GÜHRING

New market standard for 5µ fixed sizes

Expansion of the H7 series

HR 500 short: A short design with high-performance

new

HR 500

High-performance reamers ready to take on any high-precision task

ISO-code

P	Steel, high-alloy steel
M	Stainless steel
K	Grey cast, spheroidal graphite iron and malleable cast iron
N	Aluminium and other non-ferrous metals
S	Special, super and titanium alloys
H	Hardened steel and chilled cast iron
O	Fibre-reinforced plastics (FRP), graphite

Tool recommendations regarding the suitability for application groups or specifications of max. tensile strength and hardness can be found on the product and cutting value pages.

● Ideally suitable ○ Suitable under certain conditions

Pictograms

Cutting material

Solid carbide

Carbide-tipped

Cermet-tipped

Internal cooling

Standard

According to Gühring standards

Type

Blind hole (S) Through-hole (D)

Cutting direction

Right-hand

Design

Hole tolerance H7

Tool tolerance 0/+0.005

Hole type


Through-hole


Blind hole

Number of cutting edges

Shank form

Helix angle


Straight-fluted

Pitch

Extremely unequal

Material removal

When reaming, the recommended stock removal depends on the material to be machined and the surface finish of the prefabricated hole. Refer to the following table for general stock removal guidelines:

Optimum pre-machining diameter

Recommended undersizes in mm			up to Ø 5	up to Ø 10	up to Ø 16	up to Ø 25	up to Ø 40	> Ø 40
All materials			Ø 0.1 – 0.2	Ø 0.2	Ø 0.2 – 0.3	Ø 0.3	Ø 0.3 – 0.4	Ø 0.4 – 0.5
Hardened steel	H	up to 48 HRC	Ø 0.1 – 0.2	Ø 0.2	Ø 0.2	Ø 0.2	Ø 0.3	Ø 0.3
		up to 63 HRC	Ø 0.1	Ø 0.1	Ø 0.1 – 0.2	Ø 0.2	Ø 0.2	Ø 0.2

CONTENTS

MONOLITHIC

P	M	S	H	N	K

Fixed-size series

HR 500 5/1000

VHM

#1675 P. 17 | #1676 P. 17

H7 series

HR 500 short

VHM

#4195 P. 23 | #4196 P. 23

H7 series

HR 500

VHM

#1685 P. 26 | #1686 P. 26

H7 series

HR 500 Alu

VHM

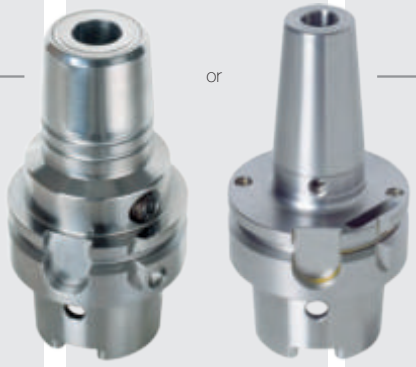
#1678 P. 29 | #1679 P. 29

H7 series

HR 500 cast iron

VHM

#1036 P. 31 | #1037 P. 31



#4299 or #4736

Ø 1.95 – 12.050	Ø 3.000 – 14.000	Ø 2.000 – 20.000	Ø 2.000 – 20.000	Ø 3.000 – 20.000

Ø in mm

MODULAR

P K M K | P M S H | P K M K S

H7 series

HR 500 G

Cermet

#1682 P. 37 | #1683 P. 37

#4299

HM

#1680 P. 36 | #1681 P. 36

Ø 6.000 – 40.000

Ø 22.000 – 40.000

H7 series

HR 500 T

VHM

#1548 P. 41 | #1549 P. 41

#4299 + #4719

Ø 14.000 – 42.000

H7 series

HR 500 GT

Cermet

#1040/1041 P. 45

#4299

HM

#1038/1039 P. 44

or

#4290

Ø 41.000 – 76.000

Ø in mm

50 x faster than conventional reamers

HR 500

Innovative reamers for every diameter range

When it comes to reaming, we split the µ.
With the HR 500 range, Gühring meets these high demands and offers its customers standard high-performance reamers for all diameters from 1.95 mm to 76 mm.
Thanks to the perfect combination of cutting edge geometry, carbide and coating, the HR 500 family enables you to master high-precision reaming processes in any material with maximum performance and precision.

Gühring enables customers to pick from two series:
In addition to the popular H7 series, Gühring also offers the fixed-size series. While conventional fixed sizes offer a range of ± 0.03 and in 10 µ increments, Gühring is the only tool manufacturer to expand the fixed-size range to a range of ± 0.05 and in 5 µ increments. As a result, you benefit from over 100 % more wear buffer and double the tool lives in selected fits.

Cost reduction
thanks to longer tool lives and faster machining

High process reliability
thanks to high feed rates and cutting speeds

100 % stock availability
ensures fast delivery

Wide range of applications
Tool variants for use in steel (P), stainless steel (M), titanium and special alloys (S), hardened steel (H), aluminium (N) and cast iron (K)

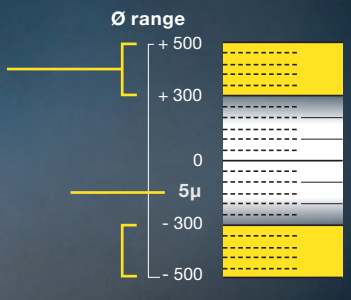
Innovative cooling
for perfect results and controlled chip removal

NEW RELEASES

Ø range extended from
± 0.03 mm to ± 0.05 mm
to cover all tolerance ranges

Dimensions in 5µ increments
Halving the increments results
in up to double the tool life

Compact dimensions of HR 500 short
For machining in limited installation space



SUCCESS STORY

Successfully increasing performance leads to satisfied customers:
Fabian Hambach (left) with Marcel Horn from Gühring (right).

We tried out the reamer and immediately achieved a very good result: With the HR 500, we were able to double tool lives and reduce machining time by a factor of 8.

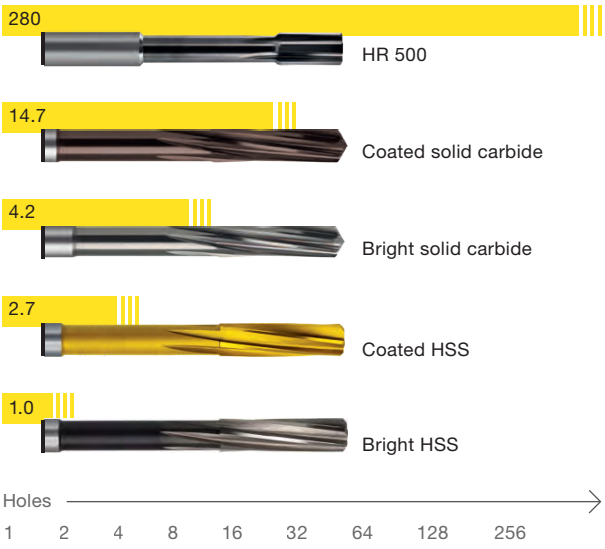
Fabian Hambach, Deputy Head of Toolmaking,
Fritz Schmidt Metallgießerei GmbH & Co. KG

UNBEATABLE SPEED & WEAR RESISTANCE

Top hole quality, narrow tolerances, maximum precision: This is what is important when manufacturing mould inserts made of hardened steel. To achieve this, Fritz Schmidt Metallgießerei GmbH & Co. KG relies on high-performance reamers from the HR 500 range from Gühring. This means that the Meckenheim-based company has been able to double tool lives compared to machining with previous reamers from a competitor. And it also saves 8 times the machining time thanks to the five-factor increase in cutting speeds.

The benefits

- Long tool lives thanks to extreme wear resistance
- Maximum feed rates and cutting speeds
- Powerful in steel, stainless steel, titanium and special alloys and hardened steels up to 63 HRC



Performance comparison: In the time it takes a bright HSS reamer to make one hole, the HR 500 creates 280 holes.

TOOL PERFORMANCE REPORT

Tool	Competitor	**HR 500**
Diameter (Ø) [mm]	10	10
Component	Mould insert	Mould insert
Material [48–50 HRC]	1.2399	1.2399
Cutting speed (v_c) [m/min]	10	50
Speed (n) [rpm]	320	1590
Feed (f_n) [mm/rev.]	0.2	0.315
Feed rate (v_f) [mm/min]	65	500
Pre-machining hole diameter [mm]	9.8	9.8
Reaming depth [mm]	20	20
Tool life (in holes)	115	230
Machining time (in sec. per hole)	18.4	2.3

Tool life doubled, machining time reduced by a factor of 8

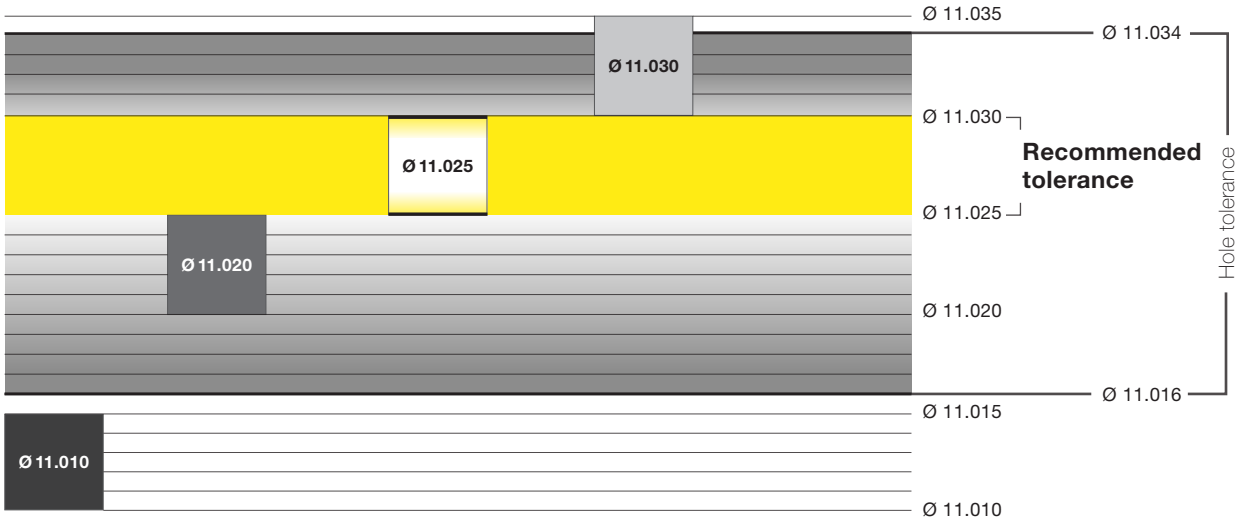
SPECIAL BECOMES STANDARD:
NO SUCH THING AS A POOR FIT

New intermediate dimensions for maximum precision

If you'd like to avoid using an expensive special tool for producing tight tolerances outside the H7 fit system, then opt for a reamer from one of our fixed sizes. However, conventional models only offer dimensions in 1/100 increments. And at ± 0.03 mm in the range. The result? The reamers are only suitable to a limited extent.

Gühring is now changing all this with Gühring's new fixed-dimension market standard: Thanks to new fixed-dimension reamers ± from 0.05 mm and dimensions in precise 5µ increments, the tool manufacturer is closing the gap in the market and covering numerous tolerances even outside the H7 class. And it does this with a great deal of precision – without making any compromises or using costly custom-made products.

Example of fit: **Ø 11 F7** | Hole tolerance: 11.016 / 11.034 mm
Recommended tolerance: 11.025 / 11.030 mm



Ø 11.010: The reamer does not fall within the required tolerance range of the hole.
The hole ends up being too small.

