	★	★	★	★	▲			

Ø D1 mm		Ø-range mm	L1 mm	L2 mm	LA mm	Ø D2 mm	L3 mm	
1.00	●	0.95 - 1.06	34	6	15	1	19	3
1.10	○	1.07 - 1.12	34	6	15	1	19	3
1.20	●		38	8	16.5	1.2	21.5	3
1.30	○	1.13 - 1.32	38	8	16.5	1.2	21.5	3
1.40	●		40	8	18	1.4	22	3
1.50	●	1.33 - 1.51	40	8	18	1.5	22	3

Ø D1 mm		Ø-range mm	L1 mm	L2 mm	LA mm	Ø D2 mm	L3 mm	
1.60	●	1.52 - 1.71	49	11	26	1.6	23	3
1.80	●	1.72 - 1.91	49	11	25	1.8	24	4
2.00	●	1.92 - 2.13	49	11	24	2	25	4
2.20	●	2.14 - 2.37	57	15	30	2.2	27	4
2.50	●	2.38 - 2.66	57	15	28	2.5	29	4
2.80	●	2.67 - 2.89	61	15	32	2.8	29	4

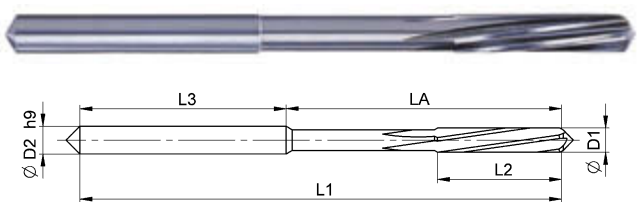
- Ex stock, subject to being unsold
- Delivery on short notice


Machine reamers


040111

right-hand cutting, spiral flutes, extremely unequal spacing

DIN 8093 Type B Solid carbide H7



Ø D1 mm		Ø-range mm	L1 mm	L2 mm	LA mm	Ø D2 mm	L3 mm	
3.00	●	2.89 - 3.10	61	15	30	3	31	6
3.20	●	3.11 - 3.35	70	18	33	3.2	37	6
3.50	●	3.36 - 3.75	70	18	33	3.5	37	6
4.00	●	3.76 - 4.25	75	19	44	4	31	6

Ø D1 mm		Ø-range mm	L1 mm	L2 mm	LA mm	Ø D2 mm	L3 mm	
4.50	●	4.26 - 4.75	80	21	46	4.5	34	6
5.00	●	4.76 - 5.30	86	23	53	5	33	6
5.50	●	5.31 - 5.70	93	26	56	5.6	37	6
6.00	●	5.71 - 6.11	93	26	56	5.6	37	6

- Ex stock, subject to being unsold
- Delivery on short notice

For special tolerances and intermediate diameters in the above mentioned Ø-ranges also delivery on short notice.

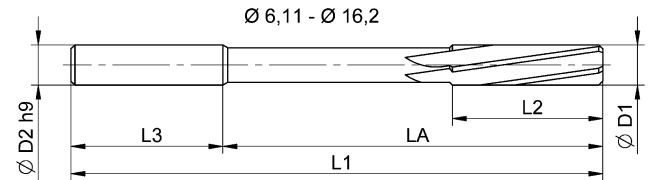
Subject to technical alterations!


Machine reamers


040220

right-hand cutting, spiral flutes, extremely unequal spacing, long cutting section

DIN 8093	Type B	Solid carbide head	H7
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	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group 4	 vc / f p. 186
	★	★	▲	★	★	★	★	★	▲			

Ø D1 mm		Ø-range mm	L1 mm	L2 mm	LA mm	Ø D2 mm	L3 mm	
6.50	●	6.11 - 6.70	101	28	63	6.3	38	6
7.00	●	6.71 - 7.10	109	31	69	7.1	40	6
7.50	●	7.11 - 7.70	109	31	69	7.1	40	6
8.00	●	7.71 - 8.10	117	33	75	8	42	6
8.50	●	8.11 - 8.60	117	33	75	8	42	6
9.00	●	8.61 - 9.10	125	36	81	9	44	6
9.50	●	9.11 - 9.60	125	36	81	9	44	6
10.00	●	9.61 - 10.10	133	38	87	10	46	6
10.50	●	10.11 - 10.60	133	38	87	10	46	6
11.00	●	10.61 - 11.10	142	41	96	10	46	6
12.00	●	11.11 - 12.10	151	44	105	10	46	6
13.00	●	12.11 - 13.10	151	44	105	10	46	6
14.00	●	13.11 - 14.10	160	47	110	12.5	50	8
15.00	●	14.11 - 15.10	162	50	112	12.5	50	8
16.00	●	15.11 - 16.10	170	52	120	12.5	50	8

- Ex stock, subject to being unsold
- Delivery on short notice

For special tolerances and intermediate diameters in the above mentioned Ø-ranges also delivery on short notice.

Subject to technical alterations!

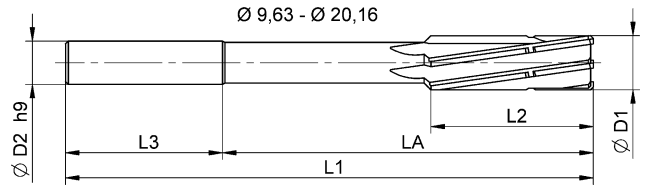
2

Machine reamers

040223


right-hand cutting, spiral flutes, extremely unequal spacing, long cutting section

DIN 8093	Type B	Carbide tipped	H7
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	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group 4	 vc / f p. 186
	★	★	▲	★	★	★	★	★	▲			

2

Ø D1 mm		Ø-range mm	L1 mm	L2 mm	LA mm	Ø D2 mm	L3 mm	
10.00	●	9.63 - 10.20	133	38	87	10	46	6
10.50	○	10.21 - 10.64	133	38	87	10	46	6
11.00	●	10.65 - 11.14	142	41	96	10	46	6
11.50	○	11.15 - 11.80	142	41	96	10	46	6
12.00	●	11.81 - 12.20	151	44	105	10	46	6
13.00	●	12.21 - 13.20	151	44	105	10	46	6
14.00	●	13.21 - 14.14	160	47	110	12.5	50	6
15.00	●	14.15 - 15.14	162	50	112	12.5	50	6
16.00	●	15.15 - 16.14	170	52	120	12.5	50	6
17.00	●	16.15 - 17.14	175	54	123	14	52	6
18.00	●	17.15 - 18.14	182	56	130	14	52	6
19.00	●	18.15 - 19.16	189	58	131	16	58	6
20.00	●	19.17 - 20.16	195	60	137	16	58	6

- Ex stock, subject to being unsold
- Delivery on short notice

For special tolerances and intermediate diameters in the above mentioned Ø-ranges also delivery on short notice.

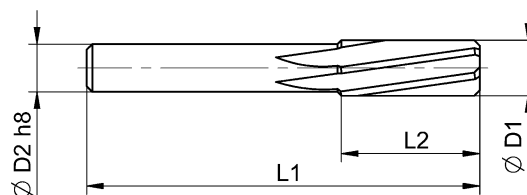
Subject to technical alterations!



Reamers for automatic lathes


040230

right-hand cutting, spiral flutes, short version

DIN 8090	Type B	Solid carbide	H7
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	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group 4	 vc / f p. 186
	★	★	▲	★	★	★	★	★	▲			

Ø D1 mm		Ø-range mm	L1 mm	L2 mm	Ø D2 mm	
3,00	○	2,89 - 3,10	56	20	2,5	6
3,20	○	3,11 - 3,30	56	20	2,8	6
3,50	○	3,31 - 3,70	56	20	3	6
4,00	○	3,71 - 4,25	56	20	3,55	6
4,50	○	4,26 - 4,60	63	22	4	6
4,80	○	4,61 - 4,95	63	22	4	6
5,00	○	4,96 - 5,30	63	22	4	6
5,50	○	5,31 - 5,70	63	22	5	6
6,00	○	5,71 - 6,20	63	22	5	6
6,50	○	6,21 - 6,70	63	22	5	6
7,00	○	6,71 - 7,20	71	25	6,3	6
7,50	○	7,21 - 7,70	71	25	6,3	6
8,00	○	7,71 - 8,20	71	25	6,3	6
8,50	○	8,21 - 8,70	71	25	6,3	6
9,00	○	8,71 - 9,20	71	25	8	6
9,50	○	9,21 - 9,70	71	25	8	6
10,00	○	9,71 - 10,20	71	25	8	6
10,50	○	10,21 - 10,60	71	25	8	6
11,00	○	10,61 - 11,20	80	28	10	6
11,50	○	11,21 - 11,70	80	28	10	6
12,00	○	11,71 - 12,20	80	28	10	6

- Ex stock, subject to being unsold
- Delivery on short notice

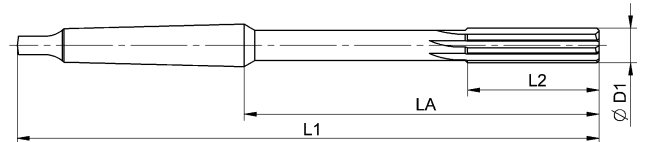
For special tolerances and intermediate diameters in the above mentioned Ø-ranges also delivery on short notice.


Machine reamers

040420


right-hand cutting, straight flutes, extremely unequal spacing, long cutting section

DIN 8094	Type A	Solid carbide head	H7
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	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group 4	 vc / f p. 186
	★	★	▲	★	★	★	★	★	▲			

2

Ø D1 mm		Ø-range mm	L1 mm	L2 mm	LA mm	MT	
5.00	●	4.75 - 5.30	133	23	67.5	1	6
5.50	○	5.31 - 5.70	138	26	72.5	1	6
6.00	●	5.71 - 6.11	138	26	72.5	1	6
6.50	○	6.12 - 6.70	144	28	78.5	1	6
7.00	●	6.71 - 7.20	150	31	84.5	1	6
7.50	○	7.21 - 7.70	150	31	84.5	1	6
8.00	●	7.71 - 8.20	156	33	90.5	1	6
8.50	○	8.21 - 8.70	156	33	90.5	1	6
9.00	●	8.71 - 9.20	162	36	96.5	1	6
9.50	○	9.21 - 9.70	162	36	96.5	1	6
10.00	●	9.71 - 10.20	168	38	102.5	1	6
10.50	○	10.21 - 10.70	168	38	102.5	1	6
11.00	●	10.71 - 11.20	175	41	109.5	1	6
11.50	○	11.21 - 11.70	175	41	109.5	1	6
12.00	●	11.71 - 12.20	182	44	116.5	1	6
13.00	●	12.21 - 13.20	182	44	116.5	1	6
14.00	●	13.21 - 14.20	189	47	123.5	1	8
15.00	●	14.21 - 15.20	204	50	124	2	8
16.00	●	15.21 - 16.20	210	52	130	2	8

- Ex stock, subject to being unsold
- Delivery on short notice

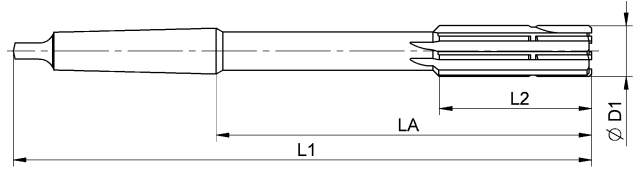
For special tolerances and intermediate diameters in the above mentioned Ø-ranges also delivery on short notice.



Machine reamers


040421

right-hand cutting, straight flutes, extremely unequal spacing, long cutting section

DIN 8094	Type A	Carbide tipped	H7
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	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group 4	 vc / f p. 186
	★	★	▲	★	★	★	★	★	▲			

Ø D1 mm		Ø-range mm	L1 mm	L2 mm	LA mm	MT	
17.00	•	16.15 - 17.14	214	54	134	2	6
18.00	•	17.15 - 18.14	219	56	139	2	6
19.00	•	18.15 - 19.16	223	58	143	2	6
20.00	•	19.17 - 20.16	228	60	148	2	6
21.00	•	20.17 - 21.20	232	62	152	2	6
22.00	•	21.21 - 22.20	237	64	157	2	6
23.00	•	22.21 - 23.20	241	66	161	2	6
24.00	•	23.21 - 24.20	268	68	169	3	8
25.00	•	24.21 - 25.16	268	68	169	3	8
26.00	•	25.17 - 26.20	273	70	174	3	8
27.00	•	26.21 - 27.20	277	71	178	3	8
28.00	•	27.21 - 28.16	277	71	178	3	8
30.00	•	29.21 - 30.16	281	73	182	3	8
32.00	•	31.21 - 32.20	317	77	193	4	8
34.00	•	33.21 - 34.20	321	78	197	4	8
35.00	•	34.21 - 35.20	321	78	197	4	8
36.00	•	35.21 - 36.20	325	79	201	4	8
38.00	•	37.21 - 38.20	329	81	205	4	8
40.00	•	39.21 - 40.16	329	81	205	4	8

- Ex stock, subject to being unsold
- Delivery on short notice

For special tolerances and intermediate diameters in the above mentioned Ø-ranges also delivery on short notice.

Subject to technical alterations!

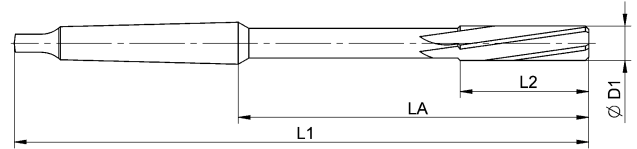
2



Machine reamers

040422


right-hand cutting, spiral flutes, extremely unequal spacing, long cutting section

DIN 8094	Type B	Solid carbide head	H7
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	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group 4	 vc / f p. 186
	★	★	▲	★	★	★	★	★	▲			

2

Ø D1 mm		Ø-range mm	L1 mm	L2 mm	LA mm	MT	
5.00	●	4.75 - 5.30	133	23	67.5	1	6
5.50	○	5.31 - 5.70	138	26	72.5	1	6
6.00	●	5.71 - 6.11	138	26	72.5	1	6
6.50	○	6.12 - 6.70	144	28	78.5	1	6
7.00	●	6.71 - 7.20	150	31	84.5	1	6
7.50	○	7.21 - 7.70	150	31	84.5	1	6
8.00	●	7.71 - 8.20	156	33	90.5	1	6
8.50	○	8.21 - 8.70	156	33	90.5	1	6
9.00	●	8.71 - 9.20	162	36	96.5	1	6
9.50	○	9.21 - 9.70	162	36	96.5	1	6
10.00	●	9.71 - 10.20	168	38	102.5	1	6
10.50	○	10.21 - 10.70	168	38	102.5	1	6
11.00	●	10.71 - 11.20	175	41	109.5	1	6
11.50	○	11.21 - 11.70	175	41	109.5	1	6
12.00	●	11.71 - 12.20	182	44	116.5	1	6
13.00	●	12.21 - 13.20	182	44	116.5	1	6
14.00	●	13.21 - 14.20	189	47	123.5	1	8
15.00	●	14.21 - 15.20	204	50	124	2	8
16.00	●	15.21 - 16.20	210	52	130	2	8

- Ex stock, subject to being unsold
- Delivery on short notice

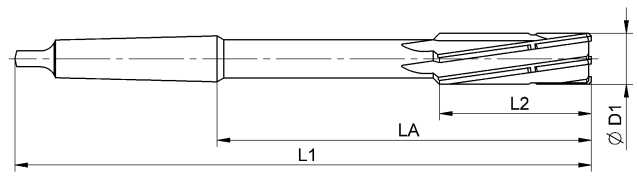
For special tolerances and intermediate diameters in the above mentioned Ø-ranges also delivery on short notice.



Machine reamers


040423

right-hand cutting, spiral flutes, extremely unequal spacing, long cutting section

DIN 8094 Type B Carbide tipped H7



	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group 4	 vc / f p. 186
	★	★	▲	★	★	★	★	★	▲			

Ø D1 mm		Ø-range mm	L1 mm	L2 mm	LA mm	MT	
10.00	●	9.64 - 10.20	168	38	102.5	1	6
10.50	○	10.21 - 10.64	168	38	102.5	1	6
11.00	●	10.65 - 11.14	175	41	109.5	1	6
11.50	○	11.15 - 11.80	175	41	109.5	1	6
12.00	●	11.81 - 12.20	182	44	116.5	1	6
13.00	●	12.21 - 13.20	182	44	116.5	1	6
14.00	●	13.21 - 14.14	189	47	123.5	1	6
15.00	●	14.15 - 15.14	204	50	124	2	6
16.00	●	15.15 - 16.14	210	52	130	2	6
17.00	●	16.15 - 17.14	214	54	134	2	6
18.00	●	17.15 - 18.14	219	56	139	2	6
19.00	●	18.15 - 19.16	223	58	143	2	6
20.00	●	19.17 - 20.16	228	60	148	2	6
21.00	●	20.17 - 21.20	232	62	152	2	6
22.00	●	21.21 - 22.20	237	64	157	2	6
23.00	●	22.21 - 23.20	241	66	161	2	6
24.00	●	23.21 - 24.20	268	68	169	3	8
25.00	●	24.21 - 25.16	268	68	169	3	8
26.00	●	25.17 - 26.20	273	70	174	3	8
27.00	●	26.21 - 27.20	277	71	178	3	8
28.00	●	27.21 - 28.16	277	71	178	3	8
29.00	○	28.17 - 29.20	281	73	182	3	8
30.00	●	29.21 - 30.16	281	73	182	3	8
31.00	○	30.17 - 31.20	285	75	186	3	8
32.00	●	31.21 - 32.20	317	77	193	4	8
34.00	●	33.21 - 34.20	321	78	197	4	8
35.00	●	34.21 - 35.20	321	78	197	4	8
36.00	●	35.21 - 36.20	325	79	201	4	8
38.00	●	37.21 - 38.20	329	81	205	4	8
40.00	●	39.21 - 40.16	329	81	205	4	8

- Ex stock, subject to being unsold
- Delivery on short notice

For special tolerances and intermediate diameters in the above mentioned Ø-ranges also delivery on short notice.

Subject to technical alterations!

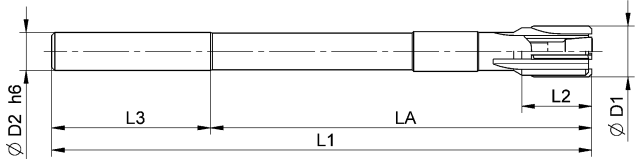
2



Expanding machine reamers

040311


right-hand cutting, straight flutes, short cutting section, **expandable of approx. 0,03 mm by means of head screw**

DIN 8050 sim.	Type A	Carbide tipped	H7
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	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group 4	 vc / f p. 186
	★	★		★	★	★	★	★	▲			

2

Ø D1 mm		Ø-range mm	L1 mm	L2 mm	LA mm	Ø D2 mm	L3 mm	
8.00	●	7.70 - 8.20	117	12	75	8	42	4
8.50	○	8.21 - 8.70	117	12	75	8	42	4
9.00	●	8.71 - 9.20	125	12	79	10	46	6
9.50	○	9.21 - 9.70	125	12	79	10	46	6
10.00	●	9.71 - 10.20	133	12	87	10	46	6
10.50	○	10.21 - 10.70	133	12	87	10	46	6
11.00	●	10.71 - 11.20	142	12	96	10	46	6
11.50	○	11.21 - 11.70	142	12	96	10	46	6
12.00	●	11.71 - 12.20	151	12	105	10	46	6
12.50	○	12.21 - 12.70	151	12	105	10	46	6
13.00	●	12.71 - 13.20	151	12	105	10	46	6
14.00	●	13.21 - 14.20	160	16	110	12	50	6
15.00	●	14.21 - 15.20	162	16	112	12	50	6
16.00	●	15.21 - 16.20	170	19	120	12	50	6
17.00	○	16.21 - 17.20	175	19	123	14	52	6
18.00	●	17.21 - 18.20	182	19	130	14	52	6
19.00	○	18.21 - 19.20	189	19	131	16	58	6
20.00	●	19.21 - 20.20	195	19	137	16	58	6

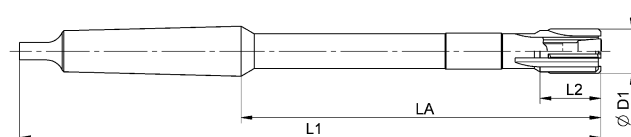
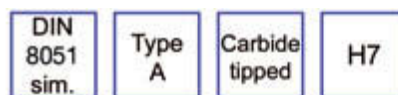
- Ex stock, subject to being unsold
- Delivery on short notice



For special tolerances and intermediate diameters in the above mentioned Ø-ranges also delivery on short notice.


Expanding machine reamers

040511

right-hand cutting, straight flutes, short cutting section, **expandable of approx. 0,03 mm by means of head screw**



	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group 4	 vc / f p. 186
	★	★		★	★	★	★	★	▲			

Ø D1 mm		Ø-range mm	L1 mm	L2 mm	LA mm	MT	
8.00	●	7.70 - 8.20	156	12	90.5	1	4
8.50	○	8.21 - 8.70	156	12	90.5	1	4
9.00	●	8.71 - 9.20	162	12	96.5	1	4
9.50	○	9.21 - 9.70	162	12	96.5	1	6
10.00	●	9.71 - 10.20	168	12	102.5	1	6
10.50	○	10.21 - 10.70	168	12	102.5	1	6
11.00	●	10.71 - 11.20	175	12	109.5	1	6
11.50	○	11.21 - 11.70	175	12	109.5	1	6
12.00	●	11.71 - 12.20	182	12	116.5	1	6
12.50	○	12.21 - 12.70	182	12	116.5	1	6
13.00	●	12.71 - 13.20	182	12	116.5	1	6
14.00	●	13.21 - 14.20	189	16	123.5	1	6
15.00	●	14.21 - 15.20	204	16	124	2	6
16.00	●	15.21 - 16.20	210	19	130	2	6
17.00	●	16.21 - 17.20	214	19	134	2	6
18.00	●	17.21 - 18.20	219	19	139	2	6
19.00	●	18.21 - 19.20	223	19	143	2	6
20.00	●	19.21 - 20.20	228	19	148	2	6
21.00	○	20.21 - 21.20	232	19	152	2	6
22.00	●	21.21 - 22.20	237	22	157	2	6
23.00	○	22.21 - 23.20	241	22	161	2	6
24.00	●	23.21 - 24.20	268	22	169	3	6
25.00	●	24.21 - 25.20	268	22	169	3	6
26.00	●	25.21 - 26.20	273	22	174	3	6
27.00	○	26.21 - 27.20	277	25	178	3	6
28.00	●	27.21 - 28.20	277	25	178	3	6
30.00	●	29.21 - 30.20	281	25	182	3	6
32.00	●	31.21 - 32.20	317	25	193	4	6
34.00	●	33.21 - 34.20	321	25	197	4	8
35.00	●	34.21 - 35.20	321	25	197	4	8
36.00	●	35.21 - 36.20	325	25	201	4	8
38.00	●	37.21 - 38.20	329	25	205	4	8
40.00	●	39.21 - 40.20	329	25	205	4	8

- Ex stock, subject to being unsold
- Delivery on short notice

For special tolerances and intermediate diameters in the above mentioned Ø-ranges also delivery on short notice.

2

Special machine reamers with precutting step

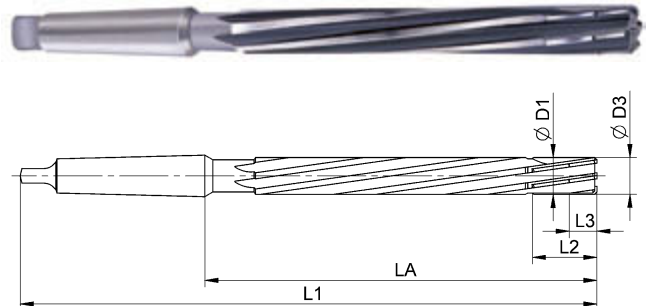
040512

right-hand cutting, spiral flutes. The size following the cutting diameter is reduced of 0,3 to 0,4 mm

BECK
Standard
WN280


Carbide
tipped

H7



	Steel	Steel	VA	GG	GGG	GGG	Cu/Zn/Mg	Alu	Ti	HRC	Group	 vc / f p. 186
	<900 N	900-1400N	Stainless steel			>GGG50				< 63 HRC	4	
	★	★		★	★	★	★	★				

2

Ø D1 mm		L1 mm	L2 mm	Ø D3 mm	L3 mm	LA mm	MT	
5.00	●	165	25	4.92	10	99.5	1	6
6.00	●	165	25	5.92	10	99.5	1	6
7.00	●	185	25	6.92	10	119.5	1	6
8.00	●	205	23	7.92	10	139.5	1	6
9.00	●	215	23	8.9	10	149.5	1	6
10.00	●	230	28	9.9	12	164.5	1	6
11.00	●	230	28	10.9	12	164.5	1	6
12.00	●	230	28	11.9	12	164.5	1	6
13.00	○	230	28	12.9	12	164.5	1	6
14.00	●	230	28	13.9	12	164.5	1	6
15.00	●	245	28	14.9	12	165	2	6
16.00	●	250	28	15.9	12	170	2	6
17.00	○	255	28	16.9	12	175	2	6
18.00	●	255	28	17.9	12	175	2	6
19.00	●	260	28	18.9	12	180	2	6
20.00	●	260	33	19.9	15	180	2	6
22.00	●	265	33	21.85	15	185	2	6
24.00	●	285	33	23.85	15	186	3	8
25.00	●	285	33	24.85	15	186	3	8
26.00	○	285	33	25.85	15	186	3	8
28.00	○	290	33	27.85	15	191	3	8
30.00	●	300	33	29.85	15	201	3	8
32.00	○	330	33	31.85	15	206	4	8
34.00	○	335	33	33.85	15	211	4	8
35.00	●	335	33	34.85	15	211	4	8
36.00	○	340	33	35.85	15	216	4	8
38.00	○	345	33	37.85	15	221	4	8
40.00	●	345	33	39.85	15	221	4	8

- Ex stock, subject to being unsold
- Delivery on short notice

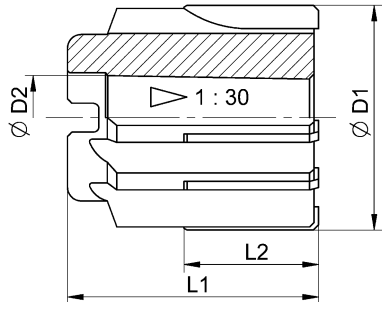
For intermediate diameters and special tolerances also delivery on short notice.

Shell reamers



040910


right-hand cutting, straight flutes, locating bore with 1:30 taper and driving slot to DIN 138, for shell reamer holders to DIN 217 (please see page 126)


DIN 8054	Type A	Carbide tipped	H7
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2

	Steel <900 N ★	Steel 900-1400N ★	VA Stainless steel	GG ★	GGG ★	GGG >GGG50 ★	Cu/Zn/Mg ★	Alu ★	Ti ▲	HRC < 63 HRC	Group 4	 vc / f p. 186
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$\varnothing D1$ mm		L1 mm	L2 mm	$\varnothing D2$ mm	
25.00	●	45	25	13	6
26.00	○	45	25	13	6
28.00	○	45	25	13	6
30.00	●	45	30	13	6
31.00	○	45	30	13	8
32.00	●	45	30	13	8
33.00	○	45	30	13	8
34.00	●	45	30	13	8
35.00	●	45	30	13	8
36.00	●	50	30	16	8
37.00	●	50	30	16	8
38.00	●	50	30	16	8
39.00	○	50	30	16	8
40.00	●	50	30	16	8
41.00	○	50	30	16	8
42.00	●	50	30	16	8
43.00	○	50	30	16	8

$\varnothing D1$ mm		L1 mm	L2 mm	$\varnothing D2$ mm	
44.00	●	50	30	16	8
45.00	●	50	30	16	8
46.00	○	56	30	19	10
47.00	○	56	30	19	10
48.00	●	56	30	19	10
49.00	○	56	30	19	10
50.00	●	56	30	19	10
52.00	○	56	30	19	10
55.00	●	63	30	22	10
58.00	●	63	30	22	10
60.00	●	63	30	22	10
62.00	○	63	30	22	10
68.00	○	71	30	27	12
70.00	●	71	30	27	12
72.00	○	71	30	27	12
73.00	○	71	30	27	12
75.00	●	71	30	27	12

- Ex stock, subject to being unsold
- Delivery on short notice

Intermediate diameters and special tolerances on request.

D2 = Nom. dia. D1 of the suitable holder

NC-reamers

030505

right-hand cutting, spiral flutes, with straight shank diameters for direct clamping in hydraulic and high precision chucks

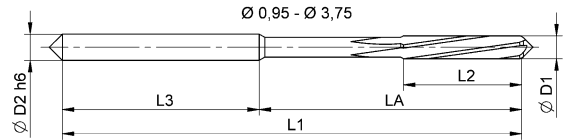
DIN
212-3


Type
B

HSS-
E


H7


DIN
6535-HA



	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group 3	 vc / f p. 187
	★	★		★	★		★	★				

2

Ø D1 mm		Ø-range mm	L1 mm	L2 mm	LA mm	Ø D2 mm	L3 mm	
1.00	○	0.95 - 1.06	34	5.5	15	1	19	3
1.10	○	1.07 - 1.18	36	6.5	15.5	1	20.5	3
1.20	○	1.19 - 1.32	38	7.5	16.5	2	21.5	3
1.40	○	1.33 - 1.41	40	8	18	2	22	3
1.50	●	1.42 - 1.50	40	8	18	2	22	3
1.60	●	1.51 - 1.70	43	9	20	2	23	3
1.70	●		43	9	20	2	23	3
1.80	●	1.71 - 1.90	46	10	22	2	24	4
1.90	●		46	10	22	2	24	4
2.00	●	1.91 - 2.12	49	11	24	2	25	4
2.10	●		49	11	24	2	25	4
2.20	●	2.13 - 2.36	53	12	25	3	28	4
2.30	●		53	12	25	3	28	4
2.40	●		57	14	29	3	28	4
2.50	●	2.37 - 2.65	57	14	29	3	28	4
2.60	●		57	14	29	3	28	4
2.70	●		61	15	33	3	28	6
2.80	●	2.66 - 2.80	61	15	33	3	28	6
2.90	●		61	15	33	3	28	6
3.00	●	2.81 - 3.00	61	15	33	3	28	6
3.10	●		65	16	37	4	28	6
3.20	●	3.01 - 3.35	65	16	37	4	28	6
3.30	●		65	16	37	4	28	6
3.40	●		70	18	42	4	28	6
3.50	●	3.36 - 3.75	70	18	42	4	28	6
3.60	●		70	18	42	4	28	6
3.70	●		70	18	42	4	28	6

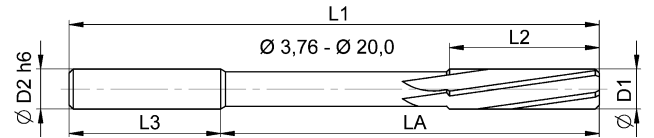
- Ex stock, subject to being unsold
- Delivery on short notice



For special tolerances and intermediate diameters in the above mentioned Ø-ranges also delivery on short notice.


NC-reamers

030505

right-hand cutting, spiral flutes, with straight shank diameters for direct clamping in hydraulic and high precision chucks



	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group 3	 vc / f
	★	★		★	★		★	★				p. 187

Ø D1 mm		Ø-range mm	L1 mm	L2 mm	LA mm	Ø D2 mm	L3 mm	
3.80	•		75	19	47	4	28	6
3.90	•		75	19	47	4	28	6
4.00	•	3.76 - 4.25	75	19	47	4	28	6
4.10	•		75	19	47	4	28	6
4.20	•		75	19	47	4	28	6
4.30	•		80	21	52	5	28	6
4.40	•		80	21	52	5	28	6
4.50	•	4.26 - 4.75	80	21	52	5	28	6
4.60	•		80	21	52	5	28	6
4.70	•		80	21	52	5	28	6
4.80	•		86	23	58	5	28	6
4.90	•		86	23	58	5	28	6
5.00	•	4.76 - 5.30	86	23	58	5	28	6
5.10	•		86	23	58	5	28	6
5.20	•		86	23	58	5	28	6
5.30	•		86	23	58	5	28	6
5.40	•		93	26	57	6	36	6
5.50	•	5.31 - 5.60	93	26	57	6	36	6
5.60	•		93	26	57	6	36	6
5.70	•		93	26	57	6	36	6
5.80	•		93	26	57	6	36	6
5.90	•		93	26	57	6	36	6
6.00	•	5.61 - 6.00	93	26	57	6	36	6
6.10	•		101	28	65	6	36	6
6.20	•		101	28	65	6	36	6
6.30	•		101	28	65	6	36	6
6.40	•		101	28	65	6	36	6
6.50	•	6.01 - 6.70	101	28	65	6	36	6
6.60	•		101	28	65	6	36	6
6.70	•		101	28	65	6	36	6
6.80	•		109	31	73	8	36	6
6.90	•		109	31	73	8	36	6
7.00	•	6.71 - 7.20	109	31	73	8	36	6
7.10	•		109	31	73	8	36	6
7.20	•		109	31	73	8	36	6
7.30	•		109	31	73	8	36	6
7.40	•		109	31	73	8	36	6
7.50	•	7.21 - 7.50	109	31	73	8	36	6
7.60	•		117	33	81	8	36	6
7.70	•		117	33	81	8	36	6
7.80	•		117	33	81	8	36	6
7.90	•		117	33	81	8	36	6
8.00	•	7.51 - 8.20	117	33	81	8	36	6
8.10	•		117	33	81	8	36	6

2

NC-reamers

030505

right-hand cutting, spiral flutes, with straight shank diameters for direct clamping in hydraulic and high precision chucks

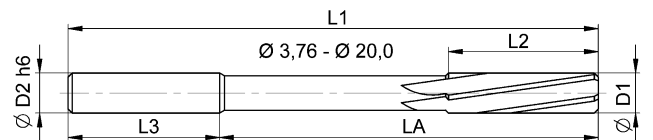
DIN
212-3



Type
B

HSS-
E


H7


DIN
6535-HA



	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group 3	 vc / f p. 187
	★	★		★	★		★	★				

2

Ø D1 mm		Ø-range mm	L1 mm	L2 mm	LA mm	Ø D2 mm	L3 mm	
8.20	●		117	33	81	8	36	6
8.30	●		117	33	81	8	36	6
8.40	●		117	33	81	8	36	6
8.50	●	8.21 - 8.50	117	33	81	8	36	6
8.60	●		125	36	85	10	40	6
8.70	●		125	36	85	10	40	6
8.80	●		125	36	85	10	40	6
8.90	●		125	36	85	10	40	6
9.00	●	8.51 - 9.20	125	36	85	10	40	6
9.10	●		125	36	85	10	40	6
9.20	●		125	36	85	10	40	6
9.30	●		125	36	85	10	40	6
9.40	●		125	36	85	10	40	6
9.50	●	9.21 - 9.50	125	36	85	10	40	6
9.60	●		133	38	93	10	40	6
9.70	●		133	38	93	10	40	6
9.80	●		133	38	93	10	40	6
9.90	●		133	38	93	10	40	6
10.00	●	9.51 - 10.20	133	38	93	10	40	6
10.50	○	10.21 - 10.60	133	38	93	10	40	6
11.00	●	10.61 - 11.20	142	41	102	10	40	6
11.50	○	11.21 - 11.80	142	41	102	10	40	6
12.00	●	11.81 - 12.20	151	44	111	10	40	6
13.00	●	12.21 - 13.20	151	44	111	10	40	6
14.00	●	13.21 - 14.00	160	47	115	14	45	8
15.00	●	14.01 - 15.00	162	50	117	14	45	8
16.00	●	15.01 - 16.00	170	52	125	14	45	8
17.00	●	16.01 - 17.00	175	54	130	14	45	8
18.00	●	17.01 - 18.00	182	56	137	14	45	8
19.00	●	18.01 - 19.00	189	58	141	16	48	8
20.00	●	19.01 - 20.00	195	60	147	16	48	8

- Ex stock, subject to being unsold
- Delivery on short notice

For special tolerances and intermediate diameters in the above mentioned Ø-ranges also delivery on short notice.

