

HR 500

HR 500

Solid carbide high-performance reamers
up to Ø 20 mm

HR 500 G

Carbide- or cermet-tipped
high-performance reamers
from Ø 20 mm up to 40 mm

NEW

HR 500 Alu

Solid carbide high-performance reamers for
the machining of aluminium and AlSi-
alloys

HR 500 ACTIVE

Special range of solid carbide
high-performance reamers

EXCLUSIVELINE®

HR 500 high-performance reamers Technology and advantages

Dramatic time reduction up to factor 50

With the comprehensive HR 500 range Guhring provides high-performance reamers for virtually any application task. Countless technical innovations give HR 500 high-performance reamers their exceptional properties, from which the user benefits from maximum cutting rates and therefore shortest machining times as well as optimum hole qualities.

New ways of machining through holes

The specially developed straight-flute geometry is unique with reamers for through holes. It enables extremely high cutting rates also for deep holes. At the same time, the straight-flute geometry combined with the exceptional coolant delivery supports the problem-free chip evacuation ahead of the cutting edge. Subsequently, the excellent reamed surface remains optimally preserved, as chips do not return back within the flutes.



The optimal coolant supply is ensured by patent applied for longitudinal grooves ground in the re-inforced HA shank, their position exactly synchronised to the spacing of the reamer flute. This version of external cooling has more than one advantage over internal cooling via radial coolant ducts: The solid portion is considerably more rigid and a flow restriction is not created through eroded or sintered cooling ducts. In addition, chips cannot become lodged - with this solution non-existent - exit holes of the coolant ducts. Furthermore, the optimal

coolant delivery is unconditionally maintained even with re-ground tools. By the way, the user need not fear a negative influence on the clamping in hydraulic or shrink fit chucks due to the oil grooves. The remaining bearing surface is more than sufficient for a secure clamping.

Maximum performance in blind holes

HR 500 high-performance reamers for the machining of blind holes are internally cooled with a central coolant duct. Its especially large cross-section ensures the optimal delivery of the coolant to the cutting edge of the tool. The straight-fluted tool geometry combined with the outstanding coolant supply again ensure the safe evacuation of the optimally formed chips.



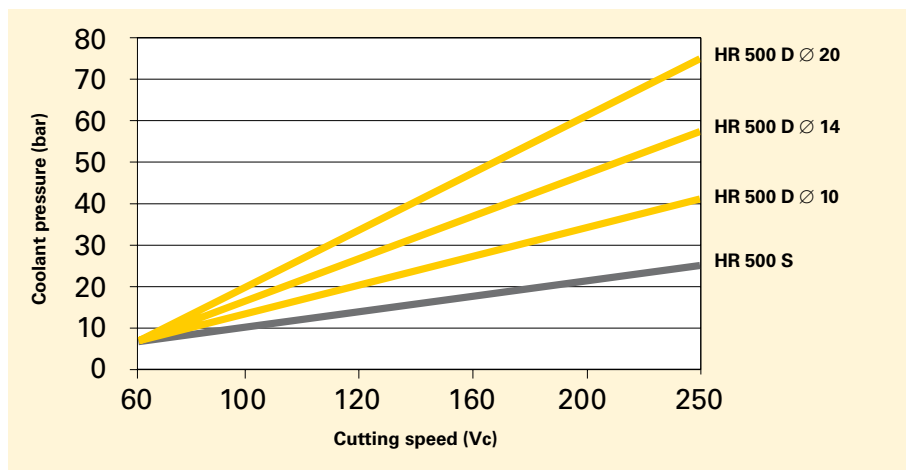
Better than cermet, but without its disadvantages: HR 500 solid carbide high- performance reamers

The performance level of solid carbide HPC reamers HR 500 could so far only be achieved with cermet tools and had to be acquired with several disadvantages. Cermet reamers are only suitable for the machining of few materials, whilst solid carbide reamers HR 500 can be applied in close to all materials including soft and stainless steels as well as aluminium and AISi-alloys.

Machining with interrupted cut or non-rigid machining conditions are not possible at all with cermet tools but with solid carbide in most cases this is not a problem. In addition, generally cermet reamers are comparatively more expensive.











The user gains multiple benefits with the new Guhring HR 500 reamer:

- extremely high cutting rates,
- considerable time saving and therefore cost saving in the production
- broad range of application
- a standard program with favourable prices as well as excellent stock availability
- intermediate dimensions, that can be produced quickly and cost-effectively at any time.
- HR 500 ACTIVE special range with 4 weeks delivery for intermediate sizes and stepped tools.



Coolant pressure - cutting speed
valid for standard dimensions

HR 500 solid carbide high-performance reamers Program summary

DIN	Type	Shank form	Tool illustration	Tool material	Surface finish	Diameter range	Guhring no.	Page
HR 500 S								
for the machining of blind holes								
Guhring std.	HR 500 S	straight h6		Solid carbide	TiAlN	4.000 - 20.000	1685	4
Guhring std.	HR 500 S	straight h6		Solid carbide	TiAlN	3.970 - 12.030	1675	6
HR 500 D								
for the machining of through holes								
Guhring std.	HR 500 D	straight h6		Solid carbide	TiAlN	4.000 - 20.000	1686	4
Guhring std.	HR 500 D	straight h6		Solid carbide	TiAlN	3.970 - 12.030	1676	6
HR 500 ALU S								
for the machining of blind holes								
Guhring std.	HR 500 S	straight h6	 NEW	Solid carbide	Carbo	4.000 - 20.000	1678	5
HR 500 ALU D								
for the machining of through holes								
Guhring std.	HR 500 D	straight h6	 NEW	Solid carbide	Carbo	4.000 - 20.000	1679	5
HR 500 GS								
for the machining of blind holes								
Guhring std.	HR 500 GS	straight h6	 NEW	Carbide	TiAlN	22.000 - 40.000	1680	12
Guhring std.	HR 500 GS	straight h6	 NEW	Cermet	bright	22.000 - 40.000	1682	13
HR 500 GD								
for the machining of through holes								
Guhring std.	HR 500 GD	straight h6	 NEW	Carbide	TiAlN	22.000 - 40.000	1681	12
Guhring std.	HR 500 GD	straight h6	 NEW	Cermet	bright	22.000 - 40.000	1683	13
HR 500 Active								16
Special range of solid carbide high-performance reamers								

HR 500 solid carbide high-performance reamers Standard range and dimensions

HR 500 solid carbide high-performance reamers

Product information

- right-hand cutting
- extremely unequal flute spacing
- straight-fluted
- straight shank tolerance h6 for hydraulic or shrink fit chucks

The solid carbide HPC reamer HR 500 operates with highest cutting rates (see GuhringNavigator) and produces extremely high-quality holes. Therefore, it enables considerable savings in production costs. In addition, it provides very high process reliability. The coolant supply ensures an optimal chip evacuation and an optimal cooling.

