

MAPAL fixed reamers Carbide and Cermet



Perfect for you.

Fixed solid carbide and Cermet reamers

The standard programme at a glance

Fixed NC-reamers
without internal coolant
pages 4, 8 – 11

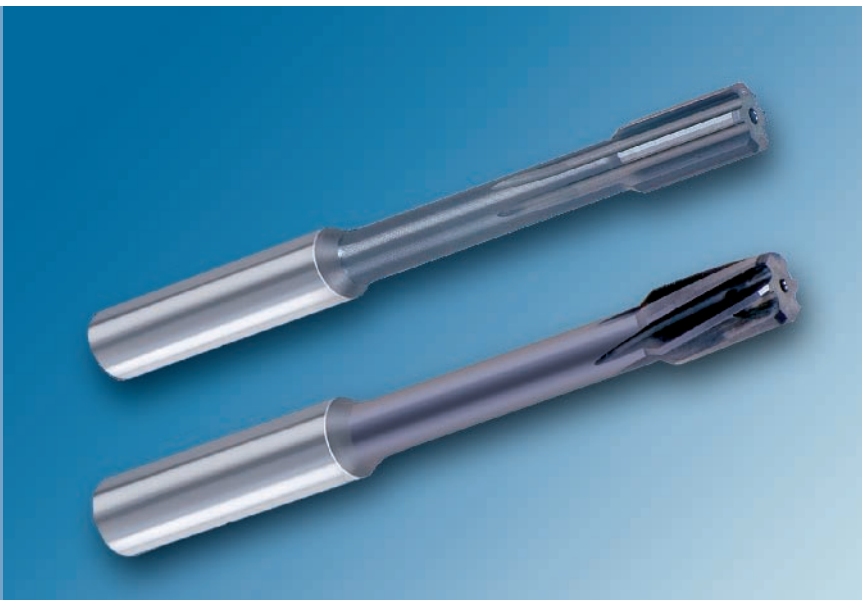


Fixed NC-reamers without IC, solid carbide, with/without coating

Carbide NC-reamers are designed for a very broad range of applications. Steels and cast iron materials as well as non-ferrous metals and plastics can be machined with very good results.

A further advantage: the tools can be mounted directly in hydraulic chucks or thermal expanding chucks.

Fixed NC-reamers
with internal coolant
pages 5, 12 – 13



Fixed NC-reamers with IC, solid carbide with/without coating

The perfect solution! The tool concept is characterized by high-quality materials, optimised cutting geometries and easy handling. Nearly all workpiece materials can be machined.

Another advantage: Coated tools allow unprecedented cutting speeds.

Fixed reamers
with internal coolant, HPC-design
pages 6, 7, 14 – 19



Fixed reamers with IC, HPC-design, Cermet

The HPC-design of the fixed Cermet reamers allows enormous machining speeds and at the same time very tight tolerances and excellent surface qualities.

An important programme extension is the expandable version that combines the advantages of a monoblock tool with the facility for making minor adjustments.

Fixed solid carbide and Cermet reamers

The right tool for every workpiece material

The innovative and further developed monoblock tools allow almost all materials to be machined.

Even difficult to machine materials can be machined due to the adaptable principle (modification of cutting geometries and coatings).

Short delivery times

Even intermediate sizes and special

tolerances are available at short notice. With the 1/100-reamers various fit sizes are also covered by standard tools. For example, the dimension $8.02 +0.005$ corresponds to the fit size 8^{F7} .

Quality

All series shown in this catalogue offer the outstanding MAPAL quality with long tool life, outstanding qualities of the finished bore and often quite amazing cutting speeds.

- For nearly every workpiece material
- Tools available from 0.98 mm
- Long tool life and optimum machining results



Fixed NC-reamers

Solid carbide / carbide-tipped, without internal coolant



High demands on the quality of the bore and concentricity require constant further development of standard tools

Carbide NC-reamers similar to DIN 8093 for through hole machining are designed for a very broad range of applications and workpiece materials.

The tools have adapted shank dimensions and can therefore be mounted directly in high precision chucks, hydraulic chucks and thermal expanding chucks.

The advantages are obvious:

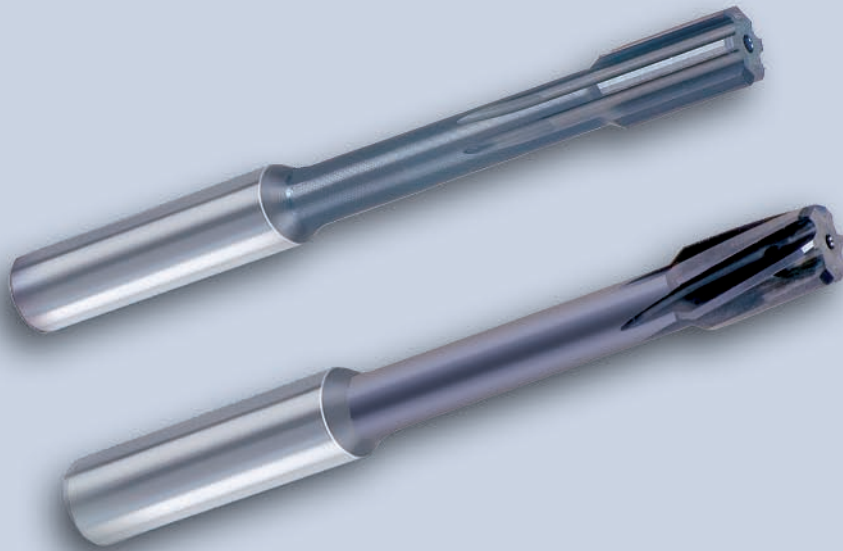
- No need for special holders or adaptors – a considerable cost saving potential.
- The direct mounting allows for highest concentricities.

The results:

- Longer tool life and higher cutting speeds.
- In brief, a tool that can be universally applied in the diameter range \varnothing 0.98 – 30 mm.

Fixed NC-reamers

Solid carbide, with internal coolant



Up-to-date production technology for a broad range of materials and workpieces

The broad range of applications for these multi-bladed solid carbide reamers comprises high performance cutting from high volume to single-item and repair production.

In the past, this application area was mostly covered by tools made to or similar to DIN standards. These are characterized by an easy design and good practical value. However they cannot satisfy today's requirements for high productivity, e.g. when used on machining centres.

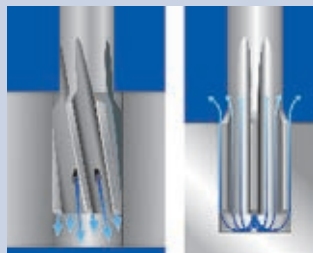
Therefore the application of fixed solid carbide reamers with internal coolant is recommended. Application know-how, high-quality materials and an up-to-date production technology have been merged to a highly productive tooling concept for a broad range of applications and materials.

Features and advantages

Internal coolant

The cutting edges are reliably supplied with coolant due to the sintered, central coolant passage – even when machining deep bores.

Longer tool life and a very good chip clearance are the result.



Solid carbide tool body

The main element of these tools are sturdy tubes from high-quality, wear-resistant micro-grain carbide. This material is characterized by a good resistance to bending and high hardness. The robust design avoids possible disadvantages arising

from a soldered joint.

Concentricity

Concentricity is decisive for tool life. The sturdy carbide tool body allows an optimum rigidity during the machining process. This is the prerequisite for even concentricity in the tool, including the cutting edges, the radial land and the shank.

Even with reground tools, there is no loss in quality.

Reduced number of shank dimensions

Due to the extremely reduced number of shank dimensions the complete diameter range can be used with a very limited number of holders and no reducing sleeves. The shanks do not have clamping surfaces and are virtually free of unbalance.

Optimised cutting edge geometry

The cutting edge geometry of the reamers was adapted to high performance cutting. In combination with the material of the tool body, chattering is suppressed even with increasing cutting speeds.

For machining materials which are difficult to machine, tools with modified cutting edge geometry and special coating are available at short notice.

Coating for highest performance

Tool lives and cutting speeds can be further increased and built-up edges can be avoided by using tools with coating. A high-quality TiAlN-coating allows a better utilisation of the tool. Other coatings are available on request.

Fixed reamers

HPC design, Cermet



High machining data – high process reliability

Those are the main requirements to a reaming tool in an up-to-date cutting process. For only a tool that meets these requirements offer the prerequisites to produce a product of continuously high quality – even in large batch production.

MAPAL therefore added another design to its programme of fixed reamers that allows enormous cutting speeds in the sense of High Performance Cutting, and at the same time safely achieves tight tolerances and highest surface qualities. The effective

performance offered by the HPC design is shown in the illustration. The HPC reamer is designed for a broad range of applications which have so far been reserved to grinding or honing.

advantages of a solid tool are combined with the expandability. The mechanism can easily absorb the enormous forces of HPC-machining.