NC-reamers increasing by 0,01 mm

030506

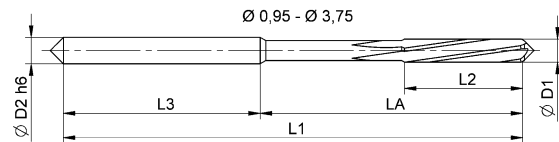
right-hand cutting, spiral flutes, with straight shank diameters for direct clamping in hydraulic and high precision chucks


DIN
212-3


Type
B

HSS-
E


DIN
6535-HA



	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group	 vc / f
	★	★		★	★		★	★				p. 187

Ø D1 mm		Tol.	L1 mm	L2 mm	LA mm	Ø D2 mm	L3 mm	
1.00	●	+0,004	34	5.5	15	1	19	3
1.01	●	+0,004	34	5.5	15	1	19	3
1.02	●	+0,004	34	5.5	15	1	19	3
1.50	●	+0,004	40	8	18	2	22	3
1.51	●	+0,004	43	9	20	2	23	3
1.52	●	+0,004	43	9	20	2	23	3
1.97	●	+0,004	49	11	24	2	25	4
1.98	●	+0,004	49	11	24	2	25	4
1.99	●	+0,004	49	11	24	2	25	4
2.00	●	+0,004	49	11	24	2	25	4
2.01	●	+0,004	49	11	24	2	25	4
2.02	●	+0,004	49	11	24	2	25	4
2.48	●	+0,004	57	14	29	3	28	4
2.49	●	+0,004	57	14	29	3	28	4
2.50	●	+0,004	57	14	29	3	28	4
2.51	●	+0,004	57	14	29	3	28	4
2.52	●	+0,004	57	14	29	3	28	4
2.97	●	+0,004	61	15	33	3	28	6
2.98	●	+0,004	61	15	33	3	28	6
2.99	●	+0,004	61	15	33	3	28	6
3.00	●	+0,004	61	15	33	3	28	6
3.01	●	+0,004	65	16	37	4	28	6
3.02	●	+0,004	65	16	37	4	28	6

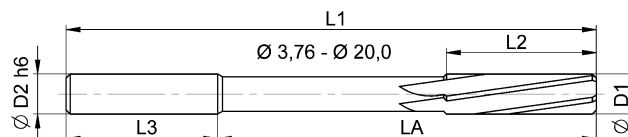
- Ex stock, subject to being unsold
- Delivery on short notice




2

NC-reamers increasing by 0,01 mm


030506

right-hand cutting, spiral flutes, with straight shank diameters for direct clamping
in hydraulic and high precision chucks



	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group	 vc / f
	★	★		★	★		★	★				p. 187

2

Ø D1 mm		Tol.	L1 mm	L2 mm	LA mm	Ø D2 mm	L3 mm	
3.97	●	+0,004	75	19	47	4	28	6
3.98	●	+0,004	75	19	47	4	28	6
3.99	●	+0,004	75	19	47	4	28	6
4.00	●	+0,004	75	19	47	4	28	6
4.01	●	+0,004	75	19	47	4	28	6
4.02	●	+0,004	75	19	47	4	28	6
4.97	●	+0,004	86	23	58	5	28	6
4.98	●	+0,004	86	23	58	5	28	6
4.99	●	+0,004	86	23	58	5	28	6
5.00	●	+0,004	86	23	58	5	28	6
5.01	●	+0,004	86	23	58	5	28	6
5.02	●	+0,004	86	23	58	5	28	6
5.97	●	+0,005	93	26	57	6	36	6
5.98	●	+0,005	93	26	57	6	36	6
5.99	●	+0,005	93	26	57	6	36	6
6.00	●	+0,005	93	26	57	6	36	6
6.01	●	+0,005	101	28	65	6	36	6
6.02	●	+0,005	101	28	65	6	36	6
7.97	●	+0,005	117	33	81	8	36	6
7.98	●	+0,005	117	33	81	8	36	6
7.99	●	+0,005	117	33	81	8	36	6
8.00	●	+0,005	117	33	81	8	36	6
8.01	●	+0,005	117	33	81	8	36	6
8.02	●	+0,005	117	33	81	8	36	6
9.00	●	+0,005	125	36	85	10	40	6
9.01	●	+0,005	125	36	85	10	40	6
9.02	●	+0,005	125	36	85	10	40	6
9.97	●	+0,005	133	38	93	10	40	6
9.98	●	+0,005	133	38	93	10	40	6
9.99	●	+0,005	133	38	93	10	40	6
10.00	●	+0,005	133	38	93	10	40	6
10.01	●	+0,005	133	38	93	10	40	6
10.02	●	+0,005	133	38	93	10	40	6
11.97	●	+0,005	151	44	111	10	40	6
11.98	●	+0,005	151	44	111	10	40	6
11.99	●	+0,005	151	44	111	10	40	6
12.00	●	+0,005	151	44	111	10	40	6

- Ex stock, subject to being unsold
- Delivery on short notice

Set of NC reamers

030507



right-hand cutting, spiral flutes, with straight shank diameters for direct clamping in hydraulic and high precision chucks, **composed of 10 pcs.**

Ø 1,5 / 2,0 / 3,0 / 4,0 / 5,0 / 6,0 / 7,0 / 8,0 / 10,0 / 12,0 mm H7

DIN 212-3	Type B	HSS- E	H7	 DIN 6535-HA
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2

	Steel <900 N ★	Steel 900-1400N ★	VA Stainless steel	GG ★	GGG ★	GGG >GGG50	Cu/Zn/Mg ★	Alu ★	Ti	HRC < 63 HRC	Group 3	 vc / f p. 187
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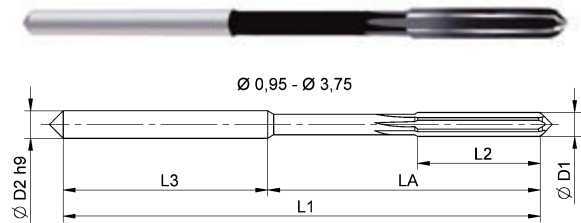
Ex stock, subject to being unsold



Machine reamers

030510


right-hand cutting, straight flutes

DIN 212-1	Type A	HSS- E	H7
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	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group 3	 vc / f p. 187
	★	★		★	★		★	★				

2

Ø D1 mm		Ø-range mm	L1 mm	L2 mm	LA mm	Ø D2 mm	L3 mm	
1.00	●	0.95 - 1.06	34	5.5	15	1	19	3
1.10	○	1.07 - 1.18	36	6.5	15.5	1.1	20.5	3
1.20	○	1.19 - 1.32	38	7.5	16.5	1.2	21.5	3
1.40	○	1.33 - 1.41	40	8	18	1.4	22	3
1.50	●	1.42 - 1.50	40	8	18	1.5	22	3
1.60	○	1.51 - 1.70	43	9	20	1.6	23	3
1.80	○	1.71 - 1.90	46	10	22	1.8	24	4
2.00	●	1.91 - 2.12	49	11	24	2	25	4
2.20	○	2.13 - 2.36	53	12	25	2.2	28	4
2.50	●	2.37 - 2.65	57	14	29	2.5	28	4
2.80	○	2.66 - 2.80	61	15	33	3	28	6
3.00	●	2.81 - 3.00	61	15	33	3	28	6
3.20	○	3.01 - 3.35	65	16	37	3.2	28	6
3.50	●	3.36 - 3.75	70	18	42	3.5	28	6

- Ex stock, subject to being unsold
- Delivery on short notice

For special tolerances and intermediate diameters in the above mentioned Ø-ranges also delivery on short notice.

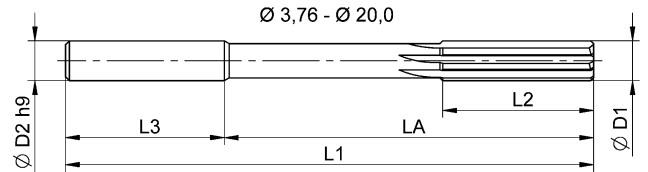
Please note: Modifications of DIN standard can temporarily lead to deviations of shank measures.

Machine reamers


030510

right-hand cutting, straight flutes

DIN 212-2	Type A	HSS-E	H7
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	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group	 vc / f
	★	★		★	★		★	★				p. 187

Ø D1 mm		Ø-range mm	L1 mm	L2 mm	LA mm	Ø D2 mm	L3 mm	
4.00	•	3.76 - 4.25	75	19	47	4	28	6
4.50	•	4.26 - 4.75	80	21	52	4.5	28	6
5.00	•	4.76 - 5.30	86	23	58	5	28	6
5.50	•	5.31 - 5.60	93	26	57	5.6	36	6
6.00	•	5.61 - 6.00	93	26	57	5.6	36	6
6.50	•	6.01 - 6.70	101	28	65	6.3	36	6
7.00	•	6.71 - 7.20	109	31	73	7.1	36	6
7.50	•	7.21 - 7.50	109	31	73	7.1	36	6
8.00	•	7.51 - 8.20	117	33	81	8	36	6
8.50	•	8.21 - 8.50	117	33	81	8	36	6
9.00	•	8.51 - 9.20	125	36	85	9	40	6
9.50	•	9.21 - 9.50	125	36	85	9	40	6
10.00	•	9.51 - 10.20	133	38	93	10	40	6
10.50	•	10.21 - 10.60	133	38	93	10	40	6
11.00	•	10.61 - 11.20	142	41	102	10	40	6
11.50	•	11.21 - 11.80	142	41	102	10	40	6
12.00	•	11.81 - 12.20	151	44	111	10	40	6
13.00	•	12.21 - 13.20	151	44	111	10	40	6
14.00	•	13.21 - 14.00	160	47	115	12.5	45	8
15.00	•	14.01 - 15.00	162	50	117	12.5	45	8
16.00	•	15.01 - 16.00	170	52	125	12.5	45	8
17.00	•	16.01 - 17.00	175	54	130	14	45	8
18.00	•	17.01 - 18.00	182	56	137	14	45	8
19.00	•	18.01 - 19.00	189	58	141	16	48	8
20.00	•	19.01 - 20.00	195	60	147	16	48	8

- Ex stock, subject to being unsold
- Delivery on short notice

For special tolerances and intermediate diameters in the above mentioned Ø-ranges also delivery on short notice.

Please note: Modifications of DIN standard can temporarily lead to deviations of shank measures.

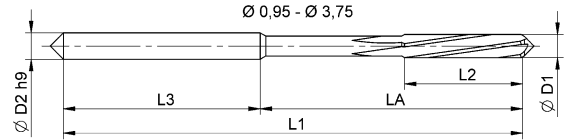
2

Machine reamers

030511


right-hand cutting, spiral flutes

DIN 212-1	Type B	HSS- E	H7
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	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group 3	 vc / f p. 187
	★	★		★	★		★	★				

2

Ø D1 mm		Ø-range mm	L1 mm	L2 mm	LA mm	Ø D2 mm	L3 mm	
1.00	•	0.95 - 1.06	34	5.5	15	1	19	3
1.10	•	1.07 - 1.18	36	6.5	15.5	1.1	20.5	3
1.20	•	1.19 - 1.32	38	7.5	16.5	1.2	21.5	3
1.30	•		38	7.5	16.5	1.2	21.5	3
1.40	•	1.33 - 1.41	40	8	18	1.4	22	3
1.50	•	1.42 - 1.50	40	8	18	1.5	22	3
1.60	•	1.51 - 1.70	43	9	20	1.6	23	3
1.70	•		43	9	20	1.6	23	3
1.80	•	1.71 - 1.90	46	10	22	1.8	24	4
1.90	•		46	10	22	1.8	24	4
2.00	•	1.91 - 2.12	49	11	24	2	25	4
2.10	•		49	11	24	2	25	4
2.20	•	2.13 - 2.36	53	12	25	2.2	28	4
2.30	•		53	12	25	2.2	28	4
2.40	•		57	14	29	2.5	28	4
2.50	•	2.37 - 2.65	57	14	29	2.5	28	4
2.60	•		57	14	29	2.5	28	4
2.70	•		61	15	33	3	28	6
2.80	•	2.66 - 2.80	61	15	33	3	28	6
2.90	•		61	15	33	3	28	6
3.00	•	2.81 - 3.00	61	15	33	3	28	6
3.10	•		65	16	37	3.2	28	6
3.20	•	3.01 - 3.35	65	16	37	3.2	28	6
3.30	•		65	16	37	3.2	28	6
3.40	•		70	18	42	3.5	28	6
3.50	•	3.36 - 3.75	70	18	42	3.5	28	6
3.60	•		70	18	42	3.5	28	6
3.70	•		70	18	42	3.5	28	6

- Ex stock, subject to being unsold
- Delivery on short notice

For special tolerances and intermediate diameters in the above mentioned Ø-ranges also delivery on short notice.

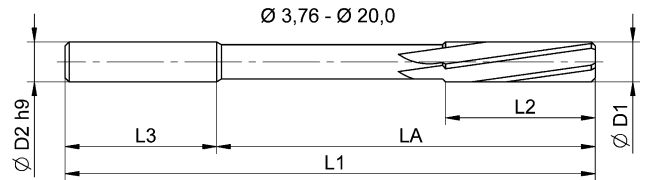
Please note: Modifications of DIN standard can temporarily lead to deviations of shank measures.



Machine reamers


030511

right-hand cutting, spiral flutes

DIN 212-2	Type B	HSS-E	H7
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	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group 3	 vc / f p. 187
	★	★		★	★		★	★				

Ø D1 mm		Ø-range mm	L1 mm	L2 mm	LA mm	Ø D2 mm	L3 mm	
3.80	•		75	19	47	4	28	6
3.90	•		75	19	47	4	28	6
4.00	•	3.76 - 4.25	75	19	47	4	28	6
4.10	•		75	19	47	4	28	6
4.20	•		75	19	47	4	28	6
4.30	•		80	21	52	4.5	28	6
4.40	•		80	21	52	4.5	28	6
4.50	•	4.26 - 4.75	80	21	52	4.5	28	6
4.60	•		80	21	52	4.5	28	6
4.70	•		80	21	52	4.5	28	6
4.80	•		86	23	58	5	28	6
4.90	•		86	23	58	5	28	6
5.00	•	4.76 - 5.30	86	23	58	5	28	6
5.10	•		86	23	58	5	28	6
5.20	•		86	23	58	5	28	6
5.30	•		86	23	58	5	28	6
5.40	•		93	26	57	5.6	36	6
5.50	•	5.31 - 5.60	93	26	57	5.6	36	6
5.60	•		93	26	57	5.6	36	6
5.70	•		93	26	57	5.6	36	6
5.80	•		93	26	57	5.6	36	6
5.90	•		93	26	57	5.6	36	6
6.00	•	5.61 - 6.00	93	26	57	5.6	36	6
6.10	•		101	28	65	6.3	36	6
6.20	•		101	28	65	6.3	36	6
6.30	•		101	28	65	6.3	36	6
6.40	•		101	28	65	6.3	36	6
6.50	•	6.01 - 6.70	101	28	65	6.3	36	6
6.60	•		101	28	65	6.3	36	6
6.70	•		101	28	65	6.3	36	6
6.80	•		109	31	73	7.1	36	6
6.90	•		109	31	73	7.1	36	6
7.00	•	6.71 - 7.20	109	31	73	7.1	36	6
7.10	•		109	31	73	7.1	36	6
7.20	•		109	31	73	7.1	36	6
7.30	•		109	31	73	7.1	36	6
7.40	•		109	31	73	7.1	36	6
7.50	•	7.21 - 7.50	109	31	73	7.1	36	6
7.60	•		117	33	81	8	36	6
7.70	•		117	33	81	8	36	6
7.80	•		117	33	81	8	36	6
7.90	•		117	33	81	8	36	6

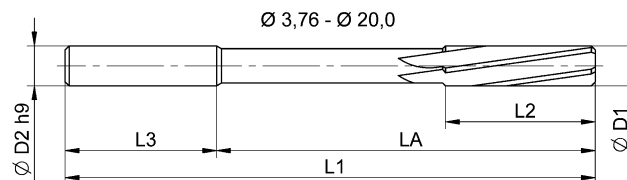
2



Machine reamers

030511


right-hand cutting, spiral flutes

DIN 212-2	Type B	HSS-E	H7
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	Steel <900 N ★	Steel 900-1400N ★	VA Stainless steel	GG ★	GGG ★	GGG >GGG50	Cu/Zn/Mg ★	Alu ★	Ti	HRC < 63 HRC	Group 3	 vc / f p. 187
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2

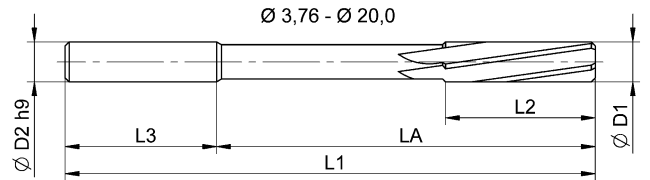
Ø D1 mm		Ø-range mm	L1 mm	L2 mm	LA mm	Ø D2 mm	L3 mm	
8.00	•	7.51 - 8.20	117	33	81	8	36	6
8.10	•		117	33	81	8	36	6
8.20	•		117	33	81	8	36	6
8.30	•		117	33	81	8	36	6
8.40	•		117	33	81	8	36	6
8.50	•	8.21 - 8.50	117	33	81	8	36	6
8.60	•		125	36	85	9	40	6
8.70	•		125	36	85	9	40	6
8.80	•		125	36	85	9	40	6
8.90	•		125	36	85	9	40	6
9.00	•	8.51 - 9.20	125	36	85	9	40	6
9.10	•		125	36	85	9	40	6
9.20	•		125	36	85	9	40	6
9.30	•		125	36	85	9	40	6
9.40	•		125	36	85	9	40	6
9.50	•	9.21 - 9.50	125	36	85	9	40	6
9.60	•		133	38	93	10	40	6
9.70	•		133	38	93	10	40	6
9.80	•		133	38	93	10	40	6
9.90	•		133	38	93	10	40	6
10.00	•	9.51 - 10.20	133	38	93	10	40	6
10.10	•		133	38	93	10	40	6
10.20	•		133	38	93	10	40	6
10.30	•		133	38	93	10	40	6
10.40	•		133	38	93	10	40	6
10.50	•	10.21 - 10.60	133	38	93	10	40	6
10.60	•		133	38	93	10	40	6
10.70	•		142	41	102	10	40	6
10.80	•		142	41	102	10	40	6
10.90	•		142	41	102	10	40	6
11.00	•	10.61 - 11.20	142	41	102	10	40	6
11.10	•		142	41	102	10	40	6
11.20	•		142	41	102	10	40	6
11.30	•		142	41	102	10	40	6
11.40	•		142	41	102	10	40	6
11.50	•	11.21 - 11.80	142	41	102	10	40	6
11.60	•		142	41	102	10	40	6
11.70	•		142	41	102	10	40	6
11.80	•		142	41	102	10	40	6
11.90	•		151	44	111	10	40	6
12.00	•	11.81 - 12.20	151	44	111	10	40	6
13.00	•	12.21 - 13.20	151	44	111	10	40	6




Machine reamers


030511

right-hand cutting, spiral flutes

DIN 212-2	Type B	HSS-E	H7
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	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group	 vc / f
	★	★		★	★		★	★				p. 187

Ø D1 mm		Ø-range mm	L1 mm	L2 mm	LA mm	Ø D2 mm	L3 mm	
14.00	●	13.21 - 14.00	160	47	115	12.5	45	8
15.00	●	14.01 - 15.00	162	50	117	12.5	45	8
16.00	●	15.01 - 16.00	170	52	125	12.5	45	8
17.00	●	16.01 - 17.00	175	54	130	14	45	8
18.00	●	17.01 - 18.00	182	56	137	14	45	8
19.00	●	18.01 - 19.00	189	58	141	16	48	8
20.00	●	19.01 - 20.00	195	60	147	16	48	8

- Ex stock, subject to being unsold
- Delivery on short notice

For special tolerances and intermediate diameters in the above mentioned Ø-ranges also delivery on short notice.

Please note: Modifications of DIN standard can temporarily lead to deviations of shank measures.

2

Machine reamers increasing by 0,01 mm

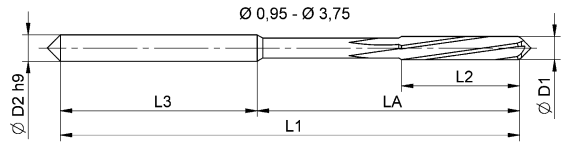
030513



right-hand cutting, spiral flutes


DIN
212-1

Type
B

HSS-
E



	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group 3	 vc / f p. 187
	★	★		★	★		★	★				

	Tol.	Ø-range mm	L1 mm	L2 mm	LA mm	Ø D2 mm	L3 mm	
•	+0,004	0.95 - 1.06	34	5.5	15	1	19	3
•	+0,004	1.07 - 1.18	36	6.5	15.5	1.1	20.5	3
•	+0,004	1.19 - 1.32	38	7.5	16.5	1.2	21.5	3
•	+0,004	1.33 - 1.41	40	8	18	1.4	22	3
•	+0,004	1.42 - 1.50	40	8	18	1.5	22	3
•	+0,004	1.51 - 1.70	43	9	20	1.6	23	3
•	+0,004	1.71 - 1.90	46	10	22	1.8	24	4
•	+0,004	1.91 - 2.12	49	11	24	2	25	4
•	+0,004	2.13 - 2.36	53	12	25	2.2	28	4
•	+0,004	2.37 - 2.65	57	14	29	2.5	28	4
•	+0,004	2.66 - 2.80	61	15	33	3	28	6
•	+0,004	2.81 - 3.00	61	15	33	3	28	6
•	+0,004	3.01 - 3.35	65	16	37	3.2	28	6
•	+0,004	3.36 - 3.75	70	18	42	3.5	28	6

- Ex stock, subject to being unsold
- Delivery on short notice

Within the mentioned Ø-ranges all tools increasing by 0,01 mm are in stock.

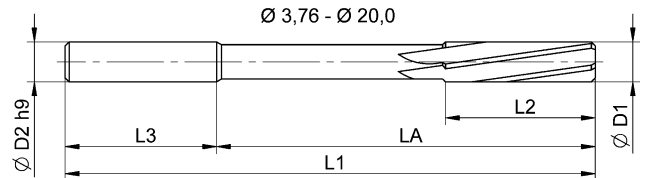
Please note: Modifications of DIN standard can temporarily lead to deviations of shank measures.



Machine reamers increasing by 0,01 mm


030513

right-hand cutting, spiral flutes

DIN 212-2	Type B	HSS- E
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	Steel <900 N ★	Steel 900-1400N ★	VA Stainless steel	GG ★	GGG ★	GGG >GGG50	Cu/Zn/Mg ★	Alu ★	Ti	HRC < 63 HRC	Group 3	 vc / f p. 187
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	Tol.	Ø-range mm	L1 mm	L2 mm	LA mm	Ø D2 mm	L3 mm	
•	+0,004	3.76 - 4.25	75	19	47	4	28	6
•	+0,004	4.26 - 4.75	80	21	52	4.5	28	6
•	+0,004	4.76 - 5.30	86	23	58	5	28	6
•	+0,004	5.31 - 5.50	93	26	57	5.6	36	6
•	+0,005	5.51 - 5.60	93	26	57	5.6	36	6
•	+0,005	5.61 - 6.00	93	26	57	5.6	36	6
•	+0,005	6.01 - 6.70	101	28	65	6.3	36	6
•	+0,005	6.71 - 7.20	109	31	73	7.1	36	6
•	+0,005	7.21 - 7.50	109	31	73	7.1	36	6
•	+0,005	7.51 - 8.20	117	33	81	8	36	6
•	+0,005	8.21 - 8.50	117	33	81	8	36	6
•	+0,005	8.51 - 9.20	125	36	85	9	40	6
•	+0,005	9.21 - 9.50	125	36	85	9	40	6
•	+0,005	9.51 - 10.20	133	38	93	10	40	6
•	+0,005	10.21 - 10.60	133	38	93	10	40	6
•	+0,005	10.61 - 11.20	142	41	102	10	40	6
•	+0,005	11.21 - 11.80	142	41	102	10	40	6
•	+0,005	11.81 - 12.05	151	44	111	10	40	6

- Ex stock, subject to being unsold
- Delivery on short notice

Within the mentioned Ø-ranges all tools increasing by 0,01 mm are in stock.

Please note: Modifications of DIN standard can temporarily lead to deviations of shank measures.

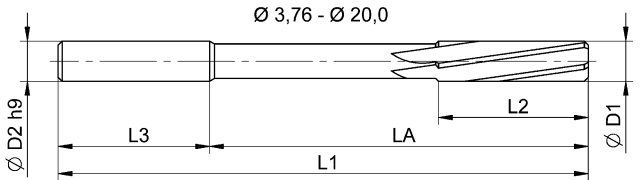
2



Machine reamers

033511


right-hand cutting, spiral flutes

DIN 212-2	Type B	HSS- E	TiN	H7
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	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group 3	 vc / f p. 187
	★	★		★	★	★	★					

2

Ø D1 mm		L1 mm	L2 mm	LA mm	Ø D2 mm	L3 mm	
4.00	•	75	19	47	4	28	6
5.00	•	86	23	58	5	28	6
6.00	•	93	26	57	5.6	36	6
7.00	•	109	31	73	7.1	36	6
8.00	•	117	33	81	8	36	6
9.00	•	125	36	85	9	40	6
10.00	•	133	38	93	10	40	6
11.00	•	142	41	102	10	40	6
12.00	•	151	44	111	10	40	6
13.00	•	151	44	111	10	40	6
14.00	•	160	47	115	12.5	45	8
15.00	•	162	50	117	12.5	45	8
16.00	•	170	52	125	12.5	45	8
17.00	•	175	54	130	14	45	8
18.00	•	182	56	137	14	45	8
19.00	•	189	58	141	16	48	8
20.00	•	195	60	147	16	48	8

- Ex stock, subject to being unsold
- Delivery on short notice

Intermediate diameters and tolerances other than H7 on request.

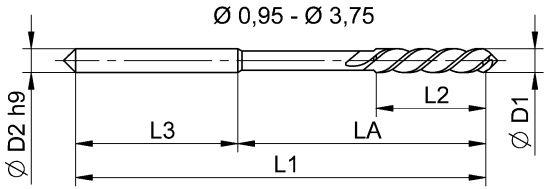
Please note: Modifications of DIN standard can temporarily lead to deviations of shank measures.


Helical machine reamers


030610

right-hand cutting, spiral flutes

DIN 212-1 sim.	Type C 45° left	HSS- E	H7
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	Steel <900 N ★	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu ★	Ti	HRC < 63 HRC	Group 3	 vc / f p. 187
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Ø D1 mm		Ø-range mm	L1 mm	L2 mm	LA mm	Ø D2 mm	L3 mm	
1.00	●	0.95 - 1.06	34	5.5	15	1	19	2
1.10	○	1.07 - 1.18	36	6.5	15.5	1.1	20.5	2
1.20	●	1.19 - 1.32	38	7.5	16.5	1.2	21.5	2
1.40	●	1.33 - 1.41	40	8	18	1.4	22	2
1.50	●	1.42 - 1.50	40	8	18	1.5	22	2
1.60	●	1.51 - 1.70	43	9	20	1.6	23	2
1.80	●	1.71 - 1.90	46	10	22	1.8	24	2
2.00	●	1.91 - 2.12	49	11	24	2	25	3
2.20	●	2.13 - 2.36	53	12	25	2.2	28	3
2.50	●	2.37 - 2.65	57	14	29	2.5	28	3
2.80	●	2.66 - 2.80	61	15	33	3	28	3
3.00	●	2.81 - 3.00	61	15	33	3	28	3
3.20	●	3.01 - 3.35	65	16	37	3.2	28	3
3.50	●	3.36 - 3.75	70	18	42	3.5	28	3

- Ex stock, subject to being unsold
- Delivery on short notice

For special tolerances and intermediate diameters in the above mentioned Ø-ranges also delivery on short notice.

Please note: Modifications of DIN standard can temporarily lead to deviations of shank measures.

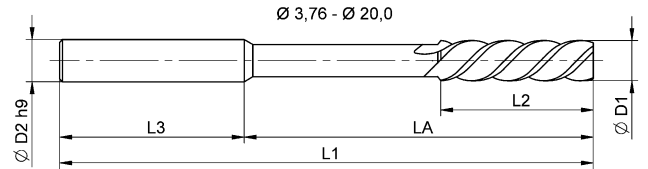
2



Helical machine reamers

030610


right-hand cutting, spiral flutes

DIN 212-2	Type C 45° left	HSS- E	H7
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	Steel <900 N ★	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu ★	Ti	HRC < 63 HRC	Group 3	 vc / f p. 187
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2

Ø D1 mm		Ø-range mm	L1 mm	L2 mm	LA mm	Ø D2 mm	L3 mm	
4.00	●	3.76 - 4.25	75	19	47	4	28	3
4.50	●	4.26 - 4.75	80	21	52	4.5	28	3
5.00	●	4.76 - 5.30	86	23	58	5	28	3
5.50	●	5.31 - 5.60	93	26	57	5.6	36	3
6.00	●	5.61 - 6.00	93	26	57	5.6	36	3
6.50	●	6.01 - 6.70	101	28	65	6.3	36	3
7.00	●	6.71 - 7.20	109	31	73	7.1	36	3
7.50	●	7.21 - 7.50	109	31	73	7.1	36	3
8.00	●	7.51 - 8.20	117	33	81	8	36	3
8.50	●	8.21 - 8.50	117	33	81	8	36	3
9.00	●	8.51 - 9.20	125	36	85	9	40	3
9.50	●	9.21 - 9.50	125	36	85	9	40	3
10.00	●	9.51 - 10.20	133	38	93	10	40	3
10.50	○	10.21 - 10.60	133	38	93	10	40	3
11.00	●	10.61 - 11.20	142	41	102	10	40	3
11.50	○	11.21 - 11.80	142	41	102	10	40	3
12.00	●	11.81 - 12.20	151	44	111	10	40	3
13.00	●	12.21 - 13.20	151	44	111	10	40	3
14.00	●	13.21 - 14.00	160	47	115	12.5	45	3
15.00	●	14.01 - 15.00	162	50	117	12.5	45	3
16.00	●	15.01 - 16.00	170	52	125	12.5	45	3
17.00	●	16.01 - 17.00	175	54	130	14	45	3
18.00	●	17.01 - 18.00	182	56	137	14	45	3
19.00	●	18.01 - 19.00	189	58	141	16	48	3
20.00	●	19.01 - 20.00	195	60	147	16	48	3

- Ex stock, subject to being unsold
- Delivery on short notice

For special tolerances and intermediate diameters in the above mentioned Ø-ranges also delivery on short notice.

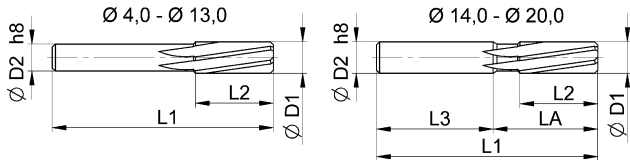
Please note: Modifications of DIN standard can temporarily lead to deviations of shank measures.