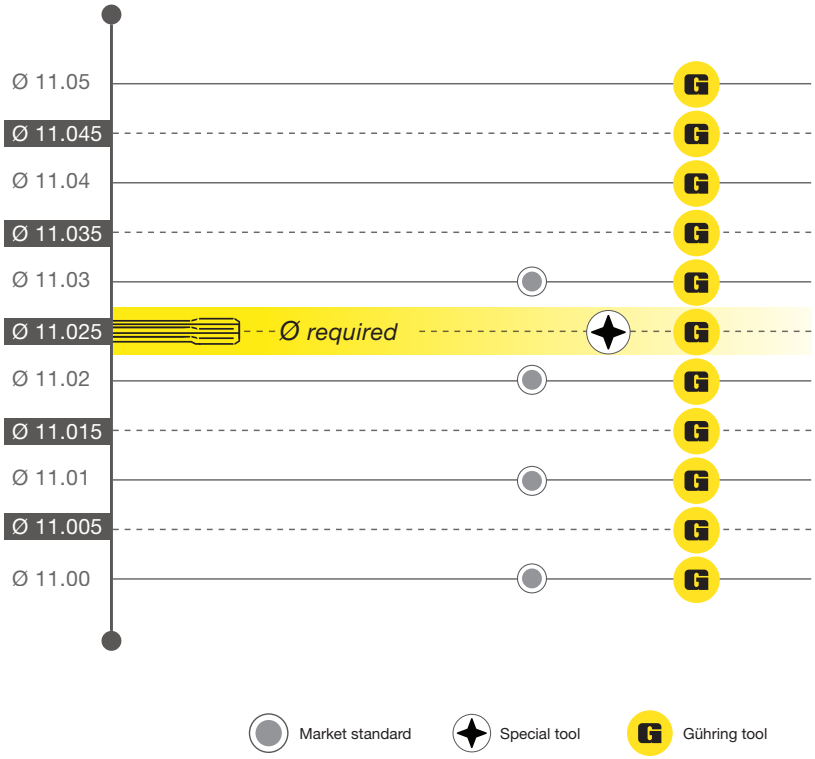
Ø 11.020: The reamer falls within the tolerance range of the hole.
The wear buffer for the lower tolerance variable is only 0.004 µ.
The tool wears prematurely, there is no process reliability.

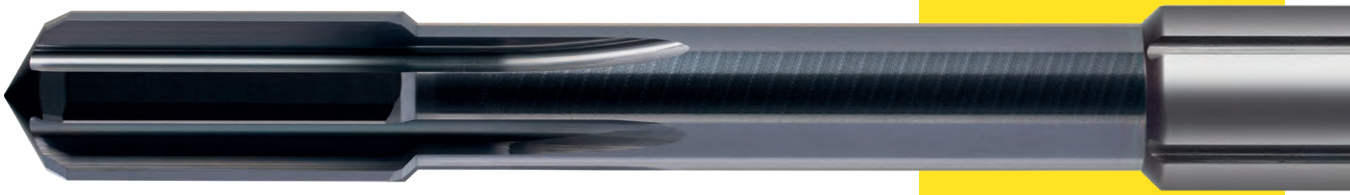
Ø 11.030: The reamer falls within the required tolerance range of the hole,
but exceeds the upper tolerance limit.
Risk of the hole becoming too large.

Ø 11.025: With the new market standard for fixed sizes,
Gühring now covers all tolerance ranges with a precise fit.
The special tool of yesterday is today's standard.

With the new fixed-size reamers in 5µ increments, Gühring covers all tolerance ranges with a precision-fit.

Fixed sizes 5µ-increments





Quick and convenient: With our new online tolerance calculator, you can find the most economical dimension to achieve maximum tool life and process reliability for your desired fit

1. Scan the QR code & open the tolerance calculator
2. Enter the desired hole tolerance
3. Select the recommended reamer
4. Buy everything you need directly in the shop

https://webnavigator.guehring.de/en/

new

P	M	K	N	S	H	Tool illustration	Ø tolerance	Hole type	Type	Shank form	Tool material	Surface	d1/mm	Article no.	Page
High-performance reamers, fixed-size series															
●	●	○	○	●	●		+0,005 +0		HR 500 S	HA	VHM	a	1.950 - 12.050	1675	17
●	●	○	○	●	●		+0,005 +0		HR 500 D	HA	VHM	a	1.950 - 12.050	1676	17
High-performance reamers, H7 series															
●	●	○	○	●	●		H7		HR 500 Short S	HA	VHM	a	3.000 - 14.000	4195	23
●	●	○	○	●	●		H7		HR 500 Short D	HA	VHM	a	3.000 - 14.000	4196	23
●	●	○	○	●	●		H7		HR 500 S	HA	VHM	a	2.000 - 20.000	1685	26
●	●	○	○	●	●		H7		HR 500 D	HA	VHM	a	2.000 - 20.000	1686	26
			●				H7		HR 500 Alu S	HA	VHM	Cb	2.000 - 20.000	1678	29
			●				H7		HR 500 Alu D	HA	VHM	Cb	2.000 - 20.000	1679	29
		●					H7		HR 500 Guss S	HA	VHM	Y	3.000 - 20.000	1036	31
		●					H7		HR 500 Guss D	HA	VHM	Y	3.000 - 20.000	1037	31
○	●	●	○	○			H7		HR 500 G S	HA	HM	a	22.000 - 40.000	1680	36
○	●	●	○	○			H7		HR 500 G D	HA	HM	a	22.000 - 40.000	1681	36
●		●					H7		HR 500 G S	HA	Cermet	○	6.000 - 40.000	1682	37
●		●					H7		HR 500 G D	HA	Cermet	○	6.000 - 40.000	1683	37
●	●	○	○	●	●		H7		HR 500 T S	HA	VHM	a	14.000 - 42.000	1548	41
●	●	○	○	●	●		H7		HR 500 T D	HA	VHM	a	14.000 - 42.000	1549	41
○	●	●	○	●			H7		HR 500 GT S	~HA	HM	a	41.000 - 76.000	1038	44
○	●	●	○	●			H7		HR 500 GT D	~HA	HM	a	41.000 - 76.000	1039	44
●		●					H7		HR 500 GT S	~HA	Cermet	○	41.000 - 76.000	1040	45
●		●					H7		HR 500 GT D	~HA	Cermet	○	41.000 - 76.000	1041	45

P	M	K	N	S	H	Tool illustration	Ø tolerance	Hole type	Type	Shank form	Tool material	Surface	d1/mm	Article no.	Page
Deburring reamers															
●	●	●	○	●	○				EWR 500	HA	VHM	a	2.970 - 11.970	**4103**	47
Shrink fit extensions															
										~HA		○		**4719**	49
HSK-A hydraulic chucks, overlength															
										HSK-A		○		**4290**	50

IT DOESN'T GET MORE PRECISE: **THE HR 500 UNIVERSAL FIXED SIZE**

new

An all-rounder for every application

The HR 500 Universal impresses with its extremely wide range of applications. The high-performance reamer showcases its strengths in almost all materials and thus ensures perfect friction in steel, stainless steel, special alloys and hardened steel up to 63 HRC.

But that's not all. Gühring has expanded the range in the diameter range of 1.95 – 12.05 mm from ± 0.03 mm to ± 0.05 mm. Instead of the usual 10µ increments available on the market, Gühring now offers even more precise increments of 5 µ.

Suitable for applications in **steel**, **stainless steel**, **special alloys** and **hardened steel up to 63 HRC**

1.95 – 12.050

- **New market standard for fixed sizes**
  covers numerous fits with µ-level accuracy outside the H7 system
- **Double the tool life**
  thanks to more than 100% the wear buffer for selected fits

The quickest way to find the right reamer

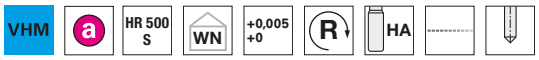
Select #1675 for blind hole machining or #1676 for through hole machining. Add the code at the bottom of the table listed with respect to diameter and your tolerance requirements. The table shows you the appropriate diameter for your fit. The diameters marked in yellow show you the extended market standard.

New: Fixed size addition, 5µ increments ± 0.05 range

Tolerance class	Nominal diameter										
	2	3	4	5	6	7	8	9	10	11	12
E6	2.015	3.015	4.020	5.020	6.020	7.025	8.025	9.025	10.025	11.035	12.035
E7	2.015	3.015	4.025	5.025	6.025	7.035	8.035	9.035	10.035	11.045	12.045
E8	2.020	3.020	4.030	5.030	6.030	7.040	8.040	9.040	10.040	11.050	12.050
E9	2.030	3.030	4.045	5.045	6.045	7.050	8.050	9.050	10.050	11.050	12.050
F6			4.010	5.010	6.010	7.015	8.015	9.015	10.015	11.020	12.020
F7	2.010	3.010	4.015	5.015	6.015	7.020	8.020	9.020	10.020	11.025	12.025
F8	2.015	3.015	4.020	5.020	6.020	7.030	8.030	9.030	10.030	11.035	12.035
F9	2.025	3.025	4.035	5.035	6.035	7.040	8.040	9.040	10.040	11.050	12.050
G6			4.005	5.005	6.005	7.005	8.005	9.005	10.005	11.010	12.010
G7	2.005	3.005	4.010	5.010	6.010	7.015	8.015	9.015	10.015	11.015	12.015
G8	2.010	3.010	4.015	5.015	6.015	7.020	8.020	9.020	10.020	11.025	12.025
G9	2.020	3.020	4.025	5.025	6.025	7.035	8.035	9.035	10.035	11.040	12.040
H6	2.000	3.000	4.000	5.000	6.000	7.000	8.000	9.000	10.000	11.005	12.005
H7	See #1685, #1686 H7 series										
H8	2.005	3.005	4.010	5.010	6.010	7.015	8.015	9.015	10.015	11.020	12.020
H9	2.020	3.020	4.025	5.025	6.025	7.030	8.030	9.030	10.030	11.035	12.035
J6			4.000	5.000	6.000	7.000	8.000	9.000	10.000	11.000	12.000
J7	1.995	2.995	4.000	5.000	6.000	7.000	8.000	9.000	10.000	11.005	12.005
J8	2.000	3.000	4.005	5.005	6.005	7.005	8.005	9.005	10.005	11.010	12.010
J9/JS9	2.005	3.005	4.010	5.010	6.010	7.010	8.010	9.010	10.010	11.015	12.015
K6	1.995	2.995	3.995	4.995	5.995	6.995	7.995	8.995	9.995	10.995	11.995
K7	1.995	2.995	3.995	4.995	5.995	7.000	8.000	9.000	10.000	11.000	12.000
K8	1.995	2.995	4.000	5.000	6.000	7.000	8.000	9.000	10.000	11.000	12.000
K9	1.995	2.995	Not defined in DIN ISO 286								
M6						6.990	7.990	8.990	9.990	10.990	11.990
M7	1.990	2.990	3.995	4.995	5.995	6.995	7.995	8.995	9.995	10.995	11.995
M8	1.990	2.990	3.995	4.995	5.995	6,995	7.995	8.995	9.995	10.995	11.995
M9	1.990	2.990	3.990	4.990	5.990	6.985	7.985	8.985	9.985	10.985	11.985
N6	1.990	2.990	3.990	4.990	5.990	6.985	7.985	8.985	9.985	10.985	11.985
N7	1.990	2.990	3.990	4.990	5.990	6.990	7.990	8.990	9.990	10.990	11.990
N8	1.990	2.990	3.990	4.990	5.990	6.990	7.990	8.990	9.990	10.990	11.990
N9	1.990	2.990	3.995	4.995	5.995	6.995	7.995	8.995	9.995	10.995	11.995
P6			3.985	4.985	5.985	6.980	7.980	8.980	9.980	10.980	11.980
P7	1.985	2.985	3.985	4.985	5.985	6.985	7.985	8.985	9.985	10.980	11.980
P8	1.985	2.985	3.980	4.980	5.980	6,980	7.980	8.980	9.980	10.975	11.975
P9	1.985	2.985	3.980	4.980	5.980	6,980	7.980	8.980	9.980	10.975	11.975
R6	1.985	2.985	3.980	4.980	5.980	6.975	7.975	8.975	9.975	10.975	11.975
R7	1.985	2.985	3.980	4,980	5.980	6,980	7.980	8.980	9.980	10.975	11.975
R8	1.985	2.985	3.980	4.980	5.980	6.975	7.975	8.975	9.975	10.970	11.970
R9	1.985	2.985	3.980	4.980	5.980	6.975	7.975	8.975	9.975	10.970	11.970
S6	1.980	2.980				6.975	7.975	8.975	9.975	10.970	11.970
S7	1.980	2.980	3.980	4.980	5.980	6.975	7.975	8.975	9.975	10.970	11.970
S8	1.980	2.980	3.975	4.975	5.975	6.970	7.970	8.970	9.970	10.965	11.965
S9	1.980	2.980	3.975	4.975	5.975	6.970	7.970	8.970	9.970	10.965	11.965