Tool material/carbide grade

Surface finish

Discount group

Guhring no.

Type

DIN

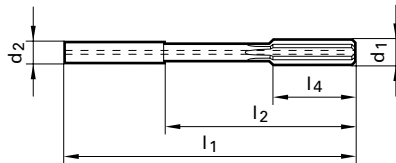
Tolerance



Guhring std.

hole tolerance zone H7

HR 500 ACTIVE

Intermediate sizes and stepped reamers see page 16!



Solid carbide	Solid carbide
TiAlN	TiAlN
166	166
1685	1686
S for blind holes	D for through holes
	

Nom.-Ø d ₁	Shank-Ø d ₂ h6	Total length l ₁	Effective length l ₂	Cutting edge length l ₄	No. of flutes	Unit price in £	
4.00	4.00	68	40	12	4	92.65	92.65
4.50	6.00	76	40	12	4	106.92	106.92
5.00	6.00	76	40	12	4	94.96	94.96
5.50	6.00	76	40	12	4	110.66	110.66
6.00	6.00	76	40	12	4	98.47	98.47
6.50	8.00	101	65	16	6	120.45	120.45
7.00	8.00	101	65	16	6	106.85	106.85
7.50	8.00	101	65	16	6	116.82	116.82
8.00	8.00	101	65	16	6	104.42	104.42
8.50	10.00	101	61	19	6	134.20	134.20
9.00	10.00	101	61	19	6	121.03	121.03
9.50	10.00	101	61	19	6	163.90	163.90
10.00	10.00	101	61	19	6	149.53	149.53
10.50	12.00	130	85	19	6	209.99	209.99
11.00	12.00	130	85	19	6	193.44	193.44
11.50	12.00	130	85	19	6	216.26	216.26
12.00	12.00	130	85	19	6	199.38	199.38
13.00	14.00	130	85	22	6	213.58	213.58
14.00	14.00	130	85	22	6	220.73	220.73
15.00	16.00	150	102	22	6	220.73	220.73
16.00	16.00	150	102	22	6	228.00	228.00
17.00	18.00	150	102	25	6	228.00	228.00
18.00	18.00	150	102	25	6	263.41	263.41
19.00	20.00	150	100	25	6	263.41	263.41
20.00	20.00	150	100	25	6	282.57	282.57

HR 500 solid carbide high-performance reamers Standard range and dimensions

HR 500 Alu solid carbide high-performance reamers

Product information

- right-hand cutting
- extremely unequal flute spacing
- straight-fluted
- straight shank tolerance h6 for hydraulic or shrink fit chucks

The HR 500 Alu solid carbide high-performance reamer makes reaming qualities and tool life on a level between a conventional solid carbide reamer and a PCD reamer possible. Furthermore, feed rates even superior to PCD levels can be achieved (see Guhring-Navigator).

With optimal cutting rates and rigid conditions there is no formation of built-up edges!

Therefore, they enable considerable savings in production costs. In addition, it provides very high reliability.

Tool material/carbide grade

Surface finish

Discount group

Guhring no.

Type

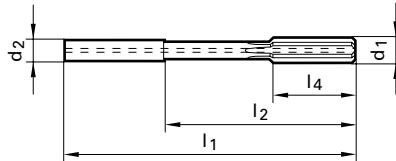
DIN



Tolerance

Guhring std.

hole tolerance zone H7

Intermediate sizes on request.



Solid carbide	Solid carbide
Carbo	Carbo
166	166
1678	1679
S for blind holes	D for through holes
	

Nom.-Ø d ₁	Shank-Ø d ₂ h6	Total length l ₁	Effective length l ₂	Cutting edge length l ₄	No. of flutes	Unit price in £	
4.00	4.00	68	40	12	4	169.46	169.46
5.00	6.00	76	40	12	4	173.29	173.29
6.00	6.00	76	40	12	4	175.74	175.74
7.00	8.00	101	65	16	6	187.94	187.94
8.00	8.00	101	65	16	6	185.50	185.50
10.00	10.00	101	61	19	6	237.97	237.97
12.00	12.00	130	85	19	6	295.33	295.33
14.00	14.00	130	85	22	6	322.15	322.15
16.00	16.00	150	102	22	6	329.50	329.50
18.00	18.00	150	102	25	6	370.98	370.98
20.00	20.00	150	100	25	6	392.95	392.95

HR 500 solid carbide high-performance reamers Standard range and dimensions

HR 500 solid carbide high-performance reamers

Product information

- right-hand cutting
- extremely unequal flute spacing
- straight-fluted
- straight shank tolerance h6 for hydraulic or shrink fit chucks

The solid carbide HPC reamer HR 500 operates with highest cutting rates (see GuhringNavigator) and produces extremely high-quality holes. Therefore, it often enables considerable savings in production costs. In addition, it provides very high process reliability. The coolant supply ensures an optimal chip evacuation and an optimal cooling.

Tool material/carbide grade

Surface finish

Discount group

Guhring no.

Type

DIN

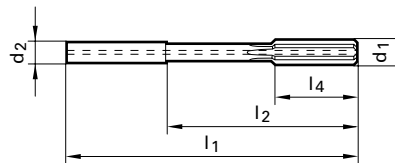
Guhring std.



Tolerance

+ 0.005

HR 500 ACTIVE

Intermediate sizes and stepped reamers see page 16!