Reamers for automatic lathes


030716

right-hand cutting, spiral flutes, short version

DIN 8089	Type B	HSS-E	H7
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	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group 3	 vc / f p. 187
	★	★		★	★		★	★				

Ø D1 mm		Ø-range mm	L1 mm	L2 mm	LA mm	Ø D2 mm	L3 mm	
4.00	○	3.75 - 4.20	56	20		3.55		6
4.20	○	4.21 - 4.25	56	20		3.55		6
4.50	○	4.26 - 4.70	63	22		4		6
5.00	○	4.71 - 5.20	63	22		4		6
5.20	○	5.21 - 5.30	63	22		4		6
5.50	○	5.31 - 5.70	63	22		5		6
6.00	○	5.71 - 6.20	63	22		5		6
6.50	○	6.21 - 6.70	63	22		5		6
7.00	○	6.71 - 7.20	71	25		6.3		6
7.50	○	7.21 - 7.70	71	25		6.3		6
8.00	○	7.71 - 8.20	71	25		6.3		6
8.50	○	8.21 - 8.70	71	25		6.3		6
9.00	○	8.71 - 9.20	71	25		8		6
9.50	○	9.21 - 9.70	71	25		8		6
10.00	○	9.71 - 10.20	71	25		8		6
10.50	○	10.20 - 10.60	71	25		8		6
11.00	○	10.61 - 11.20	80	28		10		6
11.50	○	11.21 - 11.70	80	28		10		6
12.00	○	11.71 - 12.20	80	28		10		6
13.00	○	12.21 - 13.20	80	28		10		6
14.00	○	13.21 - 14.20	90	32	38	12.5	52	8
15.00	○	14.21 - 15.20	90	32	38	12.5	52	8
16.00	○	15.21 - 16.20	90	32	38	12.5	52	8
17.00	○	16.21 - 17.20	90	32	38	12.5	52	8
18.00	○	17.21 - 18.20	100	36	43	16	57	8
19.00	○	18.21 - 19.20	100	36	43	16	57	8
20.00	○	19.21 - 20.20	100	36	43	16	57	8

- Ex stock, subject to being unsold
- Delivery on short notice

For special tolerances and intermediate diameters in the above mentioned Ø-ranges also delivery on short notice.

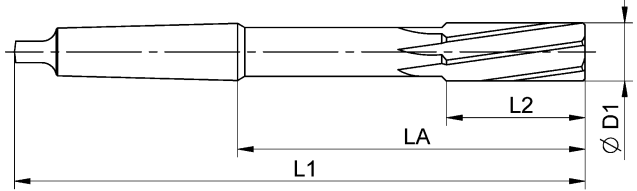
2

Machine reamers




030111


right-hand cutting, spiral flutes


DIN 208	Type B	HSS-E	H7
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2

	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group	 vc / f
	★	★		★	★		★	★				p. 187

Ø D1 mm		Ø-range mm	L1 mm	L2 mm	LA mm	MT	
3.00	●	2.81 - 3.00	113	15	47.5	1	6
3.20	○	3.01 - 3.35	117	16	51.5	1	6
3.50	○	3.36 - 3.75	120	18	54.5	1	6
4.00	●	3.76 - 4.25	124	19	58.5	1	6
4.50	○	4.26 - 4.75	128	21	62.5	1	6
5.00	●	4.76 - 5.30	133	23	67.5	1	6
6.00	●	5.31 - 6.05	138	26	72.5	1	6
6.50	○	6.06 - 6.70	144	28	78.5	1	6
7.00	●	6.71 - 7.50	150	31	84.5	1	6
8.00	●	7.51 - 8.50	156	33	90.5	1	6
9.00	●	8.51 - 9.50	162	36	96.5	1	6
10.00	●	9.51 - 10.60	168	38	102.5	1	6
11.00	●	10.61 - 11.80	175	41	109.5	1	6
12.00	●	11.81 - 12.20	182	44	116.5	1	6
13.00	●	12.21 - 13.20	182	44	116.5	1	6
14.00	●	13.21 - 14.10	189	47	123.5	1	8
15.00	●	14.11 - 15.10	204	50	124	2	8
16.00	●	15.11 - 16.10	210	52	130	2	8
17.00	●	16.11 - 17.10	214	54	134	2	8
18.00	●	17.11 - 18.10	219	56	139	2	8
19.00	●	18.11 - 19.10	223	58	143	2	8
20.00	●	19.11 - 20.10	228	60	148	2	8
21.00	●	20.11 - 21.20	232	62	152	2	8
22.00	●	21.21 - 22.40	237	64	157	2	8

Ø D1 mm		Ø-range mm	L1 mm	L2 mm	LA mm	MT	
23.00	●	22.41 - 23.60	241	66	161	2	8
24.00	●	23.61 - 25.10	268	68	169	3	8
25.00	●		268	68	169	3	8
26.00	●	25.11 - 26.50	273	70	174	3	8
27.00	●		277	71	178	3	10
28.00	●	26.51 - 28.10	277	71	178	3	10
29.00	●		281	73	182	3	10
30.00	●	28.11 - 30.10	281	73	182	3	10
31.00	●	30.11 - 31.50	285	75	186	3	10
32.00	●	31.51 - 33.50	317	77	193	4	10
33.00	●		317	77	193	4	10
34.00	●	33.51 - 35.50	321	78	197	4	10
35.00	●		321	78	197	4	10
36.00	●	35.51 - 37.50	325	79	201	4	10
37.00	●		325	79	201	4	10
38.00	●	37.51 - 40.10	329	81	205	4	10
40.00	●		329	81	205	4	10
42.00	●	40.11 - 42.50	333	82	209	4	12
44.00	●	42.51 - 45.10	336	83	212	4	12
45.00	●		336	83	212	4	12
46.00	●	45.11 - 47.50	340	84	216	4	12
47.00	●		340	84	216	4	12
48.00	●	47.51 - 50.10	344	86	220	4	12
50.00	●		344	86	220	4	12

- Ex stock, subject to being unsold
- Delivery on short notice

The following executions are also available on short notice: intermediate diameters, special tolerances as well as machine reamers DIN 208 Type A (straight flutes) within the above mentioned diameter ranges.

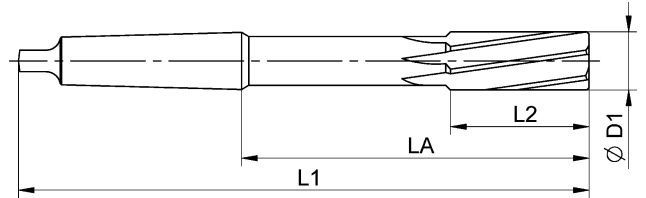
Subject of technical alterations.



Machine reamers


033111

right-hand cutting, spiral flutes

DIN 208	Type B	HSS-E	TiN	H7
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	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group 3	 vc / f p. 187
	★	★		★	★	★	★					

Ø D1 mm		L1 mm	L2 mm	LA mm	MT	
10.00	○	168	38	102.5	1	6
11.00	○	175	41	109.5	1	6
12.00	○	182	44	116.5	1	6
13.00	○	182	44	116.5	1	6
14.00	○	189	47	123.5	1	8
15.00	○	204	50	124	2	8
16.00	○	210	52	130	2	8
17.00	○	214	54	134	2	8
18.00	○	219	56	139	2	8
19.00	○	223	58	143	2	8
20.00	○	228	60	148	2	8

- Ex stock, subject to being unsold
- Delivery on short notice

Intermediate diameters and tolerances other than H7 on request.

Subject to technical alterations.

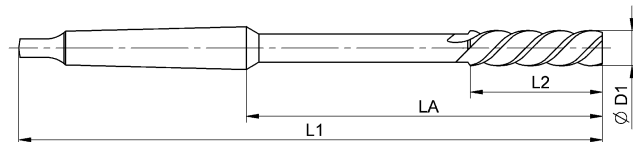
2



Helical machine reamers

030310


right-hand cutting, spiral flutes

DIN 208	Type C 45° left	HSS-E	H7
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	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group 3	 vc / f p. 187
	★							★				

2

Ø D1 mm		Ø-range mm	L1 mm	L2 mm	LA mm	MT	
5.00	●	4.75 - 5.20	133	23	67.5	1	3
5.20	○	5.21 - 5.30	133	23	67.5	1	3
5.50	○	5.31 - 5.70	138	26	72.5	1	3
6.00	●	5.71 - 6.11	138	26	72.5	1	3
6.50	○	6.12 - 6.70	144	28	78.5	1	3
7.00	●	6.71 - 7.20	150	31	84.5	1	3
7.50	○	7.21 - 7.63	150	31	84.5	1	3
8.00	●	7.64 - 8.20	156	33	90.5	1	3
8.50	○	8.21 - 8.63	156	33	90.5	1	3
9.00	●	8.64 - 9.20	162	36	96.5	1	3
9.50	○	9.21 - 9.63	162	36	96.5	1	3
10.00	●	9.64 - 10.20	168	38	102.5	1	3
11.00	●	10.21 - 11.20	175	41	109.5	1	3
12.00	●	11.21 - 12.20	182	44	116.5	1	3
13.00	●	12.21 - 13.20	182	44	116.5	1	3
14.00	●	13.21 - 14.14	189	47	123.5	1	3
15.00	●	14.15 - 15.14	204	50	124	2	3
16.00	●	15.15 - 16.14	210	52	130	2	3
17.00	●	16.15 - 17.14	214	54	134	2	3
18.00	●	17.15 - 18.14	219	56	139	2	3
19.00	●	18.15 - 19.16	223	58	143	2	3
20.00	●	19.17 - 20.16	228	60	148	2	3
21.00	●	20.17 - 21.20	232	62	152	2	3
22.00	●	21.21 - 22.20	237	64	157	2	3
23.00	●	22.21 - 23.20	241	66	161	2	3
24.00	●	23.21 - 24.20	268	68	169	3	3
25.00	●	24.21 - 25.16	268	68	169	3	3
26.00	●	25.17 - 26.20	273	70	174	3	3
27.00	●	26.21 - 27.20	277	71	178	3	3
28.00	●	27.21 - 28.16	277	71	178	3	3
29.00	●	28.17 - 29.20	281	73	182	3	3
30.00	●	29.21 - 30.16	281	73	182	3	3
31.00	●	30.17 - 31.20	285	75	186	3	3
32.00	●	31.21 - 32.20	317	77	193	4	3

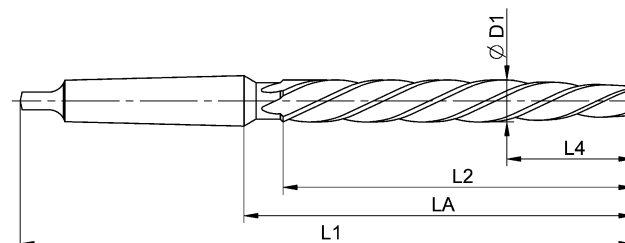
- Ex stock, subject to being unsold
- Delivery on short notice



For intermediate diameters and special tolerances also delivery on short notice.


Bridge reamers

030010

right-hand cutting, spiral flutes, with 1:10 starting taper (L4)



	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group 3	 vc / f p. 187
	★	★		★	★		★	★				

Ø D1 mm		L1 mm	L2 mm	L4 mm	LA mm	MT	
6.40	●	151	75	19	85.5	1	3
7.40	●	156	80	22	90.5	1	3
8.40	●	161	85	25	95.5	1	3
9.50	●	166	90	27	100.5	1	4
10.00	●	171	95	30	105.5	1	4
11.00	●	176	100	33	110.5	1	4
12.00	●	199	105	39	119	2	4
13.00	●	199	105	39	119	2	4
14.00	●	209	115	42	129	2	4
15.00	●	219	125	45	139	2	4
16.00	●	229	135	48	149	2	4
17.00	●	251	135	51	152	3	4
18.00	●	261	145	58	162	3	4
19.00	●	261	145	58	162	3	4
20.00	●	271	155	62	172	3	4
21.00	●	271	155	62	172	3	4
22.00	●	281	165	66	182	3	4
23.00	●	281	165	66	182	3	4
24.00	●	296	180	72	197	3	4
25.00	●	296	180	72	197	3	4
26.00	●	296	180	72	197	3	4
27.00	●	311	195	78	212	3	4
28.00	●	311	195	78	212	3	4
30.00	●	311	195	78	212	3	5
31.00	●	326	210	84	227	3	5
32.00	●	354	210	84	230	4	5
33.00	●	354	210	84	230	4	5
34.00	●	364	220	88	240	4	5
37.00	●	364	220	88	240	4	5
40.00	●	374	230	92	250	4	5

- Ex stock, subject to being unsold
- Delivery on short notice

Intermediate diameters and special tolerances on request.

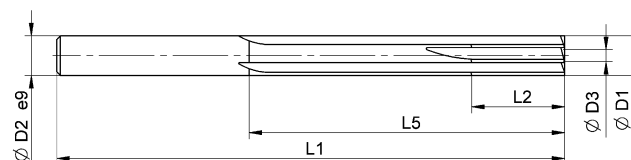
2



Machine end face reamers

030810


right-hand cutting, straight flutes, front-cutting

BECK Standard	Type A	HSS- E	H7
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	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group 3	 vc / f p. 187
	★	★		★	★		★	★				

2

Ø D1 mm		Ø-range mm	L1 mm	L2 mm	L5 mm	Ø D3 mm	Ø D2 mm	
2.50	●	2.20 - 2.69	57	12	33		2.5	4
3.00	●	2.70 - 3.10	61	12	33	1.5	3	6
3.50	●	3.11 - 3.65	70	12	39	1.5	3.5	6
4.00	●	3.66 - 4.20	75	16	44	1.7	4	6
4.50	●	4.21 - 4.70	80	16	48	1.7	4.5	6
5.00	●	4.71 - 5.20	86	20	53	1.7	5	6
5.50	○	5.21 - 5.70	93	20	59	2	5.5	6
6.00	●	5.71 - 6.11	93	20	59	2	6	6
6.50	○	6.12 - 6.70	101	20	65	2	6.5	6
7.00	●	6.71 - 7.20	109	22	69	2.5	7	6
7.50	○	7.21 - 7.63	109	22	69	2.5	7.5	6
8.00	●	7.64 - 8.20	117	24	71	3	8	6
8.50	○	8.21 - 8.63	117	24	71	3	8.5	6
9.00	●	8.64 - 9.20	125	24	77	3.5	9	6
9.50	○	9.21 - 9.63	125	24	77	3.5	9.5	6
10.00	●	9.64 - 10.20	133	26	84	4.5	10	6
11.00	●	10.21 - 11.20	142	26	89	4.5	11	6
12.00	●	11.21 - 12.22	151	26	96.5	4.5	12	6

- Ex stock, subject to being unsold
- Delivery on short notice

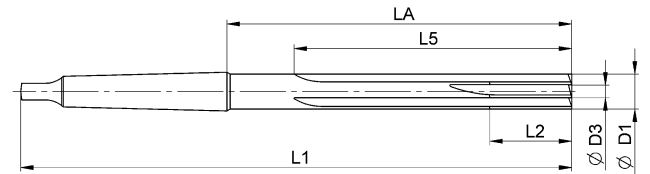
For intermediate diameters and special tolerances also delivery on short notice.



Machine end face reamers


030811


right-hand cutting, straight flutes, front-cutting

BECK Standard	Type A	HSS- E	H7
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	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group 3	 vc / f p. 187
	★	★		★	★		★	★				

Ø D1 mm		Ø-range mm	L1 mm	L2 mm	L5 mm	LA mm	Ø D3 mm	MT	
3.00	●	2.69 - 3.10	114	12	33	48.5	1.5	1	6
3.50	●	3.11 - 3.65	120	12	39	54.5	1.5	1	6
4.00	●	3.66 - 4.20	124	16	44	58.5	1.7	1	6
4.50	●	4.21 - 4.70	128	16	48	62.5	1.7	1	6
5.00	○	4.71 - 5.20	133	20	53	67.5	1.7	1	6
5.50	○	5.21 - 5.70	138	20	59	72.5	2	1	6
6.00	●	5.71 - 6.11	138	20	59	72.5	2	1	6
6.50	○	6.12 - 6.70	144	20	65	78.5	2	1	6
7.00	●	6.71 - 7.20	150	22	69	84.5	2.5	1	6
7.50	○	7.21 - 7.63	150	22	69	84.5	2.5	1	6
8.00	●	7.64 - 8.20	156	24	71	90.5	3	1	6
8.50	○	8.21 - 8.63	156	24	71	90.5	3	1	6
9.00	●	8.64 - 9.20	162	24	77	96.5	3.5	1	6
9.50	○	9.21 - 9.63	162	24	77	96.5	3.5	1	6
10.00	●	9.64 - 10.20	168	26	84	102.5	4.5	1	6
10.50	○	10.21 - 10.69	168	26	84	102.5	4.5	1	6
11.00	●	10.70 - 11.20	175	26	89.5	109.5	4.5	1	6
11.50	○	11.21 - 11.80	175	26	89.5	109.5	4.5	1	6
12.00	●	11.81 - 12.20	182	26	96.5	116.5	4.5	1	6

Ø D1 mm		Ø-range mm	L1 mm	L2 mm	L5 mm	LA mm	Ø D3 mm	MT	
13.00	●	12.21 - 13.20	182	26	96.5	116.5	4.5	1	6
14.00	●	13.21 - 14.14	189	28	103.5	123.5	5	1	8
15.00	●	14.15 - 15.14	204	28	104	124	5	2	8
16.00	●	15.15 - 16.14	210	30	108	130	6	2	8
17.00	●	16.15 - 17.14	214	30	112	134	6	2	8
18.00	●	17.15 - 18.14	219	30	117	139	6	2	8
19.00	●	18.15 - 19.16	223	32	119	143	8	2	8
20.00	●	19.17 - 20.16	228	32	124	148	8	2	8
21.00	●	20.17 - 21.20	232	32	128	152	8	2	8
22.00	●	21.21 - 22.20	237	34	133	157	10	2	8
24.00	●	22.21 - 24.20	268	34	139	169	10	3	8
25.00	●	24.21 - 25.16	268	36	139	169	12	3	8
26.00	●	25.17 - 26.20	273	36	144	174	12	3	8
27.00	○	26.21 - 27.20	277	38	148	178	14	3	10
28.00	●	27.21 - 28.16	277	38	148	178	14	3	10
29.00	○	28.17 - 29.20	281	42	150	182	14	3	10
30.00	●	29.21 - 30.16	281	42	150	182	16	3	10
31.00	●	30.17 - 31.20	285	44	154	186	16	3	10
32.00	●	30.21 - 32.20	317	44	157	193	16	4	10

- Ex stock, subject to being unsold
- Delivery on short notice

For intermediate diameters and special tolerances also delivery on short notice.

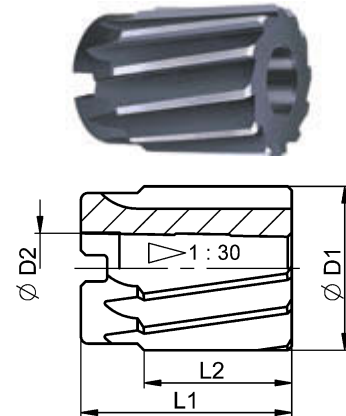
2

Shell reamers



031211


right-hand cutting, spiral flutes, locating bore with 1:30 taper and driving slot to DIN 138, for shell reamer holders to DIN 217 (please see page 126)

DIN 219	Type B	HSS-E	H7
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2

	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group 3	 vc / f p. 187
	★	★		★	★		★	★				

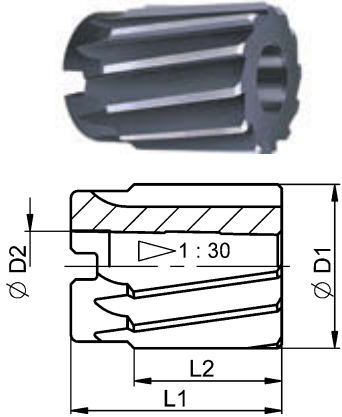
Ø D1 mm		Ø-range mm	L1 mm	L2 mm	Ø D2 mm	
25.00	●	24.20 - 25.20	45	32	13	8
26.00	●	25.21 - 26.20	45	32	13	8
27.00	●	26.21 - 27.20	45	32	13	8
28.00	●	27.21 - 28.20	45	32	13	8
29.00	●	28.21 - 29.20	45	32	13	8
30.00	●	29.21 - 30.16	45	32	13	8
31.00	●	30.17 - 31.20	50	36	16	10
32.00	●	31.21 - 32.20	50	36	16	10
33.00	●	32.21 - 33.20	50	36	16	10
34.00	●	33.21 - 34.20	50	36	16	10
35.00	●	34.21 - 35.20	50	36	16	10
36.00	●	35.21 - 36.20	56	40	19	10
37.00	●	36.21 - 37.20	56	40	19	10
38.00	●	37.21 - 38.20	56	40	19	10
39.00	○	38.21 - 39.20	56	40	19	10
40.00	●	39.21 - 40.20	56	40	19	10
41.00	○	40.21 - 41.20	56	40	19	10
42.00	●	41.21 - 42.20	56	40	19	10
44.00	●	43.21 - 44.20	63	45	22	12
45.00	●	44.21 - 45.20	63	45	22	12
46.00	●	45.21 - 46.20	63	45	22	12
47.00	●	46.21 - 47.20	63	45	22	12
48.00	●	47.21 - 48.20	63	45	22	12
49.00	○	48.21 - 49.20	63	45	22	12
50.00	●	49.21 - 50.20	63	45	22	12
51.00	○	50.21 - 51.20	71	50	27	12
52.00	●	51.21 - 52.20	71	50	27	12
53.00	○	52.21 - 53.20	71	50	27	12
54.00	○	53.21 - 54.20	71	50	27	12
55.00	●	54.21 - 55.20	71	50	27	12
57.00	○	56.21 - 57.20	71	50	27	12
58.00	●	57.21 - 58.20	71	50	27	12
59.00	○	58.21 - 59.20	71	50	27	12
60.00	●	59.21 - 60.20	71	50	27	12
61.00	○	60.21 - 61.20	80	56	32	14
62.00	●	61.21 - 62.20	80	56	32	14
63.00	○	62.21 - 63.20	80	56	32	14
64.00	○	63.21 - 64.20	80	56	32	14



Shell reamers


031211

right-hand cutting, spiral flutes, locating bore with 1:30 taper and driving slot to DIN 138, for shell reamer holders to DIN 217 (please see page 126)

DIN 219	Type B	HSS-E	H7
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	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group 3	 vc / f p. 187
	★	★		★	★		★	★				

Ø D1 mm		Ø-range mm	L1 mm	L2 mm	Ø D2 mm	
65.00	●	64.21 - 65.20	80	56	32	14
66.00	○	65.21 - 66.20	80	56	32	14
67.00	○	66.21 - 67.20	80	56	32	14
68.00	●	67.21 - 68.20	80	56	32	14
69.00	○	68.21 - 69.20	80	56	32	14
70.00	●	69.21 - 70.20	80	56	32	14
71.00	○	70.21 - 71.20	80	56	32	14
72.00	●	71.21 - 72.20	90	63	40	14
73.00	○	72.21 - 73.20	90	63	40	14
74.00	○	73.21 - 74.20	90	63	40	14
75.00	●	74.21 - 75.20	90	63	40	14
76.00	○	75.21 - 76.20	90	63	40	14
78.00	●	76.21 - 78.20	90	63	40	14
80.00	●	78.21 - 80.20	90	63	40	14
82.00	●	80.21 - 82.20	90	63	40	14
83.00	○	82.21 - 83.20	90	63	40	14
84.00	○	83.21 - 84.20	90	63	40	14
85.00	●	84.21 - 85.20	90	63	40	14
86.00	○	85.21 - 86.20	100	71	50	16
87.00	○	86.21 - 87.20	100	71	50	16
88.00	●	87.21 - 88.20	100	71	50	16
90.00	●	88.21 - 90.20	100	71	50	16
92.00	●	90.21 - 92.20	100	71	50	16
95.00	●	92.21 - 95.20	100	71	50	16
96.00	○	95.21 - 96.20	100	71	50	16
98.00	●	96.21 - 98.20	100	71	50	16
100.00	●	98.21 - 100.20	100	71	50	16

- Ex stock, subject to being unsold
- Delivery on short notice

Intermediate diameters and special tolerances on request.

D2 = Nom. dia. D1 of the suitable holder

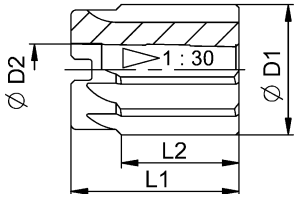
2

Shell reamers (*)



031210


right-hand cutting, straight flutes, locating bore with 1:30 taper and driving slot to DIN 138, for shell reamer holders to DIN 217 (please see page 126)


DIN 219	Type A	HSS-E	H7
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2

	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group 3	 vc / f p. 187
	★	★		★	★		★	★				

Ø D1 mm	L1 mm	L2 mm	Ø D2 mm	
25.00	45	32	13	8
26.00	45	32	13	8
27.00	45	32	13	8
28.00	45	32	13	8
29.00	45	32	13	8
30.00	45	32	13	8
31.00	50	36	16	10
32.00	50	36	16	10
33.00	50	36	16	10
34.00	50	36	16	10
35.00	50	36	16	10
36.00	56	40	19	10
37.00	56	40	19	10
38.00	56	40	19	10
41.00	56	40	19	10
42.00	56	40	19	10
43.00	63	45	22	12
47.00	63	45	22	12
48.00	63	45	22	12
49.00	63	45	22	12
52.00	71	50	27	12
53.00	71	50	27	12

Ø D1 mm	L1 mm	L2 mm	Ø D2 mm	
58.00	71	50	27	12
68.00	80	56	32	14
69.00	80	56	32	14
72.00	90	63	40	14
73.00	90	63	40	14
74.00	90	63	40	14
75.00	90	63	40	14
76.00	90	63	40	14
78.00	90	63	40	14
80.00	90	63	40	14
82.00	90	63	40	14
83.00	90	63	40	14
84.00	90	63	40	14
85.00	90	63	40	14
86.00	100	71	50	16
87.00	100	71	50	16
88.00	100	71	50	16
92.00	100	71	50	16
95.00	100	71	50	16
98.00	100	71	50	16
100.00	100	71	50	16

(*) Production is being discontinued, delivery until current stocks are exhausted. Furthermore available as special execution on request.

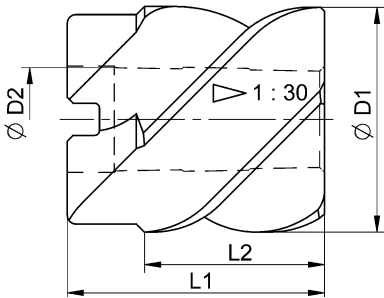
D2 = Nom. dia. D1 of the suitable holder



Shell helical reamers


031310


right-hand cutting, spiral flutes, locating bore with 1:30 taper and driving slot to DIN 138, for shell reamer holders to DIN 217 (please see page 126)

DIN 219	Type C	HSS-E	H7
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	Steel <900 N ★	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu ★	Ti	HRC < 63 HRC	Group 3	 vc / f p. 187
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Ø D1 mm		Ø-range mm	L1 mm	L2 mm	Ø D2 mm	
25.00	●	24.50 - 25.30	45	32	13	3
26.00	●	25.31 - 26.30	45	32	13	3
27.00	●	26.31 - 27.30	45	32	13	3
28.00	●	27.31 - 28.30	45	32	13	3
29.00	●	28.31 - 29.30	45	32	13	3
30.00	●	29.31 - 30.30	45	32	13	3
31.00	●	30.31 - 31.30	50	36	16	3
32.00	●	31.31 - 32.30	50	36	16	3
34.00	●	33.31 - 34.30	50	36	16	3
35.00	●	34.31 - 35.30	50	36	16	3
36.00	●	35.31 - 36.30	56	40	19	5
37.00	●	36.31 - 37.30	56	40	19	5
38.00	●	37.31 - 38.30	56	40	19	5
40.00	●	39.31 - 40.30	56	40	19	5
42.00	●	41.51 - 42.30	56	40	19	5
44.00	●	43.31 - 44.30	63	45	22	5
45.00	●	44.31 - 45.30	63	45	22	5
46.00	●	45.31 - 46.30	63	45	22	5
47.00	●	46.31 - 47.30	63	45	22	5
48.00	●	47.31 - 48.30	63	45	22	5
50.00	●	49.31 - 50.30	63	45	22	5

Ø D1 mm		Ø-range mm	L1 mm	L2 mm	Ø D2 mm	
52.00	●	51.31 - 52.30	71	50	27	5
55.00	●	54.51 - 55.30	71	50	27	5
58.00	●	57.31 - 58.30	71	50	27	5
60.00	●	59.31 - 60.30	71	50	27	5
62.00	●	61.31 - 62.30	80	56	32	5
65.00	●	64.31 - 65.30	80	56	32	5
68.00	●	67.31 - 68.30	80	56	32	5
70.00	●	69.31 - 70.30	80	56	32	5
72.00	●	71.31 - 72.30	90	63	40	5
75.00	●	74.31 - 75.30	90	63	40	5
78.00	●	77.31 - 78.30	90	63	40	5
80.00	●	79.31 - 80.30	90	63	40	5
82.00	●	81.31 - 82.30	90	63	40	7
85.00	●	84.31 - 85.30	90	63	40	7
88.00	●	87.31 - 88.30	100	71	50	7
90.00	●	89.31 - 90.30	100	71	50	7
92.00	●	91.31 - 92.30	100	71	50	7
95.00	●	94.31 - 95.30	100	71	50	7
98.00	●	97.31 - 98.30	100	71	50	7
100.00	●	99.31 - 100.30	100	71	50	7

- Ex stock, subject to being unsold
- Delivery on short notice

Intermediate diameters and special tolerances on request.

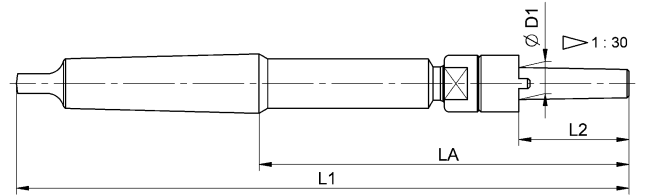
D2 = Nom. dia. D1 of the suitable holder

2

Shell reamer holders

031610

taper 1:30, with driving ring and release nut, for shell reamers to DIN 219 and DIN 8054 as well as shell core drills to DIN 222



2

Ø D1 mm		For DIN 219 Ø mm	For DIN 8054 Ø mm	For DIN 222 Ø mm	L1 mm	L2 mm	LA mm	MT	order number
13.00	•	25.00 - 30.00	25.00 - 35.00	24.00 - 35.00	250	45	151	3	031610
16.00	•	31.00 - 35.00	36.00 - 45.00	36.00 - 45.00	261	50	162	3	031610
19.00	•	36.00 - 42.00	46.00 - 53.00	46.00 - 53.00	298	56	174	4	031610
19.00	•	36.00 - 42.00	46.00 - 53.00	46.00 - 53.00	273	56	174	3	031611 (*)
22.00	•	43.00 - 50.00	54.00 - 63.00	54.00 - 63.00	312	63	188	4	031610
22.00	•	43.00 - 50.00	54.00 - 63.00	54.00 - 63.00	287	63	188	3	031611 (*)
27.00	•	51.00 - 60.00	64.00 - 75.00	64.00 - 75.00	359	71	203	5	031610
27.00	•	51.00 - 60.00	64.00 - 75.00	64.00 - 75.00	327	71	203	4	031612 (*)
32.00	•	61.00 - 71.00		76.00 - 90.00	376	80	220	5	031610
32.00	•	61.00 - 71.00		76.00 - 90.00	344	80	220	4	031612 (*)
40.00	•	72.00 - 85.00		91.00 - 100.00	396	90	240	5	031610
50.00	•	86.00 - 100.00			416	100	260	5	031610

- Ex stock, subject to being unsold
- Delivery on short notice

(*) non-standardised

The following spare parts are also available ex stock:

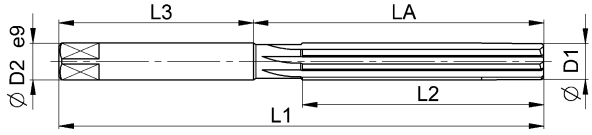
- Driving rings - order no. 031511
- Release nuts - order no. 031512
- Washers - order no. 031513



Hand reamers


010010


right-hand cutting, straight flutes, with long conical first cut,
with cylindrical shank and square end (wrench size SW please see below)

DIN 206	Type A	HSS	H7
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	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group 1	 vc / f
	★	★		★	★		★	★				

Ø D1 mm		Ø-range mm	L1 mm	L2 mm	LA mm	Ø D2 mm	L3 mm	SW mm	
1.00	●	0.95 - 1.09	34	13		1			3
1.10	○	1.10 - 1.19	34	13		1.1			3
1.30	○	1.20 - 1.39	38	17		1.3			3
1.50	●	1.40 - 1.59	41	20		1.5		1.12	3
1.60	○	1.60 - 1.79	44	21		1.6		1.25	3
1.80	○	1.80 - 1.98	47	23		1.8		1.4	4
2.00	●	1.99 - 2.12	50	25		2		1.6	4
2.20	○	2.13 - 2.39	54	27		2.2		1.8	4
2.50	●	2.40 - 2.69	58	29		2.5		2.1	4
2.80	○	2.70 - 2.89	62	31		2.8		2.1	6
3.00	●	2.90 - 3.10	62	31		3		2.4	6
3.20	○	3.11 - 3.30	66	33	45	3.2	21	2.4	6
3.50	●	3.31 - 3.60	71	35	47	3.5	24	2.7	6
4.00	●	3.61 - 4.20	76	38	50	4	26	3	6
4.50	●	4.21 - 4.70	81	41	53	4.5	28	3.4	6
5.00	●	4.71 - 5.20	87	44	56	5	31	3.8	6
5.50	●	5.21 - 5.60	93	47	59	5.5	34	4.3	6
6.00	●	5.61 - 6.10	93	47	59	6	34	4.9	6
6.50	●	6.11 - 6.70	100	50	62	6.5	38	4.9	6
7.00	●	6.71 - 7.10	107	54	66	7	41	5.5	6
7.50	●	7.11 - 7.60	107	54	66	7.5	41	6.2	6
8.00	●	7.61 - 8.10	115	58	70	8	45	6.2	6
8.50	●	8.11 - 8.60	115	58	70	8.5	45	7	6
9.00	●	8.61 - 9.10	124	62	75	9	49	7	6
9.50	●	9.11 - 9.60	124	62	75	9.5	49	8	6
10.00	●	9.61 - 10.10	133	66	80	10	53	8	6
10.50	●	10.11 - 10.60	133	66	80	10.5	53	8	6
11.00	●	10.61 - 11.10	142	71	86	11	56	9	6
11.50	●	11.11 - 11.60	142	71	86	11.5	56	9	6
12.00	●	11.61 - 12.30	152	76	91	12	61	9	6
12.50	●	12.31 - 12.55	152	76	91	12.5	61	10	6
13.00	●	12.56 - 13.20	152	76	91	13	61	10	6
13.50	●	13.21 - 13.55	163	81	97	13.5	66	11	8
14.00	●	13.56 - 14.20	163	81	97	14	66	11	8
14.50	●	14.21 - 14.55	163	81	97	14.5	66	11	8

Ø D1 mm		Ø-range mm	L1 mm	L2 mm	LA mm	Ø D2 mm	L3 mm	SW mm	
15.00	●	14.56 - 15.10	163	81	97	15	66	12	8
15.50	●	15.11 - 15.80	175	87	105	15.5	70	12	8
16.00	●	15.81 - 16.20	175	87	105	16	70	12	8
16.50	●	16.21 - 16.70	175	87	105	16.5	70	13	8
17.00	●	16.71 - 17.10	175	87	105	17	70	13	8
17.50	●	17.11 - 17.55	188	93	112	17.5	76	14.5	8
18.00	●	17.56 - 18.20	188	93	112	18	76	14.5	8
18.50	●	18.21 - 18.60	188	93	112	18.5	76	14.5	8
19.00	●	18.61 - 19.10	188	93	112	19	76	14.5	8
19.50	●	19.11 - 19.80	201	100	119	19.5	82	16	8
20.00	●	19.81 - 20.20	201	100	119	20	82	16	8
21.00	●	20.21 - 21.20	201	100	119	21	82	16	8
22.00	●	21.21 - 22.20	215	107	129	22	86	18	8
23.00	●	22.21 - 23.20	215	107	129	23	86	18	8
24.00	●	23.21 - 24.20	231	115	137	24	94	20	8
25.00	●	24.21 - 25.20	231	115	137	25	94	20	8
26.00	●	25.21 - 26.20	231	115	137	26	94	20	8
27.00	●	26.21 - 27.20	247	124	149	27	98	22	10
28.00	●	27.21 - 28.20	247	124	149	28	98	22	10
29.00	●	28.21 - 29.20	247	124	149	29	98	22	10
30.00	●	29.21 - 30.20	247	124	149	30	98	24	10
31.00	●	30.21 - 31.20	265	133	160	31	105	24	10
32.00	●	31.21 - 32.20	265	133	160	32	105	24	10
33.00	●	32.21 - 33.20	265	133	160	33	105	26	10
34.00	●	33.21 - 34.20	284	142	169	34	115	26	10
35.00	●	34.21 - 35.20	284	142	169	35	115	29	10
36.00	●	35.21 - 36.20	284	142	169	36	115	29	10
37.00	●	36.21 - 37.20	284	142	169	37	115	29	10
38.00	●	37.21 - 38.20	305	152	183	38	122	29	10
39.00	●	38.21 - 39.20	305	152	183	39	122	32	10
40.00	●	39.21 - 40.20	305	152	183	40	122	32	10
45.00	●	44.21 - 45.20	326	163	196	45	130	35	12
50.00	●	49.21 - 50.20	347	174	211	50	136	39	12
60.00	●	58.21 - 60.20	367	184	225	60	142	49	12

- Ex stock, subject to being unsold
- Delivery on short notice

For special tolerances and intermediate diameters also delivery on short notice.