High-performance reamers, fixed-size series

Article no. **1675**



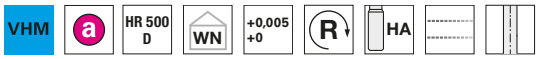
for cutting data see page 52

P	M	K	N	S	H
●	●	○	○	●	●

extremely unequal flute spacing • central internal coolant supply, outlet on the face • 5/1000 dimension • intermediate dimensions of Ø 1.95-20.1 mm possible • for clamping in hydraulic and shrink fit chucks

High-performance reamers, fixed-size series

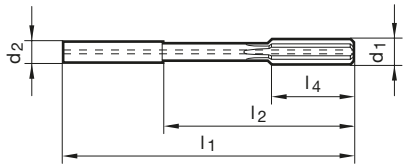
Article no. **1676**



for cutting data see page 52

P	M	K	N	S	H
●	●	○	○	●	●

extremely unequal flute spacing • central internal coolant supply, outlet via oil grooves on shank • 5/1000 dimension • intermediate dimensions of Ø 1.95-20.1 mm possible • for clamping in hydraulic and shrink fit chucks



d1 mm	d2 h6 mm	l1 mm	l2 mm	l4 mm	Z	Article no. 1675	Article no. 1676
1.950	4.00	50.0	22.0	8.0	4	1675 1.950	1676 1.950
1.955	4.00	50.0	22.0	8.0	4	1675 1.955	1676 1.955
1.960	4.00	50.0	22.0	8.0	4	1675 1.960	1676 1.960
1.965	4.00	50.0	22.0	8.0	4	1675 1.965	1676 1.965
1.970	4.00	50.0	22.0	8.0	4	1675 1.970	1676 1.970
1.975	4.00	50.0	22.0	8.0	4	1675 1.975	1676 1.975
1.980	4.00	50.0	22.0	8.0	4	1675 1.980	1676 1.980
1.985	4.00	50.0	22.0	8.0	4	1675 1.985	1676 1.985
1.990	4.00	50.0	22.0	8.0	4	1675 1.990	1676 1.990
1.995	4.00	50.0	22.0	8.0	4	1675 1.995	1676 1.995
2.000	4.00	50.0	22.0	8.0	4	1675 2.000	1676 2.000
2.005	4.00	50.0	22.0	8.0	4	1675 2.005	1676 2.005
2.010	4.00	50.0	22.0	8.0	4	1675 2.010	1676 2.010
2.015	4.00	50.0	22.0	8.0	4	1675 2.015	1676 2.015
2.020	4.00	50.0	22.0	8.0	4	1675 2.020	1676 2.020
2.025	4.00	50.0	22.0	8.0	4	1675 2.025	1676 2.025
2.030	4.00	50.0	22.0	8.0	4	1675 2.030	1676 2.030
2.035	4.00	50.0	22.0	8.0	4	1675 2.035	1676 2.035
2.040	4.00	50.0	22.0	8.0	4	1675 2.040	1676 2.040
2.045	4.00	50.0	22.0	8.0	4	1675 2.045	1676 2.045
2.050	4.00	50.0	22.0	8.0	4	1675 2.050	1676 2.050
2.950	4.00	68.0	40.0	12.0	4	1675 2.950	1676 2.950
2.955	4.00	68.0	40.0	12.0	4	1675 2.955	1676 2.955
2.960	4.00	68.0	40.0	12.0	4	1675 2.960	1676 2.960
2.965	4.00	68.0	40.0	12.0	4	1675 2.965	1676 2.965
2.970	4.00	68.0	40.0	12.0	4	1675 2.970	1676 2.970
2.975	4.00	68.0	40.0	12.0	4	1675 2.975	1676 2.975
2.980	4.00	68.0	40.0	12.0	4	1675 2.980	1676 2.980
2.985	4.00	68.0	40.0	12.0	4	1675 2.985	1676 2.985
2.990	4.00	68.0	40.0	12.0	4	1675 2.990	1676 2.990
2.995	4.00	68.0	40.0	12.0	4	1675 2.995	1676 2.995
3.000	4.00	68.0	40.0	12.0	4	1675 3.000	1676 3.000
3.005	4.00	68.0	40.0	12.0	4	1675 3.005	1676 3.005
3.010	4.00	68.0	40.0	12.0	4	1675 3.010	1676 3.010
3.015	4.00	68.0	40.0	12.0	4	1675 3.015	1676 3.015
3.020	4.00	68.0	40.0	12.0	4	1675 3.020	1676 3.020
3.025	4.00	68.0	40.0	12.0	4	1675 3.025	1676 3.025
3.030	4.00	68.0	40.0	12.0	4	1675 3.030	1676 3.030
3.035	4.00	68.0	40.0	12.0	4	1675 3.035	1676 3.035
3.040	4.00	68.0	40.0	12.0	4	1675 3.040	1676 3.040
3.045	4.00	68.0	40.0	12.0	4	1675 3.045	1676 3.045
3.050	4.00	68.0	40.0	12.0	4	1675 3.050	1676 3.050
3.950	4.00	68.0	40.0	12.0	4	1675 3.950	1676 3.950
3.955	4.00	68.0	40.0	12.0	4	1675 3.955	1676 3.955
3.960	4.00	68.0	40.0	12.0	4	1675 3.960	1676 3.960
3.965	4.00	68.0	40.0	12.0	4	1675 3.965	1676 3.965
3.970	4.00	68.0	40.0	12.0	4	1675 3.970	1676 3.970
3.975	4.00	68.0	40.0	12.0	4	1675 3.975	1676 3.975
3.980	4.00	68.0	40.0	12.0	4	1675 3.980	1676 3.980
3.985	4.00	68.0	40.0	12.0	4	1675 3.985	1676 3.985
3.990	4.00	68.0	40.0	12.0	4	1675 3.990	1676 3.990
3.995	4.00	68.0	40.0	12.0	4	1675 3.995	1676 3.995
4.000	4.00	68.0	40.0	12.0	4	1675 4.000	1676 4.000
4.005	4.00	68.0	40.0	12.0	4	1675 4.005	1676 4.005

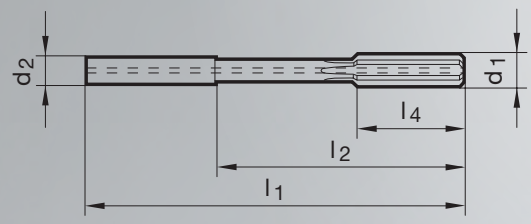
						Article no.	1675	1676
d1 mm	d2 h6 mm	l1 mm	l2 mm	l4 mm	Z	Order no.		
4.010	4.00	68.0	40.0	12.0	4		1675 4.010	1676 4.010
4.015	4.00	68.0	40.0	12.0	4		1675 4.015	1676 4.015
4.020	4.00	68.0	40.0	12.0	4		1675 4.020	1676 4.020
4.025	4.00	68.0	40.0	12.0	4		1675 4.025	1676 4.025
4.030	4.00	68.0	40.0	12.0	4		1675 4.030	1676 4.030
4.035	4.00	68.0	40.0	12.0	4		1675 4.035	1676 4.035
4.040	4.00	68.0	40.0	12.0	4		1675 4.040	1676 4.040
4.045	4.00	68.0	40.0	12.0	4		1675 4.045	1676 4.045
4.050	4.00	68.0	40.0	12.0	4		1675 4.050	1676 4.050
4.950	6.00	76.0	40.0	12.0	4		1675 4.950	1676 4.950
4.955	6.00	76.0	40.0	12.0	4		1675 4.955	1676 4.955
4.960	6.00	76.0	40.0	12.0	4		1675 4.960	1676 4.960
4.965	6.00	76.0	40.0	12.0	4		1675 4.965	1676 4.965
4.970	6.00	76.0	40.0	12.0	4		1675 4.970	1676 4.970
4.975	6.00	76.0	40.0	12.0	4		1675 4.975	1676 4.975
4.980	6.00	76.0	40.0	12.0	4		1675 4.980	1676 4.980
4.985	6.00	76.0	40.0	12.0	4		1675 4.985	1676 4.985
4.990	6.00	76.0	40.0	12.0	4		1675 4.990	1676 4.990
4.995	6.00	76.0	40.0	12.0	4		1675 4.995	1676 4.995
5.000	6.00	76.0	40.0	12.0	4		1675 5.000	1676 5.000
5.005	6.00	76.0	40.0	12.0	4		1675 5.005	1676 5.005
5.010	6.00	76.0	40.0	12.0	4		1675 5.010	1676 5.010
5.015	6.00	76.0	40.0	12.0	4		1675 5.015	1676 5.015
5.020	6.00	76.0	40.0	12.0	4		1675 5.020	1676 5.020
5.025	6.00	76.0	40.0	12.0	4		1675 5.025	1676 5.025
5.030	6.00	76.0	40.0	12.0	4		1675 5.030	1676 5.030
5.035	6.00	76.0	40.0	12.0	4		1675 5.035	1676 5.035
5.040	6.00	76.0	40.0	12.0	4		1675 5.040	1676 5.040
5.045	6.00	76.0	40.0	12.0	4		1675 5.045	1676 5.045
5.050	6.00	76.0	40.0	12.0	4		1675 5.050	1676 5.050
5.950	6.00	76.0	40.0	12.0	4		1675 5.950	1676 5.950
5.955	6.00	76.0	40.0	12.0	4		1675 5.955	1676 5.955
5.960	6.00	76.0	40.0	12.0	4		1675 5.960	1676 5.960
5.965	6.00	76.0	40.0	12.0	4		1675 5.965	1676 5.965
5.970	6.00	76.0	40.0	12.0	4		1675 5.970	1676 5.970
5.975	6.00	76.0	40.0	12.0	4		1675 5.975	1676 5.975
5.980	6.00	76.0	40.0	12.0	4		1675 5.980	1676 5.980
5.985	6.00	76.0	40.0	12.0	4		1675 5.985	1676 5.985
5.990	6.00	76.0	40.0	12.0	4		1675 5.990	1676 5.990
5.995	6.00	76.0	40.0	12.0	4		1675 5.995	1676 5.995
6.000	6.00	76.0	40.0	12.0	4		1675 6.000	1676 6.000
6.005	6.00	76.0	40.0	12.0	4		1675 6.005	1676 6.005
6.010	6.00	76.0	40.0	12.0	4		1675 6.010	1676 6.010
6.015	6.00	76.0	40.0	12.0	4		1675 6.015	1676 6.015
6.020	6.00	76.0	40.0	12.0	4		1675 6.020	1676 6.020
6.025	6.00	76.0	40.0	12.0	4		1675 6.025	1676 6.025
6.030	6.00	76.0	40.0	12.0	4		1675 6.030	1676 6.030
6.035	6.00	76.0	40.0	12.0	4		1675 6.035	1676 6.035
6.040	6.00	76.0	40.0	12.0	4		1675 6.040	1676 6.040
6.045	6.00	76.0	40.0	12.0	4		1675 6.045	1676 6.045
6.050	6.00	76.0	40.0	12.0	4		1675 6.050	1676 6.050
6.950	8.00	101.0	65.0	16.0	6		1675 6.950	1676 6.950
6.955	8.00	101.0	65.0	16.0	6		1675 6.955	1676 6.955
6.960	8.00	101.0	65.0	16.0	6		1675 6.960	1676 6.960
6.965	8.00	101.0	65.0	16.0	6		1675 6.965	1676 6.965
6.970	8.00	101.0	65.0	16.0	6		1675 6.970	1676 6.970
6.975	8.00	101.0	65.0	16.0	6		1675 6.975	1676 6.975
6.980	8.00	101.0	65.0	16.0	6		1675 6.980	1676 6.980
6.985	8.00	101.0	65.0	16.0	6		1675 6.985	1676 6.985
6.990	8.00	101.0	65.0	16.0	6		1675 6.990	1676 6.990
6.995	8.00	101.0	65.0	16.0	6		1675 6.995	1676 6.995
7.000	8.00	101.0	65.0	16.0	6		1675 7.000	1676 7.000
7.005	8.00	101.0	65.0	16.0	6		1675 7.005	1676 7.005
7.010	8.00	101.0	65.0	16.0	6		1675 7.010	1676 7.010
7.015	8.00	101.0	65.0	16.0	6		1675 7.015	1676 7.015
7.020	8.00	101.0	65.0	16.0	6		1675 7.020	1676 7.020
7.025	8.00	101.0	65.0	16.0	6		1675 7.025	1676 7.025
7.030	8.00	101.0	65.0	16.0	6		1675 7.030	1676 7.030
7.035	8.00	101.0	65.0	16.0	6		1675 7.035	1676 7.035
7.040	8.00	101.0	65.0	16.0	6		1675 7.040	1676 7.040
7.045	8.00	101.0	65.0	16.0	6		1675 7.045	1676 7.045
7.050	8.00	101.0	65.0	16.0	6		1675 7.050	1676 7.050
7.950	8.00	101.0	65.0	16.0	6		1675 7.950	1676 7.950
7.955	8.00	101.0	65.0	16.0	6		1675 7.955	1676 7.955
7.960	8.00	101.0	65.0	16.0	6		1675 7.960	1676 7.960
7.965	8.00	101.0	65.0	16.0	6		1675 7.965	1676 7.965
7.970	8.00	101.0	65.0	16.0	6		1675 7.970	1676 7.970
7.975	8.00	101.0	65.0	16.0	6		1675 7.975	1676 7.975
7.980	8.00	101.0	65.0	16.0	6		1675 7.980	1676 7.980
7.985	8.00	101.0	65.0	16.0	6		1675 7.985	1676 7.985
7.990	8.00	101.0	65.0	16.0	6		1675 7.990	1676 7.990
7.995	8.00	101.0	65.0	16.0	6		1675 7.995	1676 7.995
8.000	8.00	101.0	65.0	16.0	6		1675 8.000	1676 8.000
8.005	8.00	101.0	65.0	16.0	6		1675 8.005	1676 8.005