Solid carbide	Solid carbide
TiAlN	TiAlN
166	166
1675	1676
S for blind holes	D for through holes
	

Nom.-Ø d ₁	Shank-Ø d ₂ h6	Total length l ₁	Effective length l ₂	Cutting edge length l ₄	No. of flutes	Unit price in £	
3.97	4.00	68	40	12	4	104.50	104.50
3.98	4.00	68	40	12	4	104.50	104.50
3.99	4.00	68	40	12	4	104.50	104.50
4.00	4.00	68	40	12	4	104.50	104.50
4.01	4.00	68	40	12	4	104.50	104.50
4.02	4.00	68	40	12	4	104.50	104.50
4.03	4.00	68	40	12	4	104.50	104.50
4.97	6.00	76	40	12	4	106.92	106.92
4.98	6.00	76	40	12	4	106.92	106.92
4.99	6.00	76	40	12	4	106.92	106.92
5.00	6.00	76	40	12	4	106.92	106.92
5.01	6.00	76	40	12	4	106.92	106.92
5.02	6.00	76	40	12	4	106.92	106.92
5.03	6.00	76	40	12	4	106.92	106.92
5.97	6.00	76	40	12	4	110.66	110.66
5.98	6.00	76	40	12	4	110.66	110.66
5.99	6.00	76	40	12	4	110.66	110.66
6.00	6.00	76	40	12	4	110.66	110.66
6.01	6.00	76	40	12	4	110.66	110.66
6.02	6.00	76	40	12	4	110.66	110.66
6.03	6.00	76	40	12	4	110.66	110.66
7.00	8.00	101	65	16	6	110.66	110.66
7.97	8.00	101	65	16	6	116.82	116.82
7.98	8.00	101	65	16	6	116.82	116.82
7.99	8.00	101	65	16	6	116.82	116.82
8.00	8.00	101	65	16	6	116.82	116.82
8.01	8.00	101	65	16	6	116.82	116.82
8.02	8.00	101	65	16	6	116.82	116.82
8.03	8.00	101	65	16	6	116.82	116.82
9.00	10.00	101	61	19	6	134.20	134.20
9.97	10.00	101	61	19	6	163.90	163.90
9.98	10.00	101	61	19	6	163.90	163.90
9.99	10.00	101	61	19	6	163.90	163.90

HR 500 solid carbide high-performance reamers GuhringNavigator

HR 500 reamers up to 20.00 mm

Tools with **bold** feed column no. are preferred choice.

Tool material/Carbide grade	Carb./K10
Surface finish	TiAlN
Guhring no.	1685 1686
Guhring no.	1675 1676

Reamer- Ø mm	Feed column no.						
	71	72	73	74	75	76	77
	f (mm/rev.)						
< 4.00	0.080	0.100	0.125	0.300	0.500	0.800	1.000
4.00	0.100	0.125	0.160	0.300	0.500	1.000	1.200
5.00	0.100	0.125	0.160	0.400	0.600	1.000	1.400
6.30	0.125	0.160	0.200	0.400	0.700	1.200	1.600
8.00	0.160	0.200	0.250	0.600	1.000	1.800	2.400
10.00	0.200	0.250	0.315	0.600	1.200	1.800	2.400
12.50	0.200	0.250	0.315	0.800	1.200	2.000	2.500
16.00	0.250	0.315	0.400	0.800	1.400	2.200	2.600
20.00	0.315	0.400	0.500	0.800	1.400	2.200	2.600
25.00	0.400	0.500	0.630	1.000	1.600	2.500	3.000
31.50	0.400	0.500	0.630	1.000	2.000	3.000	3.600
40.00	0.500	0.630	0.800	1.200	2.000	3.000	3.600
50.00	0.630	0.800	1.000	1.400	2.200	3.200	3.600
> 50.00	0.800	1.000	1.250	1.600	2.200	3.200	3.600

For an optimal cooling lubricant supply to HR 500 type D reamer cutting edges for through holes we recommend clamping in hydraulic or shrink fit chucks to the maximum clamping depth.

Coolant:
 soluble oil
 neat oil
 air



Material group	Material examples <i>Figures in bold = material no. to DIN EN 10 027</i>	Tensile strength N/mm ²	Cool- ant	v _c m/min	Feed column no.
Common structural steels	1.0035 S185, 1.0486 StE P275N, 1.0345 P235GH, 1.0425 P265GH 1.0050 E295, 1.0070 E360, 1.8937 P500NH	≤500 >500-850	<input type="radio"/> <input type="radio"/>	120-250 120-250	75-76 75-76
Free-cutting steels	1.0718 11SMnPb30, 1.0736 115Mn37 1.0727 46 S20, 1.0728 60 S20, 1.0757 46SPb20	≤850 850-1000	<input type="radio"/> <input type="radio"/>	120-250 120-250	75-76 75-76
Unalloyed heat-treatable steels	1.0402 C22, 1.1178 C30E 1.0503 C45, 1.1191 C45E 1.0601 C60, 1.1221 C60E	≤ 700 700-850 850-1000	<input type="radio"/> <input type="radio"/> <input type="radio"/>	120-250 120-250 120-250	75-76 75-76 75-76
Alloyed heat-treatable steels	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	850-1000 1000-1200	<input type="radio"/> <input type="radio"/>	120-250 120-250	75-76 75-76
Unalloyed case hardened steels	1.0301 C10, 1.1121 C10E	≤750	<input type="radio"/>	120-250	75-76
Alloyed case hardened steels	1.7043 38Cr4 1.5752 14NiCr14, 1.7131 16MnCr5, 1.7264 20CrMo5	850-1000 1000-1200	<input checked="" type="radio"/> <input checked="" type="radio"/>	120-250 120-250	75-76 75-76
Nitriding steels	1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7	≥850-1000 1000-1200	<input type="radio"/> <input checked="" type="radio"/>	120-250 120-250	75-76 75-76
Tool steels	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤850 850-1000	<input type="radio"/> <input checked="" type="radio"/>	120-250 120-250	75-76 75-76
High speed steels	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 61CrV4	≥650-1000	<input checked="" type="radio"/>	60-120	75-76
Spring steels	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4	≥330 HB	<input checked="" type="radio"/>	30-60	73-74
Stainless steels, sulphured	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 1.4301 X5CrNi18 10, 1.4541 X6CrNiTi18 10, 1.4571 X6CrNiMoTi 17 12 2 1.4057 X17CrNi16-1, 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18 2	≤850 ≤850 ≤850	<input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/>	60-120 40-80 60-120	74-75 74-75 74-75
Hardened steels	-	≤40-48 HRC >48-62 HRC	<input checked="" type="radio"/> <input checked="" type="radio"/>	40-60 30-60	73-74 73-74
Special alloys	Nimonic, Inconel, Monel, Hastelloy	≤1200	<input checked="" type="radio"/>	40-60	74-75
Cast iron	0.6010 EN-GJL-100 (GG10) 0.6020 EN-GJL-200 (GG20) 0.6025 EN-GJL-250 (GG25) 0.6035 EN-GJL-350 (GG35)	≤240 HB <300 HB	<input type="radio"/> <input type="radio"/>	60-140 60-140	75-76 75-76
Spheroidal graphite and malleable cast iron	0.7050 EN-GJS-500-7 (GGG50) 0.8035 EN-GJMW-350-4 (GTW5) 0.7060 EN-GJS-600-3 (GGG60) 0.7070 EN-GJS-700-2 (GGG70)	≤240 HB <300 HB	<input type="radio"/> <input type="radio"/>	120-250 60-120	75-76 75-76
Chilled cast iron	-	≤350 HB	<input type="radio"/>	30-50	74-75
Ti and Ti-alloys	3.7024 Ti99.5, 3.7114 TiAl5Sn2.5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7164 TiAl6V4, 3.7184 TiAl4Mo4Sn2.5, -TiAl8Mo1V1	≤850 850-1200	<input checked="" type="radio"/> <input checked="" type="radio"/>	40-80 40-80	74-75 74-75
Aluminium and Al-alloys	3.0255 Al99.5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400	<input type="radio"/>		
Al wrought alloys		≤450	<input type="radio"/>		
Al cast iron ≤ 10 % Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9 3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600 ≤600	<input type="radio"/> <input type="radio"/>		
> 10 % Si			<input type="radio"/>		
Magnesium alloys	MgMn2, G-MgAl8Zn1, G-MgAl6Zn3	≤450	<input type="radio"/>	80-160	75-76
Copper, low-alloyed	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb	≤400	<input type="radio"/>		
Brass, short-chipping	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2	≤600	<input type="radio"/>	100-250	75-76
long-chipping	2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0.5	≤600	<input type="radio"/>		
Bronze, short-chipping	2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn 2.0790 CuNi18Zn19Pb	≤600 >600-850	<input type="radio"/> <input checked="" type="radio"/>	100-250 100-250	75-76 75-76
Bronze, long-chipping	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10 2.0980 CuAl11Ni, 2.1247 CuBe2	≤850 850-1000	<input checked="" type="radio"/> <input checked="" type="radio"/>		
Duroplastics	Bakelit, Resopal, Pertinax, Moltopren		<input type="radio"/>	80-200	75-76
Thermoplastics	Plexiglass, Hostalen, Novodur, Makralon		<input type="radio"/>	80-200	75-76
Kevlar	Kevlar		<input type="radio"/>	80-200	75-76
Glass/carbon fibre reinf. plastics	GFP/CFP		<input type="radio"/>	80-200	75-76