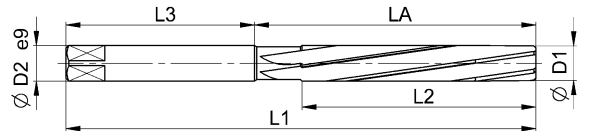
2



Hand reamers

010011


right-hand cutting, left-hand spiral flutes, with long conical first cut, with cylindrical shank and square end (wrench size SW please see below)


DIN 206	Type B	HSS	H7
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	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group 1	 vc / f
	★	★		★	★		★	★				

2

Ø D1 mm		Ø-range mm	L1 mm	L2 mm	LA mm	Ø D2 mm	L3 mm	SW mm	
1.00	●	0.95 - 1.09	34	13		1			3
1.10	○	1.10 - 1.19	34	13		1.1			3
1.30	○	1.20 - 1.39	38	17		1.3			3
1.50	●	1.40 - 1.59	41	20		1.5		1.12	3
1.60	○	1.60 - 1.79	44	21		1.6		1.25	3
1.80	○	1.80 - 1.98	47	23		1.8		1.4	4
2.00	●	1.99 - 2.12	50	25		2		1.6	4
2.20	○	2.13 - 2.39	54	27		2.2		1.8	4
2.50	●	2.40 - 2.69	58	29		2.5		2.1	4
2.80	○	2.70 - 2.89	62	31		2.8		2.1	6
3.00	●	2.90 - 3.10	62	31		3		2.4	6
3.20	○	3.11 - 3.30	66	33	45	3.2	21	2.4	6
3.50	●	3.31 - 3.60	71	35	47	3.5	24	2.7	6
4.00	●	3.61 - 4.20	76	38	50	4	26	3	6
4.50	●	4.21 - 4.70	81	41	53	4.5	28	3.4	6
5.00	●	4.71 - 5.20	87	44	56	5	31	3.8	6
5.50	●	5.21 - 5.60	93	47	59	5.5	34	4.3	6
6.00	●	5.61 - 6.10	93	47	59	6	34	4.9	6
6.50	●	6.11 - 6.70	100	50	62	6.5	38	4.9	6
7.00	●	6.71 - 7.10	107	54	66	7	41	5.5	6
7.50	●	7.11 - 7.60	107	54	66	7.5	41	6.2	6
8.00	●	7.61 - 8.10	115	58	70	8	45	6.2	6
8.50	●	8.11 - 8.60	115	58	70	8.5	45	7	6
9.00	●	8.61 - 9.10	124	62	75	9	49	7	6
9.50	●	9.11 - 9.60	124	62	75	9.5	49	8	6
10.00	●	9.61 - 10.10	133	66	80	10	53	8	6
10.50	●	10.11 - 10.60	133	66	80	10.5	53	8	6
11.00	●	10.61 - 11.10	142	71	86	11	56	9	6
11.50	●	11.11 - 11.60	142	71	86	11.5	56	9	6
12.00	●	11.61 - 12.30	152	76	91	12	61	9	6
12.50	●	12.31 - 12.55	152	76	91	12.5	61	10	6
13.00	●	12.56 - 13.20	152	76	91	13	61	10	6
13.50	●	13.21 - 13.55	163	81	97	13.5	66	11	8
14.00	●	13.56 - 14.20	163	81	97	14	66	11	8
14.50	●	14.21 - 14.55	163	81	97	14.5	66	11	8

Ø D1 mm		Ø-range mm	L1 mm	L2 mm	LA mm	Ø D2 mm	L3 mm	SW mm	
15.00	●	14.56 - 15.10	163	81	97	15	66	12	8
15.50	●	15.11 - 15.80	175	87	105	15.5	70	12	8
16.00	●	15.81 - 16.20	175	87	105	16	70	12	8
16.50	●	16.21 - 16.70	175	87	105	16.5	70	13	8
17.00	●	16.71 - 17.10	175	87	105	17	70	13	8
17.50	●	17.11 - 17.55	188	93	112	17.5	76	14.5	8
18.00	●	17.56 - 18.20	188	93	112	18	76	14.5	8
18.50	●	18.21 - 18.60	188	93	112	18.5	76	14.5	8
19.00	●	18.61 - 19.10	188	93	112	19	76	14.5	8
19.50	●	19.11 - 19.80	201	100	119	19.5	82	16	8
20.00	●	19.81 - 20.20	201	100	119	20	82	16	8
21.00	●	20.21 - 21.20	201	100	119	21	82	16	8
22.00	●	21.21 - 22.20	215	107	129	22	86	18	8
23.00	●	22.21 - 23.20	215	107	129	23	86	18	8
24.00	●	23.21 - 24.20	231	115	137	24	94	20	8
25.00	●	24.21 - 25.20	231	115	137	25	94	20	8
26.00	●	25.21 - 26.20	231	115	137	26	94	20	8
27.00	●	26.21 - 27.20	247	124	149	27	98	22	10
28.00	●	27.21 - 28.20	247	124	149	28	98	22	10
29.00	●	28.21 - 29.20	247	124	149	29	98	22	10
30.00	●	29.21 - 30.20	247	124	149	30	98	24	10
31.00	●	30.21 - 31.20	265	133	160	31	105	24	10
32.00	●	31.21 - 32.20	265	133	160	32	105	24	10
33.00	●	32.21 - 33.20	265	133	160	33	105	26	10
34.00	●	33.21 - 34.20	284	142	169	34	115	26	10
35.00	●	34.21 - 35.20	284	142	169	35	115	29	10
36.00	●	35.21 - 36.20	284	142	169	36	115	29	10
37.00	●	36.21 - 37.20	284	142	169	37	115	29	10
38.00	●	37.21 - 38.20	305	152	183	38	122	29	10
39.00	●	38.21 - 39.20	305	152	183	39	122	32	10
40.00	●	39.21 - 40.20	305	152	183	40	122	32	10
45.00	●	44.21 - 45.20	326	163	196	45	130	35	12
50.00	●	49.21 - 50.20	347	174	211	50	136	39	12
60.00	●	58.21 - 60.20	367	184	225	60	142	49	12

- Ex stock, subject to being unsold
- Delivery on short notice

For special tolerances and intermediate diameters also delivery on short notice.

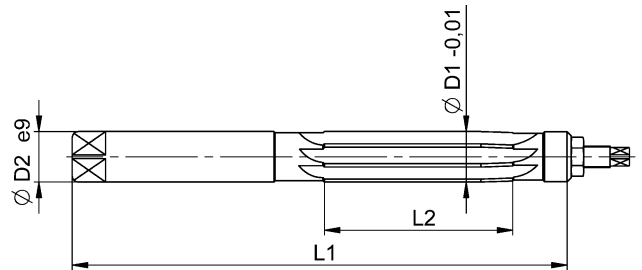
Adjustable hand reamers



011010


right-hand cutting, straight flutes, with cylindrical shank and square end (wrench size SW please see below)

adjustment range approx. 1/100 of the diameter (e.g. reamer \varnothing 5 mm = adjustable by 0,05 mm)

DIN 859	Type A	HSS
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	Steel <900 N ★	Steel 900-1400N ★	VA Stainless steel	GG ★	GGG ★	GGG >GGG50	Cu/Zn/Mg ★	Alu ★	Ti	HRC < 63 HRC	Group 1	 vc / f
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\varnothing D1 mm		\varnothing -range mm	L1 mm	L2 mm	\varnothing D2 mm	SW mm	
4.00	●	3.90 - 4.20	76	24	4	3	6
4.50	●	4.21 - 4.70	81	27	4.5	3.4	6
5.00	●	4.71 - 5.20	87	30	5	3.8	6
5.50	●	5.21 - 5.70	93	33	5.5	4.3	6

- Ex stock, subject to being unsold
- Delivery on short notice

For special tolerances and intermediate diameters also delivery on short notice.

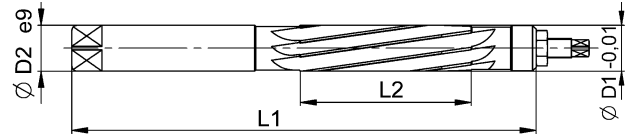
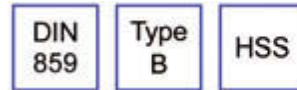
2


Adjustable hand reamers

011011


right-hand cutting, left-hand spiral flutes, with cylindrical shank and square end
(wrench size SW please see below)


adjustment range approx. 1/100 of the diameter (e.g. reamer \varnothing 20 mm = adjustable by 0,2 mm)



	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group 1	 vc / f
	★	★		★	★		★	★				

2

Ø D1 mm		Ø-range mm	L1 mm	L2 mm	Ø D2 mm	SW mm	
6.00	●	5.70 - 6.20	93	33	6	4.9	6
6.50	●	6.21 - 6.70	100	34	6.5	4.9	6
7.00	●	6.71 - 7.20	107	38	7	5.5	9
7.50	●	7.21 - 7.63	107	38	7.5	6.2	9
8.00	●	7.64 - 8.20	115	42	8	6.2	9
8.50	●	8.21 - 8.63	115	42	8.5	7	9
9.00	●	8.64 - 9.20	124	46	9	7	9
9.50	●	9.21 - 9.63	124	46	9.5	8	9
10.00	●	9.64 - 10.20	133	50	10	8	9
10.50	●	10.21 - 10.60	133	50	10.5	8	9
11.00	●	10.61 - 11.20	142	51	11	9	9
11.50	●	11.21 - 11.80	142	51	11.5	9	9
12.00	●	11.81 - 12.40	152	56	12	9	9
12.50	●		152	56	12.5	10	9
13.00	●	12.41 - 13.20	152	56	13	10	9
13.50	●	13.21 - 13.64	163	61	13.5	11	9
14.00	●	13.65 - 14.14	163	61	14	11	9
14.50	○	14.15 - 14.64	163	61	14.5	11	9
15.00	●	14.65 - 15.14	163	61	15	12	9
15.50	○	15.15 - 15.64	175	67	15.5	12	9
16.00	●	15.65 - 16.14	175	67	16	12	9
16.50	○	16.15 - 16.64	175	67	16.5	13	9
17.00	●	16.65 - 17.14	175	67	17	13	9
17.50	○	17.15 - 17.64	188	68	17.5	14.5	9
18.00	●	17.65 - 18.14	188	68	18	14.5	9
18.50	○	18.14 - 18.40	188	68	18.5	14.5	9
19.00	●	18.41 - 19.16	188	68	19	14.5	9
19.50	○	19.17 - 19.66	201	75	19.5	16	9
20.00	●	19.67 - 20.16	201	75	20	16	9
21.00	○	20.17 - 21.20	201	75	21	16	9
22.00	●	21.21 - 22.20	215	82	22	18	12
23.00	○	22.21 - 23.20	215	82	23	18	12
24.00	●	23.21 - 24.20	231	85	24	18	12
25.00	●	24.21 - 25.20	231	85	25	20	12
26.00	●	25.21 - 26.20	231	85	26	20	12

Ø D1 mm		Ø-range mm	L1 mm	L2 mm	Ø D2 mm	SW mm	
27.00	○	26.21 - 27.20	247	94	27	22	12
28.00	●	27.21 - 28.20	247	94	28	22	12
29.00	○	28.21 - 29.20	247	94	29	22	12
30.00	●	29.21 - 30.20	247	94	30	24	12
31.00	○	30.20 - 31.20	265	99	31	24	12
32.00	●	31.20 - 32.20	265	99	32	24	12
33.00	○	32.20 - 33.20	265	99	33	26	12
34.00	○	33.21 - 34.20	284	108	34	26	12
35.00	●	34.21 - 35.20	284	108	35	29	12
36.00	●	35.21 - 36.20	284	108	36	29	12
37.00	○	36.21 - 37.20	284	108	37	29	12
38.00	●	37.21 - 38.20	305	111	38	29	12
39.00	○	38.21 - 39.20	305	111	39	32	12
40.00	●	39.21 - 40.20	305	111	40	32	12
41.00	○	40.21 - 41.20	305	111	41	32	12
42.00	○	41.21 - 42.20	305	111	42	32	12
43.00	○	42.21 - 43.20	326	120	43	35	12
44.00	○	43.21 - 44.20	326	120	44	35	12
45.00	●	44.21 - 45.20	326	120	45	35	12
46.00	○	45.21 - 46.20	326	120	46	35	12
47.00	○	46.21 - 47.20	326	120	47	39	12
48.00	○	47.21 - 48.20	347	131	48	39	12
49.00	○	48.21 - 49.20	347	131	49	39	12
50.00	●	49.21 - 50.20	347	131	50	39	12
51.00	○	50.21 - 51.20	347	131	51	39	16
52.00	○	51.21 - 52.20	347	131	52	39	16
53.00	○	52.21 - 53.20	347	131	53	44	16
54.00	○	53.21 - 54.20	367	134	54	44	16
55.00	●	54.21 - 55.20	367	134	55	44	16
56.00	○	55.21 - 56.20	367	134	56	44	16
57.00	○	56.21 - 57.20	367	134	57	44	16
58.00	○	57.21 - 58.20	367	134	58	44	16
59.00	○	58.20 - 59.20	367	134	59	49	16
60.00	●	59.21 - 60.20	367	134	60	49	16

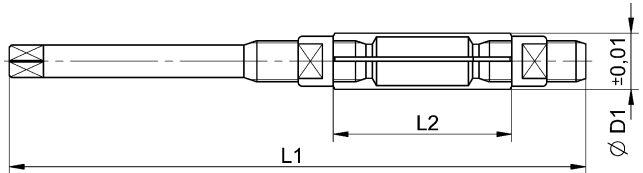
- Ex stock, subject to being unsold
- Delivery on short notice

For intermediate diameters and special tolerances also delivery on short notice.


Hand reamers quickly adjustable

012011

right-hand cutting, with interchangeable blades, large range of adjustment, with cylindrical shank and square end (wrench size SW please see below), **especially suitable for repair work**



	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group 1	 vc / f
	★	★		★	★		★	★				

Ø D1 mm	Size		Ø D1 - Ø D1 mm	Ø D1 - Ø D1 inch	L1 mm	L2 mm	SW mm	
6.40	000	●	6.40 - 7.20	—	110	32	3	4
7.20	00	●	7.20 - 8.00	—	110	32	3.4	4
8.00	0	●	8.00 - 9.00	21/64 - 23/64	115	34	3.8	5
9.00	1	●	9.00 - 10.00	23/64 - 25/64	115	34	4.3	5
10.00	2	●	10.00 - 11.00	25/64 - 7/16	115	34	4.9	5
11.00	3	●	11.00 - 12.00	7/16 - 15/32	125	35	4.9	5
12.00	4	●	12.00 - 13.50	15/32 - 17/32	135	41	6.2	5
13.50	5	●	13.50 - 15.50	17/32 - 39/64	146	50	7	5
15.50	6	●	15.50 - 18.00	39/64 - 45/64	166	60	8	5
18.00	7	●	18.00 - 21.00	45/64 - 53/64	178	65	9	5
21.00	8	●	21.00 - 24.00	53/64 - 61/64	195	76	11	5
24.00	9	●	24.00 - 27.50	61/64 - 1 5/64	218	82	12	5
27.50	10	●	27.50 - 31.50	1 5/64 - 1 15/64	245	86	14.5	5
31.50	11	●	31.50 - 37.00	1 15/64 - 1 29/64	280	98	18	6
37.00	12	●	37.00 - 45.00	1 29/64 - 1 49/64	325	108	20	6
45.00	13	●	45.00 - 55.00	1 49/64 - 2 5/32	370	118	26	6
55.00	14	●	55.00 - 67.00	2 5/32 - 2 41/64	400	125	32	6
67.00	15	●	67.00 - 80.00	2 41/64 - 3 5/32	435	140	39	8
80.00	16	●	80.00 - 95.00	3 5/32 - 3 3/4	475	155	49	8

- Ex stock, subject to being unsold
- Delivery on short notice




2

Set of hand reamers quickly adjustable

012015

right-hand cutting, with interchangeable blades, large range of adjustment, especially suitable for repair work, **11 pcs., size 0 - 10 (range 8 - 31,5 mm)**



	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group	 vc / f
	★	★		★	★		★	★				

Ex stock, subject to being unsold

Set of hand reamers quickly adjustable

012016

right-hand cutting, with interchangeable blades, large range of adjustment, especially suitable for repair work, **13 pcs., size 0 - 12 (range 8 - 45 mm)**



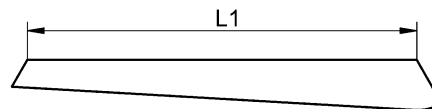
Ex stock, subject to being unsold


2


Sets of spare blades

012013

for quickly adjustable hand reamers WN 50 (Please note that the spare blades can only be supplied in sets!)



Size		L1 mm	
000	•	32	4
00	•	32	4
0	•	34	5
1	•	34	5
2	•	34	5
3	•	35	5
4	•	41	5
5	•	50	5
6	•	60	5
7	•	65	5

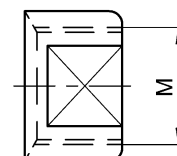
Size		L1 mm	
8	•	76	5
9	•	82	5
10	•	86	5
11	•	98	6
12	•	108	6
13	•	118	6
14	•	125	6
15	•	140	8
16	•	155	8

- Ex stock, subject to being unsold
- Delivery on short notice

Adjusting nuts

012014

for quickly adjustable hand reamers WN 50



Size		Thread
000	•	M 5 x 0,75
00	•	M 5,5 x 0,75
0	•	M 6,5 x 0,75
1	•	M 7 x 0,75
2	•	M 7,5 x 0,75
3	•	M 8 x 0,75
4	•	M 9,5 x 1
5	•	M 10,5 x 1
6	•	M 12,5 x 1,25
7	•	M 14,5 x 1,25

Size		Thread
8	•	M 16 x 1,25
9	•	M 18 x 1,25
10	•	M 22 x 1,5
11	•	M 25 x 1,5
12	•	M 30 x 1,5
13	•	M 37 x 1,5
14	•	M 46 x 1,5
15	•	M 55 x 2
16	•	M 68 x 2

- Ex stock, subject to being unsold
- Delivery on short notice

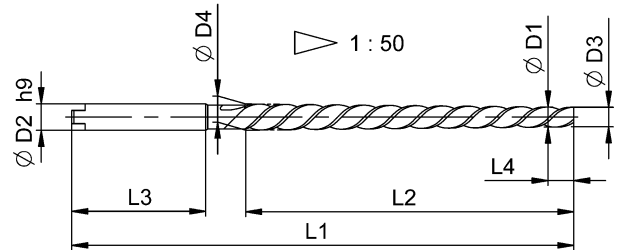
2

Helical machine taper reamers



021010


right-hand cutting, spiral flutes, corresponding to taper pins DIN 1, DIN 258, DIN 7977 and DIN 7978, with cylindrical shank and driving tang to DIN 1809

DIN 2179	45° left	HSS-E	1:50
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2

	Steel <900 N ★	Steel 900-1400N ▲	VA Stainless steel	GG ★	GGG ★	GGG >GGG50	Cu/Zn/Mg ★	Alu ★	Ti	HRC < 63 HRC	Group 2	 vc / f
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Ø D1 mm		Ø D3 mm	Ø D4 mm	L1 mm	L2 mm	L4 mm	Ø D2 mm	L3 mm	
1.00	●	0.8	1.46	60	33	5	1.4	23	2
1.50	●	1.4	2.14	70	37	5	2.1	29	2
2.00	●	1.9	2.86	86	48	5	3.15	29	3
2.50	●	2.4	3.36	86	48	5	3.15	29	3
3.00	●	2.9	4.06	100	58	5	4	32	3
4.00	●	3.9	5.26	112	68	5	5	34	3
5.00	●	4.9	6.36	122	73	5	6.3	38	3
6.00	●	5.9	8	160	105	5	8	42	3
6.50	●	6.4	8.78	188	119	5	8.5	46	3
8.00	●	7.9	10.8	207	145	5	10	46	3
10.00	●	9.9	13.4	245	175	5	12.5	50	3
12.00	●	11.8	16	290	210	10	16	58	3

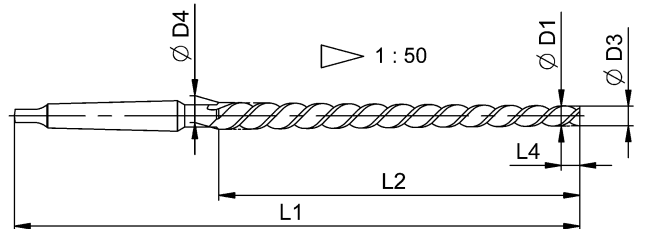
- Ex stock, subject to being unsold
- Delivery on short notice



Helical machine taper reamers


021011

right-hand cutting, spiral flutes, corresponding to taper pins DIN 1, DIN 258, DIN 7977 and DIN 7978, with morse taper shank

DIN 2180	45° left	HSS-E	1:50
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	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group 2	 vc / f
	★	▲		★	★		★	★				

Ø D1 mm		Ø D3 mm	Ø D4 mm	L1 mm	L2 mm	L4 mm	MT	
5.00	●	4.9	6.36	155	73	5	1	3
6.00	●	5.9	8	187	105	5	1	3
8.00	●	7.9	10.8	227	145	5	1	3
10.00	●	9.9	13.4	257	175	5	1	3
12.00	●	11.8	16	315	210	10	2	3
13.00	●	12.86	16.74	295	194	10	2	3
14.00	●	13.86	17.74	295	194	10	2	3
16.00	●	15.8	20.4	335	230	10	2	3
20.00	●	19.8	24.8	377	250	10	3	3
25.00	●	24.7	30.7	427	300	15	3	3
30.00	●	29.7	36.1	475	320	15	4	4
40.00	●	39.7	46.5	495	340	15	4	6
50.00	●	49.7	56.9	550	360	15	5	8

- Ex stock, subject to being unsold
- Delivery on short notice

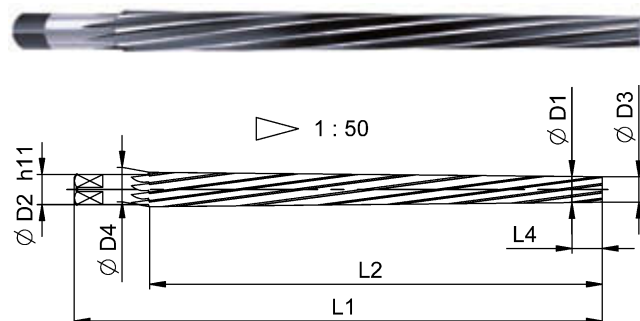
2



Hand taper reamers


020011

right-hand cutting, spiral flutes, with cylindrical shank and square end (wrench size SW please see below), corresponding to taper pins DIN 1, DIN 258, DIN 7977 and DIN 7978

DIN 9	Type B	HSS	1:50
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	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group 2	 vc / f
	★	★		★	★		★	★				

Ø D1 mm		Ø D3 mm	Ø D4 mm	L1 mm	L2 mm	L4 mm	Ø D2 mm	SW mm	
3.00	•	2.9	4.06	80	58	5	4	3	5
3.50	•	3.4	4.66	87	63	5	4.5	3.4	5
4.00	•	3.9	5.26	93	68	5	5	3.8	5
4.50	•	4.4	5.8	95	70	5	5.6	4.3	5
5.00	•	4.9	6.36	100	73	5	6.3	4.9	5
5.50	•	5.4	7.2	118	90	5	7.1	5.5	6
6.00	•	5.9	8	135	105	5	8	6.2	6
6.50	•	6.4	8.6	140	110	5	8	6.2	6
7.00	•	6.9	9.4	160	125	5	9	7	6
8.00	•	7.9	10.8	180	145	5	10	8	6
9.00	•	8.9	12.1	195	160	5	11.2	9	6
10.00	•	9.9	13.4	215	175	5	12.5	10	6
12.00	•	11.8	16	255	210	10	14	11	8
13.00	•	12.8	17	255	210	10	16	12	8
14.00	•	13.8	18	255	210	10	16	12	8
16.00	•	15.8	20.4	280	230	10	18	14.5	8
20.00	•	19.8	24.8	310	250	10	22.4	18	8
25.00	•	24.7	30.7	370	300	15	28	22	10
30.00	•	29.7	36.1	400	320	15	31.5	24	10
40.00	•	39.7	46.5	430	340	15	40	32	12
50.00	•	49.7	56.9	460	360	15	50	39	12

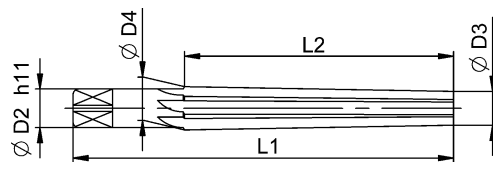
- Ex stock, subject to being unsold
- Delivery on short notice



Hand taper reamers


024011


right-hand cutting, straight flutes, with cylindrical shank and square end (wrench size SW please see below), finishing reamer for Morse tapers

DIN 204 Type C HSS



	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group	 vc / f
	★	★		★	★		★	★			2	

	For MT size	Ø D3 mm	Ø D4 mm	L1 mm	L2 mm	Ø D2 mm	SW mm	
●	0	6.547	9.722	93	61	8	6.2	6
●	1	9.571	12.863	102	66	10	8	7
●	2	14.733	18.679	121	79	14	11	8
●	3	20.01	24.829	146	96	20	16	8

	For MT size	Ø D3 mm	Ø D4 mm	L1 mm	L2 mm	Ø D2 mm	SW mm	
●	4	26.229	32.41	179	119	25	20	10
●	5	37.873	45.767	222	150	31.5	24	12
●	6	54.172	65.016	300	208	45	35	14

- Ex stock, subject to being unsold
- Delivery on short notice

2

Counterboring, deburring, countersinking

■ Countersink sets



■ Core drills of HSS



■ Countersinks of solid carbide and HSS









■ Counterbores of solid carbide and HSS













Countersinking tools form a comprehensive complement for bore machining, as countersinking operations have to be carried out on practically all workpieces that are machined. Countersinking and boring tools are required in particular for flush screw connections. The spectrum extends from simple deburring tools right up to countersinks with highly wear-resistant coating.

HSS core drills are used to create the necessary initial size of a bore for the subsequent reaming. They are characterised by their simple handling. More important, however, is the preparation of the diameter for the subsequent reaming operation. This eliminates the need for expensive drilling tools with intermediate diameters.



Standard	Shape	Design	Cutting material	Dia. range	Code	Page
Boring tools						
DIN 344		Finish size	HSS	5,0 – 20,0	050010	142
DIN 344		Undersize	HSS	4,8 – 19,7	050011	143
DIN 343		Finish size	HSS	8,0 – 50,0	050110	144
DIN 343		Undersize	HSS	7,8 – 49,6	050111	145
DIN 222		Finish size	HSS	24,0 – 100,0	050310	146
DIN 222		Undersize	HSS	23,7 – 99,5	050311	147

Countersinks						
Similar DIN 335		90°	Solid Carbide	6,3 – 31,0	041020	148
Similar DIN 335		Double-sided 90°	Solid Carbide	8,3 – 12,4	041021	148
DIN 335		Standard version 90°	HSS	4,3 – 31,0	051209	149
DIN 335		Precision version 90°	HSS	4,3 – 31,0	051210	150
DIN 335		Precision version 90°	HSS-E	6,3 – 31,0	051220	151
DIN 335		Precision version 90°	HSS + TiAlN	6,3 – 31,0	053212	152
DIN 335		Precision version 90°	HSS + TiN	4,8 – 31,0	053210	153
DIN 335		Precision version 90° Shank with 3 driving flats	HSS	11,5 – 31,0	051207	154
DIN 335		Precision version 90° Shank with 3 driving flats	HSS + TiN	11,5 – 31,0	053207	155
DIN 335		12-piece set Standard version 90°	HSS	5,3 – 25,0	051212	156
DIN 335		6-piece set Standard version 90°	HSS	6,3 – 25,0	051218	156
DIN 335		6-piece set Precision version 90°	HSS + TiAlN	6,3 – 25,0	053218	157
DIN 335		6-piece set Precision version 90°	HSS + TiN	6,3 – 25,0	053220	157
DIN 335		Standard version 90°	HSS	15,0 – 100,0	051309	158
DIN 335		Precision version 90°	HSS	15,0 – 100,0	051310	159

Standard	Shape	Design	Cutting material	Dia. range	Code	Page
Countersinks						
DIN 335		Precision version 90°	HSS + TiN	25,0 – 63,0	053310	160
DIN 335		Hand version 90°	HSS	12,4 – 25,0	051211	160
DIN 335		Multi-bladed 90°	HSS	8,0 – 20,0	050810	161
WN 181		Single-bladed 90°	HSS	6,0 – 31,5	051011	161
DIN 334		Precision version 60°	HSS	6,3 – 25,0	051110	162
DIN 334		Precision version 60°	HSS + TiN	6,3 – 25,0	053320	163
DIN 334		Precision version 60°	HSS	16,0 – 80,0	051111	164
DIN 334		Multi-bladed 60°	HSS	8,0 – 20,0	050610	165
WN 180		Single-bladed 60°	HSS	6,0 – 31,5	051010	165

Counterbores						
DIN 373		Through hole, fine	HSS	6,0 – 20,0	051510	166
DIN 373		6-piece set Through hole, fine	HSS	M 3 – M 10	051513	166
DIN 373		Through hole, fine	HSS + TiN	6,0 – 20,0	053510	167
DIN 373		Through hole, medium	HSS	6,0 – 20,0	051511	168
DIN 373		6-piece set Through hole, medium	HSS	M 3 – M 10	051514	168
DIN 373		Through hole, medium	HSS + TiN	6,0 – 20,0	053511	169
DIN 373		Tap hole	HSS	6,0 – 20,0	051512	170
DIN 373		6-piece set Tap hole	HSS	M 3 – M 10	051515	170
WN 178		Through hole, fine	HSS	18,0 – 40,0	051710	171
WN 178		Through hole, medium	HSS	18,0 – 40,0	051711	171
DIN 375		For detachable pilots	HSS	15,0 – 63,0	051610	172
DIN 1868		Detachable pilots for through hole, fine		8,4 – 25,0	051611	173
DIN 1868		Detachable pilots for through hole, medium		9,0 – 39,0	051611	174
DIN 1868		Detachable pilots for tap hole		6,8 – 32,0	051611	175

Core drills finish size

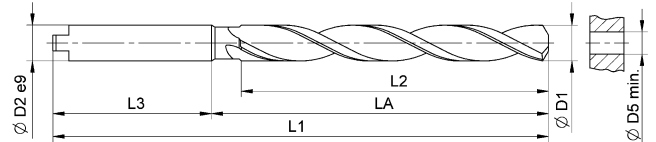
050010



right-hand cutting, 3 flutes, approx. 27° right-hand spiral, with cylindrical shank and driving tang to DIN 1809


DIN
344

HSS

h8



	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group	 vc / f
	★	★		★	★	★	★	★			5	

Ø D1 mm		Ø-range mm	L1 mm	L2 mm	LA mm	Ø D2 mm	L3 mm	Ø D5 min. mm	
5.00	●	4.70 - 5.20	108	65	76	5	32	3.5	3
5.50	○	5.21 - 5.70	116	71	82	5.5	34	4.2	3
6.00	●	5.71 - 6.20	116	71	82	6	34	4.2	3
6.50	○	6.21 - 6.70	124	77	93	6.5	36	4.2	3
7.00	●	6.71 - 7.20	133	84	94	7	39	4.9	3
7.50	○	7.21 - 7.70	133	84	94	7.5	39	4.9	3
8.00	●	7.71 - 8.20	142	91	101	8	41	5.6	3
8.50	○	8.21 - 8.70	142	91	101	8.5	41	5.6	3
9.00	●	8.71 - 9.20	151	98	108	9	43	6.3	3
9.50	○	9.21 - 9.70	151	98	108	9.5	43	6.3	3
10.00	●	9.71 - 10.20	162	107	117	10	45	7	3
10.50	○	10.21 - 10.60	162	107	117	10.5	45	7	3
11.00	●	10.61 - 11.20	173	114	128	11	45	7.7	3
11.50	○	11.21 - 11.70	173	114	128	11.5	45	7.7	3
12.00	●	11.71 - 12.20	184	123	137	12	47	8.4	3
13.00	●	12.40 - 13.20	184	123	137	13	47	9.1	3
14.00	●	13.40 - 14.20	194	132	147	14	47	9.8	3
15.00	●	14.40 - 15.20	202	137	152	15	50	10.5	3
16.00	●	15.40 - 16.20	211	143	158	16	53	11.2	3
17.00	●	16.40 - 17.20	218	146	166	17	52	11.9	3
18.00	●	17.40 - 18.20	226	152	170	18	56	12.6	3
19.00	●	18.40 - 19.20	234	158	176	19	58	13.3	3
20.00	●	19.21 - 20.20	242	164	182	20	60	14	3

- Ex stock, subject to being unsold
- Delivery on short notice

For intermediate diameters and special tolerances also delivery on short notice.