						Article no.	1675	1676
d1 mm	d2 h6 mm	l1 mm	l2 mm	l4 mm	Z	Order no.		
8.010	8.00	101.0	65.0	16.0	6		1675 8.010	1676 8.010
8.015	8.00	101.0	65.0	16.0	6		1675 8.015	1676 8.015
8.020	8.00	101.0	65.0	16.0	6		1675 8.020	1676 8.020
8.025	8.00	101.0	65.0	16.0	6		1675 8.025	1676 8.025
8.030	8.00	101.0	65.0	16.0	6		1675 8.030	1676 8.030
8.035	8.00	101.0	65.0	16.0	6		1675 8.035	1676 8.035
8.040	8.00	101.0	65.0	16.0	6		1675 8.040	1676 8.040
8.045	8.00	101.0	65.0	16.0	6		1675 8.045	1676 8.045
8.050	8.00	101.0	65.0	16.0	6		1675 8.050	1676 8.050
8.950	10.00	101.0	61.0	19.0	6		1675 8.950	1676 8.950
8.955	10.00	101.0	61.0	19.0	6		1675 8.955	1676 8.955
8.960	10.00	101.0	61.0	19.0	6		1675 8.960	1676 8.960
8.965	10.00	101.0	61.0	19.0	6		1675 8.965	1676 8.965
8.970	10.00	101.0	61.0	19.0	6		1675 8.970	1676 8.970
8.975	10.00	101.0	61.0	19.0	6		1675 8.975	1676 8.975
8.980	10.00	101.0	61.0	19.0	6		1675 8.980	1676 8.980
8.985	10.00	101.0	61.0	19.0	6		1675 8.985	1676 8.985
8.990	10.00	101.0	61.0	19.0	6		1675 8.990	1676 8.990
8.995	10.00	101.0	61.0	19.0	6		1675 8.995	1676 8.995
9.000	10.00	101.0	61.0	19.0	6		1675 9.000	1676 9.000
9.005	10.00	101.0	61.0	19.0	6		1675 9.005	1676 9.005
9.010	10.00	101.0	61.0	19.0	6		1675 9.010	1676 9.010
9.015	10.00	101.0	61.0	19.0	6		1675 9.015	1676 9.015
9.020	10.00	101.0	61.0	19.0	6		1675 9.020	1676 9.020
9.025	10.00	101.0	61.0	19.0	6		1675 9.025	1676 9.025
9.030	10.00	101.0	61.0	19.0	6		1675 9.030	1676 9.030
9.035	10.00	101.0	61.0	19.0	6		1675 9.035	1676 9.035
9.040	10.00	101.0	61.0	19.0	6		1675 9.040	1676 9.040
9.045	10.00	101.0	61.0	19.0	6		1675 9.045	1676 9.045
9.050	10.00	101.0	61.0	19.0	6		1675 9.050	1676 9.050
9.950	10.00	101.0	61.0	19.0	6		1675 9.950	1676 9.950
9.955	10.00	101.0	61.0	19.0	6		1675 9.955	1676 9.955
9.960	10.00	101.0	61.0	19.0	6		1675 9.960	1676 9.960
9.965	10.00	101.0	61.0	19.0	6		1675 9.965	1676 9.965
9.970	10.00	101.0	61.0	19.0	6		1675 9.970	1676 9.970
9.975	10.00	101.0	61.0	19.0	6		1675 9.975	1676 9.975
9.980	10.00	101.0	61.0	19.0	6		1675 9.980	1676 9.980
9.985	10.00	101.0	61.0	19.0	6		1675 9.985	1676 9.985
9.990	10.00	101.0	61.0	19.0	6		1675 9.990	1676 9.990
9.995	10.00	101.0	61.0	19.0	6		1675 9.995	1676 9.995
10.000	10.00	101.0	61.0	19.0	6		1675 10.000	1676 10.000
10.005	10.00	101.0	61.0	19.0	6		1675 10.005	1676 10.005
10.010	10.00	101.0	61.0	19.0	6		1675 10.010	1676 10.010
10.015	10.00	101.0	61.0	19.0	6		1675 10.015	1676 10.015
10.020	10.00	101.0	61.0	19.0	6		1675 10.020	1676 10.020
10.025	10.00	101.0	61.0	19.0	6		1675 10.025	1676 10.025
10.030	10.00	101.0	61.0	19.0	6		1675 10.030	1676 10.030
10.035	10.00	101.0	61.0	19.0	6		1675 10.035	1676 10.035
10.040	10.00	101.0	61.0	19.0	6		1675 10.040	1676 10.040
10.045	10.00	101.0	61.0	19.0	6		1675 10.045	1676 10.045
10.050	10.00	101.0	61.0	19.0	6		1675 10.050	1676 10.050
10.950	12.00	130.0	85.0	19.0	6		1675 10.950	1676 10.950
10.955	12.00	130.0	85.0	19.0	6		1675 10.955	1676 10.955
10.960	12.00	130.0	85.0	19.0	6		1675 10.960	1676 10.960
10.965	12.00	130.0	85.0	19.0	6		1675 10.965	1676 10.965
10.970	12.00	130.0	85.0	19.0	6		1675 10.970	1676 10.970
10.975	12.00	130.0	85.0	19.0	6		1675 10.975	1676 10.975
10.980	12.00	130.0	85.0	19.0	6		1675 10.980	1676 10.980
10.985	12.00	130.0	85.0	19.0	6		1675 10.985	1676 10.985
10.990	12.00	130.0	85.0	19.0	6		1675 10.990	1676 10.990
10.995	12.00	130.0	85.0	19.0	6		1675 10.995	1676 10.995
11.000	12.00	130.0	85.0	19.0	6		1675 11.000	1676 11.000
11.005	12.00	130.0	85.0	19.0	6		1675 11.005	1676 11.005
11.010	12.00	130.0	85.0	19.0	6		1675 11.010	1676 11.010
11.015	12.00	130.0	85.0	19.0	6		1675 11.015	1676 11.015
11.020	12.00	130.0	85.0	19.0	6		1675 11.020	1676 11.020
11.025	12.00	130.0	85.0	19.0	6		1675 11.025	1676 11.025
11.030	12.00	130.0	85.0	19.0	6		1675 11.030	1676 11.030
11.035	12.00	130.0	85.0	19.0	6		1675 11.035	1676 11.035
11.040	12.00	130.0	85.0	19.0	6		1675 11.040	1676 11.040
11.045	12.00	130.0	85.0	19.0	6		1675 11.045	1676 11.045
11.050	12.00	130.0	85.0	19.0	6		1675 11.050	1676 11.050
11.950	12.00	130.0	85.0	19.0	6		1675 11.950	1676 11.950
11.955	12.00	130.0	85.0	19.0	6		1675 11.955	1676 11.955
11.960	12.00	130.0	85.0	19.0	6		1675 11.960	1676 11.960
11.965	12.00	130.0	85.0	19.0	6		1675 11.965	1676 11.965
11.970	12.00	130.0	85.0	19.0	6		1675 11.970	1676 11.970
11.975	12.00	130.0	85.0	19.0	6		1675 11.975	1676 11.975
11.980	12.00	130.0	85.0	19.0	6		1675 11.980	1676 11.980
11.985	12.00	130.0	85.0	19.0	6		1675 11.985	1676 11.985
11.990	12.00	130.0	85.0	19.0	6		1675 11.990	1676 11.990
11.995	12.00	130.0	85.0	19.0	6		1675 11.995	1676 11.995
12.000	12.00	130.0	85.0	19.0	6		1675 12.000	1676 12.000
12.005	12.00	130.0	85.0	19.0	6		1675 12.005	1676 12.005

						Article no.	1675	1676
d1 mm	d2 h6 mm	l1 mm	l2 mm	l4 mm	Z	Order no.		
12.010	12.00	130.0	85.0	19.0	6		1675 12.010	1676 12.010
12.015	12.00	130.0	85.0	19.0	6		1675 12.015	1676 12.015
12.020	12.00	130.0	85.0	19.0	6		1675 12.020	1676 12.020
12.025	12.00	130.0	85.0	19.0	6		1675 12.025	1676 12.025
12.030	12.00	130.0	85.0	19.0	6		1675 12.030	1676 12.030
12.035	12.00	130.0	85.0	19.0	6		1675 12.035	1676 12.035
12.040	12.00	130.0	85.0	19.0	6		1675 12.040	1676 12.040
12.045	12.00	130.0	85.0	19.0	6		1675 12.045	1676 12.045
12.050	12.00	130.0	85.0	19.0	6		1675 12.050	1676 12.050

HR 500 L & XL

Special tools for reaming deep or sunken holes



HR 500 L & XL

Design	d1 mm	d2 mm	l1 mm	l2 mm	l4 mm	z
L	4.00	4.00	101.0	73.0	12.0	4
XL	4.00	4.00	150.0	122.0	12.0	4
L	5.00	5.00	101.0	65.0	12.0	4
XL	5.00	5.00	150.0	114.0	12.0	4
L	6.00	6.00	101.0	94.0	12.0	4
XL	6.00	6.00	150.0	124.0	12.0	4
L	8.00	8.00	130.0	94.0	16.0	6
XL	8.00	8.00	200.0	164.0	16.0	6
L	10.00	10.00	130.0	90.0	19.0	6
XL	10.00	10.00	200.0	160.0	19.0	6
L	12.00	12.00	160.0	115.0	19.0	6
XL	12.00	12.00	200.0	155.0	19.0	6

We also offer longer designs on enquiry.
Please contact our sales team.

COMPACT, PRECISE, POWERFUL:
THE HR 500 SHORT

new

The powerhouse for limited installation space

In applications where there is limited space for machining the workpiece, longer reamers quickly reach their limits: If the tool cannot be brought into the optimum machining position, the results will be unsatisfactory.

A case for the new **HR 500 short**: Thanks to its extremely short design, the reamer comes into its own where space is a critical resource.