EXCLUSIVE LINE®

Special solution HR 500 G carbide- or cermet-tipped high-performance reamers - technology and advantages

On the strength of the excellent results that solid carbide high-performance reamers HR 500 achieve in the diameter range up to 20 mm, Guhring has carried over this successful concept to the new HR 500 G high-performance reamers for diameters above 20.00 mm. HR 500 G brazed carbide- or cermet-tipped high-performance reamers offer particularly economical advantages for these large diameters in comparison with solid carbide high-performance reamers with comparable performance figures. In comparison with conventional interchangeable head systems the brazed HR 500 G high-performance reamers are convincing thanks to the following advantages:

- considerably higher rigidity thanks to monoblock-design.
- additional errors in concentricity through additional interface are avoided.
- no restriction of coolant delivery by avoiding an additional interface
- installation errors are impossible.
- very simple handling.
- higher rigidity against torsional and radial forces.
- reduced tendency to chattering.
- long tool life thanks to single interface installation

In order to offer the optimal tool material tip for every application range, tipped HR 500 G high-performance reamers are available with carbide inserts and TiAlN-coating for the machining of cast iron and special steels or with cermet inserts for the machining of steels and GGG materials. Detailed information regarding optimal application can be found in the GuhringNavigator for these tools.

The geometry of tipped HR 500 high-performance reamers corresponds to those in solid carbide. Therefore, there is a choice of four different tipped designs:

- cermet or carbide-tipped HR 500 GS for the machining of blind holes.
- cermet or carbide-tipped HR 500 GD for the machining of through holes.

**NEW:
Now standard range**



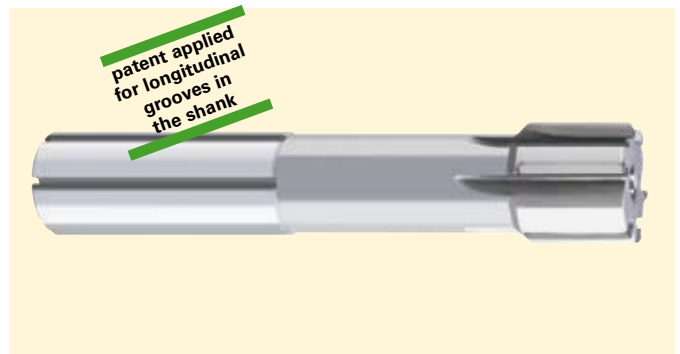
Carbide-tipped HR 500 GSTiAlN-coated high-performance reamers for the machining of blind holes, Guhring no. 1680



Carbide-tipped HR 500 GDTiAlN-coated high-performance reamers for the machining of through holes, Guhring no. 1681



Cermet-tipped high-performance reamers HR 500 GS for the machining of blind holes, Guhring no. 1682



Cermet-tipped high-performance reamers HR 500 GD for the machining of through holes, Guhring no. 1683

EXCLUSIVE LINE®

Special solution HR 500 G carbide- or cermet-tipped high-performance reamers - special designs

Carbide- or cermet-tipped HR 500 high-performance reamers are available in preferred sizes as standard range. In addition we manufacture special tools to customer specifications on request.

The flexible system of HR 500 G high-performance reamers also allows designs with shrunken head for a larger penetration depth. Guhring can also provide head designs for very small reaming depths. this special solution can be clamped in all current hydraulic chucks and shrink fit chucks.



Design with shrunken head



EXCLUSIVE LINE®

HR 500 G high-performance reamers Standard range and dimensions

HR 500 G carbide-tipped high-performance reamers

Product information

- right-hand cutting
- extremely unequal flute spacing
- straight-fluted
- straight shank tolerance h6 for hydraulic or shrink fit chucks

The carbide-tipped HPC reamer HR 500 G operates at highest cutting rates (see GuhringNavigator) and produces extremely high-quality holes. Therefore, it often enables considerable savings in production costs. In addition, it provides very high process reliability. The coolant supply ensures an optimal chip evacuation and an optimal cooling.