Core drills undersize

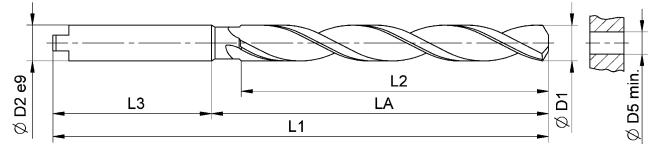
050011



right-hand cutting, 3 flutes, approx. 27° right-hand spiral, with cylindrical shank and driving tang to DIN 1809


DIN
344

HSS

h8



	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group	 vc / f
	★	★		★	★	★	★	★				

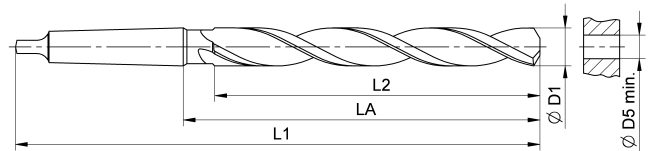
Ø D1 mm		L1 mm	L2 mm	LA mm	Ø D2 mm	L3 mm	Ø D5 min. mm	
4.80	•	108	65	76	5	32	3.5	3
5.80	•	116	71	82	6	34	4.2	3
6.80	•	133	84	94	7	39	4.9	3
7.80	•	142	91	101	8	41	5.6	3
8.80	•	151	98	108	9	43	6.3	3
9.80	•	162	107	117	10	45	7	3
10.75	•	173	114	128	11	45	7.7	3
11.75	•	184	123	137	12	47	8.4	3
12.75	•	184	123	137	13	47	9.1	3
13.75	•	194	132	147	14	47	9.8	3
14.75	•	202	137	152	15	50	10.5	3
15.75	•	211	143	158	16	53	11.2	3
16.75	•	218	146	166	17	52	11.9	3
17.75	•	226	152	170	18	56	12.6	3
18.70	•	234	158	176	19	58	13.3	3
19.70	•	242	164	182	20	60	14	3



- Ex stock, subject to being unsold
- Delivery on short notice


Core drills finish size


050110

right-hand cutting, 3 flutes, approx. 27° right-hand spiral,
with morse taper shank



	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group 5	 vc / f
	★	★		★	★	★	★	★				

Ø D1 mm		Ø-range mm	L1 mm	L2 mm	LA mm	MT	Ø D5 min. mm	
8.00	●	7.60 - 8.20	156	68	90.5	1	5.6	3
8.50	○	8.21 - 8.70	156	68	90.5	1	5.6	3
9.00	●	8.71 - 9.20	162	74	96.5	1	6.3	3
9.50	○	9.21 - 9.70	162	74	96.5	1	6.3	3
10.00	●	9.71 - 10.20	168	80	102.5	1	7	3
10.50	○	10.21 - 10.70	168	80	102.5	1	7	3
11.00	●	10.71 - 11.20	175	84	109.5	1	7.7	3
11.50	○	11.21 - 11.70	175	84	109.5	1	7.7	3
12.00	●	11.71 - 12.20	182	91	116.5	1	8.4	3
12.50	○	12.21 - 12.70	182	91	116.5	1	9.1	3
13.00	●	12.71 - 13.20	182	91	116.5	1	9.1	3
13.50	○	13.21 - 13.70	189	98	123.5	1	9.8	3
14.00	●	13.71 - 14.20	189	98	123.5	1	9.8	3
14.50	○	14.21 - 14.70	212	106	132	2	10.5	3
15.00	●	14.71 - 15.20	212	106	132	2	10.5	3
15.50	○	15.21 - 15.70	218	108	138	2	11.2	3
16.00	●	15.71 - 16.20	218	108	138	2	11.2	3
16.50	○	16.21 - 16.70	223	113	143	2	11.9	3
17.00	●	16.71 - 17.20	223	113	143	2	11.9	3
17.50	○	17.20 - 17.70	228	118	148	2	12.6	3
18.00	●	17.71 - 18.20	228	118	148	2	12.6	3
19.00	●	18.21 - 19.20	233	123	153	2	13.3	3
20.00	●	19.21 - 20.20	238	128	158	2	14	3
21.00	●	20.21 - 21.20	243	129	163	2	14.6	3
22.00	●	21.21 - 22.20	248	134	168	2	15.3	3
23.00	●	22.21 - 23.20	253	139	173	2	16	3
24.00	●	23.21 - 24.20	281	148	182	3	16.6	3

Ø D1 mm		Ø-range mm	L1 mm	L2 mm	LA mm	MT	Ø D5 min. mm	
25.00	●	24.21 - 25.20	281	144	182	3	17.3	3
26.00	●	25.21 - 26.20	286	149	187	3	18	3
27.00	●	26.21 - 27.20	291	154	192	3	18.6	3
28.00	●	27.21 - 28.20	291	162	192	3	19.3	3
29.00	●	28.21 - 29.20	296	167	197	3	20	3
30.00	●	29.21 - 30.20	296	167	197	3	20.5	3
31.00	●	30.21 - 31.20	301	170	202	3	21	3
32.00	●	31.21 - 32.20	334	178	210	4	22	3
33.00	●	32.21 - 33.20	334	178	210	4	23	3
34.00	●	33.21 - 34.20	339	183	215	4	24	3
35.00	●	34.21 - 35.20	339	181	215	4	25	3
36.00	●	35.21 - 36.20	344	186	220	4	25.5	3
37.00	●	36.20 - 37.20	344	186	220	4	26	3
38.00	●	37.20 - 38.20	349	191	225	4	26.5	3
39.00	●	38.21 - 39.20	349	189	225	4	27	3
40.00	●	39.21 - 40.20	349	189	225	4	28	3
41.00	●	40.21 - 41.20	354	194	230	4	28.5	3
42.00	●	41.21 - 42.20	354	194	230	4	29	3
43.00	●	42.21 - 43.20	359	197	235	4	30	3
44.00	●	43.21 - 44.20	359	197	235	4	30.5	3
45.00	●	44.21 - 45.20	359	197	235	4	31	3
46.00	●	45.21 - 46.20	364	202	240	4	32	3
47.00	●	46.21 - 47.20	364	200	240	4	32.5	3
48.00	●	47.21 - 48.20	369	205	245	4	33	3
49.00	●	48.20 - 49.20	369	205	245	4	34	3
50.00	●	49.21 - 50.20	369	205	245	4	34.5	3

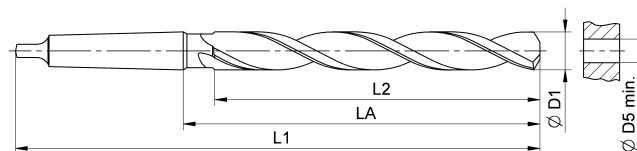
- Ex stock, subject to being unsold
- Delivery on short notice



For intermediate diameters and special tolerances also delivery on short notice.


Core drills undersize


050111

right-hand cutting, 3 flutes, approx. 27° right-hand spiral,
with morse taper shank



	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group 5	 vc / f
	★	★		★	★	★	★	★				

Ø D1 mm		L1 mm	L2 mm	LA mm	MT	Ø D5 min. mm	
7.80	●	156	68	90.5	1	5.6	3
8.80	●	162	74	96.5	1	6.3	3
9.80	●	168	80	102.5	1	7	3
10.75	●	175	84	109.5	1	7.7	3
11.75	●	182	91	116.5	1	8.4	3
12.75	●	182	91	116.5	1	9.1	3
13.75	●	189	98	123.5	1	9.8	3
14.75	●	212	106	132	2	10.5	3
15.75	●	218	108	138	2	11.2	3
16.75	●	223	113	143	2	11.9	3
17.75	●	228	118	148	2	12.6	3
18.70	●	233	123	153	2	13.3	3
19.70	●	238	128	158	2	14	3
20.70	●	243	129	163	2	14.6	3
21.70	●	248	134	168	2	15.3	3
22.70	●	253	139	173	2	16	3
23.70	●	281	148	182	3	16.6	3
24.70	●	281	144	182	3	17.3	3
25.70	●	286	149	187	3	18	3
26.70	●	291	154	192	3	18.6	3
27.70	●	291	162	192	3	19.3	3
28.70	●	296	167	197	3	20	3

Ø D1 mm		L1 mm	L2 mm	LA mm	MT	Ø D5 min. mm	
29.70	●	296	167	197	3	20.5	3
30.60	●	301	170	202	3	21	3
31.60	●	334	178	210	4	22	3
32.60	●	334	178	210	4	23	3
33.60	●	339	183	215	4	24	3
34.60	●	339	181	215	4	25	3
35.60	●	344	186	220	4	25.5	3
36.60	●	344	186	220	4	26	3
37.60	●	349	191	225	4	26.5	3
38.60	●	349	189	225	4	27	3
39.60	●	349	189	225	4	28	3
40.60	●	354	194	230	4	28.5	3
41.60	●	354	194	230	4	29	3
42.60	●	359	197	235	4	30	3
43.60	●	359	197	235	4	30.5	3
44.60	●	359	197	235	4	31	3
45.60	●	364	202	240	4	32	3
46.60	●	364	200	240	4	32.5	3
47.60	●	369	205	245	4	33	3
48.60	●	369	205	245	4	34	3
49.60	●	369	205	245	4	34.5	3

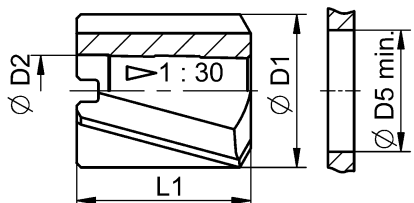
- Ex stock, subject to being unsold
- Delivery on short notice

Shell core drills finish size


050310


right-hand cutting, approx. 15° right-hand spiral, locating bore with 1:30 taper and driving slot to DIN 138, for holders to DIN 217 (please see page 126)

DIN 222 HSS h8



	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group 5	 vc / f
	★	★		★	★	★	★	★				

Ø D1 mm		Ø-range mm	L1 mm	Ø D2 mm	Ø D5 min. mm	
24.00	●	23.20 - 24.20	45	13	20	4
25.00	●	24.21 - 25.20	45	13	21	4
26.00	●	25.21 - 26.20	45	13	22	4
27.00	●	26.21 - 27.20	45	13	23	4
28.00	●	27.21 - 28.20	45	13	24	4
29.00	●	28.21 - 29.20	45	13	25	4
30.00	●	29.21 - 30.20	45	13	26	4
31.00	●	30.21 - 31.20	45	13	27	4
32.00	●	31.21 - 32.20	45	13	28	4
33.00	●	32.21 - 33.20	45	13	29	4
34.00	●	33.21 - 34.20	45	13	30	4
35.00	●	34.21 - 35.20	45	13	31	4
36.00	●	35.21 - 36.20	50	16	31	4
37.00	●	36.21 - 37.20	50	16	32	4
38.00	●	37.21 - 38.20	50	16	33	4
39.00	●	38.21 - 39.20	50	16	34	4
40.00	●	39.21 - 40.20	50	16	35	4
42.00	●	41.21 - 42.20	50	16	37	4
44.00	●	43.21 - 44.20	50	16	39	4
45.00	●	44.21 - 45.20	50	16	40	4
46.00	●	45.21 - 46.20	56	19	40	4
47.00	●	46.21 - 47.20	56	19	41	4

Ø D1 mm		Ø-range mm	L1 mm	Ø D2 mm	Ø D5 min. mm	
48.00	●	47.21 - 48.20	56	19	42	4
50.00	●	49.21 - 50.20	56	19	44	4
52.00	●	51.21 - 52.20	56	19	46	4
55.00	●	54.21 - 55.20	63	22	48	4
58.00	●	57.21 - 58.20	63	22	51	4
60.00	●	59.21 - 60.20	63	22	53	4
62.00	●	61.20 - 62.20	63	22	55	4
65.00	●	64.21 - 65.20	71	27	57	4
68.00	●	67.21 - 68.20	71	27	60	4
70.00	●	69.21 - 70.20	71	27	62	4
72.00	●	71.21 - 72.20	71	27	64	4
75.00	●	74.21 - 75.20	71	27	67	4
78.00	●	76.21 - 78.20	80	32	68	6
80.00	●	79.21 - 80.20	80	32	70	6
82.00	●	81.21 - 82.20	80	32	72	6
85.00	●	84.21 - 85.20	80	32	75	6
88.00	●	86.51 - 88.20	80	32	78	6
90.00	●	88.51 - 90.20	80	32	80	6
95.00	●	93.51 - 95.20	90	40	83	6
98.00	●	96.51 - 98.20	90	40	86	6
100.00	●	98.51 - 100.20	90	40	88	6

- Ex stock, subject to being unsold
- Delivery on short notice

For intermediate diameters and special tolerances also delivery on short notice.

D2 = Nom. dia. D1 of the suitable holder

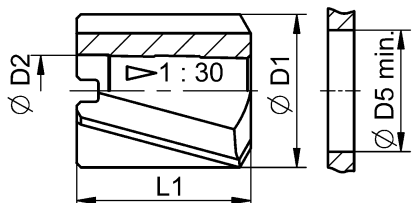
3


Shell core drills undersize


050311

right-hand cutting, approx. 15° right-hand spiral, locating bore with 1:30 taper and driving slot to DIN 138, for holders to DIN 217 (please see page 126)

DIN 222 **HSS** **h8**



	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group 5	 vc / f
	★	★		★	★	★	★	★				

Ø D1 mm		L1 mm	Ø D2 mm	Ø D5 min. mm	
23.70	●	45	13	20	4
24.70	●	45	13	21	4
25.70	●	45	13	22	4
26.70	●	45	13	23	4
27.70	●	45	13	24	4
28.70	●	45	13	25	4
29.70	●	45	13	26	4
30.60	●	45	13	27	4
31.60	●	45	13	28	4
32.60	●	45	13	29	4
33.60	●	45	13	30	4
34.60	●	45	13	31	4
35.60	●	50	16	31	4
36.60	●	50	16	32	4
37.60	●	50	16	33	4
38.60	●	50	16	34	4
39.60	●	50	16	35	4
41.60	●	50	16	37	4
43.60	●	50	16	39	4
44.60	●	50	16	40	4
45.60	●	56	19	40	4
46.60	●	56	19	41	4

Ø D1 mm		L1 mm	Ø D2 mm	Ø D5 min. mm	
47.60	●	56	19	42	4
49.60	●	56	19	44	4
51.50	●	56	19	46	4
54.50	●	63	22	48	4
57.50	●	63	22	51	4
59.50	●	63	22	53	4
61.50	●	63	22	55	4
64.50	●	71	27	57	4
67.50	●	71	27	60	4
69.50	●	71	27	62	4
71.50	●	71	27	64	4
74.50	●	71	27	67	4
77.50	●	80	32	68	6
79.50	●	80	32	70	6
81.50	●	80	32	72	6
84.50	●	80	32	75	6
87.50	●	80	32	78	6
89.50	●	80	32	80	6
94.50	●	90	40	83	6
97.50	●	90	40	86	6
99.50	●	90	40	88	6


- Ex stock, subject to being unsold
- Delivery on short notice

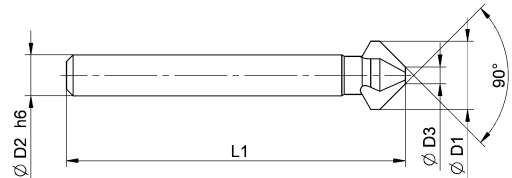
D2 = Nom. dia. D1 of the suitable holder

Taper countersinks 90°


041020


right-hand cutting, with 3 flutes, radially relieved, also suitable for direct clamping in hydraulic and shrink chucks

sim. DIN 335 Type C Solid carbide 



	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group 4	 vc / f p. 188
	★	★	★	★	★	★	★	★	★	★		

Ø D1 mm		Ø D3 mm	L1 mm	Ø D2 mm	
6.30	•	1.5	45	5	3
8.30	•	2	50	6	3
10.40	•	2.5	50	6	3
12.40	•	2.8	56	8	3


Ø D1 mm		Ø D3 mm	L1 mm	Ø D2 mm	
16.50	•	3.2	60	10	3
20.50	•	3.5	63	10	3
25.00	•	3.8	67	10	3
31.00	•	4.2	71	12	3

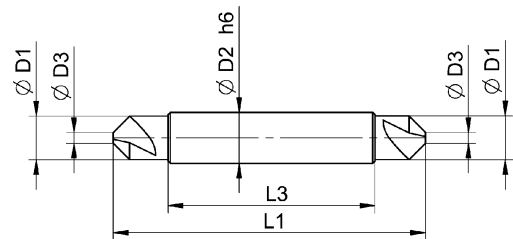
- Ex stock, subject to being unsold
- Delivery on short notice


Taper countersinks 90°


041021

cutting edges on both ends, right-hand cutting, with 3 flutes, radially relieved

sim. DIN 335 Solid carbide 



Ø D1 mm		Ø D3 mm	L1 mm	Ø D2 mm	L3 mm	
8.30	•	2	67	10	46	3
10.40	•	2.5	74	12	47	3

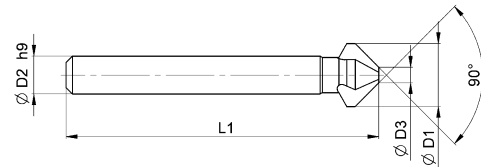
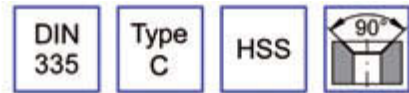
Ø D1 mm		Ø D3 mm	L1 mm	Ø D2 mm	L3 mm	
12.40	•	2.8	76	14	45	3



- Ex stock, subject to being unsold
- Delivery on short notice


Taper countersinks 90°

051209

Standard execution, right-hand cutting, 3 flutes, radially relieved



	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group 5	 vc / f p. 189
	★	★		★	★	★	★	★				

Ø D1 mm		Ø D3 mm	L1 mm	Ø D2 mm	
4.30	•	1.3	40	4	3
4.80	•	1.5	40	4	3
5.00	•	1.5	40	4	3
5.30	•	1.5	40	4	3
5.80	•	1.5	45	5	3
6.00	•	1.5	45	5	3
6.30	•	1.5	45	5	3
7.00	•	1.8	50	6	3
7.30	•	1.8	50	6	3
8.00	•	2	50	6	3
8.30	•	2	50	6	3
9.40	•	2.2	50	6	3
10.00	•	2.5	50	6	3
10.40	•	2.5	50	6	3
11.50	•	2.8	56	8	3
12.40	•	2.8	56	8	3
13.40	•	2.9	56	8	3
14.40	•	3	56	8	3
15.00	•	3.2	60	10	3
16.50	•	3.2	60	10	3
19.00	•	3.5	63	10	3
20.50	•	3.5	63	10	3
23.00	•	3.8	67	10	3
25.00	•	3.8	67	10	3
26.00	•	3.8	67	10	3
28.00	•	4	71	12	3
30.00	•	4.2	71	12	3
31.00	•	4.2	71	12	3

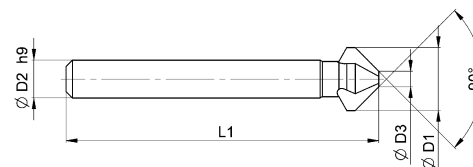
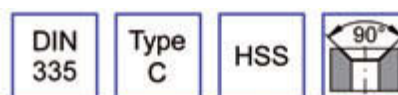
- Ex stock, subject to being unsold
- Delivery on short notice



3


Taper countersinks 90°

051210

Precision execution, right-hand cutting, 3 flutes, radially relieved



	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group 5	 vc / f p. 189
	★	★		★	★	★	★	★				

Ø D1 mm		Ø D3 mm	L1 mm	Ø D2 mm	
4.30	•	1.3	40	4	3
4.80	•	1.5	40	4	3
5.00	•	1.5	40	4	3
5.30	•	1.5	40	4	3
5.80	•	1.5	45	5	3
6.00	•	1.5	45	5	3
6.30	•	1.5	45	5	3
7.00	•	1.8	50	6	3
7.30	•	1.8	50	6	3
8.00	•	2	50	6	3
8.30	•	2	50	6	3
9.40	•	2.2	50	6	3
10.00	•	2.5	50	6	3
10.40	•	2.5	50	6	3
11.50	•	2.8	56	8	3
12.40	•	2.8	56	8	3
13.40	•	2.9	56	8	3
14.40	•	3	56	8	3
15.00	•	3.2	60	10	3
16.50	•	3.2	60	10	3
19.00	•	3.5	63	10	3
20.50	•	3.5	63	10	3
23.00	•	3.8	67	10	3
25.00	•	3.8	67	10	3
26.00	•	3.8	67	10	3
28.00	•	4	71	12	3
30.00	•	4.2	71	12	3
31.00	•	4.2	71	12	3

- Ex stock, subject to being unsold
- Delivery on short notice

Taper countersinks 90°

051220

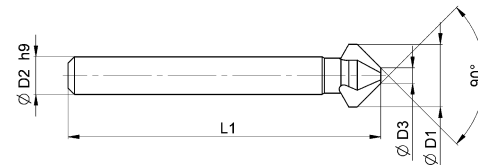
HSS-E precision execution, right-hand cutting, 3 flutes, radially relieved




DIN
335


Type
C

HSS-
E





	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group	 vc / f
	★	★	★	★	★	★	★	★				p. 189

Ø D1 mm		Ø D3 mm	L1 mm	Ø D2 mm	
6.30	•	1.5	45	5	3
8.30	•	2	50	6	3
10.40	•	2.5	50	6	3
12.40	•	2.8	56	8	3
15.00	•	3.2	60	10	3
16.50	•	3.2	60	10	3
20.50	•	3.5	63	10	3
25.00	•	3.8	67	10	3
31.00	•	4.2	71	12	3

- Ex stock, subject to being unsold
- Delivery on short notice

Taper countersinks 90°

053212

Precision execution, right-hand cutting, 3 flutes, radially relieved

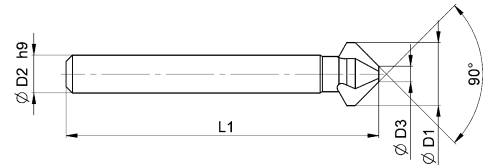
DIN
335



Type
C


HSS

TiAIN





	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group 5	 vc / f p. 189
	★	★	★	★	★	★	★					

Ø D1 mm		Ø D3 mm	L1 mm	Ø D2 mm	
6.30	•	1.5	45	5	3
8.30	•	2	50	6	3
10.40	•	2.5	50	6	3
12.40	•	2.8	56	8	3
15.00	•	3.2	60	10	3
16.50	•	3.2	60	10	3
20.50	•	3.5	63	10	3
25.00	•	3.8	67	10	3
31.00	•	4.2	71	12	3

- Ex stock, subject to being unsold
- Delivery on short notice

Taper countersinks 90°

053210

Precision execution, right-hand cutting, 3 flutes, radially relieved

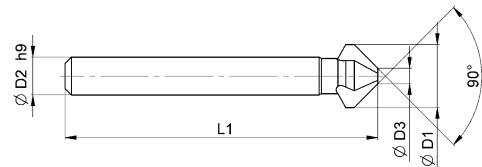
DIN
335



Type
C


HSS

TiN





	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group 	 vc / f p. 189
	★	★	★	★	★	★	★					

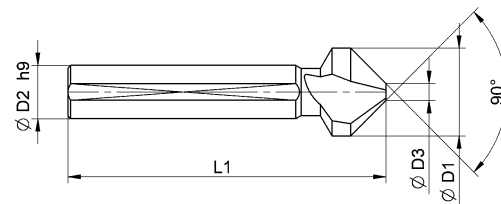
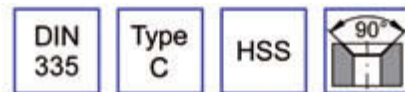
Ø D1 mm		Ø D3 mm	L1 mm	Ø D2 mm	
4.80	•	1.5	40	4	3
5.00	•	1.5	40	4	3
6.00	•	1.5	45	5	3
6.30	•	1.5	45	5	3
7.00	•	1.8	50	6	3
7.30	•	1.8	50	6	3
8.00	•	2	50	6	3
8.30	•	2	50	6	3
9.40	•	2.2	50	6	3
10.00	•	2.5	50	6	3
10.40	•	2.5	50	6	3
11.50	•	2.8	56	8	3
12.40	•	2.8	56	8	3
15.00	•	3.2	60	10	3
16.50	•	3.2	60	10	3
19.00	•	3.5	63	10	3
20.50	•	3.5	63	10	3
23.00	•	3.8	67	10	3
25.00	•	3.8	67	10	3
31.00	•	4.2	71	12	3

- Ex stock, subject to being unsold
- Delivery on short notice


Taper countersinks 90°

051207

Precision execution, right-hand cutting, 3 flutes, radially relieved, shank with 3 driving flats



	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group	 vc / f
	★	★		★	★	★	★	★				p. 189

Ø D1 mm		Ø D3 mm	L1 mm	Ø D2 mm	
11.50	•	2.8	56	8	3
12.40	•	2.8	56	8	3
13.40	•	2.9	56	8	3
15.00	•	3.2	60	10	3
16.50	•	3.2	60	10	3
19.00	•	3.5	63	10	3
20.50	•	3.5	63	10	3
23.00	•	3.8	67	10	3
25.00	•	3.8	67	10	3
26.00	•	3.8	67	10	3
28.00	•	4	71	12	3
30.00	•	4.2	71	12	3
31.00	•	4.2	71	12	3

- Ex stock, subject to being unsold
- Delivery on short notice

Taper countersinks 90°

053207

Precision execution, right-hand cutting, 3 flutes, radially relieved, shank with 3 driving flats

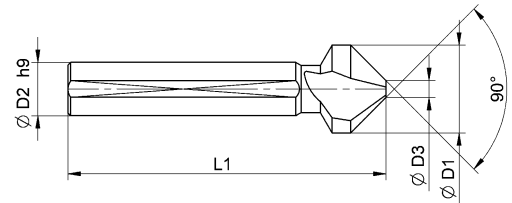
DIN
335

Type
C


HSS

TiN





	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group 5	 vc / f p. 189
	★	★		★	★	★	★					

Ø D1 mm		Ø D3 mm	L1 mm	Ø D2 mm	
11.50	•	2.8	56	8	3
12.40	•	2.8	56	8	3
13.40	•	2.9	56	8	3
15.00	•	3.2	60	10	3
16.50	•	3.2	60	10	3
19.00	•	3.5	63	10	3
20.50	•	3.5	63	10	3
23.00	•	3.8	67	10	3
25.00	•	3.8	67	10	3
31.00	•	4.2	71	12	3

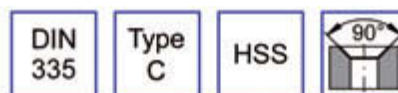
- Ex stock, subject to being unsold
- Delivery on short notice

Sets of taper countersinks 90°

051212

Standard execution

right-hand cutting, 3 flutes, radially relieved, composed of 12 pcs.,
 Ø 5,3 / 5,8 / 6,3 / 7,3 / 8,4 / 9,4 / 10,4 / 12,4 / 13,4 / 16,5 / 20,5 / 25,0 mm



	Steel <900 N ★	Steel 900-1400N ★	VA Stainless steel	GG ★	GGG ★	GGG >GGG50 ★	Cu/Zn/Mg ★	Alu ★	Ti	HRC < 63 HRC	Group 5	 vc / f p. 189
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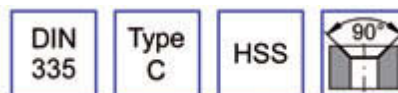
Ex stock, subject to being unsold

Sets of taper countersinks 90°

051218

Standard execution

right-hand cutting, 3 flutes, radially relieved, composed of 5 pcs.,
 Ø 6,3 / 10,4 / 16,5 / 20,5 / 25,0 mm



Ex stock, subject to being unsold




Sets of taper countersinks 90°

053218

Precision execution

right-hand cutting, 3 flutes, radially relieved, composed of 5 pcs.,
 Ø 6,3 / 10,4 / 16,5 / 20,5 / 25,0 mm



	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group	 vc / f
	★	★	★	★	★	★	★					p. 189

Ex stock, subject to being unsold

Sets of taper countersinks 90°

053220

Precision execution

right-hand cutting, 3 flutes, radially relieved, composed of 5 pcs.,
 Ø 6,3 / 10,4 / 16,5 / 20,5 / 25,0 mm

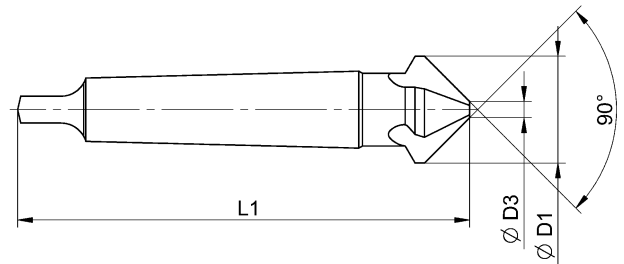



Ex stock, subject to being unsold


Taper countersinks 90°

051309

Standard execution, right-hand cutting, 3 flutes, radially relieved



	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group 5	 vc / f p. 189
	★	★		★	★	★	★	★				

Ø D1 mm		Ø D3 mm	L1 mm	MT	
15.00	•	3.2	85	1	3
16.50	•	3.2	85	1	3
19.00	•	3.5	100	2	3
20.50	•	3.5	100	2	3
23.00	•	3.8	106	2	3
25.00	•	3.8	106	2	3
26.00	•	3.8	106	2	3
28.00	•	4	112	2	3
30.00	•	4.2	112	2	3
31.00	•	4.2	112	2	3
34.00	•	4.5	118	2	3
37.00	•	4.8	118	2	3
40.00	•	10	140	3	3
50.00	•	14	150	3	3
63.00	•	16	180	4	3
80.00	•	22	190	4	3
100.00	•	28	200	4	3

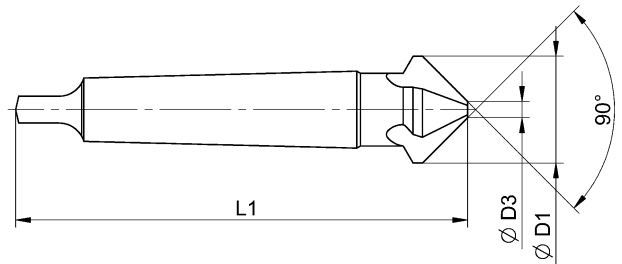
- Ex stock, subject to being unsold
- Delivery on short notice

Taper countersinks 90°


051310

Precision execution, right-hand cutting, 3 flutes, radially relieved

DIN 335
Type D
HSS

	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group 5	 vc / f p. 189
	★	★		★	★	★	★	★				