3.000 – 14.000

- **Short projection of the cutting part** for maximum stability & an optimum gauge
- **Maximum cost-effectiveness** thanks to maximum cutting performance and high cutting values
- **Universal compatibility** in almost all materials

High-performance reamers, H7 series

Article no. **4195**

VHM | a | HR 500 Short S | WN | H7 | R | HA

for cutting data see page 53

P	M	K	N	S	H
●	●	○	○	●	●

H7 series in accordance with DIN 1420 • extremely unequal flute spacing • central internal coolant supply, outlet on the face • intermediate dimensions of Ø 1.95-20.1 mm possible • for clamping in hydraulic and shrink fit chucks

High-performance reamers, H7 series

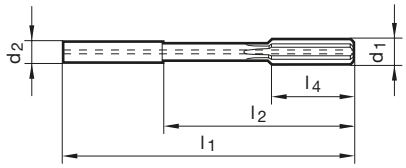
Article no. **4196**

VHM | a | HR 500 Short D | WN | H7 | R | HA

for cutting data see page 53

P	M	K	N	S	H
●	●	○	○	●	●

H7 series in accordance with DIN 1420 • extremely unequal flute spacing • central internal coolant supply, outlet via oil grooves on shank • intermediate dimensions of Ø 1.95-20.1 mm possible • for clamping in hydraulic and shrink fit chucks



d1 mm	d2 h6 mm	l1 mm	l2 mm	l4 mm	Z	Article no. 4195	Article no. 4196
3.00	4.00	50.0	22.0	10.0	4	4195 3.000	4196 3.000
3.50	4.00	50.0	22.0	10.0	4	4195 3.500	4196 3.500
4.00	4.00	50.0	22.0	10.0	4	4195 4.000	4196 4.000
4.50	6.00	58.0	22.0	10.0	4	4195 4.500	4196 4.500
5.00	6.00	58.0	22.0	10.0	4	4195 5.000	4196 5.000
5.50	6.00	58.0	22.0	10.0	4	4195 5.500	4196 5.500
6.00	6.00	58.0	22.0	10.0	4	4195 6.000	4196 6.000
6.50	8.00	76.0	40.0	16.0	6	4195 6.500	4196 6.500
7.00	8.00	76.0	40.0	16.0	6	4195 7.000	4196 7.000
7.50	8.00	76.0	40.0	16.0	6	4195 7.500	4196 7.500
8.00	8.00	76.0	40.0	16.0	6	4195 8.000	4196 8.000
8.50	10.00	76.0	36.0	19.0	6	4195 8.500	4196 8.500
9.00	10.00	76.0	36.0	19.0	6	4195 9.000	4196 9.000
9.50	10.00	76.0	36.0	19.0	6	4195 9.500	4196 9.500
10.00	10.00	76.0	36.0	19.0	6	4195 10.000	4196 10.000
10.50	12.00	80.0	35.0	19.0	6	4195 10.500	4196 10.500
11.00	12.00	80.0	35.0	19.0	6	4195 11.000	4196 11.000
11.50	12.00	80.0	35.0	19.0	6	4195 11.500	4196 11.500
12.00	12.00	80.0	35.0	19.0	6	4195 12.000	4196 12.000
13.00	14.00	90.0	45.0	22.0	6	4195 13.000	4196 13.000
14.00	14.00	90.0	45.0	22.0	6	4195 14.000	4196 14.000

TRIED-AND-TESTED BRILLIANCE: **HR 500 H7 SERIES**

new

An all-rounder for every application

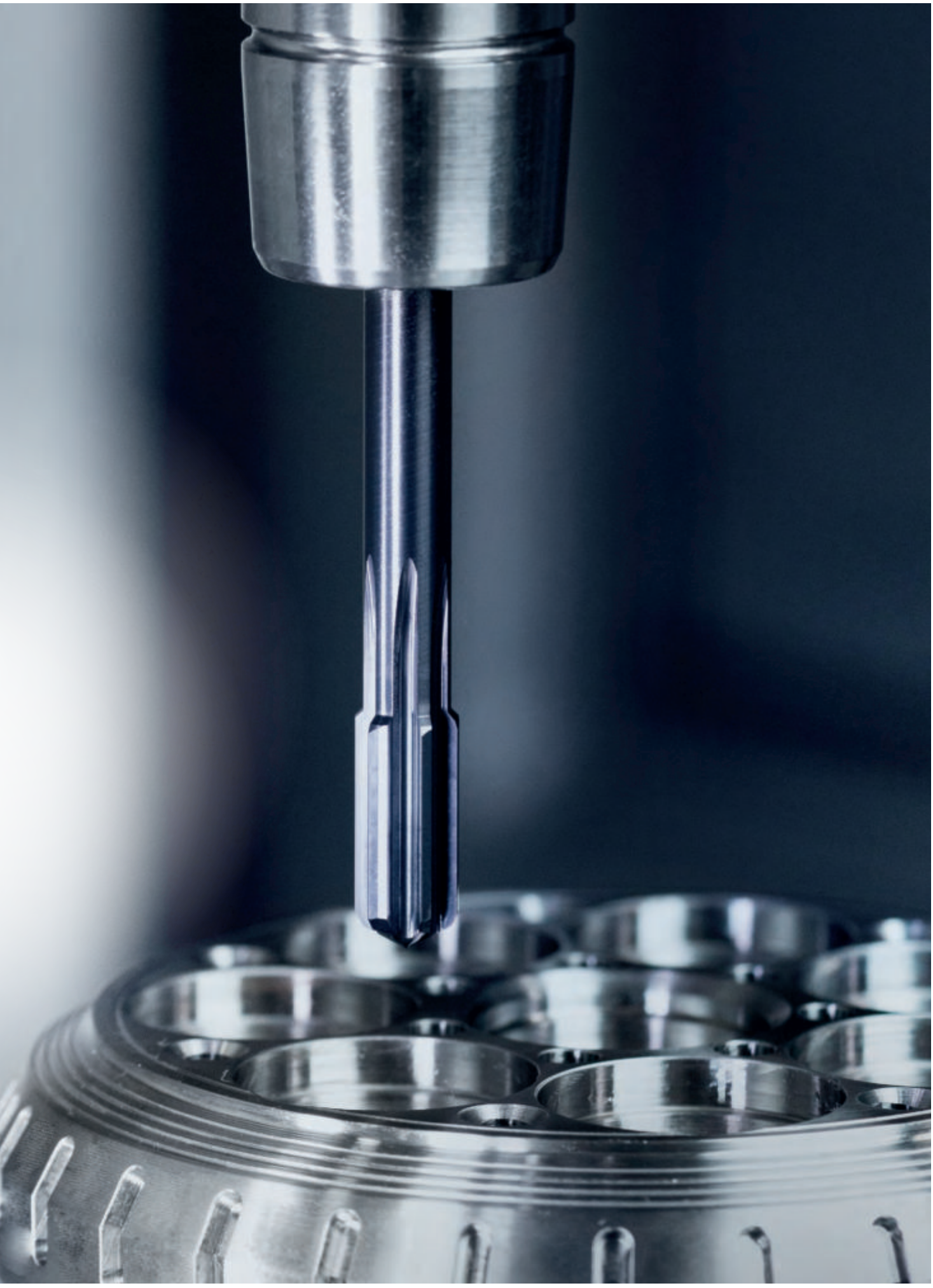
In addition to the fixed-size series, the HR 500 Universal is also available in the tried-and-tested H7 series. Gühring offers reamers for general steel machining from Ø 2–20 mm in all straight, half and selected 1/10 dimensions.

Thanks to production in accordance with DIN 1420, you can achieve maximum tool lives and process reliability with the H7 fit system.

Suitable for applications in **steel**, **stainless steel**, **special alloys** and **hardened steel up to 63 HRC**

2.000 – 20.000

- **nanoA coating** prevents built-up edges for maximum process reliability
- **enables significant process-cost savings** to be achieved



High-performance reamers, H7 series

Article no. **1685**

for cutting data see page 52

P	M	K	N	S	H
●	●	○	○	●	●

VHM | a | HR 500 S | WN | H7 | R | HA

H7 series in accordance with DIN 1420 • extremely unequal flute spacing • central internal coolant supply, outlet on the face • intermediate dimensions of Ø 1.95-20.1 mm possible • for clamping in hydraulic and shrink fit chucks

High-performance reamers, H7 series

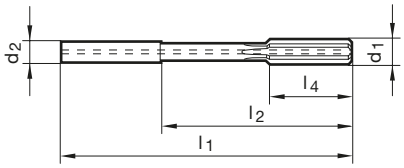
Article no. **1686**

for cutting data see page 52

P	M	K	N	S	H
●	●	○	○	●	●

VHM | a | HR 500 D | WN | H7 | R | HA

H7 series in accordance with DIN 1420 • extremely unequal flute spacing • central internal coolant supply, outlet via oil grooves on shank • intermediate dimensions of Ø 1.95-20.1 mm possible • for clamping in hydraulic and shrink fit chucks



d1 mm	d2 h6 mm	l1 mm	l2 mm	l4 mm	Z	Article no. 1685 Order no.	Article no. 1686 Order no.
2.00	4.00	50.0	22.0	8.0	4	1685 2.000	1686 2.000
2.10	4.00	50.0	22.0	8.0	4	1685 2.100	1686 2.100
2.20	4.00	50.0	22.0	8.0	4	1685 2.200	1686 2.200
2.50	4.00	50.0	22.0	8.0	4	1685 2.500	1686 2.500
2.80	4.00	50.0	22.0	8.0	4	1685 2.800	1686 2.800
3.00	4.00	68.0	40.0	12.0	4	1685 3.000	1686 3.000
3.10	4.00	68.0	40.0	12.0	4	1685 3.100	1686 3.100
3.20	4.00	68.0	40.0	12.0	4	1685 3.200	1686 3.200
3.50	4.00	68.0	40.0	12.0	4	1685 3.500	1686 3.500
3.80	4.00	68.0	40.0	12.0	4	1685 3.800	1686 3.800
4.00	4.00	68.0	40.0	12.0	4	1685 4.000	1686 4.000
4.10	4.00	68.0	40.0	12.0	4	1685 4.100	1686 4.100
4.20	6.00	76.0	40.0	12.0	4	1685 4.200	1686 4.200
4.50	6.00	76.0	40.0	12.0	4	1685 4.500	1686 4.500
4.80	6.00	76.0	40.0	12.0	4	1685 4.800	1686 4.800
5.00	6.00	76.0	40.0	12.0	4	1685 5.000	1686 5.000
5.10	6.00	76.0	40.0	12.0	4	1685 5.100	1686 5.100
5.20	6.00	76.0	40.0	12.0	4	1685 5.200	1686 5.200
5.50	6.00	76.0	40.0	12.0	4	1685 5.500	1686 5.500
5.80	6.00	76.0	40.0	12.0	4	1685 5.800	1686 5.800
6.00	6.00	76.0	40.0	12.0	4	1685 6.000	1686 6.000
6.10	6.00	76.0	40.0	12.0	4	1685 6.100	1686 6.100
6.20	8.00	101.0	65.0	16.0	6	1685 6.200	1686 6.200
6.35	8.00	101.0	65.0	16.0	6	1685 6.350	1686 6.350
6.50	8.00	101.0	65.0	16.0	6	1685 6.500	1686 6.500
6.80	8.00	101.0	65.0	16.0	6	1685 6.800	1686 6.800
7.00	8.00	101.0	65.0	16.0	6	1685 7.000	1686 7.000
7.10	8.00	101.0	65.0	16.0	6	1685 7.100	1686 7.100
7.20	8.00	101.0	65.0	16.0	6	1685 7.200	1686 7.200
7.50	8.00	101.0	65.0	16.0	6	1685 7.500	1686 7.500
7.80	8.00	101.0	65.0	16.0	6	1685 7.800	1686 7.800
8.00	8.00	101.0	65.0	16.0	6	1685 8.000	1686 8.000
8.10	8.00	101.0	65.0	16.0	6	1685 8.100	1686 8.100
8.20	10.00	101.0	61.0	19.0	6	1685 8.200	1686 8.200
8.50	10.00	101.0	61.0	19.0	6	1685 8.500	1686 8.500
8.80	10.00	101.0	61.0	19.0	6	1685 8.800	1686 8.800
9.00	10.00	101.0	61.0	19.0	6	1685 9.000	1686 9.000
9.10	10.00	101.0	61.0	19.0	6	1685 9.100	1686 9.100
9.20	10.00	101.0	61.0	19.0	6	1685 9.200	1686 9.200
9.50	10.00	101.0	61.0	19.0	6	1685 9.500	1686 9.500
9.80	10.00	101.0	61.0	19.0	6	1685 9.800	1686 9.800
10.00	10.00	101.0	61.0	19.0	6	1685 10.000	1686 10.000
10.10	10.00	101.0	61.0	19.0	6	1685 10.100	1686 10.100
10.20	12.00	130.0	85.0	19.0	6	1685 10.200	1686 10.200
10.50	12.00	130.0	85.0	19.0	6	1685 10.500	1686 10.500
10.80	12.00	130.0	85.0	19.0	6	1685 10.800	1686 10.800
11.00	12.00	130.0	85.0	19.0	6	1685 11.000	1686 11.000
11.10	12.00	130.0	85.0	19.0	6	1685 11.100	1686 11.100
11.20	12.00	130.0	85.0	19.0	6	1685 11.200	1686 11.200
11.50	12.00	130.0	85.0	19.0	6	1685 11.500	1686 11.500
11.80	12.00	130.0	85.0	19.0	6	1685 11.800	1686 11.800
12.00	12.00	130.0	85.0	19.0	6	1685 12.000	1686 12.000
12.10	12.00	130.0	85.0	19.0	6	1685 12.100	1686 12.100
12.20	14.00	130.0	85.0	22.0	6	1685 12.200	1686 12.200