Tool material/carbide grade

Surface finish

Discount group

Guhring no.

Type

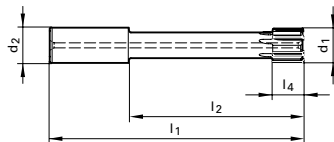
DIN



Tolerance

Guhring std.

hole tolerance zone H7

Intermediate sizes available for fast delivery.



Carbide	Carbide
TiAlN	TiAlN
166	166
1680	1681
S for blind holes	D for through holes
	

Nom.-Ø d ₁ H7	Shank-Ø d ₂	Total length l ₁	Effective length l ₂	Cutting edge length l ₄	z	Unit price in £	
22.00	20	160	110	22	6	248.94	258.73
24.00	25	180	124	22	6	248.94	258.73
25.00	25	180	124	22	6	256.27	266.03
26.00	25	180	124	22	6	256.27	266.03
28.00	25	180	124	25	6	261.15	270.91
30.00	25	180	124	25	6	261.15	270.91
32.00	32	200	140	25	6	290.42	302.63
34.00	32	200	140	25	6	290.42	302.63
36.00	32	200	140	25	8	290.42	302.63
38.00	32	200	140	25	8	297.77	309.95
40.00	32	200	140	25	8	297.77	309.95

HR 500 G high-performance reamers Standard range and dimensions

HR 500 G cermet-tipped high-performance reamers

Product information

- right-hand cutting
- extremely unequal flute spacing
- straight-fluted
- straight shank tolerance h6 for hydraulic or shrink fit chucks

The HR 500 G cermet-tipped HPC reamer operates at highest cutting rates (see GuhringNavigator) and produces extremely high-quality holes. Therefore, it often enables considerable savings in production costs. In addition, it provides very high process reliability. The coolant supply ensures an optimal chip evacuation and an optimal cooling.

Tool material/carbide grade

Surface finish

Discount group

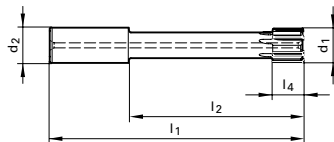
Guhring no.



Type

DIN **Guhring std.**

Tolerance **hole tolerance zone H7**

Intermediate sizes available for fast delivery.



	Cermet	Cermet
Surface finish	bright	bright
Discount group	166	166
Guhring no.	1682	1683
Type	S for blind holes	D for through holes
		

Nom.-Ø d ₁ H7	Shank-Ø d ₂	Total length l ₁	Effective length l ₂	Cutting edge length l ₄	z	Unit price in £	
22.00	20	160	110	22	6	266.03	280.70
24.00	25	180	124	22	6	266.03	280.70
25.00	25	180	124	22	6	278.24	292.88
26.00	25	180	124	22	6	278.24	292.88
28.00	25	180	124	25	6	285.56	297.77
30.00	25	180	124	25	6	285.56	297.77
32.00	32	200	140	25	6	309.95	322.15
34.00	32	200	140	25	6	309.95	322.15
36.00	32	200	140	25	8	309.95	322.15
38.00	32	200	140	25	8	317.30	329.50
40.00	32	200	140	25	8	317.30	329.50

EXCLUSIVELINE®

HR 500 G high performance reamers GuhringNavigator and application examples

HR 500 Reamers from Ø 20.00 mm up to 40.00 mm

Tools with **bold** feed column no. are preferred choice.

Tool material/Carbide grade	Carb./K10
Surface finish	TiAlN
Guhring no.	1680
Guhring no.	1681

Reamer- Ø mm	Feed column no.						
	71	72	73	74	75	76	77
	f (mm/rev.)						
< 4.00	0.080	0.100	0.125	0.300	0.500	0.800	1.000
4.00	0.100	0.125	0.160	0.300	0.500	1.000	1.200
5.00	0.100	0.125	0.160	0.400	0.600	1.000	1.400
6.30	0.125	0.160	0.200	0.400	0.700	1.200	1.600
8.00	0.160	0.200	0.250	0.600	1.000	1.800	2.400
10.00	0.200	0.250	0.315	0.600	1.200	1.800	2.400
12.50	0.200	0.250	0.315	0.800	1.200	2.000	2.500
16.00	0.250	0.315	0.400	0.800	1.400	2.200	2.600
20.00	0.315	0.400	0.500	0.800	1.400	2.200	2.600
25.00	0.400	0.500	0.630	1.000	1.600	2.500	3.000
31.50	0.400	0.500	0.630	1.000	2.000	3.000	3.600
40.00	0.500	0.630	0.800	1.200	2.000	3.000	3.600
50.00	0.630	0.800	1.000	1.400	2.200	3.200	3.600
> 50.00	0.800	1.000	1.250	1.600	2.200	3.200	3.600

For an optimal cooling lubricant supply to HR 500 type D reamer cutting edges for through holes we recommend clamping in hydraulic or shrink fit chucks to the maximum clamping depth.