Unlike the solid design, the expandable reamers have Cermet-tips. The expansion range is about 0.03 mm above the nominal diameter.

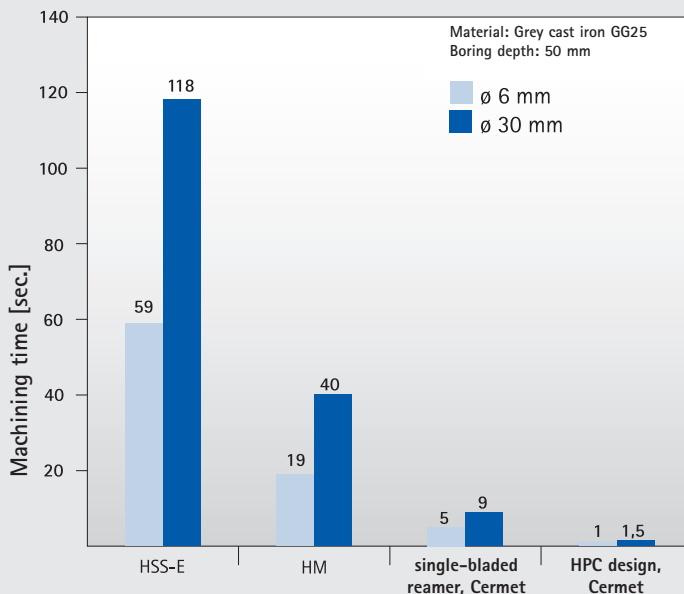
Main areas of application are the compensation for diameter reductions caused by wear and compensation for the effects on the machining diameter caused by materials or clamping.

Machining with minimum quantity lubrication

Fixed HPC reamers can easily be adapted to minimum quantity lubrication.

Expandable version

An important addition to the programme of HPC Cermet reamers is provided by the expandable version. The



Fixed reamers

HPC design, Cermet, expandable version



Guidelines for expandable fixed reamers from MAPAL

The fixed MAPAL expandable reamer can be expanded to a limited diameter.

The aim is,

- to correct the circumferential tolerance of the diameter produced; this means to be able to adjust with undersize allowance.
- to also have the facility for adjusting, for example, from IT7 to IT8, as long as the expansion limit is not exceeded.
- to be able to correct wear-contingent diameter loss and therefore lengthen the life of the tool.

Characteristics:

The expansion mechanism is set to an expansion range of approx. 0.03 mm. Beyond this point the expansion limit of the material is reached and permanent distortion is caused by further expansion.

Caution:

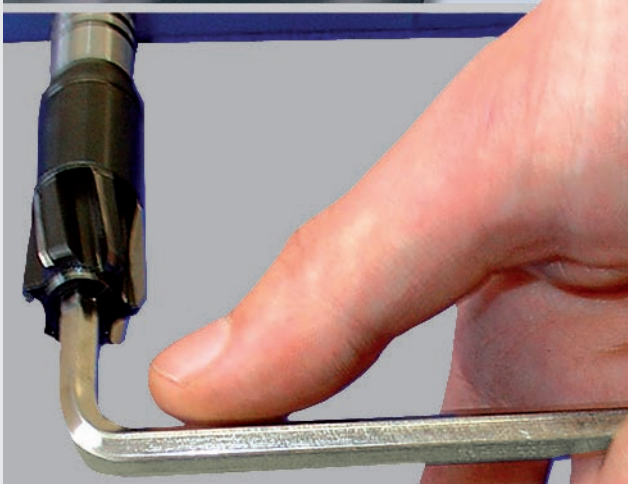
The actual size of the new tool must not be corrected into the minus zone !

Recommended procedure:

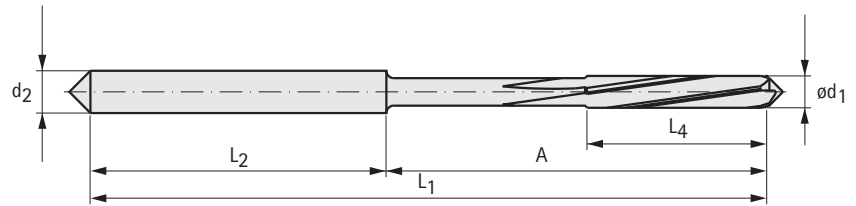
- Use the tool until the end of the tool life is reached (ϕ , surface).
- Adjust the tool diameter with the expansion bolt.

Please note:

- The expansion bolt should only be turned in the clockwise direction. Reference value: 90° corresponds to approx. 0.008 – 0.012 mm in diameter.
 - Do not expand the tool by more than 0.03 mm, or re-sharpening will only be possible once.
 - For following this recommendation, the tool can be re-sharpened numerous times!
- For re-sharpening or re-tipping we recommend the MAPAL reconditioning service! Should the diameter become too large after expanding, please proceed as follows: Loosen the expansion bolt in an anti-clockwise direction. Then expand again to the diameter in clockwise direction.



Fixed NC-reamers without internal coolant



cutting material	tool location	bore type	tool type
SC	cylindrical	through hole	B040240 B040245
SC-coated	cylindrical	through hole	B043245

P	K₁	K₂	N	B040240 B040245
P	K₁	K₂	N	B043245

Solid carbide, similar to DIN 8093, ø 0.98 – 2.97 mm

ød ₁ mm	Production tolerance	L ₁ mm	A mm	L ₄ mm	L ₂ mm	ød _{2h6} mm		B040240 & B040245			B043245	
								tool type	Avail- ability		Avail- ability	
0,98	+0,004/0	49,5	21,5	6	28	4	3	B040240	●			
0,99	+0,004/0	49,5	21,5	6	28	4	3	B040240	●			
1,00	H7	49,5	21,5	6	28	4	3	B040245	●		○	
1,01	+0,004/0	49,5	21,5	6	28	4	3	B040240	●			
1,02	+0,004/0	49,5	21,5	6	28	4	3	B040240	●			
1,03	+0,004/0	49,5	21,5	9	28	4	3	B040240	●			
1,20	H7	49,5	21,5	9	28	4	3	B040245	●		○	
1,40	H7	49,5	21,5	9	28	4	3	B040245	●		○	
1,48	+0,004/0	49,0	21,0	9	28	4	3	B040240	●			
1,49	+0,004/0	49,0	21,0	9	28	4	3	B040240	●			
1,50	H7	49,0	21,0	9	28	4	3	B040245	●		○	
1,51	+0,004/0	49,0	21,0	9	28	4	3	B040240	●			
1,52	+0,004/0	49,0	21,0	9	28	4	3	B040240	●			
1,53	+0,004/0	49,0	21,0	9	28	4	3	B040240	●			
1,60	H7	49,0	21,0	10	28	4	3	B040245	●		○	
1,80	H7	49,0	21,0	11	28	4	4	B040245	●		○	
1,98	+0,004/0	49,0	21,0	12	28	4	4	B040240	●			
1,99	+0,004/0	49,0	21,0	12	28	4	4	B040240	●			
2,00	H7	49,0	21,0	12	28	4	4	B040245	●		●	
2,01	+0,004/0	49,0	21,0	12	28	4	4	B040240	●			
2,02	+0,004/0	49,0	21,0	12	28	4	4	B040240	●			
2,03	+0,004/0	49,0	21,0	12	28	4	4	B040240	●			
2,20	H7	49,0	21,0	12	28	4	4	B040245	●		○	
2,48	+0,004/0	59,0	31,0	16	28	4	4	B040240	●			
2,49	+0,004/0	59,0	31,0	16	28	4	4	B040240	●			
2,50	H7	59,0	31,0	16	28	4	4	B040245	○		○	
2,51	+0,004/0	59,0	31,0	16	28	4	4	B040240	●			
2,52	+0,004/0	59,0	31,0	16	28	4	4	B040240	●			
2,53	+0,004/0	59,0	31,0	16	28	4	4	B040240	●			
2,80	H7	63,0	35,0	17	28	4	6	B040245	●		○	
2,97	+0,004/0	63,0	35,0	17	28	4	6	B040240	●			

Details required for ordering:

type	ø
B040240	2,49

For machining values see page 20.

Special tolerances and intermediate diameters in the given


ø-range available at short notice. Detailed delivery time on request.