						Article no.	1685	1686
d1 mm	d2 h6 mm	l1 mm	l2 mm	l4 mm	Z	Order no.		
12.50	14.00	130.0	85.0	22.0	6		1685 12.500	1686 12.500
12.70	14.00	130.0	85.0	22.0	6		1685 12.700	1686 12.700
12.80	14.00	130.0	85.0	22.0	6		1685 12.800	1686 12.800
13.00	14.00	130.0	85.0	22.0	6		1685 13.000	1686 13.000
13.10	14.00	130.0	85.0	22.0	6		1685 13.100	1686 13.100
13.20	14.00	130.0	85.0	22.0	6		1685 13.200	1686 13.200
13.50	14.00	130.0	85.0	22.0	6		1685 13.500	1686 13.500
13.80	14.00	130.0	85.0	22.0	6		1685 13.800	1686 13.800
14.00	14.00	130.0	85.0	22.0	6		1685 14.000	1686 14.000
14.50	16.00	150.0	102.0	22.0	6		1685 14.500	1686 14.500
15.00	16.00	150.0	102.0	22.0	6		1685 15.000	1686 15.000
15.50	16.00	150.0	102.0	22.0	6		1685 15.500	1686 15.500
16.00	16.00	150.0	102.0	22.0	6		1685 16.000	1686 16.000
16.50	18.00	150.0	102.0	25.0	6		1685 16.500	1686 16.500
17.00	18.00	150.0	102.0	25.0	6		1685 17.000	1686 17.000
17.50	18.00	150.0	102.0	25.0	6		1685 17.500	1686 17.500
18.00	18.00	150.0	102.0	25.0	6		1685 18.000	1686 18.000
18.50	20.00	150.0	100.0	25.0	6		1685 18.500	1686 18.500
19.00	20.00	150.0	100.0	25.0	6		1685 19.000	1686 19.000
19.50	20.00	150.0	100.0	25.0	6		1685 19.500	1686 19.500
20.00	20.00	150.0	100.0	25.0	6		1685 20.000	1686 20.000

PRECISION MADE EASY:
HR 500 ALU

The high-performance reamer for aluminium machining

The geometry of the HR 500 Alu, which has been specially adapted to the material, enables the highest cutting values and premium hole qualities to be achieved.

The innovative DLC coating prevents the formation of built-up edges. And you don't have to worry about diameter fluctuations either: With this material specialist, you can produce holes with the best possible surface quality and maximum process reliability.

2.000 – 20.000

- **For reliable machining** in aluminium
- **Geometry & coating** perfectly matched to the material

High-performance reamers, H7 series

Article no. **1678**

VHM | Cb | HR 500 Alu S | WN | H7 | R | HA

for cutting data see page 54

P	M	K	N	S	H
			●		

H7 series in accordance with DIN 1420 • extremely unequal flute spacing • central internal coolant supply, outlet on the face • intermediate dimensions of Ø 1.95-20.1 mm possible • for clamping in hydraulic and shrink fit chucks

High-performance reamers, H7 series

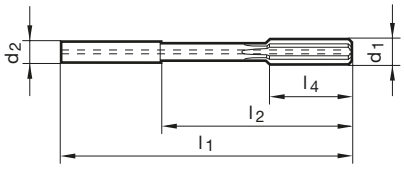
Article no. **1679**

VHM | Cb | HR 500 Alu D | WN | H7 | R | HA

for cutting data see page 54

P	M	K	N	S	H
			●		

H7 series in accordance with DIN 1420 • extremely unequal flute spacing • central internal coolant supply, outlet via oil grooves on shank • intermediate dimensions of Ø 1.95-20.1 mm possible • for clamping in hydraulic and shrink fit chucks



d1 mm	d2 h6 mm	l1 mm	l2 mm	l4 mm	Z	Article no. 1678	Article no. 1679
2.00	4.00	50.0	22.0	8.0	4	1678 2.000	1679 2.000
3.00	4.00	68.0	40.0	12.0	4	1678 3.000	1679 3.000
4.00	4.00	68.0	40.0	12.0	4	1678 4.000	1679 4.000
5.00	6.00	76.0	40.0	12.0	4	1678 5.000	1679 5.000
6.00	6.00	76.0	40.0	12.0	4	1678 6.000	1679 6.000
7.00	8.00	101.0	65.0	16.0	6	1678 7.000	1679 7.000
8.00	8.00	101.0	65.0	16.0	6	1678 8.000	1679 8.000
9.00	10.00	101.0	61.0	19.0	6	1678 9.000	1679 9.000
10.00	10.00	101.0	61.0	19.0	6	1678 10.000	1679 10.000
11.00	12.00	130.0	85.0	19.0	6	1678 11.000	1679 11.000
12.00	12.00	130.0	85.0	19.0	6	1678 12.000	1679 12.000
13.00	14.00	130.0	85.0	22.0	6	1678 13.000	1679 13.000
14.00	14.00	130.0	85.0	22.0	6	1678 14.000	1679 14.000
15.00	16.00	150.0	102.0	22.0	6	1678 15.000	1679 15.000
16.00	16.00	150.0	102.0	22.0	6	1678 16.000	1679 16.000
17.00	18.00	150.0	102.0	25.0	6	1678 17.000	1679 17.000
18.00	18.00	150.0	102.0	25.0	6	1678 18.000	1679 18.000
19.00	20.00	150.0	100.0	25.0	6	1678 19.000	1679 19.000
20.00	20.00	150.0	100.0	25.0	6	1678 20.000	1679 20.000

A PRO WITH CAST IRON:
HR 500 CAST IRON

The high-performance reamer for machining castings

Thanks to the increased number of cutting edges, you can achieve the highest feed rates and high-quality surfaces with the HR 500 cast iron.

And you don't have to worry about abrasive wear or uncontrolled diameter loss because the innovative silicon coating offers optimum wear protection.

3.000 – 20.000

- **More cutting edges**
  for maximum feed rates in cast iron
- **Optimum wear protection**
  thanks to innovative coating
- **Reduction of process costs**

High-performance reamers, H7 series

Article no. **1036**

VHM | HR 500 Guss S | WN | H7 | R | HA

for cutting data see page 55

P	M	K	N	S	H
		•			

H7 series in accordance with DIN 1420 • extremely unequal flute spacing • central internal coolant supply, outlet on the face • intermediate dimensions of Ø 1.95-20.1 mm possible • for clamping in hydraulic and shrink fit chucks

High-performance reamers, H7 series

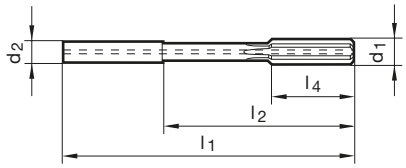
Article no. **1037**

VHM | HR 500 Guss D | WN | H7 | R | HA

for cutting data see page 55

P	M	K	N	S	H
		•			

H7 series in accordance with DIN 1420 • extremely unequal flute spacing • central internal coolant supply, outlet via oil grooves on shank • intermediate dimensions of Ø 1.95-20.1 mm possible • for clamping in hydraulic and shrink fit chucks



Article no.						1036	1037
d1 mm	d2 h6 mm	l1 mm	l2 mm	l4 mm	Z	Order no.	
3.00	4.00	68.0	40.0	12.0	6	1036 3.000	1037 3.000
4.00	4.00	68.0	40.0	12.0	6	1036 4.000	1037 4.000
5.00	6.00	76.0	40.0	12.0	6	1036 5.000	1037 5.000
6.00	6.00	76.0	40.0	12.0	6	1036 6.000	1037 6.000
7.00	8.00	101.0	65.0	16.0	8	1036 7.000	1037 7.000
8.00	8.00	101.0	65.0	16.0	8	1036 8.000	1037 8.000
9.00	10.00	101.0	61.0	19.0	8	1036 9.000	1037 9.000
10.00	10.00	101.0	61.0	19.0	8	1036 10.000	1037 10.000
11.00	12.00	130.0	85.0	19.0	8	1036 11.000	1037 11.000
12.00	12.00	130.0	85.0	19.0	8	1036 12.000	1037 12.000
13.00	14.00	130.0	85.0	22.0	8	1036 13.000	1037 13.000
14.00	14.00	130.0	85.0	22.0	8	1036 14.000	1037 14.000
15.00	16.00	150.0	102.0	22.0	8	1036 15.000	1037 15.000
16.00	16.00	150.0	102.0	22.0	8	1036 16.000	1037 16.000
17.00	18.00	150.0	102.0	25.0	8	1036 17.000	1037 17.000
18.00	18.00	150.0	102.0	25.0	8	1036 18.000	1037 18.000
19.00	20.00	150.0	100.0	25.0	8	1036 19.000	1037 19.000
20.00	20.00	150.0	100.0	25.0	8	1036 20.000	1037 20.000

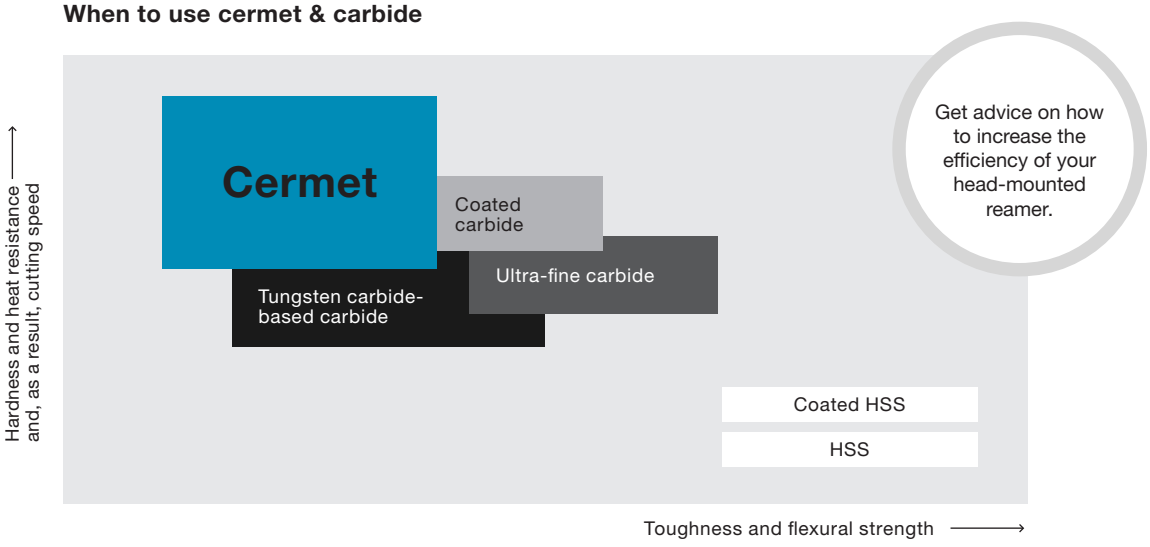
CERMET OR CARBIDE?