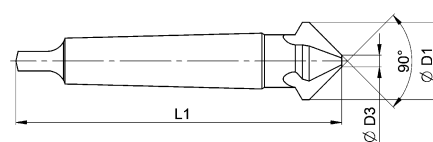
Ø D1 mm		Ø D3 mm	L1 mm	MT	
15.00	•	3.2	85	1	3
16.50	•	3.2	85	1	3
19.00	•	3.5	100	2	3
20.50	•	3.5	100	2	3
23.00	•	3.8	106	2	3
25.00	•	3.8	106	2	3
26.00	•	3.8	106	2	3
28.00	•	4	112	2	3
30.00	•	4.2	112	2	3
31.00	•	4.2	112	2	3
34.00	•	4.5	118	2	3
37.00	•	4.8	118	2	3
40.00	•	10	140	3	3
50.00	•	14	150	3	3
63.00	•	16	180	4	3
80.00	•	22	190	4	3
100.00	•	28	200	4	3



- Ex stock, subject to being unsold
- Delivery on short notice


Taper countersinks 90°


053310

Precision execution, right-hand cutting, 3 flutes, radially relieved



	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group 5	 vc / f p. 189
	★	★	★	★	★	★	★					

Ø D1 mm		Ø D3 mm	L1 mm	MT	
25.00	•	3.8	106	2	3
31.00	•	4.2	112	2	3
37.00	•	4.8	118	2	3

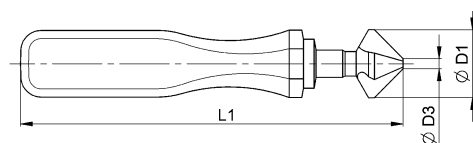
Ø D1 mm		Ø D3 mm	L1 mm	MT	
40.00	•	10	140	3	3
50.00	•	14	150	3	3
63.00	•	16	180	4	3


- Ex stock, subject to being unsold
- Delivery on short notice


Taper countersinks 90°


051211

For manual deburring, right-hand cutting, 3 flutes, radially relieved, with plastic handle



	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group 5	 vc / f
	★	★		★	★	★	★	★				

Ø D1 mm		Ø D3 mm	L1 mm	
12.40	•	2.8	133	3
16.50	•	3.2	135	3

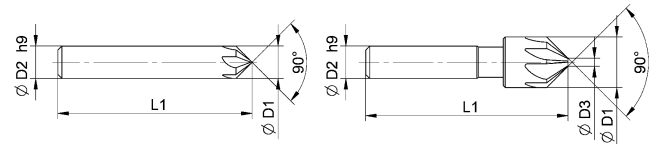
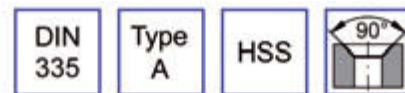
Ø D1 mm		Ø D3 mm	L1 mm	
20.50	•	3.5	138	3
25.00	•	3.8	142	3


- Ex stock, subject to being unsold
- Delivery on short notice


Taper countersinks 90°


050810

Multi-fluted, right-hand cutting, for the machining of materials with tensile strength over 1000 N/mm²



	Steel <900 N ★	Steel 900-1400N ★	VA Stainless steel	GG ★	GGG ★	GGG >GGG50 ★	Cu/Zn/Mg ★	Alu ★	Ti	HRC < 63 HRC ★	Group 5	 vc / f p. 189
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Ø D1 mm		Ø D3 mm	L1 mm	Ø D2 mm	
8.00	•		48	8	5
12.50	•	2	48	8	5

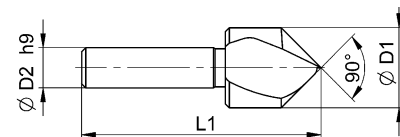
Ø D1 mm		Ø D3 mm	L1 mm	Ø D2 mm	
16.00	•	3.2	56	10	7
20.00	•	5	60	10	7



- Ex stock, subject to being unsold
- Delivery on short notice

Taper countersinks 90°

051011

single-edged, right-hand cutting, radially relieved, sharp point



	Steel <900 N ★	Steel 900-1400N	VA Stainless steel	GG ★	GGG ★	GGG >GGG50	Cu/Zn/Mg ★	Alu ★	Ti	HRC < 63 HRC	Group 5	 vc / f p. 189
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Ø D1 mm		L1 mm	Ø D2 mm
6.00	•	45	6
8.00	•	50	8
10.00	•	49	8
12.50	•	49	8

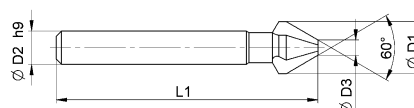
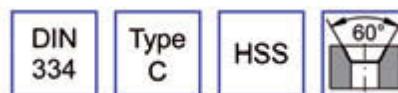
Ø D1 mm		L1 mm	Ø D2 mm
16.00	•	56	10
20.00	•	60	10
25.00	•	75	12
31.50	•	80	12



- Ex stock, subject to being unsold
- Delivery on short notice


Taper countersinks 60°


051110

Precision execution, right-hand cutting, 3 flutes, radially relieved



	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group	 vc / f
	★	★		★	★	★	★	★				p. 189

Ø D1 mm		Ø D3 mm	L1 mm	Ø D2 mm	
6.30	•	1.6	45	5	3
8.00	•	2	50	6	3
10.00	•	2.5	50	6	3
12.50	•	3.2	56	8	3

Ø D1 mm		Ø D3 mm	L1 mm	Ø D2 mm	
16.00	•	4	63	10	3
20.00	•	5	67	10	3
22.50	•	5.6	71	10	3
25.00	•	6.3	71	10	3

- Ex stock, subject to being unsold
- Delivery on short notice

Taper countersinks 60°

053320

Precision execution, right-hand cutting, 3 flutes, radially relieved

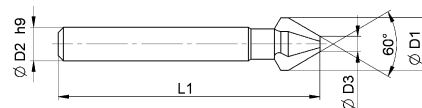
DIN
334

Type
C


HSS


TiN

60°

	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group	 vc / f
	★	★	★	★	★	★	★					p. 189

Ø D1 mm		Ø D3 mm	L1 mm	Ø D2 mm	
6.30	•	1.6	45	5	3
8.00	•	2	50	6	3
10.00	•	2.5	50	6	3
12.50	•	3.2	56	8	3


Ø D1 mm		Ø D3 mm	L1 mm	Ø D2 mm	
16.00	•	4	63	10	3
20.00	•	5	67	10	3
22.50	•	5.6	71	10	3
25.00	•	6.3	71	10	3

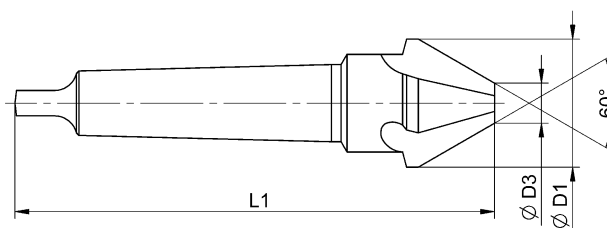
- Ex stock, subject to being unsold
- Delivery on short notice



Taper countersinks 60°


051111

Precision execution, right-hand cutting, 3 flutes, radially relieved

DIN 334
Type D
HSS




	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group 5	 vc / f p. 189
	★	★		★	★	★	★	★				

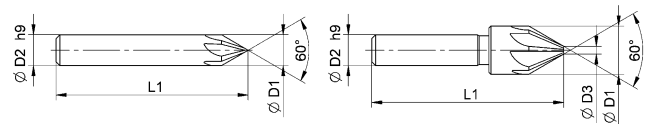
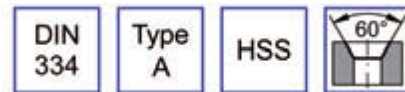
Ø D1 mm		Ø D3 mm	L1 mm	MT	
16.00	•	4	90	1	3
20.00	•	5	106	2	3
25.00	•	6.3	112	2	3
31.50	•	10	118	2	3
40.00	•	12.5	150	3	3
50.00	•	16	160	3	3
63.00	•	20	190	4	3
80.00	•	25	200	4	3

- Ex stock, subject to being unsold
- Delivery on short notice


Taper countersinks 60°


050610

Multi-fluted, right-hand cutting, for the machining of materials with tensile strength over 1000 N/mm²



	Steel <900 N ★	Steel 900-1400N ★	VA Stainless steel	GG ★	GGG ★	GGG >GGG50 ★	Cu/Zn/Mg ★	Alu ★	Ti	HRC < 63 HRC ★	Group 5	 vc / f p. 189
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Ø D1 mm		Ø D3 mm	L1 mm	Ø D2 mm	
8.00	•		50	8	5
12.50	•	2	50	8	5

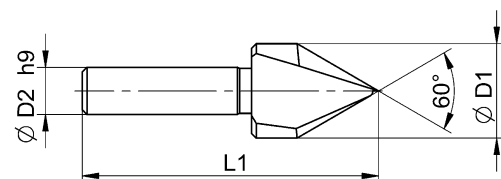
Ø D1 mm		Ø D3 mm	L1 mm	Ø D2 mm	
16.00	•	3.2	60	10	7
20.00	•	5	63	10	7



- Ex stock, subject to being unsold
- Delivery on short notice

Taper countersinks 60°

051010

single-edged, right-hand cutting, radially relieved, sharp point



	Steel <900 N ★	Steel 900-1400N	VA Stainless steel	GG ★	GGG ★	GGG >GGG50	Cu/Zn/Mg ★	Alu ★	Ti	HRC < 63 HRC	Group 5	 vc / f p. 189
--	-----------------------------	---------------------------	------------------------------	----------------	-----------------	----------------------	----------------------	-----------------	-----------	------------------------	-------------------	---

Ø D1 mm		L1 mm	Ø D2 mm
6.00	•	45	6
8.00	•	50	8
10.00	•	52	8
12.50	•	52	8

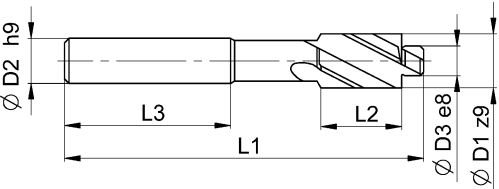
Ø D1 mm		L1 mm	Ø D2 mm
16.00	•	60	10
20.00	•	63	10
25.00	•	82	12
31.50	•	90	12

- Ex stock, subject to being unsold
- Delivery on short notice


Counterbores for fine through hole


051510

right-hand cutting, with solid pilot



	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group 5	 vc / f
	★	★		★	★	★	★	★				

Ø D1 mm		Ø D3 mm	Thread	L1 mm	L2 mm	Ø D2 mm	L3 mm	
6.00	•	3.2	M 3	71	14	5	31.5	3
6.50	•	3.2	M 3	71	14	5	31.5	3
6.50	•	3.7	M 3,5	71	14	5	31.5	3
8.00	•	4.3	M 4	71	14	5	31.5	3
10.00	•	5.3	M 5	80	18	8	35.5	3

Ø D1 mm		Ø D3 mm	Thread	L1 mm	L2 mm	Ø D2 mm	L3 mm	
11.00	•	6.4	M 6	80	18	8	35.5	3
15.00	•	8.4	M 8	100	22	12.5	40	3
18.00	•	10.5	M 10	100	22	12.5	40	3
20.00	•	13	M 12	100	22	12.5	40	3

- Ex stock, subject to being unsold
- Delivery on short notice

Sets of counterbores for fine through hole

051513

right-hand cutting, with solid pilot, composed of 6 pcs., for thread M3, M4, M5, M6, M8, M10, in metal cassette



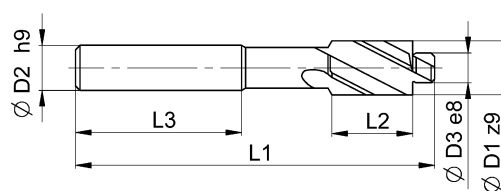
3




Ex stock, subject to being unsold


Counterbores for fine through hole

053510

right-hand cutting, with solid pilot



	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group	 vc / f
	★	★	★	★	★	★	★					

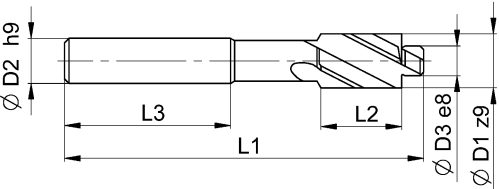
Ø D1 mm		Ø D3 mm	Thread	L1 mm	L2 mm	Ø D2 mm	L3 mm	
6.00	●	3.2	M 3	71	14	5	31.5	3
6.50	●	3.2	M 3	71	14	5	31.5	3
8.00	●	4.3	M 4	71	14	5	31.5	3
10.00	●	5.3	M 5	80	18	8	35.5	3
11.00	●	6.4	M 6	80	18	8	35.5	3
15.00	●	8.4	M 8	100	22	12.5	40	3
18.00	●	10.5	M 10	100	22	12.5	40	3
20.00	●	13	M 12	100	22	12.5	40	3

- Ex stock, subject to being unsold
- Delivery on short notice


Counterbores for medium through hole


051511

right-hand cutting, with solid pilot



	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group 5	 vc / f
	★	★		★	★	★	★	★				

Ø D1 mm		Ø D3 mm	Thread	L1 mm	L2 mm	Ø D2 mm	L3 mm	
6.00	•	3.4	M 3	71	14	5	31.5	3
6.50	•	3.4	M 3	71	14	5	31.5	3
6.50	•	3.9	M 3,5	71	14	5	31.5	3
8.00	•	4.5	M 4	71	14	5	31.5	3
10.00	•	5.5	M 5	80	18	8	35.5	3

Ø D1 mm		Ø D3 mm	Thread	L1 mm	L2 mm	Ø D2 mm	L3 mm	
11.00	•	6.6	M 6	80	18	8	35.5	3
15.00	•	9	M 8	100	22	12.5	40	3
18.00	•	11	M 10	100	22	12.5	40	3
20.00	•	13.5	M 12	100	22	12.5	40	3

- Ex stock, subject to being unsold
- Delivery on short notice

Sets of counterbores for medium through hole

051514

right-hand cutting, with solid pilot, composed of 6 pcs., for thread M3, M4, M5, M6, M8, M10, in metal cassette



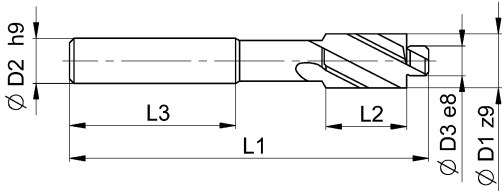
3




Ex stock, subject to being unsold


Counterbores for medium through hole

053511

right-hand cutting, with solid pilot



	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group	 vc / f
	★	★	★	★	★	★	★					

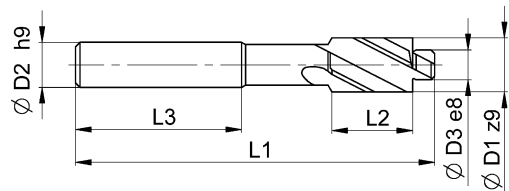
Ø D1 mm		Ø D3 mm	Thread	L1 mm	L2 mm	Ø D2 mm	L3 mm	
6.00	●	3.4	M 3	71	14	5	31.5	3
6.50	●	3.4	M 3	71	14	5	31.5	3
8.00	●	4.5	M 4	71	14	5	31.5	3
10.00	●	5.5	M 5	80	18	8	35.5	3
11.00	●	6.6	M 6	80	18	8	35.5	3
15.00	●	9	M 8	100	22	12.5	40	3
18.00	●	11	M 10	100	22	12.5	40	3
20.00	●	13.5	M 12	100	22	12.5	40	3



- Ex stock, subject to being unsold
- Delivery on short notice


Counterbores for tap hole


051512

Right-hand cutting, with solid pilot



	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group 5	 vc / f
	★	★		★	★	★	★	★				

Ø D1 mm		Ø D3 mm	Thread	L1 mm	L2 mm	Ø D2 mm	L3 mm	
6.00	•	2.5	M 3	71	14	5	31.5	3
6.50	•	2.5	M 3	71	14	5	31.5	3
6.50	•	2.9	M 3,5	71	14	5	31.5	3
8.00	•	3.3	M 4	71	14	5	31.5	3
10.00	•	4.2	M 5	80	18	8	35.5	3

Ø D1 mm		Ø D3 mm	Thread	L1 mm	L2 mm	Ø D2 mm	L3 mm	
11.00	•	5	M 6	80	18	8	35.5	3
15.00	•	6.8	M 8	100	22	12.5	40	3
18.00	•	8.5	M 10	100	22	12.5	40	3
20.00	•	10.2	M 12	100	22	12.5	40	3

- Ex stock, subject to being unsold
- Delivery on short notice

Sets of counterbores for tap hole

051515

right-hand cutting, with solid pilot, composed of 6 pcs., for thread M3, M4, M5, M6, M8, M10, in metal cassette

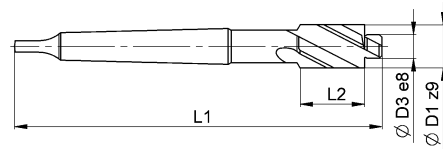



Ex stock, subject to being unsold


Counterbores for fine through hole


051710

right-hand cutting, with solid pilot,
with morse taper shank



	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group 5	 vc / f
	★	★		★	★	★	★	★				

$\varnothing D1$ mm		$\varnothing D3$ mm	Thread	L1 mm	L2 mm	MT	
18.00	●	10.5	M 10	150	25	2	3
20.00	●	13	M 12	150	25	2	3
24.00	●	15	M 14	162	30	2	3
26.00	●	17	M 16	192	35	3	3

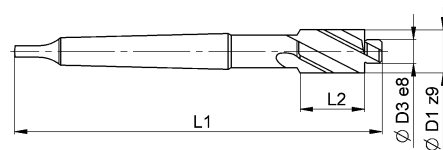
$\varnothing D1$ mm		$\varnothing D3$ mm	Thread	L1 mm	L2 mm	MT	
30.00	●	19	M 18	192	35	3	3
33.00	●	21	M 20	204	40	3	3
36.00	●	23	M 22	204	40	3	3
40.00	●	25	M 24	204	40	3	3



- Ex stock, subject to being unsold
- Delivery on short notice


Counterbores for medium through hole


051711

right-hand cutting, with solid pilot,
with morse taper shank



	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group 5	 vc / f
	★	★		★	★	★	★	★				

$\varnothing D1$ mm		$\varnothing D3$ mm	Thread	L1 mm	L2 mm	MT	
18.00	●	11	M 10	150	25	2	3
20.00	●	13.5	M 12	150	25	2	3
24.00	●	15.5	M 14	162	30	2	3
26.00	●	17.5	M 16	192	35	3	3

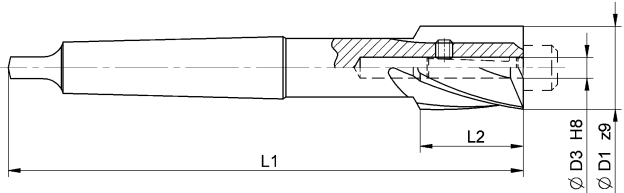
$\varnothing D1$ mm		$\varnothing D3$ mm	Thread	L1 mm	L2 mm	MT	
30.00	●	20	M 18	192	35	3	3
33.00	●	22	M 20	204	40	3	3
36.00	●	24	M 22	204	40	3	3
40.00	●	26	M 24	204	40	3	3

- Ex stock, subject to being unsold
- Delivery on short notice


Counterbores

051610

for detachable pilots to DIN 1868, right-hand cutting,
with morse taper shank



	Steel <900 N	Steel 900-1400N	VA Stainless steel	GG	GGG	GGG >GGG50	Cu/Zn/Mg	Alu	Ti	HRC < 63 HRC	Group 5	 vc / f
	★	★		★	★	★	★	★				

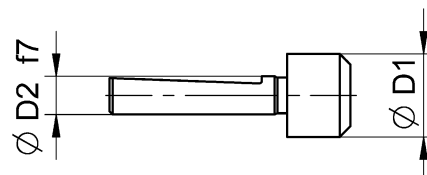
Ø D1 mm		Ø D3 mm	L1 mm	L2 mm	MT	
15.00	•	4	132	22	2	3
18.00	•	5	140	25	2	3
20.00	•	5	140	25	2	3
24.00	•	6	150	30	2	3
26.00	•	8	180	35	3	3
30.00	•	8	180	35	3	3
33.00	•	10	190	40	3	3
36.00	•	10	190	40	3	3
40.00	•	10	190	40	3	3
43.00	•	12	236	50	4	4
46.00	•	12	236	50	4	4
50.00	•	12	236	50	4	4
54.00	•	16	250	63	4	4
58.00	•	16	250	63	4	4
61.00	•	16	250	63	4	4
63.00	•	16	250	63	4	4

- Ex stock, subject to being unsold
- Delivery on short notice

Detachable pilots fine

051611

for counterbores to DIN 375, fine through hole



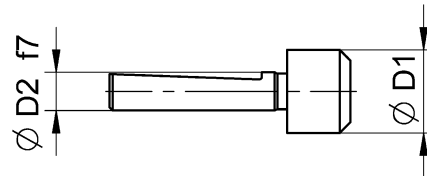
Ø D1 mm		Thread	Ø D2 mm	For counterbore-Ø
8.40	•	M 8	4	15
8.40	•	M 8	5	18 / 20
10.50	•	M 10	5	18 / 20
10.50	•	M 10	6	24
13.00	•	M 12	5	20
13.00	•	M 12	6	24
13.00	•	M 12	8	26
15.00	•	M 14	6	24
15.00	•	M 14	8	26 / 30
17.00	•	M 16	8	26 / 30
17.00	•	M 16	10	33
19.00	•	M 18	8	30
19.00	•	M 18	10	33 / 36
21.00	•	M 20	10	33 / 36 / 40
23.00	•	M 22	10	36 / 40
23.00	•	M 22	12	43
25.00	•	M 24	10	40
25.00	•	M 24	12	43 / 46

- Ex stock, subject to being unsold
- Delivery on short notice

Detachable pilots medium

051611

for counterbores to DIN 375, medium through hole



Ø D1 mm		Thread	Ø D2 mm	For counterbore-Ø
9.00	•	M 8	4	15
9.00	•	M 8	5	18 / 20
11.00	•	M 10	5	18 / 20
11.00	•	M 10	6	24
13.50	•	M 12	5	20
13.50	•	M 12	6	24
13.50	•	M 12	8	26
15.50	•	M 14	6	24
15.50	•	M 14	8	26 / 30
17.50	•	M 16	8	26 / 30
17.50	•	M 16	10	33
20.00	•	M 18	8	30
20.00	•	M 18	10	33 / 36
22.00	•	M 20	10	33 / 36 / 40
24.00	•	M 22	10	36 / 40
24.00	•	M 22	12	43
26.00	•	M 24	10	40
26.00	•	M 24	12	43 / 46
30.00	•	M 27	12	43 / 46
30.00	•	M 27	16	54
33.00	•	M 30	12	50
33.00	•	M 30	16	54 / 61
36.00	•	M 33	16	54 / 58 / 63
39.00	•	M 36	16	58 / 61

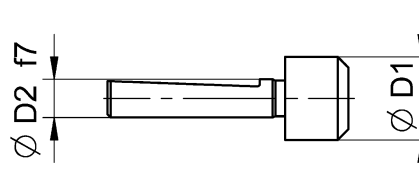
- Ex stock, subject to being unsold
- Delivery on short notice

3

Detachable pilots tap hole

051611

for counterbores to DIN 375, tap hole



Ø D1 mm		Thread	Ø D2 mm	For counterbore-Ø
6.80	•	M 8	4	15
6.80	•	M 8	5	18 / 20
8.50	•	M 10	5	18 / 20
8.50	•	M 10	6	24
10.20	•	M 12	5	20
10.20	•	M 12	6	24
10.20	•	M 12	8	26
12.00	•	M 14	6	24
12.00	•	M 14	8	26 / 30
14.00	•	M 16	8	26 / 30
14.00	•	M 16	10	33
15.50	•	M 18	8	30
15.50	•	M 18	10	33 / 36
17.50	•	M 20	10	33 / 36 / 40
19.50	•	M 22	10	36 / 40
19.50	•	M 22	12	43
21.00	•	M 24	10	40
21.00	•	M 24	12	43 / 46
24.00	•	M 27	12	43 / 46
24.00	•	M 27	16	54
26.50	•	M 30	12	50
26.50	•	M 30	16	54 / 61
29.50	•	M 33	16	54 / 58 / 63
32.00	•	M 36	16	58 / 61

- Ex stock, subject to being unsold
- Delivery on short notice

Special tools

BECK 





The continuing development of high-performance reamers together with the modern production facilities at BECK offer the best preconditions also for the creation of special solutions. Starting from semi-standard versions with, for example, special tolerances, modified working lengths or modified cutting materials and cutting leads, the specialists at BECK can also design application-specific reamers. Multi-step reamers, for example, offer further improvements in productivity and profitability.

Technical annex

Useful information on reamers	P. 179
Application data – HLR Cermet	P. 180
Application data – HLR solid carbide + coating	P. 181
Application data – HLR solid carbide	P. 182
Application data – MR 01 - MR 03 / XR	P. 183
Application data – VR	P. 184
Application data – machine reamers carbide + coating	P. 185
Application data – machine reamers carbide	P. 186
Application data – machine reamers HSS-E	P. 187
Application data – Countersinks solid carbide	P. 188
Application data – Countersinks HSS	P. 189
Cooling lubricant recommendations	P. 190
Troubleshooting on reamers	P. 191
Manufacturing tolerances and limit dimensions	P. 192
Reamers – manufacturing tolerances	P. 193
Limit dimensions for bores	P. 196
Enquiry form	P. 199
BECK regrinding service	P. 200
Series index	P. 201
Explanation of symbols and pictograms, ordering example	P. 202

BECK



Useful information on reamers

Tool construction:

Multi-bladed reamers of HSS-E, carbide, Cermet and with PCD tips are characterised in particular by their simple handling. Thanks to the designed of the minor cutting edge as an circular land chamfer which tapers axially in its diameter, these tools are reliably guided in the bore even under fairly poor cutting conditions.

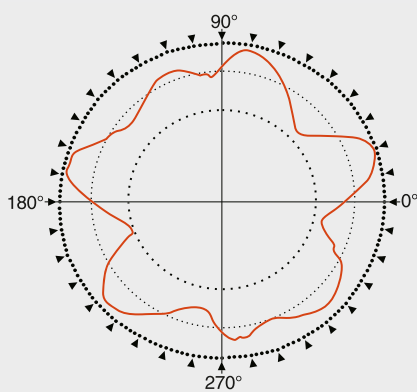
Reamers are generally used at the end of the value-added chain or a part. The demands on the process reliability of these tools is therefore correspondingly high.

BECK reamers meet these demands through a series of design and production features:

1. EU spacing for a better bore geometry
2. Highest grinding quality in the chip space for reliable chip transport
3. Highest grinding quality at the guide chamfers for the highest surface qualities
4. Double-sided centering on the tool for highest dimensional precision during production
5. Special geometries for the machining of rustproof stainless steels and hardened materials

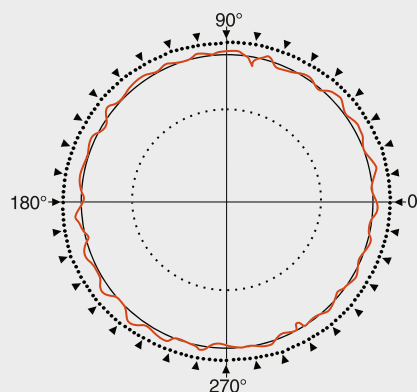
Comparison of unequal pitch / EU pitch

Unequal spacing Circularity fault up to 10 μ



Roundness results


Extreme unequal spacing (EU) Circularity fault 1-2 μ



Roundness results




Application data for high-performance reamers of Cermet with internal cooling lubricant supply

Workpiece material 	Cutting speed v_c [m/min] Feed f [mm/rev] bore allowance a in dia. [mm]	dia. [mm]					
		<5	5-8	8-12	12-16	16-30	30-50
Steel < 700 N/mm ²	v_c	100-200					
	f	0,08-0,12	0,1-0,4	0,3-0,8	0,5-1,0	0,8-1,2	0,8-2,0
	a	0,1-0,15	0,15-0,2	0,2-0,3	0,2-0,3	0,2-0,3	0,3-0,5
Steel 700-900 N/mm ²	v_c	80-120					
	f	0,08-0,12	0,1-0,4	0,3-0,8	0,5-1,0	0,8-1,2	0,8-2,0
	a	0,1-0,15	0,15-0,2	0,2-0,3	0,2-0,3	0,2-0,3	0,3-0,5
Steel 900-1200 N/mm ² *1	v_c	80-100					
	f	0,08-0,12	0,1-0,3	0,3-0,6	0,3-0,8	0,5-1,0	0,8-1,5
	a	0,08-0,12	0,1-0,2	0,2-0,3	0,2-0,3	0,2-0,3	0,3-0,5
Stainless steel < 700 N/mm ²	v_c	-					
	f	-	-	-	-	-	-
	a	-	-	-	-	-	-
Stainless steel > 700N/mm ²	v_c	-					
	f	-	-	-	-	-	-
	a	-	-	-	-	-	-
Grey cast iron (GG)	v_c	-					
	f	-	-	-	-	-	-
	a	-	-	-	-	-	-
Spheroidal graphite cast iron (bis GGG 50)	v_c	80-140					
	f	0,1-0,15	0,15-0,5	0,3-0,8	0,4-1,2	0,8-1,2	1,0-2,5
	a	0,1-0,15	0,15-0,25	0,2-0,3	0,2-0,3	0,2-0,3	0,3-0,5
Spheroidal graphite cast iron (> GGG 50) *2	v_c	80-100					
	f	0,1-0,15	0,15-0,25	0,3-0,8	0,4-1,2	0,8-1,2	1,0-2,5
	a	0,1-0,15	0,15-0,25	0,2-0,3	0,2-0,3	0,2-0,3	0,3-0,5
Cu / Zn / Mg alloys	v_c	-					
	f	-	-	-	-	-	-
	a	-	-	-	-	-	-
Aluminium alloys (Si<7 %)	v_c	-					
	f	-	-	-	-	-	-
	a	-	-	-	-	-	-
Aluminium alloys (Si>7 %)	v_c	-					
	f	-	-	-	-	-	-
	a	-	-	-	-	-	-
Plastics, soft	v_c	-					
	f	-	-	-	-	-	-
	a	-	-	-	-	-	-
Plastics, hard	v_c	-					
	f	-	-	-	-	-	-
	a	-	-	-	-	-	-
Titanium	v_c	-					
	f	-	-	-	-	-	-
	a	-	-	-	-	-	-
Hardened materials < 63 HRC	v_c	-					
	f	-	-	-	-	-	-
	a	-	-	-	-	-	-

*1 Materials above 1000 N have limited machinability with Cermet

*2 > GGG 60 have limited machinability with Cermet

Application data for high-performance reamers of solid carbide + coating with internal cooling lubricant supply


Workpiece material 	Cutting speed v_c [m/min] Feed f [mm/rev] bore allowance a in dia. [mm]	dia. [mm]					
		<5	5-8	8-12	12-16	16-30	30-50
Steel < 700 N/mm ²	v_c	120-250					
	f	0,3-0,5	0,4-1,0	0,6-1,4	0,8-2,2	0,8-2,2	1,0-3,0
	a	0,1	0,1-0,2	0,1-0,2	0,2-0,3	0,2-0,3	0,3-0,5
Steel 700-900 N/mm ²	v_c	120-250					
	f	0,3-0,5	0,4-1,0	0,6-1,4	0,8-2,2	0,8-2,2	1,0-3,0
	a	0,1	0,1-0,2	0,1-0,2	0,2-0,3	0,2-0,3	0,3-0,5
Steel 900-1200 N/mm ²	v_c	120-250					
	f	0,3-0,5	0,4-1,0	0,6-1,4	0,8-2,2	0,8-2,2	1,0-3,0
	a	0,1-0,15	0,15-0,2	0,15-0,2	0,2-0,3	0,2-0,3	0,3-0,5
Stainless steel < 700 N/mm ² *1	v_c	20-60					
	f	0,1-0,15	0,15-0,2	0,3-0,5	0,4-0,6	0,5-1,0	1,0-2,0
	a	0,05-0,1	0,1-0,15	0,1-0,2	0,15-0,2	0,15-0,25	0,2-0,3
Stainless steel > 700N/mm ² *1	v_c	20-40					
	f	0,1-0,15	0,15-0,2	0,3-0,5	0,4-0,6	0,5-1,0	1,0-2,0
	a	0,05-0,1	0,1-0,15	0,1-0,2	0,15-0,2	0,15-0,25	0,2-0,3
Grey cast iron (GG)	v_c	80-160					
	f	0,3-0,5	0,4-1,0	0,6-1,4	0,8-2,2	0,8-2,2	1,0-3,0
	a	0,1-0,15	0,15-0,2	0,15-0,25	0,2-0,3	0,2-0,3	0,3-0,5
Spheroidal graphite cast iron (bis GGG 50)	v_c	120-250					
	f	0,3-0,5	0,4-1,0	0,6-1,4	0,8-2,2	0,8-2,2	1,0-3,0
	a	0,1-0,15	0,15-0,2	0,15-0,25	0,2-0,3	0,2-0,3	0,3-0,5
Spheroidal graphite cast iron (> GGG 50)	v_c	60-120					
	f	0,3-0,5	0,4-1,0	0,6-1,4	0,8-2,2	0,8-2,2	1,0-3,0
	a	0,1-0,15	0,15-0,2	0,15-0,25	0,2-0,3	0,2-0,3	0,3-0,5
Cu / Zn / Mg - alloys	v_c	-					
	f	-	-	-	-	-	-
	a	-	-	-	-	-	-
Aluminium alloys (Si<7 %) *3	v_c	200-300					
	f	0,6-0,8	1,0-1,5	1,2-2,0	1,5-2,2	1,5-2,2	-
	a	0,1-0,15	0,2-0,3	0,2-0,3	0,25-0,35	0,3-0,4	-
Aluminium alloys (Si>7 %) *3	v_c	250-350					
	f	0,6-0,8	1,0-1,5	1,2-2,0	1,5-2,2	1,5-2,2	-
	a	0,1-0,15	0,2-0,3	0,2-0,3	0,25-0,35	0,3-0,4	-
Plastics, soft	v_c	-					
	f	-	-	-	-	-	-
	a	-	-	-	-	-	-
Plastics, hard	v_c	80-200					
	f	0,3-0,5	0,4-1,0	0,6-1,4	0,8-2,2	0,8-2,2	1,0-3,0
	a	0,1-0,15	0,15-0,2	0,15-0,25	0,2-0,3	0,2-0,3	0,3-0,5
Titanium	v_c	-					
	f	-	-	-	-	-	-
	a	-	-	-	-	-	-
Hardened materials < 63 HRC *2	v_c	8-12					
	f	0,05-0,1	0,1-0,15	0,1-0,15	0,15-0,2	0,15-0,25	0,2-0,3
	a	0,05-0,1	0,1-0,15	0,15-0,2	0,15-0,2	0,15-0,25	0,2-0,3