Coolant:
 soluble oil
 neat oil
 air



Material group	Material examples <i>Figures in bold = material no. to DIN EN 10 027</i>	Tensile strength N/mm ²	Cool- ant	v _c m/min	Feed column no.
Common structural steels	1.0035 S185, 1.0486 StE P275N, 1.0345 P235GH, 1.0425 P265GH 1.0050 E295, 1.0070 E360, 1.8937 P500NH	≤500 >500-850	<input type="radio"/> <input type="radio"/>	25-40 25-40	74-75 74-75
Free-cutting steels	1.0718 11SMnPb30, 1.0736 115Mn37 1.0727 46 S20, 1.0728 60 S20, 1.0757 46SPb20	≤850 850-1000	<input type="radio"/> <input type="radio"/>	25-40 25-40	74-75 74-75
Unalloyed heat-treatable steels	1.0402 C22, 1.1178 C30E 1.0503 C45, 1.1191 C45E 1.0601 C60, 1.1221 C60E	≤ 700 700-850 850-1000	<input type="radio"/> <input type="radio"/> <input type="radio"/>	25-40 25-40 25-40	74-75 74-75 74-75
Alloyed heat-treatable steels	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	850-1000 1000-1200	<input type="radio"/> <input type="radio"/>	25-40 25-40	74-75 74-75
Unalloyed case hardened steels	1.0301 C10, 1.1121 C10E	≤750	<input type="radio"/>	25-40	74-75
Alloyed case hardened steels	1.7043 38Cr4 1.5752 14NiCr14, 1.7131 16MnCr5, 1.7264 20CrMo5	850-1000 1000-1200	<input checked="" type="radio"/> <input checked="" type="radio"/>	25-40 25-40	74-75 74-75
Nitriding steels	1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7	≥850-1000 1000-1200	<input type="radio"/> <input checked="" type="radio"/>	25-40 25-40	74-75 74-75
Tool steels	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤850 850-1000	<input type="radio"/> <input checked="" type="radio"/>	25-40 25-40	74-75 74-75
High speed steels	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 61CrV4	≥650-1000	<input checked="" type="radio"/>	20-30	74-75
Spring steels	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4	≥330 HB	<input checked="" type="radio"/>	20-30	74-75
Stainless steels, sulphured	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305	≤850	<input checked="" type="radio"/>	30-60	74-75
austenitic	1.4301 X5CrNi18 10, 1.4541 X6CrNiTi18 10, 1.4571 X6CrNiMoTi 17 12 2	≤850	<input checked="" type="radio"/>	20-30	74-75
martensitic	1.4057 X17CrNi16-1, 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18 2	≤850	<input checked="" type="radio"/>	20-30	74-75
Hardened steels	-	≤40-48 HRC >48-62 HRC	<input checked="" type="radio"/> <input checked="" type="radio"/>	10-20	72-73
Special alloys	Nimonic, Inconel, Monel, Hastelloy	≤1200	<input checked="" type="radio"/>	20-30	73-74
Cast iron	0.6010 EN-GJL-100 (GG10) 0.6020 EN-GJL-200 (GG20) 0.6025 EN-GJL-250 (GG25) 0.6035 EN-GJL-350 (GG35)	≤240 HB <300 HB	<input type="radio"/> <input type="radio"/>	40-100 40-100	75-76 75-76
Spheroidal graphite and malleable cast iron	0.7050 EN-GJS-500-7 (GGG50) 0.8035 EN-GJMW-350-4 (GTW5) 0.7060 EN-GJS-600-3 (GGG60) 0.7070 EN-GJS-700-2 (GGG70)	≤240 HB <300 HB	<input type="radio"/> <input type="radio"/>	50-120 50-100	75-76 75-76
Chilled cast iron	-	≤350 HB	<input type="radio"/>	20-40	74-75
Ti and Ti-alloys	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7164 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, -TiAl8Mo1V1	≤850 850-1200	<input checked="" type="radio"/> <input checked="" type="radio"/>	20-40 20-40	73-74 73-74
Aluminium and Al-alloys	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400	<input type="radio"/>		
Al wrought alloys		≤450	<input type="radio"/>		
Al cast iron ≤ 10 % Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9	≤600	<input type="radio"/>		
> 10 % Si	3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600	<input type="radio"/>		
Magnesium alloys	MgMn2, G-MgAl8Zn1, G-MgAl6Zn3	≤450	<input type="radio"/>	80-160	75-76
Copper, low-alloyed	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb	≤400	<input type="radio"/>		
Brass, short-chipping	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2	≤600	<input type="radio"/>	40-120	74-75
long-chipping	2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600	<input type="radio"/>	40-120	74-75
Bronze, short-chipping	2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn 2.0790 CuNi18Zn19Pb	≤600 >600-850	<input type="radio"/> <input checked="" type="radio"/>	50-120 50-120	74-75 74-75
Bronze, long-chipping	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10 2.0980 CuAl11Ni, 2.1247 CuBe2	≤850 850-1000	<input checked="" type="radio"/> <input checked="" type="radio"/>	50-120 50-120	74-75 74-75
Duroplastics	Bakelit, Resopal, Pertinax, Moltopren		<input type="radio"/>	40-120	74-75
Thermoplastics	Plexiglass, Hostalen, Novodur, Makralon		<input type="radio"/>	40-120	74-75
Kevlar	Kevlar		<input type="radio"/>	40-120	74-75
Glass/carbon fibre reinf. plastics	GFP/CFP		<input type="radio"/>	40-120	74-75

EXCLUSIVE LINE®

HR 500 ACTIVE

Special range of HR 500 solid carbide high-performance reamers

Ever since their introduction, Guhring's solid carbide high-performance reamers HR 500 D for through holes and HR 500 S for blind holes have impressed customers with their outstanding performance. Even under difficult machining conditions such as interrupted cutting or unstable machines they ream holes at cutting rates higher than cermet levels with maximum tool life and optimal quality in almost all materials.

So the user can also fully utilise

the advantages of HR 500 high-performance reamers for the machining of the special applications Guhring has developed the HR 500 ACTIVE range:

Special tools based on HR 500 technology for cylindrical and stepped holes

There is a choice of four HR 500 ACTIVE types:

- for cylindrical blind holes
- for cylindrical through holes
- for stepped blind holes
- for stepped through holes

The four HR 500 ACTIVE types are

available in the following designs:

- with or without internal cooling
- short or long version
- with TiAlN coating or bright finish
- to hole tolerance or reamer manufacturing tolerance

You have the choice of designing the optimal HR 500 reamer for your specific application! Simply complete the questionnaire and send or fax it to the address or fax number respectively.

Your ACTIVE advantages:

Quotation within 72hrs!

Tool dispatch maximum 4 weeks!

- + perfect adaptation of tool material, geometry and coating to workpiece material and hole
- + with internal cooling: central coolant duct for blind holes, longitudinal grooves in shank for through holes
- + nominal diameter from 2.95 up to 20.1 mm
- + shank to DIN 6535 HA
- + tolerances to requirements for the perfect finish
- + available in long or short version
- + highest quality
- + best cost-performance ratio
- + delivery time: maximum 3 weeks for TiAlN-coated tools and maximum 2 weeks for bright finish tools

Perfect finish thanks to closest tolerances!

It's your choice! We produce perfect quality for you in the shortest time possible:

- + we produce your required hole tolerance to DIN 1420.
- + reamers with manufacturing tolerances according to your requirements!

The minimum manufacturing tolerance is 0.005 mm, applies to both diameters with step reamers!