● available ex stock Germany

● available ex stock Germany within 1 week

○ available ex stock Germany within 2 weeks

Solid carbide, similar to DIN 8093, ø 2.98 – 6.03 mm

ød ₁ mm	Production tolerance	L ₁ mm	A mm	L ₄ mm	L ₂ mm	ød _{2h6} mm		B040240 & B040245			B043245	
								tool type	Avail- ability		Avail- ability	
2,98	+0,004/0	63,0	35,0	17	28	4	6	B040240	●			
2,99	+0,004/0	63,0	35,0	17	28	4	6	B040240	●			
3,00	H7	63,0	35,0	17	28	4	6	B040245	●		●	
3,01	+0,004/0	63,0	35,0	17	28	4	6	B040240	●			
3,02	+0,004/0	63,0	35,0	17	28	4	6	B040240	●			
3,03	+0,004/0	63,0	35,0	17	28	4	6	B040240	●			
3,20	H7	65,0	37,0	16	28	4	6	B040245	●		○	
3,50	H7	70,0	42,0	18	28	4	6	B040245	●		○	
3,97	+0,004/0	75,0	47,0	19	28	4	6	B040240	●			
3,98	+0,004/0	75,0	47,0	19	28	4	6	B040240	●			
3,99	+0,004/0	75,0	47,0	19	28	4	6	B040240	●			
4,00	H7	75,0	47,0	19	28	4	6	B040245	●		●	
4,01	+0,004/0	75,0	47,0	19	28	4	6	B040240	●			
4,02	+0,004/0	75,0	47,0	19	28	4	6	B040240	●			
4,03	+0,004/0	75,0	47,0	19	28	4	6	B040240	●			
4,50	H7	80,0	44,0	21	36	6	6	B040245	●		○	
4,97	+0,004/0	86,0	50,0	23	36	6	6	B040240	●			
4,98	+0,004/0	86,0	50,0	23	36	6	6	B040240	●			
4,99	+0,004/0	86,0	50,0	23	36	6	6	B040240	●			
5,00	H7	86,0	50,0	23	36	6	6	B040245	●		●	
5,01	+0,004/0	86,0	50,0	23	36	6	6	B040240	●			
5,02	+0,004/0	86,0	50,0	23	36	6	6	B040240	●			
5,03	+0,004/0	86,0	50,0	23	36	6	6	B040240	●			
5,50	H7	93,0	57,0	26	36	6	6	B040245	●		○	
5,97	+0,005/0	93,0	57,0	26	36	6	6	B040240	●			
5,98	+0,005/0	93,0	57,0	26	36	6	6	B040240	●			
5,99	+0,005/0	93,0	57,0	26	36	6	6	B040240	●			
6,00	H7	93,0	57,0	26	36	6	6	B040245	●		●	
6,01	+0,005/0	93,0	57,0	26	36	6	6	B040240	●			
6,02	+0,005/0	93,0	57,0	26	36	6	6	B040240	●			
6,03	+0,005/0	93,0	57,0	26	36	6	6	B040240	●			

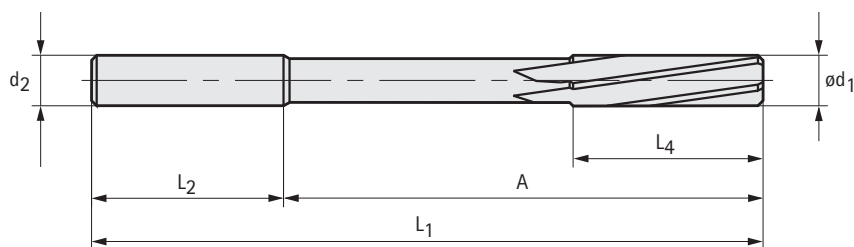
For machining values see page 20.
Special tolerances and intermediate diameters in the given
ø-range available at short notice. Detailed delivery time on request.

● available ex stock Germany
○ available ex stock Germany within 2 weeks

Fixed NC-reamers without internal coolant

cutting material	tool location	bore type	tool type
SC/carb.	cylindrical	through hole	B040240 B040245
SC/carb.-coated	cylindrical	through hole	B043245

P	K₁	K₂	N	B040240 B040245
P	K₁	K₂	N	B043245



Solid carbide/carbide, similar to DIN 8093, ø 6.50 – 11.50 mm

ød ₁ mm	Production tolerance	L ₁ mm	A mm	L ₄ mm	L ₂ mm	ød ₂ h6 mm		B040240 & B040245		B043245	
								tool type	Avail- ability	Avail- ability	
6,50	H7	101	65	28	36	8	6	B040245	●		○
7,00	H7	109	73	31	36	8	6	B040245	●		○
7,50	H7	109	73	31	36	8	6	B040245	●		○
7,97	+0,005/0	117	81	33	36	8	6	B040240	●		
7,98	+0,005/0	117	81	33	36	8	6	B040240	●		
7,99	+0,005/0	117	81	33	36	8	6	B040240	●		
8,00	H7	117	81	33	36	8	6	B040245	●		●
8,01	+0,005/0	117	81	33	36	8	6	B040240	●		
8,02	+0,005/0	117	81	33	36	8	6	B040240	●		
8,03	+0,005/0	117	81	33	36	8	6	B040240	●		
8,04	+0,005/0	117	81	33	36	8	6	B040240	●		
8,50	H7	117	81	33	36	8	6	B040245	●		○
9,00	H7	125	85	36	40	10	6	B040245	●		○
9,50	H7	125	85	36	40	10	6	B040245	●		○
9,97	+0,005/0	133	93	38	40	10	6	B040240	●		
9,98	+0,005/0	133	93	38	40	10	6	B040240	●		
9,99	+0,005/0	133	93	38	40	10	6	B040240	●		
10,00	H7	133	93	38	40	10	6	B040245	●		●
10,01	+0,005/0	133	93	38	40	10	6	B040240	●		
10,02	+0,005/0	133	93	38	40	10	6	B040240	●		
10,03	+0,005/0	133	93	38	40	10	6	B040240	●		
10,04	+0,005/0	133	93	38	40	10	6	B040240	●		
10,05	+0,005/0	133	93	38	40	10	6	B040240	●		
10,50	H7	133	93	38	40	10	6	B040245	●		○
11,00	H7	142	97	41	45	12	6	B040245	●		○
11,50	H7	142	97	41	45	12	6	B040245	●		○

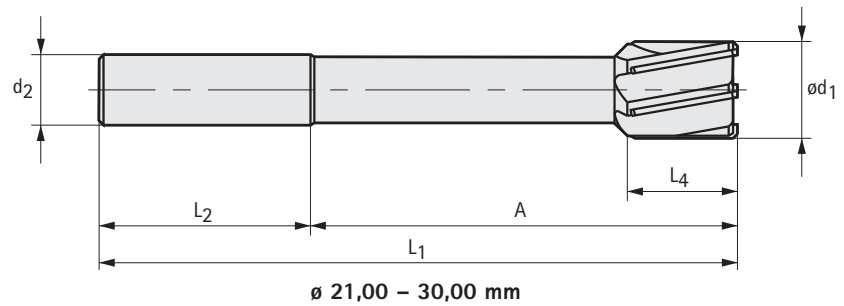
Details required for ordering:

type	ø
B040240	7,98


For machining values see page 20.

Special tolerances and intermediate diameters in the given
ø-range available at short notice. Detailed delivery time on request.

- available ex stock Germany
- available ex stock Germany within 1 weeks
- available ex stock Germany within 2 weeks



Solid carbide/carbide, similar to DIN 8093, \varnothing 11.97 – 20.00 mm
Carbide-tipped, \varnothing 21.00 – 30.00 mm

$\varnothing d_1$ mm	Production tolerance	L_1 mm	A mm	L_4 mm	L_2 mm	$\varnothing d_2 h_6$ mm		B040240 & B040245		B043245	
								tool type	Avail- ability	Avail- ability	Avail- ability
11,97	+0,005/0	151	106	44	45	12	6	B040240	●		
11,98	+0,005/0	151	106	44	45	12	6	B040240	●		
11,99	+0,005/0	151	106	44	45	12	6	B040240	●		
12,00	H7	151	106	44	45	12	6	B040245	●		●
12,01	+0,005/0	151	106	44	45	12	6	B040240	●		
12,02	+0,005/0	151	106	44	45	12	6	B040240	●		
12,03	+0,005/0	151	106	44	45	12	6	B040240	●		
12,04	+0,005/0	151	106	44	45	12	6	B040240	●		
12,05	+0,005/0	151	106	44	45	12	6	B040240	●		
13,00	H7	151	106	44	45	12	6	B040245	●		○
14,00	H7	160	112	47	48	16	8	B040245	●		●
15,00	H7	162	114	50	48	16	8	B040245	●		○
16,00	H7	170	122	52	48	16	8	B040245	●		●
17,00	H7	175	127	52	48	18	8	B040245	●		○
18,00	H7	182	134	52	48	18	8	B040245	●		○
19,00	H7	182	139	52	50	20	8	B040245	●		○
20,00	H7	195	145	52	50	20	8	B040245	●		○
21,00	H7	160	110	25	50	20	6	B040245	●		
22,00	H7	160	110	25	50	20	6	B040245	●		
23,00	H7	180	130	25	50	20	6	B040245	●		
24,00	H7	180	130	25	50	20	8	B040245	●		
25,00	H7	180	130	25	50	20	8	B040245	●		
26,00	H7	180	130	25	50	20	8	B040245	●		
27,00	H7	180	130	25	50	20	8	B040245	●		
28,00	H7	180	124	25	56	25	8	B040245	●		
29,00	H7	180	124	25	56	25	8	B040245	●		
30,00	H7	200	144	30	56	25	8	B040245	●		

For machining values see page 20.