*1 HNC-VA high-performance reamer (with special geometry)

*2 HNC-HT high-performance reamer (with special geometry)


*3 HNC-AL high-performance reamer (with special geometry)

Application data for high-performance reamers of solid carbide with internal cooling lubricant supply

Workpiece material 	Cutting speed v_c [m/min] Feed f [mm/rev] bore allowance a in dia. [mm]	dia. [mm]					
		<5	5-8	8-12	12-16	16-30	30-50
Steel < 700 N/mm ²	v_c	20-40					
	f	0,1-0,15	0,15-0,2	0,15-0,2	0,2-0,3	0,25-0,4	0,3-0,5
	a	0,1	0,1-0,2	0,1-0,2	0,2-0,3	0,2-0,3	0,3-0,5
Stahl, 700-900 N/mm ²	v_c	15-30					
	f	0,1-0,15	0,15-0,2	0,15-0,2	0,2-0,3	0,25-0,4	0,3-0,5
	a	0,1	0,1-0,2	0,1-0,2	0,2-0,3	0,2-0,3	0,3-0,5
Steel 900-1200 N/mm ²	v_c	10-20					
	f	0,1-0,15	0,15	0,15-0,2	0,15-0,25	0,25-0,3	0,3-0,5
	a	0,1-0,15	0,15-0,2	0,15-0,2	0,2-0,3	0,2-0,3	0,3-0,5
Stainless steel < 700 N/mm ²	v_c	-					
	f	-	-	-	-	-	-
	a	-	-	-	-	-	-
Stainless steel > 700N/mm ²	v_c	-					
	f	-	-	-	-	-	-
	a	-	-	-	-	-	-
Grey cast iron (GG)	v_c	20-40					
	f	0,1-0,15	0,12-0,16	0,15-0,25	0,2-0,25	0,25-0,4	0,3-0,5
	a	0,1-0,15	0,15-0,2	0,15-0,25	0,2-0,3	0,2-0,3	0,3-0,5
Spheroidal graphite cast iron (bis GGG 50)	v_c	15-30					
	f	0,1-0,15	0,12-0,16	0,15-0,25	0,2-0,3	0,25-0,4	0,3-0,5
	a	0,1-0,15	0,15-0,2	0,15-0,25	0,2-0,3	0,2-0,3	0,3-0,5
Spheroidal graphite cast iron (> GGG 50)	v_c	10-25					
	f	0,1-0,15	0,12-0,16	0,15-0,25	0,2-0,3	0,25-0,4	0,3-0,5
	a	0,1-0,15	0,15-0,2	0,15-0,25	0,2-0,3	0,2-0,3	0,3-0,5
Cu / Zn / Mg alloys	v_c	30-80					
	f	0,1-0,16	0,15-0,2	0,15-0,3	0,25-0,35	0,25-0,4	0,3-0,5
	a	0,1-0,15	0,15-0,2	0,15-0,2	0,2-0,3	0,2-0,3	0,3-0,5
Aluminium alloys (Si<7 %)	v_c	30-80					
	f	0,12-0,16	0,15-0,2	0,15-0,3	0,25-0,35	0,25-0,4	0,3-0,5
	a	0,1-0,15	0,15-0,2	0,15-0,2	0,2-0,3	0,2-0,3	0,3-0,5
Aluminium alloys (Si>7 %)	v_c	20-50					
	f	0,12-0,16	0,15-0,2	0,15-0,3	0,25-0,35	0,25-0,4	0,3-0,5
	a	0,1-0,15	0,15-0,2	0,15-0,2	0,2-0,3	0,2-0,3	0,3-0,5
Plastics, soft	v_c	20-80					
	f	0,12-0,16	0,15-0,2	0,15-0,3	0,25-0,35	0,25-0,4	0,3-0,5
	a	0,1-0,15	0,15-0,2	0,15-0,2	0,2-0,3	0,2-0,3	0,3-0,5
Plastics, hard	v_c	20-40					
	f	0,12-0,16	0,15-0,2	0,15-0,3	0,25-0,35	0,25-0,4	0,3-0,5
	a	0,1-0,15	0,15-0,2	0,15-0,2	0,2-0,3	0,2-0,3	0,3-0,5
Titanium *1	v_c	12-30					
	f	0,06-0,08	0,08-0,1	0,1-0,15	0,15-0,2	0,2-0,3	0,3-0,35
	a	0,05-0,1	0,1-0,15	0,1-0,2	0,15-0,2	0,15-0,25	0,2-0,3
Hardened materials < 63 HRC	v_c	-					
	f	-	-	-	-	-	-
	a	-	-	-	-	-	-

*1 Only with special cutting geometry

Application data for high-performance reamers type MR / XR with internal cooling lubricant supply

	Cutting material suitable for	Cutting speed v_c [m/min] Feed f [mm/rev] bore allowance a in dia. [mm]	dia. [mm]			
			8-12	12-16	16-30	30-40
Cermet	Steel < 700 N/mm ²	v_c	100-200			
		f	0,6-0,8	1,2-1,5	1,2-1,8	2,4-4
		a	0,1-0,2	0,2-0,3	0,2-0,3	0,3-0,5
	Steel 700-900 N/mm ²	v_c	80-120			
		f	0,6-0,8	1,2-1,5	1,2-1,8	2,4-4
		a	0,1-0,2	0,2-0,3	0,2-0,3	0,3-0,5
Carbide + Coating	Steel 900-1200 N/mm ²	v_c	120-250			
		f	0,6-0,8	1,2-1,5	1,2-1,8	2,4-4
		a	0,1-0,2	0,2-0,3	0,2-0,3	0,3-0,5
Carbide + Coating	Stainless steel < 700 N/mm ²	v_c	20-60			
		f	0,3-0,5	0,4-0,6	0,5-1,0	1,0-1,5
		a	0,1-0,2	0,2-0,3	0,2-0,3	0,3-0,5
Carbide + Coating	Stainless steel > 700N/mm ²	v_c	20-40			
		f	0,3-0,5	0,4-0,6	0,5-1,0	1,0-1,5
		a	0,1-0,2	0,2-0,3	0,2-0,3	0,3-0,5
Carbide + Coating	Grey cast iron (GG)	v_c	80-160			
		f	0,6-1,2	1,2-1,8	1,2-2,4	2,4-4
		a	0,1-0,2	0,2-0,3	0,2-0,3	0,3-0,5
Cermet	Spheroidal graphite cast iron (bis GGG 50)	v_c	80-140			
		f	0,6-1,2	1,2-1,8	1,2-2,4	2,4-4
		a	0,1-0,2	0,2-0,3	0,2-0,3	0,3-0,5
Carbide + Coating	Spheroidal graphite cast iron (> GGG 50)	v_c	80-100			
		f	0,6-1,2	1,2-1,8	1,2-2,4	2,4-4
		a	0,1-0,2	0,2-0,3	0,2-0,3	0,3-0,5
Carbide	Cu / Zn / Mg alloys	v_c	30-80			
		f	0,6-1,2	1,5-2,1	1,5-2,4	2,4-4
		a	0,15-0,2	0,2-0,3	0,2-0,3	0,3-0,5
	Aluminium alloys (Si<7 %)	v_c	30-80			
		f	0,6-1,2	1,5-2,1	1,5-2,4	2,4-4
	Aluminium alloys (Si>7 %)	v_c	20-50			
f		0,6-1,2	1,5-2,1	1,5-2,4	2,4-4	
Plastics, soft		v_c				
		f	-	-	-	-
		a	-	-	-	-
Plastics, hard		v_c				
		f	-	-	-	-
		a	-	-	-	-
Carbide + Coating	Titanium *1	v_c	12-30			
		f	0,4 - 0,6	1,4 - 2,8	1,4 - 3,6	2,5 - 6,4
		a	0,1 - 0,2	0,15 - 0,2	0,15 - 0,25	0,2 - 0,3
Carbide + Coating	Hardened materials < 63 HRC *2	v_c	8-12			
		f	0,4 - 0,6	0,9 - 2,1	0,9 - 2,1	2,4 - 3,8
		a	0,1 - 0,2	0,15 - 0,2	0,15 - 0,25	0,2 - 0,3


*1 Only with special cutting geometry

*2 With special coating and cutting geometry

Application data for VR 01 multi-tooth reamers with internal cooling lubricant supply

	Cutting material suitable for	No. of blades	6	8	10	12	14	16	18
		dia. mm	10-11,75	11,76-13,75	13,76-17,75	17,76-21,75	21,76-24,75	24,76-30,25	30,26-40
Cermet	Steel < 700 N/mm ²	v _c	100-250						
		fz	0,08-0,13						
		f = mm/rev.	0,5-0,8	0,6-1,0	0,8-1,3	1,0-1,5	1,2-1,8	1,3-2	1,44-2,34
		bore allowance	0,1-0,2	0,1-0,2	0,1-0,3	0,1-0,3	0,1-0,3	0,1-0,3	0,1-0,3
	Steel 700-900 N/mm ²	v _c	100-250						
		fz	0,08-0,13						
		f = mm/rev.	0,5-0,8	0,6-1,0	0,8-1,3	1,0-1,5	1,2-1,8	1,3-2	1,44-2,34
		bore allowance	0,1-0,2	0,1-0,2	0,1-0,3	0,1-0,3	0,1-0,3	0,1-0,3	0,1-0,3
	Steel 900-1200 N/mm ²	v _c	80-200						
		fz	0,08-0,13						
		f = mm/rev.	0,5-0,8	0,6-1,0	0,8-1,3	1,0-1,5	1,2-1,8	1,3-2	1,44-2,34
		bore allowance	0,1-0,2	0,1-0,2	0,1-0,3	0,1-0,3	0,1-0,3	0,1-0,3	0,1-0,3
Carbide + Coating	VA / stainless steel	v _c	20-60						
		fz	0,08-0,1						
		f = mm/rev.	0,4-0,6	0,6-0,8	0,8-1	0,9-1,2	1,1-1,4	1,2-1,6	1,4-1,8
		bore allowance	0,1	0,15	0,1-0,2	0,1-0,2	0,1-0,3	0,1-0,3	0,1-0,3
CBN	Grey cast iron (GG)	v _c	200-400						
		fz	0,2-0,5						
		f = mm/rev.	1,2-1,5	1,6-4	2,0-5,0	2,4-6	2,8-7	3,2-8	3,6-9
		bore allowance	0,1-0,2	0,1-0,2	0,1-0,3	0,1-0,3	0,1-0,3	0,1-0,3	0,1-0,3
Carbide + Coating	Grey cast iron (GG)	v _c	60-160						
		fz	0,15-0,25						
		f = mm/rev.	0,9-1,5	1,2-2	1,5-2,5	1,8-3	2,1-3,5	2,4-4	2,7-4,5
		bore allowance	0,1-0,2	0,1-0,2	0,1-0,3	0,1-0,3	0,1-0,3	0,1-0,3	0,1-0,3
Cermet	Spheroidal graphite cast iron (GGG)	v _c	80-200						
		fz	0,1-0,4						
		f = mm/rev.	0,6-2,4	0,8-3,2	1,0-4,0	1,2-4,8	1,4-5,6	1,6-6,4	1,8-7,2
		bore allowance	0,1-0,2	0,1-0,2	0,1-0,3	0,1-0,3	0,1-0,3	0,1-0,3	0,1-0,3
Carbide	Brass / copper Cu / Zn / Mg alloys	v _c	180						
		fz	0,1-0,4						
		f = mm/rev.	0,6-2,4	0,8-4	1,0-4,0	1,2-4,8	1,4-5,6	1,6-6,4	1,8-7,2
		bore allowance	0,1-0,2	0,1-0,2	0,1-0,3	0,1-0,3	0,1-0,3	0,1-0,3	0,1-0,3
PCD	Aluminium	v _c	300-400						
		fz	0,075-0,3						
		f = mm/rev.	0,5-1,8	0,6-2,4	0,8-3,0	0,9-3,6	1,0-4,2	1,2-4,8	1,35-5,4
		bore allowance	0,1-0,2	0,1-0,2	0,1-0,3	0,1-0,3	0,1-0,3	0,1-0,3	0,1-0,3
Carbide	Aluminium	v _c	30-80						
		fz	0,04-0,1						
		f = mm/rev.	0,24-0,6	0,32-0,8	0,4-1,0	0,48-1,2	0,56-1,4	0,64-1,6	0,72-1,8
		bore allowance	0,1-0,2	0,1-0,2	0,1-0,3	0,1-0,3	0,1-0,3	0,1-0,3	0,1-0,3
CBN	hardened steel 58-65 HRC	v _c	60-120						
		fz	0,02-0,05						
		f = mm/rev.	0,12-0,3	0,16-0,4	0,2-0,5	0,24-0,6	0,28-0,7	0,32-0,8	0,36-0,9
		bore allowance	0,05-0,2	0,05-0,2	0,05-0,2	0,05-0,2	0,05-0,2	0,05-0,2	0,05-0,2

Application data for machine reamers of carbide + coating without inner cooling lubricant supply

Workpiece material		Cutting speed v_c [m/min] Feed f [mm/rev] bore allowance a in dia. [mm]	dia. [mm]					
			<5	5-8	8-12	12-16	16-30	30-50
Steel < 700 N/mm ²		v_c	25-35					
		f	0,1-0,15	0,15	0,15-0,2	0,2-0,25	0,2-0,3	0,3-0,5
		a	0,1	0,1-0,2	0,1-0,2	0,2-0,3	0,2-0,3	0,3-0,5
Steel 700-900 N/mm ²		v_c	20-30					
		f	0,1-0,15	0,15	0,15-0,2	0,2-0,25	0,2-0,3	0,3-0,5
		a	0,1	0,1-0,2	0,1-0,2	0,2-0,3	0,2-0,3	0,3-0,5
Steel 900-1200 N/mm ²		v_c	12-20					
		f	0,1-0,15	0,15	0,15-0,2	0,2-0,25	0,2-0,3	0,3-0,5
		a	0,1	0,1-0,2	0,1-0,2	0,2-0,3	0,2-0,3	0,3-0,5
Stainless steel < 700 N/mm ² *1		v_c	15-20					
		f	0,08-0,15	0,1	0,1-0,2	0,2-0,25	0,2-0,3	0,3-0,5
		a	0,08-0,15	0,1	0,1-0,2	0,2-0,3	0,2-0,3	0,3-0,5
Stainless steel > 700N/mm ² *1		v_c	10-18					
		f	0,08-0,15	0,1	0,1-0,2	0,2-0,25	0,2-0,3	0,3-0,5
		a	0,08-0,15	0,1	0,1-0,2	0,2-0,3	0,2-0,3	0,3-0,5
Grey cast iron (GG)		v_c	20-35					
		f	0,1-0,15	0,15-0,2	0,15-0,3	0,2-0,3	0,2-0,4	0,3-0,5
		a	0,1-0,15	0,1-0,2	0,1-0,2	0,2-0,3	0,2-0,3	0,3-0,5
Spheroidal graphite cast iron (up to GGG 50)		v_c	20-30					
		f	0,1-0,15	0,15-0,2	0,15-0,3	0,2-0,3	0,2-0,4	0,3-0,5
		a	0,1-0,15	0,1-0,2	0,1-0,2	0,2-0,3	0,2-0,3	0,3-0,5
Spheroidal graphite cast iron (> GGG 50)		v_c	15-20					
		f	0,1-0,15	0,15-0,20	0,15-0,3	0,2-0,3	0,2-0,4	0,3-0,5
		a	0,1-0,15	0,1-0,2	0,1-0,2	0,2-0,3	0,2-0,3	0,3-0,5
Cu / Zn / Mg alloys		v_c	-					
		f	-	-	-	-	-	-
		a	-	-	-	-	-	-
Aluminium alloys (Si<7 %)		v_c	-					
		f	-	-	-	-	-	-
		a	-	-	-	-	-	-
Aluminium alloys (Si>7 %)		v_c	-					
		f	-	-	-	-	-	-
		a	-	-	-	-	-	-
Plastics, soft		v_c	-					
		f	-	-	-	-	-	-
		a	-	-	-	-	-	-
Plastics, hard		v_c	20-30					
		f	0,12-0,16	0,15-0,2	0,15-0,25	0,25-0,35	0,2-0,3	0,3-0,5
		a	0,1-0,15	0,15-0,2	0,2-0,3	0,2-0,3	0,3-0,4	0,3-0,5
Titanium		v_c	-					
		f	-	-	-	-	-	-
		a	-	-	-	-	-	-
Hardened materials < 63 HRC		v_c	-					
		f	-	-	-	-	-	-
		a	-	-	-	-	-	-

*1 Only with special cutting geometry


Attention: For cutting depths >2 x dia. aim for lower values.

Application data for machine reamers of carbide without inner cooling lubricant supply


Workpiece material 	Cutting speed v_c [m/min] Feed f [mm/rev] bore allowance a in dia. [mm]	dia. [mm]					
		<5	5-8	8-12	12-16	16-30	30-50
Steel < 700 N/mm ²	v_c	15-20					
	f	0,1-0,15	0,15	0,15-0,2	0,2-0,25	0,2-0,3	0,3-0,5
	a	0,1	0,1-0,2	0,1-0,2	0,2-0,3	0,2-0,3	0,3-0,5
Steel 700-900 N/mm ²	v_c	12-15					
	f	0,1-0,15	0,15	0,15-0,2	0,2-0,25	0,2-0,3	0,3-0,5
	a	0,1	0,1-0,2	0,1-0,2	0,2-0,3	0,2-0,3	0,3-0,5
Steel 900-1200 N/mm ²	v_c	8-12					
	f	0,1-0,15	0,15	0,15-0,2	0,2-0,25	0,2-0,3	0,3-0,5
	a	0,1	0,1-0,2	0,1-0,2	0,2-0,3	0,2-0,3	0,3-0,5
Stainless steel < 700 N/mm ²	v_c	-					
	f	-	-	-	-	-	-
	a	-	-	-	-	-	-
Stainless steel > 700N/mm ²	v_c	-					
	f	-	-	-	-	-	-
	a	-	-	-	-	-	-
Grey cast iron (GG)	v_c	12-20					
	f	0,1-0,15	0,15-0,2	0,15-0,3	0,2-0,3	0,2-0,4	0,3-0,5
	a	0,1-0,15	0,1-0,2	0,1-0,2	0,2-0,3	0,2-0,3	0,3-0,5
Spheroidal graphite cast iron (up to GGG 50)	v_c	12-15					
	f	0,1-0,15	0,15-0,2	0,15-0,3	0,2-0,3	0,2-0,4	0,3-0,5
	a	0,1-0,15	0,1-0,2	0,1-0,2	0,2-0,3	0,2-0,3	0,3-0,5
Spheroidal graphite cast iron (> GGG 50)	v_c	10-15					
	f	0,1-0,15	0,15-0,20	0,15-0,3	0,2-0,3	0,2-0,4	0,3-0,5
	a	0,1-0,15	0,1-0,2	0,1-0,2	0,2-0,3	0,2-0,3	0,3-0,5
Cu / Zn / Mg alloys	v_c	25-50					
	f	0,12-0,16	0,15-0,2	0,15-0,3	0,25-0,35	0,2-0,4	0,3-0,5
	a	0,1-0,15	0,15-0,2	0,15-0,2	0,2-0,3	0,2-0,3	0,3-0,5
Aluminium alloys (Si<7 %)	v_c	20-60					
	f	0,12-0,16	0,15-0,2	0,15-0,25	0,2-0,3	0,2-0,3	0,3-0,5
	a	0,1-0,15	0,15-0,2	0,15-0,2	0,2-0,3	0,2-0,3	0,3-0,5
Aluminium alloys (Si>7 %)	v_c	20-30					
	f	0,12-0,16	0,15-0,2	0,15-0,25	0,2-0,3	0,2-0,3	0,3-0,5
	a	0,1-0,15	0,15-0,2	0,15-0,2	0,2-0,3	0,2-0,3	0,3-0,5
Plastics, soft	v_c	20-50					
	f	0,12-0,16	0,15-0,2	0,15-0,25	0,25-0,35	0,2-0,3	0,3-0,5
	a	0,1-0,15	0,15-0,2	0,15-0,2	0,2-0,3	0,2-0,3	0,3-0,5
Plastics, hard	v_c	10-15					
	f	0,12-0,16	0,15-0,2	0,15-0,25	0,25-0,35	0,2-0,3	0,3-0,5
	a	0,1-0,15	0,15-0,2	0,2-0,3	0,2-0,3	0,3-0,4	0,3-0,5
Titanium *1	v_c	7-12					
	f	0,08-0,15	0,1	0,1-0,2	0,2-0,25	0,2-0,3	0,3-0,5
	a	0,08-0,15	0,1-0,2	0,1-0,2	0,2-0,3	0,2-0,4	0,3-0,5
Hardened materials < 63 HRC	v_c	-					
	f	-	-	-	-	-	-
	a	-	-	-	-	-	-

*1 Only with special cutting geometry


Application data for machine reamers of HSS-E without inner cooling lubricant supply

Workpiece material 	Cutting speed v_c [m/min] Feed f [mm/rev] bore allowance a in dia. [mm]	dia. [mm]					
		<5	5-8	8-12	12-16	16-30	30-50
Steel < 700 N/mm ²	v_c	10-15					
	f	0,1-0,15	0,15	0,15-0,2	0,2-0,25	0,2-0,3	0,3-0,5
	a	0,1	0,1-0,2	0,1-0,2	0,2-0,3	0,2-0,3	0,3-0,5
Steel 700-900 N/mm ²	v_c	8-12					
	f	0,1-0,15	0,15	0,15-0,2	0,2-0,25	0,2-0,3	0,3-0,5
	a	0,1	0,1-0,2	0,1-0,2	0,2-0,3	0,2-0,3	0,3-0,5
Steel 900-1200 N/mm ²	v_c	-					
	f	-	-	-	-	-	-
	a	-	-	-	-	-	-
Stainless steel < 700 N/mm ²	v_c	-					
	f	-	-	-	-	-	-
	a	-	-	-	-	-	-
Stainless steel > 700N/mm ²	v_c	-					
	f	-	-	-	-	-	-
	a	-	-	-	-	-	-
Grey cast iron (GG)	v_c	10-14					
	f	0,1-0,15	0,12-0,16	0,15-0,2	0,2-0,35	0,2-0,3	0,3-0,5
	a	0,1-0,15	0,1-0,2	0,1-0,2	0,2-0,3	0,2-0,3	0,3-0,5
Spheroidal graphite cast iron (up to GGG 50)	v_c	-					
	f	-	-	-	-	-	-
	a	-	-	-	-	-	-
Spheroidal graphite cast iron (> GGG 50)	v_c	-					
	f	-	-	-	-	-	-
	a	-	-	-	-	-	-
Cu / Zn / Mg alloys	v_c	15-30					
	f	0,12-0,16	0,15-0,2	0,15-0,2	0,2-0,25	0,2-0,3	0,3-0,5
	a	0,1-0,15	0,15-0,2	0,15-0,2	0,2-0,3	0,2-0,3	0,3-0,5
Aluminium alloys (Si<7 %)	v_c	14-20					
	f	0,12-0,16	0,15-0,2	0,15-0,2	0,2-0,25	0,2-0,3	0,3-0,5
	a	0,1-0,15	0,15-0,2	0,15-0,2	0,2-0,3	0,2-0,3	0,3-0,5
Aluminium alloys (Si>7 %)	v_c	-					
	f	-	-	-	-	-	-
	a	-	-	-	-	-	-
Plastics, soft	v_c	15-30					
	f	0,12-0,16	0,15-0,2	0,15-0,2	0,2-0,25	0,2-0,3	0,3-0,5
	a	0,1-0,15	0,15-0,2	0,15-0,2	0,2-0,3	0,2-0,3	0,3-0,5
Plastics, hard	v_c	-					
	f	-	-	-	-	-	-
	a	-	-	-	-	-	-
Titanium	v_c	-					
	f	-	-	-	-	-	-
	a	-	-	-	-	-	-
Hardened materials < 63 HRC	v_c	-					
	f	-	-	-	-	-	-
	a	-	-	-	-	-	-

Application data for countersinks of solid carbide

Workpiece material 	Cutting speed v_c [m/min] Feed f [mm/rev]	dia. [mm]							
		<5	5-8	8-12	12-16	16-20	20-25	25-40	40-63
Steel < 700 N/mm ²	v_c	60							
	f	0,06	0,08	0,10	0,12	0,14	0,18	0,22	0,30
Steel 700-900 N/mm ²	v_c	50							
	f	0,04	0,06	0,08	0,10	0,12	0,14	0,18	0,25
Steel 900-1200 N/mm ²	v_c	18							
	f	0,03	0,04	0,05	0,06	0,08	0,10	0,12	0,16
Stainless steel < 700 N/mm ²	v_c	16							
	f	0,04	0,05	0,06	0,07	0,08	0,09	0,12	0,14
Stainless steel > 700N/mm ²	v_c	16							
	f	0,04	0,05	0,06	0,07	0,08	0,09	0,12	0,14
Grey cast iron (GG)	v_c	25							
	f	0,06	0,10	0,12	0,14	0,18	0,20	0,25	0,28
Spheroidal graphite cast iron (up to GGG 50)	v_c	25							
	f	0,06	0,10	0,12	0,14	0,18	0,20	0,25	0,28
Spheroidal graphite cast iron (> GGG 50)	v_c	18							
	f	0,06	0,10	0,12	0,14	0,18	0,20	0,25	0,28
Cu / Zn / Mg alloys	v_c	65							
	f	0,10	0,12	0,14	0,18	0,20	0,20	0,30	0,40
Aluminium alloys (Si<7 %)	v_c	75							
	f	0,08	0,10	0,12	0,14	0,18	0,22	0,26	0,30
Aluminium alloys (Si>7 %)	v_c	50							
	f	0,08	0,10	0,12	0,14	0,18	0,22	0,26	0,30
Plastics, soft	v_c	65							
	f	0,10	0,12	0,14	0,18	0,20	0,24	0,30	0,40
Plastics, hard	v_c	45							
	f	0,10	0,12	0,14	0,18	0,20	0,24	0,30	0,40
Titanium	v_c	16							
	f	0,04	0,05	0,06	0,07	0,08	0,09	0,12	0,14
Hardened materials < 63 HRC	v_c	8							
	f	0,04	0,05	0,06	0,08	0,08	0,1	-	-

Application data for countersinks of HSS

Workpiece material 	Cutting speed v_c [m/min] Feed f [mm/rev]	dia. [mm]							
		<5	5-8	8-12	12-16	16-20	20-25	25-40	40-63
Steel < 700 N/mm ²	v_c	60							
	f	0,06	0,08	0,10	0,12	0,14	0,18	0,22	0,30
Steel 700-900 N/mm ²	v_c	50							
	f	0,04	0,06	0,08	0,10	0,12	0,14	0,18	0,25
Steel 900-1200 N/mm ²	v_c	18							
	f	0,03	0,04	0,05	0,06	0,08	0,10	0,12	0,16
Stainless steel < 700 N/mm ²	v_c	16							
	f	0,04	0,05	0,06	0,07	0,08	0,09	0,12	0,14
Stainless steel > 700N/mm ²	v_c	16							
	f	0,04	0,05	0,06	0,07	0,08	0,09	0,12	0,14
Grey cast iron (GG)	v_c	25							
	f	0,06	0,10	0,12	0,14	0,18	0,20	0,25	0,28
Spheroidal graphite cast iron (up to GGG 50)	v_c	25							
	f	0,06	0,10	0,12	0,14	0,18	0,20	0,25	0,28
Spheroidal graphite cast iron (> GGG 50)	v_c	18							
	f	0,06	0,10	0,12	0,14	0,18	0,20	0,25	0,28
Cu / Zn / Mg alloys	v_c	65							
	f	0,10	0,12	0,14	0,18	0,20	0,20	0,30	0,40
Aluminium alloys (Si<7 %)	v_c	75							
	f	0,08	0,10	0,12	0,14	0,18	0,22	0,26	0,30
Aluminium alloys (Si>7 %)	v_c	50							
	f	0,08	0,10	0,12	0,14	0,18	0,22	0,26	0,30
Plastics, soft	v_c	65							
	f	0,10	0,12	0,14	0,18	0,20	0,24	0,30	0,40
Plastics, hard	v_c	45							
	f	0,10	0,12	0,14	0,18	0,20	0,24	0,30	0,40
Titanium	v_c	16							
	f	0,04	0,05	0,06	0,07	0,08	0,09	0,12	0,14
Hardened materials < 63 HRC	v_c	8							
	f	0,04	0,05	0,06	0,08	0,08	0,1	-	-

Cooling lubricant recommendations for reamers of Cermet, carbide and HSS-E

Multi-bladed reamers are characterised by large contact surfaces due to their minor cutting edge geometry. For this reason, adequate lubrication is absolutely crucial. When machining steel, the lubrication provides reduced temperatures at the tool and hence ensures a good tool life.

The formation of built-up edges is also suppressed in soft steels. This formation of built-up edges also has to be prevented by the use of cooling lubricants when machining NF metals in order to achieve a good machining result.

The following recommendations should be observed:

High-performance reamers of Cermet*, carbide and with PCD tips with inner cooling lubricant supply:	
Machining of steel and cast materials:	Emulsion with min. 6 % concentration, better 10 %
Machining of NF metals:	Emulsion with min. 10 % concentration, better oil
Machine reamers of carbide and HSS-E:	
Machining of steel and cast materials:	Emulsion with min. 6 % concentration, better 10 %
Machining of NF metals:	Emulsion with min. 10 % concentration, better oil
Hand reamers:	
For all materials:	Spray the tool before machining, preferably with oil

Concentrations lower than those indicated generally lead to reductions in tool life and can also have a negative impact on the machining result.

* Cermet has only limited suitability for use with oil.

Cooling lubricant recommendations for countersinks of HSS

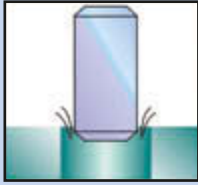
Countersinks of HSS can essentially be used dry. This is also the rule for simple deburring work.

However, a very significant reduction in the tool life is to be expected compared with wet machining.

Countersinking tools should therefore always be used with lubrication, whenever possible, particularly if large countersinking depths are to be cut.

Countersinking of steel and cast materials:	Emulsion, approx. 5 % concentration
Countersinking of NF metals:	
soft:	Oil
hard:	Emulsion with min. 5 % concentration

Troubleshooting on reamers



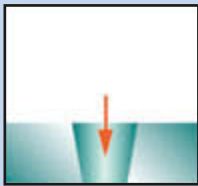
Bore becomes too large:

- Lack of lubrication (formation of built-up edges)
- Roundness of the cutting lead is not OK (after regrinding)
- above approx. 20 mm tool diameter: The tool vibrates in the spindle
- The initial bore size is too large
- Axial offset between tool and preboring (lathe)
- Oil lubrication tends to result in larger bores



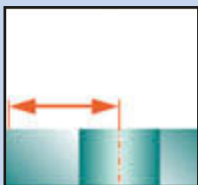
Bore becomes too small:

- The reamer is not sharp
- The initial bore size is too small
- The workpiece has very thin walls and springs back



Bore is larger at the entry than at the outlet (initial width):

- The tool vibrates in the spindle
- Axial offset between tool and preboring (lathe)



Gauge is not exactly met:

- Gauge of prebore is not correct
- Roundness of the cutting lead is not OK (after regrinding)



The bore is crowned or oval:

- The workpiece is strained during machining



The surface quality is poor:

- No or insufficient lubrication (formation of built-up edges)
- The tool is damaged (cutting edge broken out)
- The prebore already has scores
- Roundness of the cutting lead is not OK (after regrinding)

Reamers – manufacturing tolerances and limit dimensions for bores

Excerpt from DIN 1420

1.1. Fundamental information on the specification of the manufacturing tolerance for reamers

The manufacturing tolerances specified in this standard are allocated to given tolerance ranges of the bores to be reamed. They generally ensure that the reamed bore lies within the corresponding tolerance field and at the same time that the reamer can be used cost effectively.

It should be noted, however, that the size of the reamed bore depends not only on the manufacturing tolerance of the reamer, but also on other factors, e.g. on the angles at the blade, on the cutting lead of the reamer, on the clamping of the workpiece, on the tool mounting, on the condition of the machine tool and on the material of the workpiece being reamed. Special cases can therefore arise in which other manufacturing tolerances are more favourable.

In order to ensure cost effective production and stocking and the interchangeability with reamers from other manufacturers, however, other manufacturing tolerances should only be demanded in justified exceptional cases.