We make it easy for you to decide

Carbide is a proven cutting material that is known for its high hardness, good machining results and economical production. However, if you have even higher requirements for hardness and temperature resistance, you should familiarise yourself with the cutting material cermet. As the name suggests, cermet is made of ceramic and metal – and thus combines the advantages of these two cutting materials.

The ideal cutting material for your application also depends on the material to be cut and the machine conditions. Use our cutting material guide to help you choose.

When to use cermet & carbide



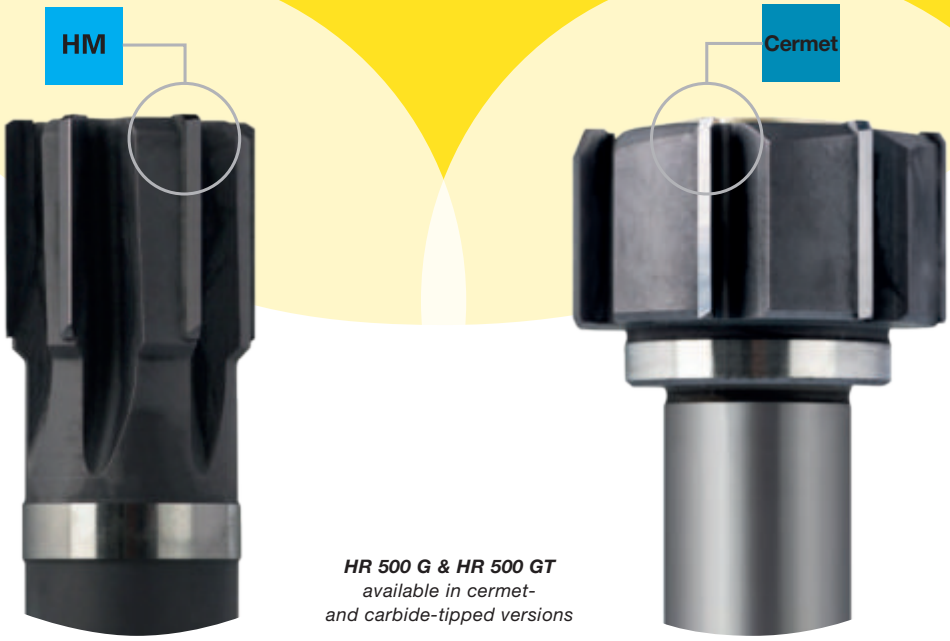
While cermet is known for its high hardness and temperature resistance, carbide scores points with greater toughness and flexural strength.

Surfaces achievable in various materials

Material	HM -tipped		Cermet -tipped
	uncoated	coated	uncoated
Mild steel S235 (1.0087) / S335 (1.0570)	≥ R_z 6.3 (R_a ≈1.8)	≥ R_z 4 (R_a ≈1.1)	≥ R_z 3.2 (R_a ≈0.85)

Compared to carbide, you can achieve significantly better surfaces with the cutting material cermet. See complete table on page 51.

YOUR GUIDE TO TIPPED REAMERS



HR 500 G & HR 500 GT
available in cermet-
and carbide-tipped versions

CARBIDE

Universal range of applications

+ **Universal range of applications**
  Even for machining non-ferrous metals
+ **Economical manufacturing**
  Cost-effective alternative to mono tools
+ **Flexible to use**
  Higher toughness and flexural strength
+ **Tailor-made cutting material**
  Thanks to the adapted composition of tungsten carbide (WC) and cobalt (Co), carbides can be individually tailored to suit different requirements
+ **Flexible machine conditions**
  Also suitable for more unstable clamping setups or weaker machines

CERMET

Outstanding performance

+ **Extreme cutting speeds**
  Short process times thanks to high heat resistance
+ **Very tight tolerances**
  Even in largescale batch production
+ **Material specialist for mild steels & castings**
  Including S235JR, C45, 16 MnCr5, GGG40 & GGG50
+ **Maximum tool lives**
  Due to minimal tendency to diffuse
+ **Extremely sharp cutting edge**
  For burr-free machining and perfect surfaces

GOOD, BETTER, BRAZED:
HR 500 G

The HR 500 G with carbide and cermet tips

Brazed tools deliver a combination of a wear-resistant carbide or cermet cutting edge and a tough carrier material. The high-performance reamers with a carbide- or cermet-coated cutting edges ensure perfect surfaces and the highest cutting performance with lower costs thanks to reconditioning.

Users not only benefit from high process reliability – process costs can also be significantly reduced with the HR 500 G.

Cermet-tipped:
Suitable for steel and cast iron

Carbide-tipped:
Suitable for stainless steels and cast iron

6.000 – 40.000
22.000 – 40.000

- **Economical manufacturing** of large and deep holes
- **Perfect surfaces** with maximum cutting performance

High-performance reamers, H7 series

Article no. **1680**

HM | a | HR 500 G S | WN | H7 | R | HA

H7 series in accordance with DIN 1420 • carbide-tipped • extremely unequal flute spacing • central internal coolant supply, outlet on the face • intermediate dimensions of Ø5.9-40.1 mm possible • NC-compliant design

for cutting data see page 56

P	M	K	N	S	H
○	●	●	○	○	

High-performance reamers, H7 series

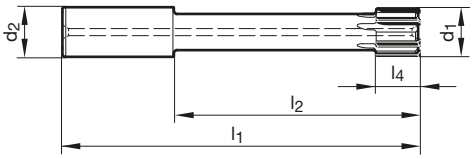
Article no. **1681**

HM | a | HR 500 G D | WN | H7 | R | HA

H7 series in accordance with DIN 1420 • carbide-tipped • extremely unequal flute spacing • central internal coolant supply, outlet via oil grooves on shank • intermediate dimensions of Ø5.9-40.1 mm possible • NC-compliant design

for cutting data see page 56

P	M	K	N	S	H
○	●	●	○	○	



Article no.		1680	1681
d1 mm	d2 h6 mm	l1 mm	l2 mm	l4 mm	Z	Order no.	
22.00	20.00	160.0	110.0	22.0	6	1680 22.000	1681 22.000
24.00	25.00	180.0	124.0	22.0	6	1680 24.000	1681 24.000
25.00	25.00	180.0	124.0	22.0	6	1680 25.000	1681 25.000
26.00	25.00	180.0	124.0	22.0	6	1680 26.000	1681 26.000
28.00	25.00	180.0	124.0	25.0	6	1680 28.000	1681 28.000
30.00	25.00	180.0	124.0	25.0	6	1680 30.000	1681 30.000
32.00	32.00	200.0	140.0	25.0	6	1680 32.000	1681 32.000
34.00	32.00	200.0	140.0	25.0	6	1680 34.000	1681 34.000
36.00	32.00	200.0	140.0	25.0	8	1680 36.000	1681 36.000
38.00	32.00	200.0	140.0	25.0	8	1680 38.000	1681 38.000
40.00	32.00	200.0	140.0	25.0	8	1680 40.000	1681 40.000

High-performance reamers, H7 series

Article no. **1682**

for cutting data see page 57

P	M	K	N	S	H
●		●			

Cermet | HR 500 G S | WN | H7 | R | HA

H7 series in accordance with DIN 1420 • CM-assembled • extremely unequal flute spacing • central internal coolant supply, outlet on the face • intermediate dimensions of Ø5.9-40.1 mm possible • NC-compliant design

High-performance reamers, H7 series

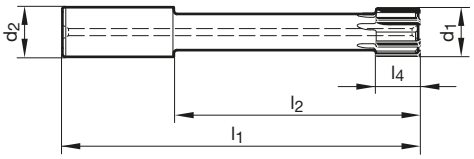
Article no. **1683**

for cutting data see page 57

P	M	K	N	S	H
●		●			

Cermet | HR 500 G D | WN | H7 | R | HA

H7 series in accordance with DIN 1420 • CM-assembled • extremely unequal flute spacing • central internal coolant supply, outlet via oil grooves on shank • intermediate dimensions of Ø5.9-40.1 mm possible • NC-compliant design



d1 mm	d2 h6 mm	l1 mm	l2 mm	l4 mm	Z	Article no. 1682	Article no. 1683
6.00	6.00	76.0	40.0	12.0	4	1682 6.000	1683 6.000
8.00	8.00	101.0	65.0	16.0	4	1682 8.000	1683 8.000
10.00	10.00	101.0	61.0	16.0	4	1682 10.000	1683 10.000
12.00	12.00	130.0	85.0	16.0	4	1682 12.000	1683 12.000
14.00	14.00	130.0	85.0	16.0	6	1682 14.000	1683 14.000
16.00	16.00	150.0	102.0	19.0	6	1682 16.000	1683 16.000
18.00	18.00	150.0	102.0	19.0	6	1682 18.000	1683 18.000
20.00	20.00	150.0	100.0	22.0	6	1682 20.000	1683 20.000
22.00	20.00	160.0	110.0	22.0	6	1682 22.000	1683 22.000
24.00	25.00	180.0	124.0	22.0	6	1682 24.000	1683 24.000
25.00	25.00	180.0	124.0	22.0	6	1682 25.000	1683 25.000
26.00	25.00	180.0	124.0	22.0	6	1682 26.000	1683 26.000
28.00	25.00	180.0	124.0	25.0	6	1682 28.000	1683 28.000
30.00	25.00	180.0	124.0	25.0	6	1682 30.000	1683 30.000
32.00	32.00	200.0	140.0	25.0	6	1682 32.000	1683 32.000
34.00	32.00	200.0	140.0	25.0	6	1682 34.000	1683 34.000
36.00	32.00	200.0	140.0	25.0	8	1682 36.000	1683 36.000
38.00	32.00	200.0	140.0	25.0	8	1682 38.000	1683 38.000
40.00	32.00	200.0	140.0	25.0	8	1682 40.000	1683 40.000

A CLEVER COMBINATION: **MODULAR REAMING TOOLS**

Adaptable & flexible

In addition to monolithic reamers, the HR 500 range also offers modular tools that you can flexibly combine as required.

Their unique design allows them to be composed of different modules, which gives them a high degree of flexibility. This flexibility enables the reamers to be adapted to different requirements. The use of modular HR 500 reamers helps to increase production efficiency as a single tool can be used for different applications.