Special tolerances and intermediate diameters in the given

\varnothing -range available at short notice. Detailed delivery time on request.

● available ex stock Germany

● available ex stock Germany within 1 weeks

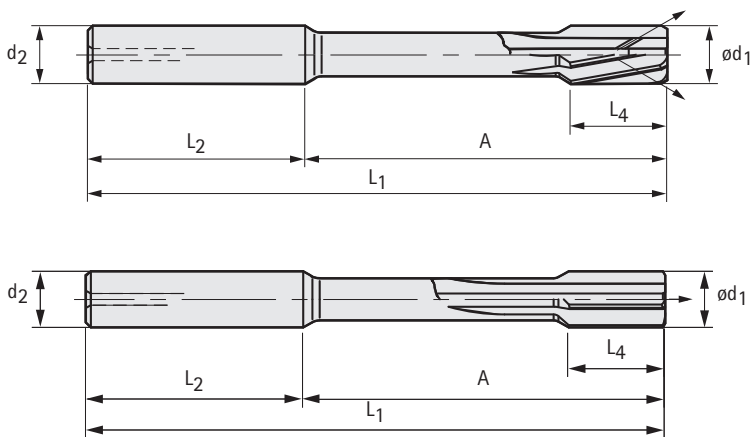
○ available ex stock Germany within 2 weeks

Fixed NC-reamers with internal coolant


cutting material	tool location	coolant supply	bore type	tool type
SC	cylindrical	to the blades	through hole	B040260
SC	cylindrical	central	blind hole	B040261
SC coated	cylindrical	to the blades	through hole	B043260
SC coated	cylindrical	central	blind hole	B043261

P **K₁** **K₂** **N** B040260
B040261

P **K₁** **K₂** **N** B043260
B043261



Solid carbide, \varnothing 3.97 – 8.01 mm

$\varnothing d_1$ mm	Production tolerance	L_1 mm	A mm	L_4 mm	L_2 mm	$\varnothing d_2 h_6$ mm		B040260 & B040261		B043260 & B043261	
								Avail- ability		Avail- ability	
3,97	+0,004/0	75	39	12	36	6	4	●		●	
3,98	+0,004/0	75	39	12	36	6	4	●		●	
3,99	+0,004/0	75	39	12	36	6	4	●		●	
4,00	H7	75	39	12	36	6	4	●		●	
4,01	+0,004/0	75	39	12	36	6	4	●		●	
4,02	+0,004/0	75	39	12	36	6	4	●		●	
4,03	+0,004/0	75	39	12	36	6	4	●		●	
4,50	H7	75	39	12	36	6	4	●		●	
4,97	+0,004/0	75	39	12	36	6	4	●		●	
4,98	+0,004/0	75	39	12	36	6	4	●		●	
4,99	+0,004/0	75	39	12	36	6	4	●		●	
5,00	H7	75	39	12	36	6	4	●		●	
5,01	+0,004/0	75	39	12	36	6	4	●		●	
5,02	+0,004/0	75	39	12	36	6	4	●		●	
5,03	+0,004/0	75	39	12	36	6	4	●		●	
5,50	H7	75	39	12	36	6	4	●		●	
5,97	+0,005/0	75	39	12	36	6	4	●		●	
5,98	+0,005/0	75	39	12	36	6	4	●		●	
5,99	+0,005/0	75	39	12	36	6	4	●		●	
6,00	H7	75	39	12	36	6	4	●		●	
6,01	+0,005/0	75	39	12	36	6	4	●		●	
6,02	+0,005/0	75	39	12	36	6	4	●		●	
6,03	+0,005/0	75	39	12	36	6	4	●		●	
6,50	H7	100	64	16	36	8	6	●		●	
7,00	H7	100	64	16	36	8	6	●		●	
7,50	H7	100	64	16	36	8	6	●		●	
7,97	+0,005/0	100	64	16	36	8	6	●		●	
7,98	+0,005/0	100	64	16	36	8	6	●		●	
7,99	+0,005/0	100	64	16	36	8	6	●		●	
8,00	H7	100	64	16	36	8	6	●		●	
8,01	+0,005/0	100	64	16	36	8	6	●		●	

Details required for ordering:


type	\varnothing
B040260	6,5

For machining values see page 21

Special tolerances and intermediate diameters in the given
 \varnothing -range available at short notice. Detailed delivery time on request.
TiAlN coating for high performance cutting.

● available ex stock Germany

In solid carbide, ø 8.02 – 20.00 mm

ød ₁ mm	Production tolerance	L ₁ mm	A mm	L ₄ mm	L ₂ mm	ød _{2h6} mm		B040260 & B040261		B043260 & B043261	
								Avail- ability		Avail- ability	
8,02	+0,005/0	100	64	16	36	8	6	●		●	
8,03	+0,005/0	100	64	16	36	8	6	●		●	
8,50	H7	100	60	20	40	10	6	●		●	
9,00	H7	100	60	20	40	10	6	●		●	
9,50	H7	120	80	20	40	10	6	●		●	
9,97	+0,005/0	120	80	20	40	10	6	●		●	
9,98	+0,005/0	120	80	20	40	10	6	●		●	
9,99	+0,005/0	120	80	20	40	10	6	●		●	
10,00	H7	120	80	20	40	10	6	●		●	
10,01	+0,005/0	120	80	20	40	10	6	●		●	
10,02	+0,005/0	120	80	20	40	10	6	●		●	
10,03	+0,005/0	120	80	20	40	10	6	●		●	
10,50	H7	120	75	20	45	12	6	●		●	
11,00	H7	120	75	20	45	12	6	●		●	
11,50	H7	120	75	20	45	12	6	●		●	
11,97	+0,005/0	120	75	20	45	12	6	●		●	
11,98	+0,005/0	120	75	20	45	12	6	●		●	
11,99	+0,005/0	120	75	20	45	12	6	●		●	
12,00	H7	120	75	20	45	12	6	●		●	
12,01	+0,005/0	120	75	20	45	12	6	●		●	
12,02	+0,005/0	120	75	20	45	12	6	●		●	
12,03	+0,005/0	120	75	20	45	12	6	●		●	
13,00	H7	130	85	22	45	14	6	●		●	
14,00	H7	130	85	22	45	14	6	●		●	
15,00	H7	130	82	22	48	16	6	●		●	
16,00	H7	150	102	25	48	16	6	●		●	
17,00	H7	150	102	25	48	18	8	●		●	
18,00	H7	150	102	25	48	18	8	●		●	
19,00	H7	150	100	25	50	20	8	●		●	
20,00	H7	150	100	25	50	20	8	●		●	

The VA version has been developed for cutting **high quality stainless steels**. There is also a fixed reamer as a further version for **hard machining**.

Both types of tool are provided with special cutting geometry and coatings. This means that even materials which are difficult to cut can be machined with optimum results. These versions are

available within 2 weeks.

For machining values see page 21.

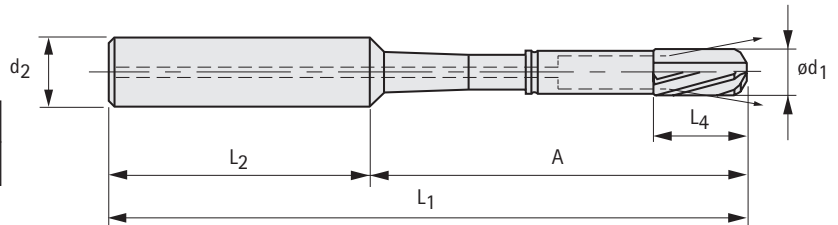
Special tolerances and intermediate diameters in the given ø-range available at short notice. Detailed delivery time on request. Diameters > 20 mm are available on request.