General conditions for HR 500 ACTIVE step reamers

With HR 500 ACTIVE step reamers please note the following pre-requisites:

- + the minimum step differential is 0.2 mm.
- + the countersink angle W1 can be chosen between 40° and 180° (± 1°).
With 180° countersink angle the outer cutting edge has a corner chamfer 0.1+0.1x45°.

Optimal clamping holders from our current GM 300 range:

- + hydraulic chucks
- + shrink fit chucks



EXCLUSIVELINE®

HR 500 ACTIVE Cutting rates on the highest level

Tools with **bold** feed column no. are preferred choice.

Tool material/carbide grade

Carb./K10

Form

Reamer- Ø mm	Feed column no.						
	71	72	73	74	75	76	77
	f (mm/rev.)						
< 4.00	0.080	0.100	0.125	0.300	0.500	0.800	1.000
4.00	0.100	0.125	0.160	0.300	0.500	1.000	1.200
5.00	0.100	0.125	0.160	0.400	0.600	1.000	1.400
6.30	0.125	0.160	0.200	0.400	0.700	1.200	1.600
8.00	0.160	0.200	0.250	0.600	1.000	1.800	2.400
10.00	0.200	0.250	0.315	0.600	1.200	1.800	2.400
12.50	0.200	0.250	0.315	0.800	1.200	2.000	2.500
16.00	0.250	0.315	0.400	0.800	1.400	2.200	2.600
20.00	0.315	0.400	0.500	0.800	1.400	2.200	2.600
25.00	0.400	0.500	0.630	1.000	1.600	2.500	3.000
31.50	0.400	0.500	0.630	1.000	2.000	3.000	3.600
40.00	0.500	0.630	0.800	1.200	2.000	3.000	3.600
50.00	0.630	0.800	1.000	1.400	2.200	3.200	3.600
> 50.00	0.800	1.000	1.250	1.600	2.200	3.200	3.600

For an optimal cooling lubricant supply to HR 500 type D reamer cutting edges for through holes we recommend clamping in hydraulic or shrink fit chucks to the maximum clamping depth.

- bright
- TiAlN
- Coolant:
- soluble oil
- neat oil
- air



Material group	Material examples, new description (old description in brackets) <i>Figures in bold = material no. to DIN EN 10 027</i>	Tensile strength N/mm ²	Cool- ant	Sur- face	Vc m/min	FC no.
Common structural steels	1.0035 S185, 1.0486 StE P275N, 1.0345 P235GH, 1.0425 P265GH 1.0050 E295, 1.0070 E360, 1.8937 P500NH	≤500 >500-850	○ ○	● ●	120-250 120-250	75-76 75-76
Free-cutting steels	1.0718 11SMnPb30, 1.0736 115Mn37 1.0727 46 S20, 1.0728 60 S20, 1.0757 46SPb20	≤850 850-1000	○ ○	● ●	120-250 120-250	75-76 75-76
Unalloyed heat-treatable steels	1.0402 C22, 1.1178 C30E 1.0503 C45, 1.1191 C45E 1.0601 C60, 1.1221 C60E	≤ 700 700-850 850-1000	○ ○ ○	● ● ●	120-250 120-250 120-250	75-76 75-76 75-76
Alloyed heat-treatable steels	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	850-1000 1000-1200	○ ○	● ●	120-250 120-250	75-76 75-76
Unalloyed case hardened steels	1.0301 C10, 1.1121 C10E	≤750	○	●	120-250	75-76
Alloyed case hardened steels	1.7043 38Cr4 1.5752 14NiCr14, 1.7131 16MnCr5, 1.7264 20CrMo5	850-1000 1000-1200	● ●	● ●	120-250 120-250	75-76 75-76
Nitriding steels	1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7	≥850-1000 1000-1200	○ ●	● ●	120-250 120-250	75-76 75-76
Tool steels	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤850 850-1000	○ ●	● ●	120-250 120-250	75-76 75-76
High speed steels	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 61CrV4	≥650-1000	●	●	60-120	75-76
Spring steels	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4	≥330 HB	●	●	30-60	73-74
Stainless steels, sulphured austenitic martensitic	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 1.4301 X5CrNi18 10, 1.4541 X6CrNiTi18 10, 1.4571 X6CrNiMoTi 17 12 2 1.4057 X17CrNi16-1, 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18 2	≤850 ≤850 ≤850	● ● ●	● ● ●	60-120 40-80 60-120	74-75 74-75 74-75
Hardened steels	-	≤40-48 HRC >48-62 HRC	● ●	● ●	40-60 30-60	73-74 73-74
Special alloys	Nimonic, Inconel, Monel, Hastelloy	≤1200	●	●	40-60	74-75
Cast iron	0.6010 EN-GJL-100 (GG10) 0.6020 EN-GJL-200 (GG20) 0.6025 EN-GJL-250 (GG25) 0.6035 EN-GJL-350 (GG35)	≤240 HB <300 HB	○ ○	● ●	60-140 60-140	75-76 75-76
Spheroidal graphite and malleable cast iron	0.7050 EN-GJS-500-7 (GGG50) 0.8035 EN-GJMW-350-4 (GTW5) 0.7070 EN-GJS-700-2 (GGG70) 0.8170 EN-GJMB-700-2 (GTS70)	≤240 HB <300 HB	○ ○	● ●	120-250 60-120	75-76 75-76
Chilled cast iron	-	≤350 HB	○	●	30-50	74-75
Ti and Ti-alloys	3.7024 Ti99.5, 3.7114 TiAl5Sn2.5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7164 TiAl6V4, 3.7184 TiAl4Mo4Sn2.5, -TiAl8Mo1V1	≤850 850-1200	● ●	○ ○	30-80 30-80	74-75 74-75
Aluminium and Al-alloys	3.0255 Al99.5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400	○	○		
Al-wrought alloys		≤450	○	○		
Al-cast alloys	≤ 10 % Si 3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9 > 10 % Si 3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600 ≤600	○ ○	○ ○		
Magnesium-alloys	MgMn2, G-MgAl8Zn1, G-MgAl6Zn3	≤450	○	●	80-160	75-76
Copper, low-alloyed	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb	≤400	○	○		
Brass, short-chipping long-chipping	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2 2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0.5	≤600 ≤600	○ ○	● ●	100-250	75-76
Bronze, short-chipping	2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn 2.0790 CuNi18Zn19Pb	≤600 >600-850	○ ●	● ●	100-250 100-250	75-76 75-76
Bronze, long-chipping	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10 2.0980 CuAl11Ni, 2.1247 CuBe2	≤850 850-1000	● ●	○ ○		
Duroplastics	Bakelite, Resopal, Pertinax, Moltopren		○	●	80-200	75-76
Thermoplastics	Plexiglass, Hostalen, Novodur, Makralon		○	○	80-200	75-76
Kevlar			○	●	80-200	75-76
Glass/carbon fibre reinf. plastics	GFP/CFP		○	○	80-200	75-76

HR 500 ACTIVE Reamers in special dimensions

Order **Inquiry**

Name/customer no. if available New customer

Street no.