1.2. Calculation of the admissible maximum and minimum sizes of reamers

The maximum admissible diameter $d_1 \text{ max.}$ of the reamer is 15 % of the respective bore tolerance (0.15 IT) below the maximum admissible diameter of the bore (see figure). The value 0.15 IT is thereby rounded up to the next larger integer or half μm value so that rounded μm values are obtained for $d_1 \text{ max.}$

The minimum admissible diameter $d_1 \text{ min.}$ of the reamer is 35 % of the respective bore tolerance (0.35 IT) below the maximum admissible reamer diameter $d_1 \text{ max.}$

1.3. Simplified calculation of the admissible maximum and minimum sizes of reamers

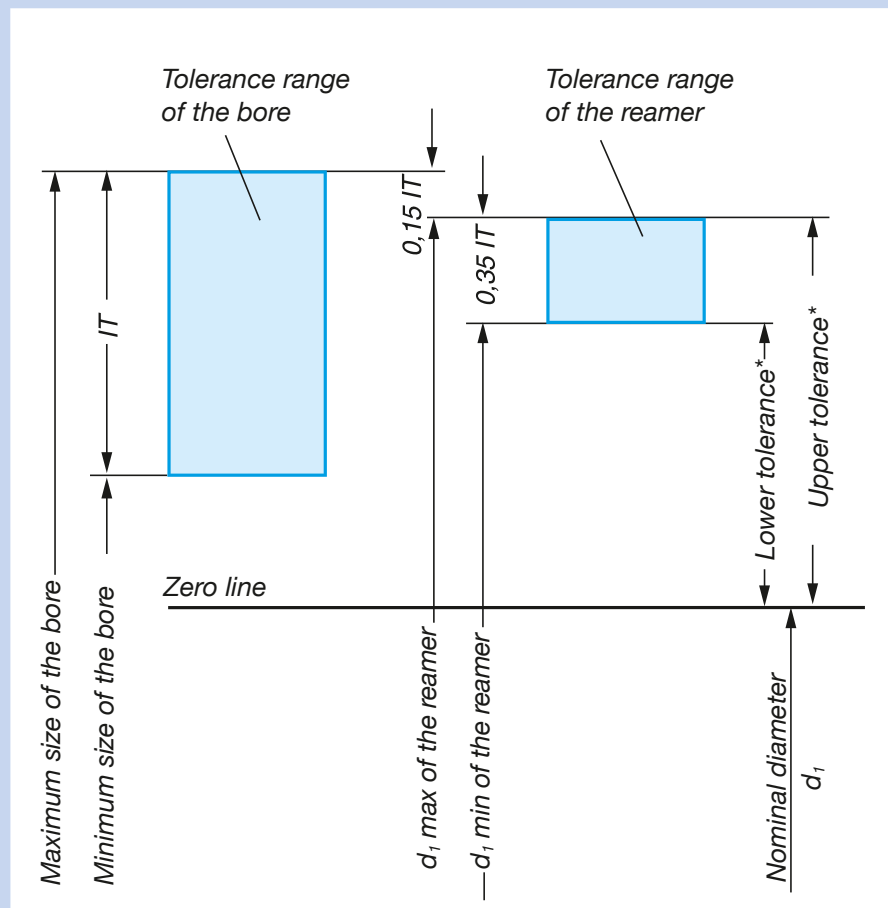
In order to simplify the calculation, the maximum and minimum tolerances for the nominal diameter d_1 of the reamer are shown for the most common tolerance ranges in the

tables on the following pages. The admissible maximum and minimum sizes of the reamers can thus be easily calculated using these tolerances.

2. Designation (excerpt)

If, in exceptional cases, reamers are ordered with maximum and minimum dimensions deviating from this standard, the maximum and minimum tolerances of the reamer must be indicated in μm in the designation instead of the ISO abbreviation for the bore tolerance range, e.g. for a reamer with a nominal diameter of 20 mm, the upper tolerance = + (p) 25 μm and the lower tolerance = + (p) 15 μm : Reamer 20 p 25 p 15 DIN...

In the designation a p is used instead of the plus sign and an m instead of the minus sign because the symbols „+“ and „-“ cannot be written on all machines, particularly the machines processing the data.



* referred to the nominal diameter d_1 of the reamer

Reamers – manufacturing tolerances – excerpt from DIN 1420

Nominal diameter of the reamer d_1 in mm		Admissible upper and lower tolerance of the nominal diameter d_1 of the reamer in μm for bore tolerance range									
		A		B				C			
		9	11	8	9	10	11	8	9	10	11
above to	1 3	+291 +282	+321 +300	+151 +146	+161 +152	+174 +160	+191 +170	+71 +66	+81 +72	+94 +80	+111 +90
above to	3 6	+295 +284	+333 +306	+155 +148	+165 +154	+180 +163	+203 +176	+85 +78	+95 +84	+110 +93	+133 +106
above to	6 10	+310 +297	+356 +324	+168 +160	+180 +167	+199 +178	+226 +194	+98 +90	+110 +97	+129 +108	+156 +124
above to	10 18	+326 +310	+383 +344	+172 +162	+186 +170	+209 +184	+243 +204	+117 +107	+131 +115	+154 +129	+188 +149
above to	18 30	+344 +325	+410 +364	+188 +176	+204 +185	+231 +201	+270 +224	+138 +126	+154 +135	+181 +151	+220 +174
above to	30 40	+362 +340	+446 +390	+203 +189	+222 +200	+255 +220	+306 +250	+153 +139	+172 +150	+205 +170	+256 +200
above to	40 50	+372 +350	+456 +400	+213 +199	+232 +210	+265 +230	+316 +260	+163 +149	+182 +160	+215 +180	+266 +210
above to	50 65	+402 +376	+501 +434	+229 +212	+252 +226	+292 +250	+351 +284	+179 +162	+202 +176	+242 +200	+301 +234
above to	65 80	+422 +396	+521 +454	+239 +222	+262 +236	+302 +260	+361 +294	+189 +172	+212 +186	+252 +210	+311 +244
above to	80 100	+453 +422	+567 +490	+265 +246	+293 +262	+339 +290	+407 +330	+215 +196	+243 +212	+289 +240	+357 +280
above to	100 120	+483 +452	+597 +520	+285 +266	+313 +282	+359 +310	+427 +350	+225 +206	+253 +222	+299 +250	+367 +290

Nominal diameter of the reamer d_1 in mm		Admissible upper and lower tolerance of the nominal diameter d_1 of the reamer in μm for bore tolerance range										
		D				E			F			
		8	9	10	11	7	8	9	6	7	8	9
above to	1 3	+ 31 + 26	+ 41 + 32	+ 54 + 40	+ 71 + 50	+ 22 + 18	+ 25 + 20	+ 35 + 26	+11 + 8	+14 +10	+17 +12	+27 +18
above to	3 6	+ 45 + 38	+ 55 + 44	+ 70 + 53	+ 93 + 66	+ 30 + 25	+ 35 + 28	+ 45 + 34	+16 +13	+20 +15	+25 +18	+35 +24
above to	6 10	+ 58 + 50	+ 70 + 57	+ 89 + 68	+ 116 + 84	+ 37 + 31	+ 43 + 35	+ 55 + 42	+20 +16	+25 +19	+31 +23	+43 +30
above to	10 18	+ 72 + 62	+ 86 + 70	+109 + 84	+143 +104	+ 47 + 40	+ 54 + 44	+ 68 + 52	+25 +21	+31 +24	+38 +28	+52 +36
above to	18 30	+ 93 + 81	+109 + 90	+136 +106	+175 +129	+ 57 + 49	+ 68 + 56	+ 84 + 65	+31 +26	+37 +29	+48 +36	+64 +45
above to	30 50	+113 + 99	+ 132 +110	+165 +130	+216 +160	+ 71 + 62	+ 83 + 69	+102 + 80	+38 +32	+46 +37	+58 +44	+77 +55
above to	50 80	+139 +122	+162 +136	+202 +160	+261 +194	+ 85 + 74	+ 99 + 82	+ 122 + 96	+46 +39	+55 +44	+69 +52	+92 +66
above to	80 120	+165 +146	+193 +162	+239 +190	+307 +230	+101 + 88	+117 + 98	+ 145 + 114	+54 +46	+65 +52	+81 +62	+109 +78

Reamers – manufacturing tolerances – excerpt from DIN 1420

Nominal diameter of the reamer d_1 in mm		Admissible upper and lower tolerance of the nominal diameter d_1 of the reamer in μm for bore tolerance range											
		G		H								J	
		6	7	6	7	8	9	10	11	12	6	7	8
above to	1 3	+7 +4	+10 +6	+5 +2	+8 +4	+11 +6	+21 +12	+34 +20	+51 +30	+85 +50	+1 -2	+2 -2	+3 -2
above to	3 6	+10 +7	+14 +9	+6 +3	+10 +5	+15 +8	+25 +14	+40 +23	+63 +36	+102 +60	+3 0	+4 -1	+7 0
above to	6 10	+12 +8	+17 +11	+7 +3	+12 +6	+18 +10	+30 +17	+49 +28	+76 +44	+127 +74	+3 -1	+5 -1	+8 0
above to	10 18	+15 +11	+21 +14	+9 +5	+15 +8	+22 +12	+36 +20	+59 +34	+93 +54	+153 +90	+4 0	+7 0	+10 0
above to	18 30	+18 +13	+24 +16	+11 +6	+17 +9	+28 +16	+44 +25	+71 +41	+110 +64	+178 +104	+6 +1	+8 0	+15 +3
above to	30 50	+22 +16	+30 +21	+13 +7	+21 +12	+33 +19	+52 +30	+85 +50	+136 +80	+212 +124	+7 +1	+10 +1	+18 +4
above to	50 80	+26 +19	+35 +24	+16 +9	+25 +14	+39 +22	+62 +36	+102 +60	+161 +94	+255 +150	+10 +3	+13 +2	+21 +4
above to	80 120	+30 +22	+41 +28	+18 +10	+29 +16	+45 +26	+73 +42	+119 +70	+187 +110	+297 +174	+12 +4	+16 +3	+25 +6

Nominal diameter of the reamer d_1 in mm		Admissible upper and lower tolerance of the nominal diameter d_1 of the reamer in μm for bore tolerance range									
		JS				K			M		
		6	7	8	9	6	7	8	6	7	8
above to	1 3	+2 -1	+3 -1	+4 -1	+8 -1	-1 -4	-2 -6	-3 -8	-3 -6	-4 -8	-5 -10
above to	3 6	+2 -1	+4 -1	+6 -1	+10 -1	0 -3	+1 -4	+2 -5	-3 -6	-2 -7	-1 -8
above to	6 10	+3 -1	+5 -1	+7 -1	+12 -1	0 -4	+2 -4	+2 -6	-5 -9	-3 -9	-3 -11
above to	10 18	+3 -1	+6 -1	+9 -1	+15 -1	0 -4	+3 -4	+3 -7	-6 -10	-3 -10	-3 -13
above to	18 30	+4 -1	+7 -1	+11 -1	+18 -1	0 -5	+2 -6	+5 -7	-6 -11	-4 -12	-1 -13
above to	30 50	+5 -1	+8 -1	+13 -1	+21 -1	0 -6	+3 -6	+6 -8	-7 -13	-4 -13	-1 -15
above to	50 80	+6 -1	+10 -1	+16 -1	+25 -1	+1 -6	+4 -7	+7 -10	-8 -15	-5 -16	-2 -19
above to	80 120	+7 -1	+12 -1	+18 -1	+30 -1	0 -8	+4 -9	+7 -12	-10 -18	-6 -19	-3 -22

Reamers – manufacturing tolerances – excerpt from DIN 1420

Nominal diameter of the reamer d_1 in mm		Admissible upper and lower tolerance of the nominal diameter d_1 of the reamer in μm for bore tolerance range									
		N						P		R	
		6	7	8	9	10	11	6	7	6	7
above to	1 3	-5 -8	-6 -10	-7 -12	-8 -17	-10 -24	-13 -34	-7 -10	-8 -12	-11 -14	-12 -16
above to	3 6	-7 -10	-6 -11	-5 -12	-5 -16	-8 -25	-12 -39	-11 -14	-10 -15	-14 -17	-13 -18
above to	6 10	-9 -13	-7 -13	-7 -15	-6 -19	-9 -30	-14 -46	-14 -18	-12 -18	-18 -22	-16 -22
above to	10 18	-11 -15	-8 -15	-8 -18	-7 -23	-11 -36	-17 -56	-17 -21	-14 -21	-22 -26	-19 -26
above to	18 30	-13 -18	-11 -19	-8 -20	-8 -27	-13 -43	-20 -66	-20 -25	-18 -26	-26 -31	-24 -32
above to	30 50	-15 -21	-12 -21	-9 -23	-10 -32	-15 -50	-24 -80	-24 -30	-21 -30	-32 -38	-29 -38
above to	50 65	-17 -24	-14 -25	-11 -28	-12 -38	-18 -60	-29 -96	-29 -36	-26 -37	-38 -45	-35 -46
above to	65 80									-40 -47	-37 -48
above to	80 100	-20 -28	-16 -29	-13 -32	-14 -45	-21 -70	-33 -110	-34 -42	-30 -43	-48 -51	-44 -47
above to	100 120									-56 -59	-57 -60

Nominal diameter of the reamer d_1 in mm		Admissible upper and lower tolerance of the nominal diameter d_1 of the reamer in μm for bore tolerance range									
		S		T	U			X		Z	
		6	7	6	6	7	10	10	11	10	11
above to	1 3	-15 -18	-16 -20	-19 -22	-19 -22	-20 -24	-24 -38	-26 -40	-29 -50	-32 -46	-35 -56
above to	3 6	-18 -21	-17 -22	-22 -25	-22 -25	-21 -26	-31 -48	-36 -53	-40 -67	-43 -60	-47 -74
above to	6 10	-22 -26	-20 -26	-27 -31	-27 -31	-25 -31	-37 -58	-43 -64	-48 -80	-51 -72	-56 -88
above to	10 14	-27 -31	-24 -31	-32 -36	-32 -36	-29 -36	-44 -69	-51 -76	-57 -96	-61 -86	-67 -106
above to	14 18							-56 -81	-62 -101	-71 -96	-77 -116
above to	18 24	-33 -38	-31 -39	-39 -44	-39 -44	-37 -45	-54 -84	-67 -97	-74 -120	-86 -116	-93 -139
above to	24 30							-77 -107	-84 -130	-101 -131	-108 -154
above to	30 40	-41 -47	-38 -47	-46 -52	-46 -52	-55 -64	-75 -110	-95 -130	-104 -160	-127 -162	-136 -192
above to	40 50							-112 -147	-121 -177	-151 -186	-160 -216
above to	50 65	-50 -57	-47 -58	-63 -70	-63 -70	-84 -91	-105 -147	-140 -182	-151 -218	-190 -232	-201 -268
above to	65 80	-56 -63	-53 -64	-72 -79	-72 -79	-99 -106	-120 -162	-164 -206	-175 -242	-228 -270	-239 -306
above to	80 100	-68 -76	-64 -77	-88 -96	-88 -96	-121 -129	-117 -130	-145 -194	-199 -288	-279 -328	-291 -368
above to	100 120	-76 -84	-72 -85	-101 -109	-101 -109	-141 -149	-137 -150	-165 -214	-231 -320	-331 -380	-343 -420

Numerical values for the basic tolerances - excerpt from DIN ISO 286 Part 1 (Nov. '90) - dimensions in µm

Standard tolerance-grades	Nominal size range mm							
	above 1 to 3	above 3 to 6	above 6 to 10	above 10 to 18	above 18 to 30	above 30 to 50	above 50 to 80	above 80 to 120
	IT 5	4	5	6	8	9	11	13
IT 6	6	8	9	11	13	16	19	22
IT 7	10	12	15	18	21	25	30	35
IT 8	14	18	22	27	33	39	46	54
IT 9	25	30	36	43	52	62	74	87
IT 10	40	48	58	70	84	100	120	140
IT 11	60	75	90	110	130	160	190	220
IT 12	100	120	150	180	210	250	300	350

Limit dimensions for bores - excerpt from DIN ISO 286 Part 2 (Nov. '90)

Nominal size range mm		Tolerances in µm									
		A		B				C			
above	to	9	11	8	9	10	11	8	9	10	11
above	1	+295	+330	+154	+165	+180	+200	+74	+85	+100	+120
to	3	+270	+270	+140	+140	+140	+140	+60	+60	+60	+60
above	3	+300	+345	+158	+170	+188	+215	+88	+100	+118	+145
to	6	+270	+270	+140	+140	+140	+140	+70	+70	+70	+70
above	6	+316	+370	+172	+186	+208	+240	+102	+116	+138	+170
to	10	+280	+280	+150	+150	+150	+150	+80	+80	+80	+80
above	10	+333	+400	+177	+193	+220	+260	+122	+138	+165	+205
to	18	+290	+290	+150	+150	+150	+150	+95	+95	+95	+95
above	18	+352	+430	+193	+212	+244	+290	+143	+162	+194	+240
to	30	+300	+300	+160	+160	+160	+160	+110	+110	+110	+110
above	30	+372	+470	+209	+232	+270	+330	+159	+182	+220	+280
to	40	+310	+310	+170	+170	+170	+170	+120	+120	+120	+120
above	40	+382	+480	+219	+242	+280	+340	+169	+192	+230	+290
to	50	+320	+320	+180	+180	+180	+180	+130	+130	+130	+130
above	50	+414	+530	+236	+264	+310	+380	+186	+214	+260	+330
to	65	+340	+340	+190	+190	+190	+190	+140	+140	+140	+140
above	65	+434	+550	+246	+274	+320	+390	+196	+224	+270	+340
to	80	+360	+360	+200	+200	+200	+200	+150	+150	+150	+150
above	80	+467	+600	+274	+307	+360	+440	+224	+257	+310	+390
to	100	+380	+380	+220	+220	+220	+220	+170	+170	+170	+170
above	100	+497	+630	+294	+327	+380	+460	+234	+267	+320	+400
to	120	+410	+410	+240	+240	+240	+240	+180	+180	+180	+180



Limit dimensions for bores - excerpt from DIN ISO 286 Part 2 (Nov. '90)

Nominal size range mm		Tolerances in μm										
		D				E			F			
		8	9	10	11	7	8	9	6	7	8	9
above	1	+34	+45	+60	+80	+24	+28	+39	+12	+16	+20	+31
to	3	+20	+20	+20	+20	+14	+14	+14	+6	+6	+6	+6
above	3	+48	+60	+78	+105	+32	+38	+50	+18	+22	+28	+40
to	6	+30	+30	+30	+30	+20	+20	+20	+10	+10	+10	+10
above	6	+62	+76	+98	+130	+40	+47	+61	+22	+28	+35	+49
to	10	+40	+40	+40	+40	+25	+25	+25	+13	+13	+13	+13
above	10	+77	+93	+120	+160	+50	+59	+75	+27	+34	+43	+59
to	18	+50	+50	+50	+50	+32	+32	+32	+16	+16	+16	+16
above	18	+98	+117	+149	+195	+61	+73	+92	+33	+41	+53	+72
to	30	+65	+65	+65	+65	+40	+40	+40	+20	+20	+20	+20
above	30	+119	+142	+180	+240	+75	+89	+112	+41	+50	+64	+87
to	50	+80	+80	+80	+80	+50	+50	+50	+25	+25	+25	+25
above	50	+146	+174	+220	+290	+90	+106	+134	+49	+60	+76	+104
to	80	+100	+100	+100	+100	+60	+60	+60	+30	+30	+30	+30
above	80	+174	+207	+260	+340	+107	+126	+159	+58	+71	+90	+123
to	120	+120	+120	+120	+120	+72	+72	+72	+36	+36	+36	+36

Nominal size range mm		Tolerances in μm											
		G		H						J			
		6	7	6	7	8	9	10	11	12	6	7	8
above	1	+8	+12	+6	+10	+14	+25	+40	+60	+100	+2	+4	+6
to	3	+2	+2	0	0	0	0	0	0	0	-4	-6	-8
above	3	+12	+16	+8	+12	+18	+30	+48	+75	+120	+5	+6	+10
to	6	+4	+4	0	0	0	0	0	0	0	-3	-6	-8
above	6	+14	+20	+9	+15	+22	+36	+58	+90	+150	+5	+8	+12
to	10	+5	+5	0	0	0	0	0	0	0	-4	-7	-10
above	10	+17	+24	+11	+18	+27	+43	+70	+110	+180	+6	+10	+15
to	18	+6	+6	0	0	0	0	0	0	0	-5	-8	-12
above	18	+20	+28	+13	+21	+33	+52	+84	+130	+210	+8	+12	+20
to	30	+7	+7	0	0	0	0	0	0	0	-5	-9	-13
above	30	+25	+34	+16	+25	+39	+62	+100	+160	+250	+10	+14	+24
to	50	+9	+9	0	0	0	0	0	0	0	-6	-11	-15
above	50	+29	+40	+19	+30	+46	+74	+120	+190	+300	+33	+18	+28
to	80	+10	+10	0	0	0	0	0	0	0	-6	-12	-18
above	80	+34	+47	+22	+35	+54	+87	+140	+220	+350	+16	+22	+34
to	120	+12	+12	0	0	0	0	0	0	0	-6	-13	-20

Nominal size range mm		Tolerances in μm										
		JS				K			M			
		6	7	8	9	6	7	8	6	7	8	
above	1	+3	+5	+7	+12,5	0	0	0	-2	-2	-4	
to	3	-3	-5	-7	-12,5	-6	-10	-14	-8	-12	-18	
above	3	+4	+6	+9	+15	+2	+3	+5	-1	0	+2	
to	6	-4	-6	-9	-15	-6	-9	-13	-9	-12	-16	
above	6	+4,5	+7,5	+11	+18	+2	+5	+6	-3	0	+1	
to	10	-4,5	-7,5	-11	-18	-7	-10	-16	-12	-15	-21	
above	10	+5,5	+9	+13,5	+21,5	+2	+6	+8	-4	0	+2	
to	18	-5,5	-9	-13,5	-21,5	-9	-12	-19	-15	-18	-25	
above	18	+6,5	+10,5	+16,5	+26	+2	+6	+10	-4	0	+4	
to	30	-6,5	-10,5	-16,5	-26	-11	-15	-23	-17	-21	-29	
above	30	+8	+12,5	+19,5	+31	+3	+7	+12	-4	0	+5	
to	50	-8	-12,5	-19,5	-31	-13	-18	-27	-20	-25	-34	
above	50	+9,5	+15	+23	+37	+4	+9	+14	-5	0	+5	
to	80	-9,5	-15	-23	-37	-15	-21	-32	-24	-30	-41	
above	80	+11	+17,5	+27	+43,5	+4	+10	+16	-6	0	+6	
to	120	-11	-17,5	-27	-43,5	-18	-25	-38	-28	-35	-48	

Limit dimensions for bores - excerpt from DIN ISO 286 Part 2 (Nov. '90)

Nominal size range mm		Tolerances in μm									
		N					P		R		
		6	7	8	9	10	11	6	7	6	7
above	1	-4	-4	-4	-4	-4	-4	-6	-6	-10	-10
to	3	-10	-14	-18	-29	-44	-64	-12	-16	-16	-20
above	3	-5	-4	-2	0	0	0	-9	-8	-12	-11
to	6	-13	-16	-20	-30	-48	-75	-17	-20	-20	-23
above	6	-7	-4	-3	0	0	0	-12	-9	-16	-13
to	10	-16	-19	-25	-36	-58	-90	-21	-24	-25	-28
above	10	-9	-5	-3	0	0	0	-15	-11	-20	-16
to	18	-20	-23	-30	-43	-70	-110	-26	-29	-31	-34
above	18	-11	-7	-3	0	0	0	-18	-14	-24	-20
to	30	-24	-28	-36	-52	-84	-130	-31	-35	-37	-41
above	30	-12	-8	-3	0	0	0	-21	-17	-29	-25
to	50	-28	-33	-42	-62	-100	-160	-37	-42	-45	-50
above	50	-14	-9	-4	0	0	0	-26	-21	-35	-30
to	65									-54	-60
above	65	-33	-39	-50	-74	-120	-190	-45	-51	-37	-32
to	80									-56	-62
above	80	-16	-10	-4	0	0	0	-30	-24	-44	-38
to	100									-66	-73
above	100	-38	-45	-58	-87	-140	-220	-52	-59	-47	-41
to	120									-69	-76

Nominal size range mm		Tolerances in μm									
		S		T	U			X		Z	
		6	7	6	6	7	10	10	11	10	11
above	1	-14	-14	-18	-18	-18	-18	-20	-20	-26	-26
to	3	-20	-24	-24	-24	-28	-58	-60	-80	-66	-86
above	3	-16	-15	-20	-20	-19	-23	-28	-28	-35	-35
to	6	-24	-27	-28	-28	-31	-71	-76	-103	-83	-110
above	6	-20	-17	-25	-25	-22	-28	-34	-34	-42	-42
to	10	-29	-32	-34	-34	-37	-86	-92	-124	-100	-132
above	10	-25	-21	-30	-30	-26	-33	-40	-40	-50	-50
to	14							-110	-150	-120	-160
above	14	-36	-39	-41	-41	-44	-103	-45	-45	-60	-60
to	18							-115	-155	-130	-170
above	18	-31	-27	-37	-37	-33	-41	-54	-54	-73	-73
to	24				-50	-54	-125	-138	-184	-157	-203
above	24	-44	-48	-50	-44	-40	-48	-64	-64	-88	-88
to	30				-57	-61	-132	-148	-194	-172	-218
above	30	-38	-34	-43	-55	-51	-60	-80	-80	-112	-112
to	40			-59	-71	-76	-160	-180	-240	-212	-272
above	40	-54	-59	-49	-65	-61	-70	-97	-97	-136	-136
to	50			-65	-81	-86	-170	-197	-257	-236	-296
above	50	-47	-42	-60	-81	-76	-87	-122	-122	-172	-172
to	65	-66	-72	-79	-100	-106	-207	-242	-312	-292	-362
above	65	-53	-48	-69	-96	-91	-102	-146	-146	-210	-210
to	80	-72	-78	-88	-115	-121	-222	-266	-336	-330	-400
above	80	-64	-58	-84	-117	-111	-124	-178	-178	-258	-258
to	100	-86	-93	-106	-139	-146	-264	-318	-398	-398	-478
above	100	-72	-66	-97	-137	-131	-144	-210	-210	-310	-310
to	120	-94	-101	-119	-159	-166	-284	-350	-430	-450	-530

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Enquiry form for fixed reamers

Please complete this form to allow us to draw up a customised quotation:

Company *	Customer No.
Department	
Contact	E-mail
Street/house number	Post code/city
Telephone	Fax
Date	Technical consultant

Workpiece

Designation/description**

Material (standard designation)*

Strength/hardness (N/mm2):

Bore diameter (mm)*

Bore length (mm)*

Dia. tolerance (mm)*

Through bore*

Blind bore*

Cross bore* ** yes no

Interruptions* ** yes no

Stepped bore** yes no

Premachining** yes no

Cutting depth/oversize (mm/dia.)

Interference contour* yes no _____ mm

Surface quality*

Roundness (µm)

Straightness (µm)

Cylindricity (µm)

Concentricity (µm)

Other remarks

Other remarks

* Mandatory fields
 ** Attach sketch/drawing

Machine

Manufacturer/Type

Type vertical
 horizontal

No. of spindles _____

Variable speed yes no

Variable feed rate yes no

Max. speed (rpm)

Power (kW)

Spindle precision (µm)

Spindle mounting (e.g. HSK, SK, ...)*

Cooling* Cooling lubricant
 MMS
 dry

Cooling lubricant supply external
 through spindle

Type Oil
 Emulsion

Emulsion Mineral oil _____ %
 Mixing ratio _____ %

Coolant pressure (bar)

Coolant flow rate (l/min)

Other remarks



BECK regrinding service



In the present day and age, providing a comprehensive service to the customer is one of the company's most important duties. With all the demands made on modern bore machining, technical advice and support for the customer has become extremely important. Our applications technicians and sales staff look after you from the tool design right through to its operation.

In order that our customers can make use of the full potential of our reamers, BECK also offers a regrinding service for its customers.

As a rule, reamers can be reground several times after reaching the end of their tool life. Particularly with very high-quality tools such as high-performance reamers, the level

of utilisation of tools can be improved and costs saved by regrinding. Correct regrinding is thereby an essential precondition for consistently good machining results.

Take advantage of the BECK regrinding service!

This service takes only a few days and you can be sure of using tools correctly reground by the specialists again.

BECK Advantages at a glance

- | | | |
|---|-----|--|
| • Regrinding in proven BECK quality | >>> | Reduction of unit costs |
| • Regrinding within a few days | >>> | Smooth continuation of production |
| • Regrinding even of reamers from other manufacturers | >>> | After-sales service beyond our own product range |

Even tools from other manufacturers can be reground by us as long as their condition allows!

If you nevertheless wish to regrind tools in your own works, Beck is at your disposal with all its know-how.

We should point out that we can offer no warranty for tools not reground at our works.













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Explanation of symbols and pictograms

Machining guide		very well suited	Cutting material		High-speed steel	Tolerance		Tolerance range H7 of the reamed bore Manufacturing tolerances DIN 1420
		suitable			High-speed steel with cobalt or vanadium			Tolerance range h8
		suitable with special cutter geometry and with coating			Carbide inserts			Tolerance field k11
		Price group from 1-12			Solid carbide	Type of bore		Through hole
		Cutting data can be found on page... (180-189)			Solid carbide head			Blind hole
Standard		DIN standard	Coating		Cermet inserts	Internal coolant supply		For through-hole machining
		Similar to DIN standard			Solid Cermet			For blind hole machining
		Works standard			Polycrystalline diamond	Shank		Cylindrical shank to DIN 6535-HA
For reamers		Straight fluted		Titanium nitride	Con- nection			BECK-replaceable head system
		Spiral fluted		Titanium aluminium nitride		For countersinking tools		Countersinking 60°
		Left-hand spiral		Special coating for high-speed machining			Countersinking 90°	
		High-performance machining		Special coating for stainless steel machining		Countersinking 180°		
For countersinks		Multi-fluted, cylindrical shank		Special coating for machining of hardened materials	Prices: For prices and surcharges please see our current price list.			
		3 flutes, cylindrical shank		Spezial coating for machining of aluminium				
		3 flutes, MK shank		Spezial coating for CFRP/GFRP				

Ordering example

Example for reamers

High-performance reamer Type MR | Finely adjustable | Through hole dia. 20.00 | H7

Order No. Dia. tolerance

041610 – 20,00 – H7

Edition 2012 | V1.1.2

General Terms and Conditions

We supply exclusively on the basis of our Terms of Delivery and Payment. These can be requested from us or downloaded from www.august-beck.de.

With the release of this catalogue, catalogue 2012 / V1.1.1 and all previous catalogues are superseded. **Changes and deviations from standards reserved.** No claims shall be derived from printing errors in technical data. Reprinting, in whole or in part, is not permitted without our express approval.



▶ 1. Quality and precision “Made in Germany”

We are convinced that quality and precision requirements at the level demanded by the automotive and aerospace industry can only be achieved at an economical price-performance ratio by products and services that are developed, planned, designed and manufactured in Germany. Highly developed production methods, the latest production

plants and infrastructure, as well as the best working conditions for qualified, committed employees make possible a very high quality standard and unlock precision in the μ range. Our business partners all have active quality management systems and are certified in accordance with ISO 9001.

▶ 2. Worldwide leading competence

The partners in “tool-traders-partner.com” are technology leaders and as brands enjoy a high level of international recognition and an excellent image. They have excellent specialists with decades of experience and

collective specialist knowledge. They stand for continuity and innovation. For the user this means: Always being one step ahead with the latest tool technology.

▶ 3. Optimal advice and assistance

A comprehensive range of stock products, efficient logistics, and the high flexibility of the partners ensure the products are available quickly to suit the needs of the trade. The training of the sales staff orientated on the trade, the competent support provided by application engineers,

specific training courses, as well as a comprehensive information system combine to provide a level of support that ensures our trade partners have a lead due to more competence and better service.

The trade partners in the association tool-traders-partner.com



August Beck GmbH & Co. KG in Winterlingen

▶ 100 years of experience

The competence and experience from more than 100 years make BECK a dependable partner in demand for bore machining. The comprehensive standard programme includes reaming and countersinking tools and covers the complete cutting material spectrum from HSS to PCD and PcBN. This programme is supplemented by high performance reamers and special tools that offer users that crucial performance plus.



MILLER GmbH, Präzisionswerkzeuge in Altenstadt

▶ Standard re-defined

The product range from MILLER includes a comprehensive standard programme of stock precision tools for drilling, milling and countersinking made of solid carbide. In 2008 a considerable investment made it possible to set-up one of the largest and most modern solid carbide tool factories in Europe. The production area was more than doubled, in addition a highly modern logistics centre was established. This expansion is safeguarding the high quality standard of MILLER products and increasing availability.



WTE Präzisionstechnik GmbH in Kempten

▶ The innovation leader

As a technology-orientated, international business, WTE develops and produces innovative machining technology. Its core competences are in precision drill chuck systems, in the hydraulic chucking sector and in shrinking technology. In the area of precision drill chucks WTE has achieved market leadership in Europe. Precision and quality paired with a high level of competence in service make WTE a dependable partner.

BECK High Precision Cutting Tools:
The specialist for multi-bladed reamers and counterboring tools

- ▶ High performance reamers with internal coolant supply in a monoblock design and modular system
- ▶ Machine reamers without internal coolant supply in accordance with DIN or similar to DIN
- ▶ Hand reamers and taper reamers
- ▶ Core drills
- ▶ Countersinks / counterbores / deburring tools



BECK 
Präzisionswerkzeuge

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