● available ex stock Germany

Fixed HPC reamers with internal coolant

cutting material	tool location	coolant supply	bore type	tool type
Cermet	cylindrical	to the blades	through hole	B040325 B040326

P **K₂**



With solid cermet head, ø 4.00 – 20.00 mm

ød ₁ mm	Production tolerance	L ₁ mm	A mm	L ₄ mm	L ₂ mm	ød ₂ h5 mm		B040325	
								Avail- ability	
4,0	H7	80	40	14	40	10	4	●	
4,5	H7	80	40	14	40	10	4	●	
5,0	H7	85	40	14	45	12	4	●	
5,5	H7	85	40	14	45	12	4	●	
6,0	H7	85	40	14	45	12	4	●	
6,5	H7	105	60	14	45	12	6	●	
7,0	H7	110	65	18	45	12	6	●	
7,5	H7	110	65	18	45	12	6	●	
8,0	H7	110	65	18	45	12	6	●	
8,5	H7	120	75	18	45	12	6	●	
9,0	H7	120	75	22	45	12	6	●	
9,5	H7	120	75	22	45	12	6	●	
10,0	H7	120	75	22	45	12	6	●	
10,5	H7	120	75	22	45	12	6	●	
11,0	H7	120	75	22	45	12	6	●	
11,5	H7	120	75	22	45	12	6	●	
12,0	H7	120	75	22	45	12	6	●	
13,0	H7	130	82	22	48	16	6	●	
14,0	H7	130	82	23	48	16	6	●	
15,0	H7	130	82	23	48	16	6	●	
16,0	H7	130	82	26	48	16	6	●	
17,0	H7	160	112	26	48	16	8	●	
18,0	H7	160	112	26	48	16	8	●	
19,0	H7	160	112	26	48	16	8	●	
20,0	H7	160	112	26	48	16	8	●	

Details required for ordering:

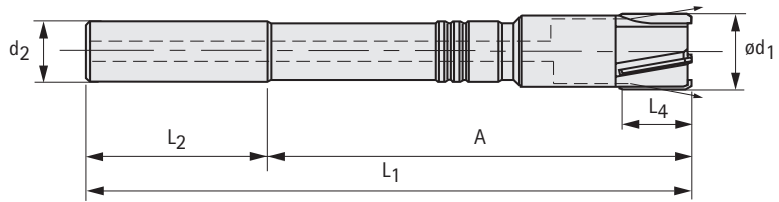
type	ø
B040325	12,0

For machining values see page 22.


Special tolerances and intermediate diameters in the given

ø-range available at short notice. Detailed delivery time on request.

● available ex stock Germany



Cermet-tipped, \varnothing 21.00 – 40.00 mm

$\varnothing d_1$ mm	Production tolerance	L_1 mm	A mm	L_4 mm	L_2 mm	$\varnothing d_2 h_5$ mm		B040326	
								Avail- ability	
21,0	H7	160	112	22	48	16	6	●	
22,0	H7	160	112	22	48	16	6	●	
23,0	H7	180	130	22	50	20	6	●	
24,0	H7	180	130	22	50	20	6	●	
25,0	H7	180	130	22	50	20	6	●	
26,0	H7	180	130	22	50	20	6	●	
27,0	H7	180	130	25	50	20	6	●	
28,0	H7	180	124	25	56	25	6	●	
29,0	H7	180	124	25	56	25	6	●	
30,0	H7	200	144	25	56	25	8	●	
31,0	H7	200	144	25	56	25	8	●	
32,0	H7	200	144	25	56	25	8	●	
33,0	H7	200	144	25	56	25	8	●	
34,0	H7	200	144	25	56	25	8	●	
35,0	H7	200	144	25	56	25	8	●	
36,0	H7	200	144	25	56	25	8	●	
37,0	H7	200	144	25	56	25	8	●	
38,0	H7	200	144	25	56	25	8	●	
39,0	H7	200	144	25	56	25	8	●	
40,0	H7	200	144	25	56	25	8	●	

For machining values see page 22.

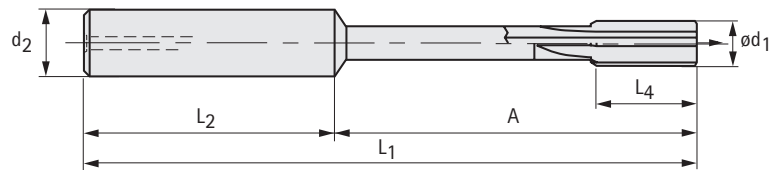
Special tolerances and intermediate diameters in the given

\varnothing -range available at short notice. Detailed delivery time on request.


● available ex stock Germany

Fixed HPC reamers with internal coolant

cutting material	tool location	coolant supply	bore type	tool type
Cermet	cylindrical	central	blind hole	B040340 B040341



With solid cermet head, \varnothing 4.00 – 20.00 mm

$\varnothing d_1$ mm	Production tolerance	L ₁ mm	A mm	L ₄ mm	L ₂ mm	$\varnothing d_2 h_5$ mm		B040340	
								Avail-ability	
4,0	H7	80	40	12	40	10	4	●	
4,5	H7	80	40	12	40	10	4	●	
5,0	H7	85	40	12	45	12	4	●	
5,5	H7	85	40	12	45	12	4	●	
6,0	H7	85	40	12	45	12	4	●	
6,5	H7	105	60	12	45	12	6	●	
7,0	H7	110	65	16	45	12	6	●	
7,5	H7	110	65	16	45	12	6	●	
8,0	H7	110	65	16	45	12	6	●	
8,5	H7	120	75	19	45	12	6	●	
9,0	H7	120	75	19	45	12	6	●	
9,5	H7	120	75	19	45	12	6	●	
10,0	H7	120	75	19	45	12	6	●	
10,5	H7	120	75	19	45	12	6	●	
11,0	H7	120	75	19	45	12	6	●	
11,5	H7	120	75	19	45	12	6	●	
12,0	H7	120	75	19	45	12	6	●	
13,0	H7	130	82	19	48	16	6	●	
14,0	H7	130	82	19	48	16	6	●	
15,0	H7	130	82	19	48	16	6	●	
16,0	H7	130	82	19	48	16	6	●	
17,0	H7	160	112	22	48	16	6	●	
18,0	H7	160	112	22	48	16	6	●	
19,0	H7	160	112	22	48	16	6	●	
20,0	H7	160	112	22	48	16	6	●	

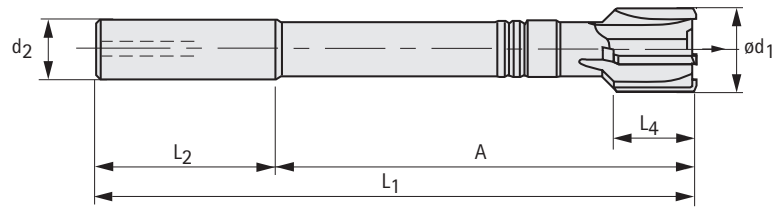
Details required for ordering:

type	\varnothing
B040340	12,0


For machining values see page 22.

Special tolerances and intermediate diameters in the given \varnothing -range available at short notice. Detailed delivery time on request.

● available ex stock Germany



Cermet-tipped, \varnothing 21.00 – 40.00 mm

$\varnothing d_1$ mm	Production tolerance	L_1 mm	A mm	L_4 mm	L_2 mm	$\varnothing d_2 h5$ mm		B040341	
								Avail- ability	
21,0	H7	160	112	19	48	16	6	●	
22,0	H7	160	112	22	48	16	6	●	
23,0	H7	180	130	22	50	20	6	●	
24,0	H7	180	130	22	50	20	6	●	
25,0	H7	180	130	22	50	20	6	●	
26,0	H7	180	130	22	50	20	6	●	
27,0	H7	180	130	25	50	20	6	●	
28,0	H7	180	124	25	56	25	6	●	
29,0	H7	180	124	25	56	25	6	●	
30,0	H7	200	144	25	56	25	6	●	
31,0	H7	200	144	25	56	25	6	●	
32,0	H7	200	144	25	56	25	6	●	
33,0	H7	200	144	25	56	25	6	●	
34,0	H7	200	144	25	56	25	6	●	
35,0	H7	200	144	25	56	25	8	●	
36,0	H7	200	144	25	56	25	8	●	
37,0	H7	200	144	25	56	25	8	●	
38,0	H7	200	144	25	56	25	8	●	
39,0	H7	200	144	25	56	25	8	●	
40,0	H7	200	144	25	56	25	8	●	

For machining values see page 22.

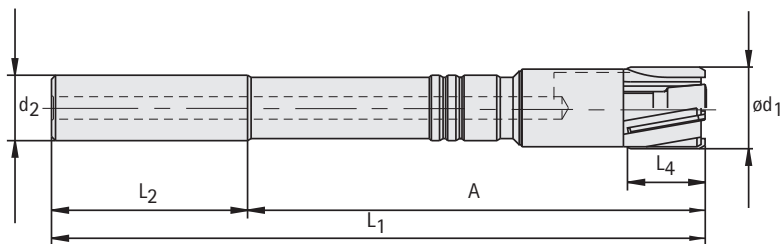
Special tolerances and intermediate diameters in the given

\varnothing -range available at short notice. Detailed delivery time on request.