Telephone

Date

Contact for questions

Order no.

Town/post code

Fax

Signature

Quantity

Minimum order quantity 5 tools

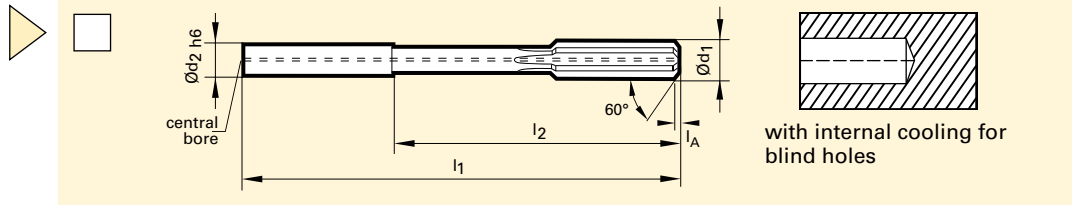
Hole Ø / tol.

or

**Reamers
manufact. Ø / tol.**

Nom.-Ø d ₁	Tolerance	Example	Example
<input type="text"/>	<input type="text"/>	Ø12 F8	Ø12 $\begin{matrix} +0.03 \\ +0.01 \end{matrix}$
Nom.-Ø d ₁	upper/lower limit	Example	
<input type="text"/>	<input type="text"/>	Ø12	$\begin{matrix} +0.008 \\ +0.002 \end{matrix}$

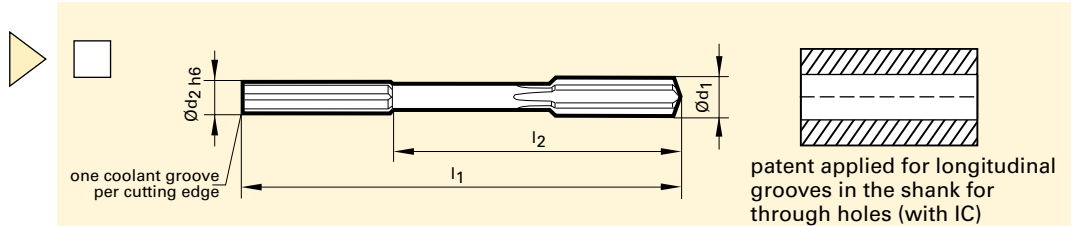
Blind hole



Through hole

with internal cooling

without internal cooling



Dimensions

long version

short version

Further dimensions on request

Nom.-Ø [mm] from - to d ₁	long version		short version		Chamfer length l _A (only blind holes)	Shank-Ø h6 DIN 6535 d ₂
	l ₁	Reach l ₂	l ₁	Reach l ₂		
2.950 – 4.1	68	40	-	-	0.4	4
4.101 – 6.1	76	40	-	-	0.4	6
6.101 – 8.1	101	65	76	40	0.4	8
8.101 – 10.1	101	61	76	36	0.4	10
10.101 – 12.1	130	85	80	35	0.5	12
12.101 – 14.1	130	85	90	45	0.5	14
14.101 – 16.1	150	102	90	42	0.5	16
16.101 – 18.1	150	102	100	52	0.5	18
18.101 – 20.1	150	100	100	50	0.5	20

Coating

TiAlN (optimal for machining cast iron and steel) bright (optimal for machining titanium)

Material

Steel/hardened steels/ GGG/VA GG

HR 500 ACTIVE Step reamers made to measure

Order **Inquiry**

Name/customer no. if available New customer

Street no.

Telephone

Date

Contact for questions

Order no.

Town/post code

Fax

Signature

Quantity Minimum order quantity 5 tools

Hole Ø / tol. or **Reamers manufact. Ø / tol.**

nom.-Ø d₁ tol. d₁ step Ø d₃ tol. d₃ Example: Ø12 F8 Ø10 H7 Example: Ø12 $\begin{matrix} +0.02 \\ -0.004 \end{matrix}$ Ø10 ± 0.2

nom.-Ø d₁ upper/lower limit step Ø d₃ upper/lower limit Example: Ø12 $\begin{matrix} +0.01 \\ -0.004 \end{matrix}$ Ø10 $\begin{matrix} +0.01 \\ -0.004 \end{matrix}$

cyl. step length/ countersink angle

Step length l₃ ±0.1 Countersink angle W₁ ±1°

Blind hole

Stepped hole Hole and countersink

Through hole

with internal cooling without internal cooling

Stepped hole Hole and countersink

Dimensions

long version short version

Further dimensions on request

Nom.-Ø [mm] from - to d ₁	smallest poss. step-Ø d ₃	long version		short version		Chamfer length l _A (only blind holes)	Shank-Ø h6 DIN 6535 d ₂
		l ₁	Reach l ₂	l ₁	Reach l ₂		
2.950 - 4.1	d1x0.7 (min.Ø2.95)	68	40	-	-	0.4	4
4.101 - 6.1	d1x0.7 (min.Ø2.95)	76	40	-	-	0.4	6
6.101 - 8.1	d1 x 0.8	101	65	76	40	0.4	8
8.101 - 10.1	d1 x 0.8	101	61	76	36	0.4	10
10.101 - 12.1	d1 x 0.8	130	85	80	35	0.5	12
12.101 - 14.1	d1 x 0.8	130	85	90	45	0.5	14
14.101 - 16.1	d1 x 0.8	150	102	90	42	0.5	16
16.101 - 18.1	d1 x 0.8	150	102	100	52	0.5	18
18.101 - 20.1	d1 x 0.8	150	100	100	50	0.5	20

Coating

TiAlN (optimal for machining cast iron and steel) bright (optimal for machining titanium)

Material

Steel/hardened steels/ GGG/VA GG

Guhring Ltd.

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