● available ex stock Germany

Fixed HPC reamers, expandable version with internal coolant

cutting material	tool location	coolant supply	bore type	tool type
Cermet	cylindrical	central	blind hole	B040327



Cermet-tipped, ø 8.00 – 21.00 mm

ød ₁ mm	Production tolerance	L ₁ mm	A mm	L ₂ mm	L ₄ mm	ød ₂ h5 mm		B040327	
								Avail- ability	
8,0	H7	110	74	12	36	6	4	●	
8,5	H7	110	74	12	36	6	4	●	
9,0	H7	110	74	12	36	6	6	●	
9,5	H7	120	84	12	36	8	6	●	
10,0	H7	120	84	12	36	8	6	●	
10,5	H7	120	84	12	36	8	6	●	
11,0	H7	120	84	12	36	8	6	●	
11,5	H7	120	84	12	36	8	6	●	
12,0	H7	140	100	12	40	10	6	●	
12,5	H7	140	100	12	40	10	6	●	
13,0	H7	140	100	12	40	10	6	●	
14,0	H7	140	95	16	45	12	6	●	
15,0	H7	140	95	16	45	12	6	●	
16,0	H7	160	115	19	45	14	6	●	
17,0	H7	160	115	19	45	14	6	●	
18,0	H7	160	112	19	48	16	6	●	
19,0	H7	160	112	19	48	16	6	●	
20,0	H7	160	112	19	48	16	6	●	
21,0	H7	160	112	19	48	16	6	●	

Details required for ordering:

type	ø
B040327	12,0


For machining values see page 22.

Special tolerances and intermediate diameters in the given
ø-range available at short notice. Detailed delivery time on request.

● available ex stock Germany

● available ex stock Germany within 1 week

Cermet-tipped, ø 22.00 – 40.00 mm

ød ₁ mm	Production tolerance	L ₁ mm	A mm	L ₂ mm	L ₄ mm	ød _{2h5} mm		B040327	
								Avail- ability	
22,0	H7	160	112	22	48	16	6	●	
23,0	H7	180	130	22	50	20	6	●	
24,0	H7	180	130	22	50	20	6	●	
25,0	H7	180	130	22	50	20	6	●	
26,0	H7	180	130	22	50	20	6	●	
27,0	H7	180	130	25	50	20	6	●	
28,0	H7	180	124	25	56	25	6	●	
29,0	H7	180	124	25	56	25	6	●	
30,0	H7	200	144	25	56	25	6	●	
31,0	H7	200	144	25	56	25	6	●	
32,0	H7	200	144	25	56	25	6	●	
33,0	H7	200	144	25	56	25	6	●	
34,0	H7	200	144	25	56	25	8	●	
35,0	H7	200	144	25	56	25	8	●	
36,0	H7	200	144	25	56	25	8	●	
37,0	H7	200	144	25	56	25	8	●	
38,0	H7	200	144	25	56	25	8	●	
39,0	H7	200	144	25	56	25	8	●	
40,0	H7	200	144	25	56	25	8	●	



For machining values see page 22.

Special tolerances and intermediate diameters in the given

ø-range available at short notice. Detailed delivery time on request.

● available ex stock Germany

Machining values for fixed NC-reamers, carbide

		Carbide reamers without IC							Carbide reamers with coating, without IC									
																		
	v_c	*	ϕ mm < 5	ϕ mm 5 - 8	ϕ mm 8 - 12	ϕ mm 12 - 16	ϕ mm 16 - 20	ϕ mm 30 - 50	v_c	*	ϕ mm < 5	ϕ mm 5 - 8	ϕ mm 8 - 12	ϕ mm 12 - 16	ϕ mm 16 - 20	ϕ mm 30 - 50		
P	Steel, < 700 N/mm ²	15 - 20	f a	0,1 - 0,15 0,1	0,15 0,1 - 0,2	0,15 - 0,2 0,1 - 0,2	0,2 - 0,25 0,2 - 0,3	0,2 - 0,3 0,2 - 0,3	0,3 - 0,5 0,3 - 0,5	25 - 35	f a	0,1 - 0,15 0,1	0,15 0,1 - 0,2	0,15 - 0,2 0,1 - 0,2	0,2 - 0,25 0,2 - 0,3	0,2 - 0,3 0,2 - 0,3	0,3 - 0,5 0,3 - 0,5	
	Steel, 700 - 900 N/mm ²	12 - 15	f a	0,1 - 0,15 0,1	0,15 0,1 - 0,2	0,15 - 0,2 0,1 - 0,2	0,2 - 0,25 0,2 - 0,3	0,2 - 0,3 0,2 - 0,3	0,3 - 0,5 0,3 - 0,5	20 - 30	f a	0,1 - 0,15 0,1	0,15 0,1 - 0,2	0,15 - 0,2 0,1 - 0,2	0,2 - 0,25 0,2 - 0,3	0,2 - 0,3 0,2 - 0,3	0,3 - 0,5 0,3 - 0,5	
	Steel, 900 - 1200 N/mm ²	8 - 12	f a	0,1 - 0,15 0,1	0,15 0,1 - 0,2	0,15 - 0,2 0,1 - 0,2	0,2 - 0,25 0,2 - 0,3	0,2 - 0,3 0,2 - 0,3	0,3 - 0,5 0,3 - 0,5	12 - 20	f a	0,1 - 0,15 0,1	0,15 0,1 - 0,2	0,15 - 0,2 0,1 - 0,2	0,2 - 0,25 0,2 - 0,3	0,2 - 0,3 0,2 - 0,3	0,3 - 0,5 0,3 - 0,5	
M	Stainless steel <700 N/mm ²	8 - 15	*1 f a	0,08 - 0,15 0,08 - 0,15	0,1 0,1	0,1 - 0,2 0,1 - 0,2	0,2 - 0,25 0,2 - 0,3	0,2 - 0,3 0,2 - 0,3	0,3 - 0,5 0,3 - 0,5	15 - 20	f a	0,08 - 0,15 0,08 - 0,15	0,1 0,1	0,1 - 0,2 0,1 - 0,2	0,2 - 0,25 0,2 - 0,3	0,2 - 0,3 0,2 - 0,3	0,3 - 0,5 0,3 - 0,5	
	Stainless steel > 700 N/mm ²	7 - 12	f a	0,08 - 0,15 0,08 - 0,15	0,1 0,1	0,1 - 0,2 0,1 - 0,2	0,2 - 0,25 0,2 - 0,3	0,2 - 0,3 0,2 - 0,3	0,3 - 0,5 0,3 - 0,5	10 - 18	f a	0,08 - 0,15 0,08 - 0,15	0,1 0,1	0,1 - 0,2 0,1 - 0,2	0,2 - 0,25 0,2 - 0,3	0,2 - 0,3 0,2 - 0,3	0,3 - 0,5 0,3 - 0,5	
K	Cast iron (CI)	12 - 20	f a	0,1 - 0,15 0,1 - 0,15	0,15 - 0,2 0,1 - 0,2	0,15 - 0,3 0,1 - 0,2	0,2 - 0,3 0,2 - 0,3	0,2 - 0,4 0,2 - 0,3	0,3 - 0,5 0,3 - 0,5	20 - 35	f a	0,1 - 0,15 0,1 - 0,15	0,15 - 0,2 0,1 - 0,2	0,15 - 0,3 0,1 - 0,2	0,2 - 0,3 0,2 - 0,3	0,2 - 0,4 0,2 - 0,3	0,3 - 0,5 0,3 - 0,5	
	Nodular graphite iron (GGG) till GGG 50	12 - 15	f a	0,1 - 0,15 0,1 - 0,15	0,15 - 0,2 0,1 - 0,2	0,15 - 0,3 0,1 - 0,2	0,2 - 0,3 0,2 - 0,3	0,2 - 0,4 0,2 - 0,3	0,3 - 0,5 0,3 - 0,5	20 - 30	f a	0,1 - 0,15 0,1 - 0,15	0,15 - 0,2 0,1 - 0,2	0,15 - 0,3 0,1 - 0,2	0,2 - 0,3 0,2 - 0,3	0,2 - 0,4 0,2 - 0,3	0,3 - 0,5 0,3 - 0,5	
	Nodular graphite iron (GGG) > GGG 50	10 - 15	f a	0,1 - 0,15 0,1 - 0,15	0,15 - 0,2 0,1 - 0,2	0,15 - 0,3 0,1 - 0,2	0,2 - 0,3 0,2 - 0,3	0,2 - 0,4 0,2 - 0,3	0,3 - 0,5 0,3 - 0,5	15 - 20	f a	0,1 - 0,15 0,1 - 0,15	0,15 - 0,2 0,1 - 0,2	0,15 - 0,3 0,1 - 0,2	0,2 - 0,3 0,2 - 0,3	0,2 - 0,4 0,2 - 0,3	0,3 - 0,5 0,3 - 0,5	
N	Brass/copper Cu/Zn/Mg-alloys	25 - 50	f a	0,12 - 0,16 0,1 - 0,15	0,15 - 0,2 0,15 - 0,2	0,15 - 0,3 0,15 - 0,2	0,25 - 0,35 0,2 - 0,3	0,2 - 0,4 0,2 - 0,3	0,3 - 0,5 0,3 - 0,5	-	f a	- -	- -	- -	- -	- -	- -	
	Aluminium alloys (Si<7%)	20 - 60	f a	0,12 - 0,16 0,1 - 0,15	0,15 - 0,2 0,15 - 0,2	0,15 - 0,25 0,15 - 0,2	0,2 - 0,3 0,2 - 0,3	0,2 - 0,3 0,2 - 0,3	0,3 - 0,5 0,3 - 0,5	-	f a	- -	- -	- -	- -	- -	- -	
	Aluminium alloys (Si>7%)	20 - 30	f a	0,12 - 0,16 0,1 - 0,15	0,15 - 0,2 0,15 - 0,2	0,15 - 0,25 0,15 - 0,2	0,2 - 0,3 0,2 - 0,3	0,2 - 0,3 0,2 - 0,3	0,3 - 0,5 0,3 - 0,5	-	f a	- -	- -	- -	- -	- -	- -	
	Plastics, soft	20 - 50	f a	0,12 - 0,16 0,1 - 0,15	0,15 - 0,2 0,15 - 0,2	0,15 - 0,25 0,15 - 0,2	0,25 - 0,35 0,2 - 0,3	0,2 - 0,3 0,2 - 0,3	0,3 - 0,5 0,3 - 0,5	-	f a	- -	- -	- -	- -	- -	- -	- -
	Plastics, hard fiber glass-/carbon fiber-reinforced	10 - 15	f a	0,12 - 0,16 0,1 - 0,15	0,15 - 0,2 0,15 - 0,2	0,15 - 0,25 0,2 - 0,3	0,25 - 0,35 0,2 - 0,3	0,2 - 0,3 0,3 - 0,4	0,3 - 0,5 0,3 - 0,5	20 - 30	f a	0,12 - 0,16 0,1 - 0,15	0,15 - 0,2 0,15 - 0,2	0,15 - 0,25 0,2 - 0,3	0,25 - 0,35 0,2 - 0,3	0,2 - 0,3 0,3 - 0,4	0,3 - 0,5 0,3 - 0,5	
S	Titanium	7 - 12	*1 f a	0,08 - 0,15 0,08 - 0,15	0,1 0,1 - 0,2	0,1 - 0,2 0,1 - 0,2	0,2 - 0,25 0,2 - 0,3	0,2 - 0,3 0,2 - 0,4	0,3 - 0,5 0,3 - 0,5	-	f a	- -	- -	- -	- -	- -	- -	
H	Hardened materials 48 - 60 HRC	-	f a	- -	- -	- -	- -	- -	-	f a	- -	- -	- -	- -	- -	- -		

Please note: if drilling depth > 2xD, try for the lower value

The figures given are guidelines. The best values for the application in question should be calculated from trials or during the machining process as the effects of component geometry, clamping and machine stability cannot be taken into account here.

*1 Special cutting geometry for uncoated reamers.

*2 Special cutting geometry TiAlN.

*3 see category "stainless steel > 700 N/mm²".

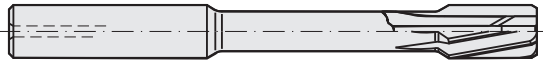
*4 Special cutting geometry and special coating.

f = Feed rate [mm/rev]

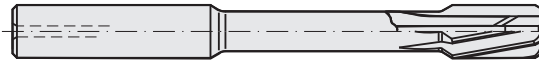
a = Bore allowance in ϕ [mm]

v_c = Cutting speed [m/min]

Carbide reamers, with IC

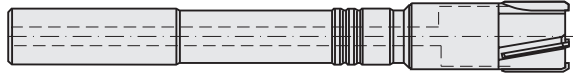
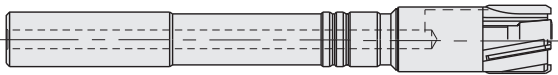


Carbide reamers with coating, with IC



v _c	*		ø mm	ø mm	ø mm	ø mm	ø mm	ø mm	v _c	*		ø mm	ø mm	ø mm	ø mm	ø mm	ø mm
			< 5	5 - 8	8 - 12	12 - 16	16 - 20	30 - 50				< 5	5 - 8	8 - 12	12 - 16	16 - 20	30 - 50
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	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			a	0,1	0,1 - 0,2	0,1 - 0,2	0,2 - 0,3	0,2 - 0,3	0,3 - 0,5
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	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			a	0,1	0,1 - 0,2	0,1 - 0,2	0,2 - 0,3	0,2 - 0,3	0,3 - 0,5
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	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			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
15 - 40	*2	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	20 - 60	*2	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			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
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	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			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
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	60 - 140		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			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
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	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			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
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	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			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
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	100 - 250		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			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
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	-		f	-	-	-	-	-	-
		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			a	-	-	-	-	-	-
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	-		f	-	-	-	-	-	-
		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			a	-	-	-	-	-	-
12 - 14		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	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 - 0,2	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
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	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 - 0,2	0,2 - 0,3	0,2 - 0,3	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
12 - 30	*1	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	-	*3	f	-	-	-	-	-	-
		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			a	-	-	-	-	-	-
8 - 12	*4	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	8 - 12	*4	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	0,1 - 0,15	0,15 - 0,2	0,15 - 0,25	0,2 - 0,3			a	0,05 - 0,1	0,1 - 0,15	0,1 - 0,15	0,15 - 0,2	0,15 - 0,25	0,2 - 0,3

Machining values for fixed Cermet reamers

		Cermet reamers, with IC								Cermet reamers, with IC, expandable version							
																	
	v_c	*	ϕ mm < 5	ϕ mm 5 - 8	ϕ mm 8 - 12	ϕ mm 12 - 16	ϕ mm 16 - 20	ϕ mm 30 - 50	v_c [m/min]	*	ϕ mm < 5	ϕ mm 5 - 8	ϕ mm 8 - 12	ϕ mm 12 - 16	ϕ mm 16 - 20	ϕ mm 30 - 50	
P	Steel, < 700 N/mm ²	100 - 200	f a	0,08 - 0,12 0,1 - 0,15	0,1 - 0,4 0,15 - 0,2	0,3 - 0,8 0,2 - 0,3	0,5 - 1,0 0,2 - 0,3	0,8 - 1,2 0,2 - 0,3	0,8 - 2,0 0,3 - 0,5	120 - 200	f a	0,08 - 0,12 0,1 - 0,15	0,1 - 0,4 0,15 - 0,2	0,3 - 0,8 0,2 - 0,3	0,5 - 1,0 0,2 - 0,3	0,8 - 1,2 0,2 - 0,3	0,8 - 2,0 0,3 - 0,5
	Steel, 700 - 900 N/mm ²	80 - 120	f a	0,08 - 0,12 0,1 - 0,15	0,1 - 0,4 0,15 - 0,2	0,3 - 0,8 0,2 - 0,3	0,5 - 1,0 0,2 - 0,3	0,8 - 1,2 0,2 - 0,3	0,8 - 2,0 0,3 - 0,5	80 - 120	f a	0,08 - 0,12 0,1 - 0,15	0,1 - 0,4 0,15 - 0,2	0,3 - 0,8 0,2 - 0,3	0,5 - 1,0 0,2 - 0,3	0,8 - 1,2 0,2 - 0,3	0,8 - 2,0 0,3 - 0,5
	Steel, 900 - 1200 N/mm ² *1	80 - 100	f a	0,08 - 0,12 0,08 - 0,12	0,1 - 0,3 0,1 - 0,2	0,3 - 0,6 0,2 - 0,3	0,3 - 0,8 0,2 - 0,3	0,5 - 1,0 0,2 - 0,3	0,8 - 1,5 0,3 - 0,5	80 - 100	f a	0,08 - 0,12 0,08 - 0,12	0,1 - 0,3 0,1 - 0,2	0,3 - 0,6 0,2 - 0,3	0,3 - 0,8 0,2 - 0,3	0,5 - 1,0 0,2 - 0,3	0,8 - 1,5 0,3 - 0,5
M	Stainless steel <700 N/mm ²	-	f a	-	-	-	-	-	-	f a	-	-	-	-	-	-	
	Stainless steel > 700 N/mm ²	-	f a	-	-	-	-	-	-	f a	-	-	-	-	-	-	
K	Cast iron (CI)	-	f a	-	-	-	-	-	-	f a	-	-	-	-	-	-	
	Nodular graphite iron (GGG) till GGG 50	80 - 140	f a	0,1 - 0,15 0,1 - 0,15	0,15 - 0,5 0,15 - 0,25	0,3 - 0,8 0,2 - 0,3	0,4 - 1,2 0,2 - 0,3	0,8 - 1,2 0,2 - 0,3	1 - 2,5 0,3 - 0,5	80 - 140	f a	0,1 - 0,15 0,1 - 0,15	0,15 - 0,5 0,15 - 0,25	0,3 - 0,8 0,2 - 0,3	0,4 - 1,2 0,2 - 0,3	0,8 - 1,2 0,2 - 0,3	1 - 2,5 0,3 - 0,5
	Nodular graphite iron (GGG) > GGG 50 *2	80 - 100	f a	0,1 - 0,15 0,1 - 0,15	0,15 - 0,25 0,15 - 0,25	0,3 - 0,8 0,2 - 0,3	0,4 - 1,2 0,2 - 0,3	0,8 - 1,2 0,2 - 0,3	1 - 2,5 0,3 - 0,5	80 - 100	f a	0,1 - 0,15 0,1 - 0,15	0,15 - 0,25 0,15 - 0,25	0,3 - 0,8 0,2 - 0,3	0,4 - 1,2 0,2 - 0,3	0,8 - 1,2 0,2 - 0,3	1 - 2,5 0,3 - 0,5
N	Brass/copper Cu/Zn/Mg-alloys	-	f a	-	-	-	-	-	-	f a	-	-	-	-	-	-	
	Aluminium alloys (Si<7%)	-	f a	-	-	-	-	-	-	f a	-	-	-	-	-	-	
	Aluminium alloys (Si>7%)	-	f a	-	-	-	-	-	-	f a	-	-	-	-	-	-	
	Plastics, soft	-	f a	-	-	-	-	-	-	f a	-	-	-	-	-	-	
	Plastics, hard fiber glass-/carbon fiber-reinforced	-	f a	-	-	-	-	-	-	f a	-	-	-	-	-	-	
S	Titanium	-	f a	-	-	-	-	-	-	f a	-	-	-	-	-	-	
H	Hardened materials 48 - 60 HRC	-	f a	-	-	-	-	-	-	f a	-	-	-	-	-	-	

The figures given are guidelines. The best values for the application in question should be calculated from trials or during the machining process as the effects of component geometry, clamping and machine stability cannot be taken into account here.

*1 Not all materials from 1000 N can be machined with Cermet.

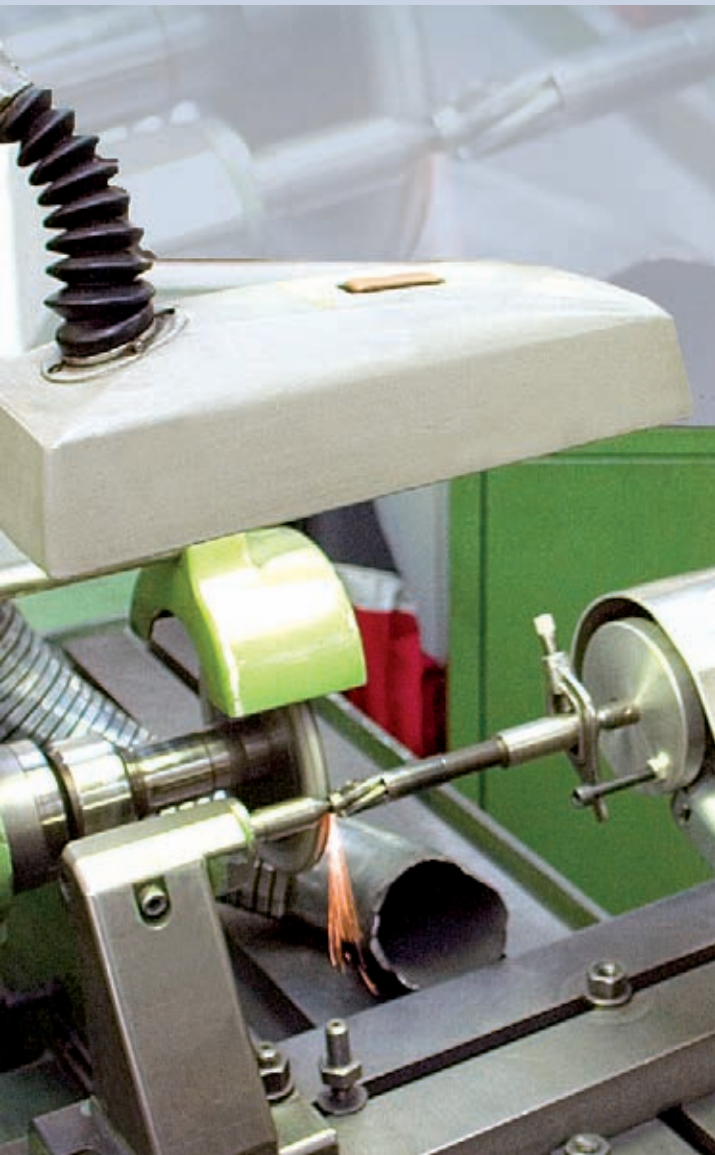
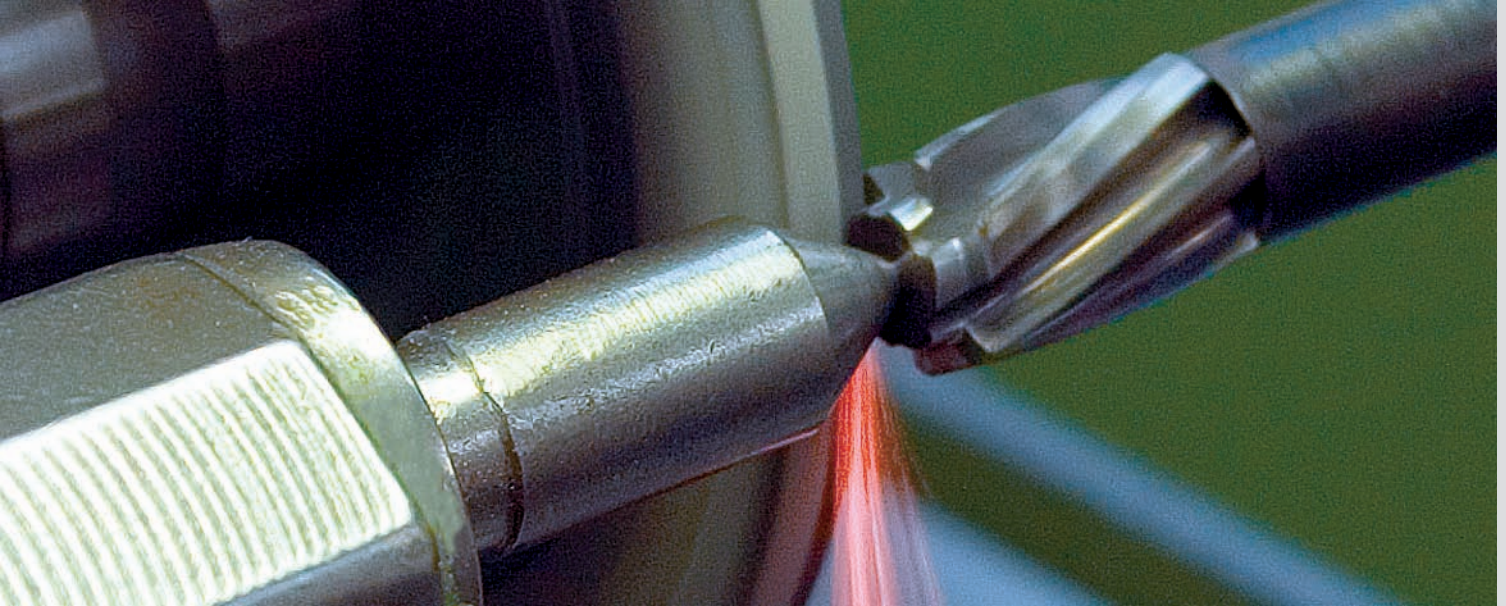
*2 Not all materials from > GGG60 (SG cast iron) can be machined with Cermet.

f = Feed rate [mm/rev]

a = Bore allowance in ϕ [mm]

v_c = Cutting speed [m/min]

MAPAL re-sharpening service for fixed reamers



Fixed reamers can normally be re-sharpened several times after reaching the end of their life. Particularly with very high-quality tools like high performance reamers, the degree of efficiency is considerably improved by re-sharpening and costs for new tools are saved. In this respect correct re-sharpening is an absolute prerequisite for constantly good results.

Why not use the MAPAL re-sharpening service!

This service takes only a few days and means you will be using tools that were correctly re-sharpened by a specialist. We will even re-sharpen tools of other makes if they are in a suitable condition.

- It is important to re-sharpen the reamers promptly so that the extent of wear can be limited as far as possible.

- Re-sharpening reamers is only feasible if the cutting edges are not broken and the concentricity of the tool between the centers is still correct.

- With the exception of tapered reamers, the tools are only reground axially on the cutting lead, not on the circumference, until the worn area is removed. This means the cutting lead geometry remains the same.

- When re-sharpening tools it is vital to ensure that the re-sharpened cutting edges lie axially at the same height. Even slight deviations lead to poor machining results, as well as a significantly reduced life.



MAPAL Präzisionswerkzeuge Dr. Kress KG

P.O. Box 1520 • D-73405 Aalen
Phone 07361 585-0 • Fax 07361 5 85-1 50
info@de.mapal.com • www.mapal.com

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