Advantages of modular tools:

Flexibility: easy customization and configuration for different applications and materials

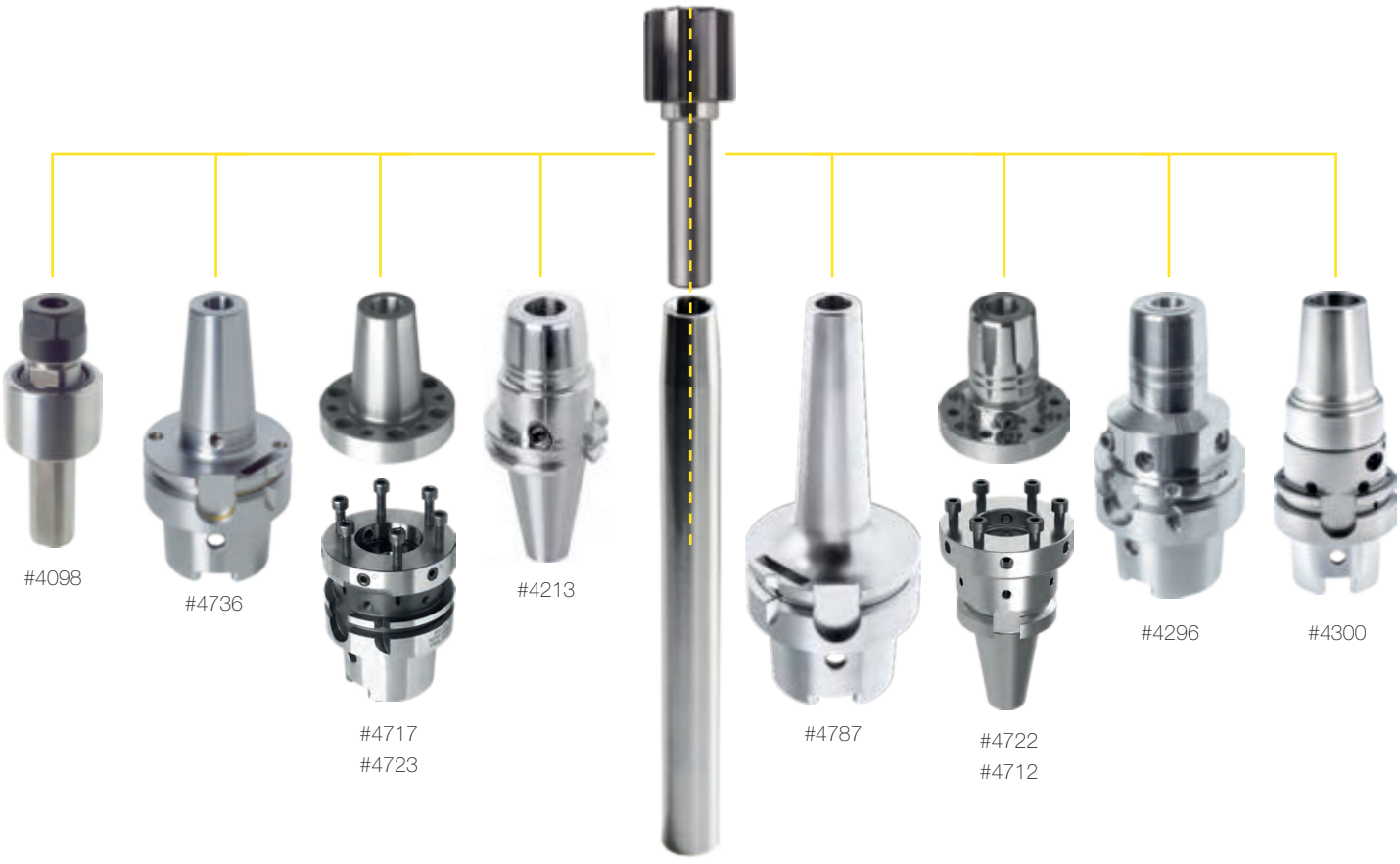
Cost efficiency: in the event of wear, there is no need to replace the entire tool, but only the part in question

Optimised stock management: instead of stocking a large number of monolithic tools, you only need to keep a few modular base components in stock and put them together as needed

Example: Solid carbide head reamer HR 500 T

One reamer, lots of options.
Discover the advantages of modular tools using the HR 500 T as an example.

Be it a hydraulic chuck, shrink fit chuck or shrink fit extension – thanks to the versatile combinations, you can adapt the selection perfectly to your individual application. All you need is a single tool.



Combining the HR 500 T does not get more flexible than this.
This not only reduces your stock levels, but your costs too.

FLEXIBILITY MEETS EFFICIENCY: **HR 500 T**

The solid carbide head reamer up to Ø 42 mm

The short, compact solution is available in the diameter range 14 – 42 mm and guarantees particularly economical production. Thanks to the universal HA shank, the HR 500 T can be flexibly combined with standard tool holders and numerous extensions.

With this tool, you can overcome challenges at large reaming depths and easily bridge interference edges. This eliminates the need for expensive special holders.

14.000 – 42.000

- **Flexible mounting options**
  thanks to HA shank
- **Easy extension**
  with shrink fit extension and hydraulic chuck
- **Maximum tool lives and process reliability**
  in the in the H7 fit system

High-performance reamers, H7 series

Article no. **1548**

for cutting data see page 58

VHM | a | HR 500 T S | WN | H7 | R | HA

P	M	K	N	S	H
●	●	○	○	●	●

H7 series in accordance with DIN 1420 • extremely unequal flute spacing • central internal coolant supply, outlet on the face • intermediate dimensions of Ø 11.9-52 mm possible • use shrink fit extension art. no. 4719 for increased projection

High-performance reamers, H7 series

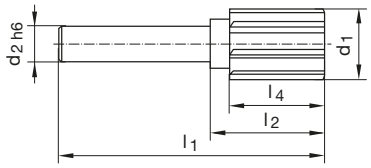
Article no. **1549**

for cutting data see page 58

VHM | a | HR 500 T D | WN | H7 | R | HA

P	M	K	N	S	H
●	●	○	○	●	●

H7 series in accordance with DIN 1420 • spiral point • extremely unequal flute spacing • central internal coolant supply, radial outlet • intermediate dimensions of Ø 11.9-52 mm possible • use shrink fit extension art. no. 4719 for increased projection



Article no.	1548	1549

d1 mm	d2 h6 mm	l1 mm	l2 mm	l4 mm	Z	Order no.	
14.00	6.00	66.0	30.0	25.0	8	1548 14.000	1549 14.000
15.00	6.00	66.0	30.0	25.0	8	1548 15.000	1549 15.000
16.00	8.00	66.0	30.0	25.0	8	1548 16.000	1549 16.000
18.00	8.00	66.0	30.0	25.0	8	1548 18.000	1549 18.000
20.00	10.00	70.0	30.0	25.0	8	1548 20.000	1549 20.000
22.00	10.00	70.0	30.0	25.0	8	1548 22.000	1549 22.000
24.00	12.00	75.0	30.0	25.0	8	1548 24.000	1549 24.000
25.00	12.00	75.0	30.0	25.0	8	1548 25.000	1549 25.000
26.00	12.00	75.0	30.0	25.0	8	1548 26.000	1549 26.000
28.00	12.00	75.0	30.0	25.0	8	1548 28.000	1549 28.000
30.00	16.00	78.0	30.0	25.0	8	1548 30.000	1549 30.000
32.00	16.00	78.0	30.0	25.0	8	1548 32.000	1549 32.000
34.00	20.00	80.0	30.0	25.0	8	1548 34.000	1549 34.000
36.00	20.00	80.0	30.0	25.0	8	1548 36.000	1549 36.000
38.00	20.00	80.0	30.0	25.0	8	1548 38.000	1549 38.000
40.00	20.00	80.0	30.0	25.0	8	1548 40.000	1549 40.000
42.00	20.00	80.0	30.0	25.0	8	1548 42.000	1549 42.000

PEAK PERFORMANCE >Ø 40 MM: **HR 500 GT**

For extra large holes

The HR 500 GT guarantees extreme cutting values and perfect surfaces, even with large diameters and deep holes.

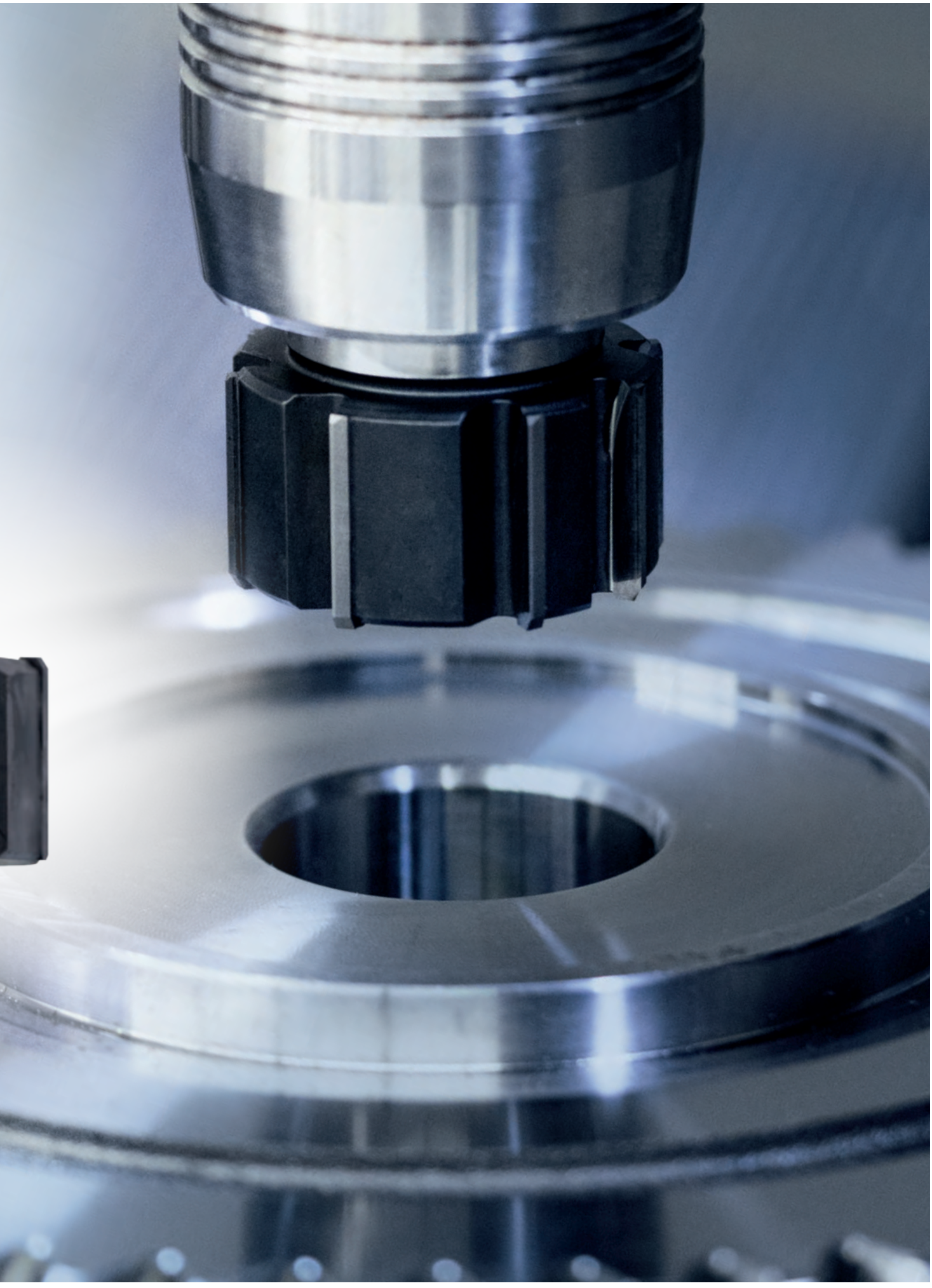
Thanks to its innovative deflection screw on the end face of the tool head, the cooling lubricant reaches the cutting edges reliably, which prevents chip jamming. The deflection screw's particularly flat design enables blind holes to be machined right down to the base of the hole.

Cermet-tipped:
Suitable for steel and cast iron

Carbide-tipped:
Suitable for stainless steels, cast iron and special alloys

41.000 – 76.000

- **For perfect surfaces** and unbeatable cutting values for large diameter machining
- **Optimised cooling** for reliable chip removal



High-performance reamers, H7 series

Article no. **1038**

HM | a | HR 500 GT S | WN | H7 | R | -HA

for cutting data see page 59

P	M	K	N	S	H
○	●	●	○	●	

H7 series in accordance with DIN 1420 • carbide-tipped • extremely unequal flute spacing • central internal coolant supply, diffuser disc outlet • intermediate dimensions of Ø 40-76.2 mm possible • for increased projection, use hydraulic chuck art. no. 4290

High-performance reamers, H7 series

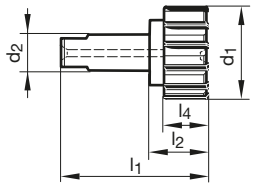
Article no. **1039**

HM | a | HR 500 GT D | WN | H7 | R | -HA

for cutting data see page 59

P	M	K	N	S	H
○	●	●	○	●	

H7 series in accordance with DIN 1420 • carbide-tipped • extremely unequal flute spacing • central internal coolant supply, diffuser disc outlet • intermediate dimensions of Ø 40-76.2 mm possible • for increased projection, use hydraulic chuck art. no. 4290



d1 mm	d2 h6 mm	l1 mm	l2 mm	l4 mm	Z	Article no. 1038	Article no. 1039
41.00	25.00	90.0	35.1	25.0	8	1038 41.000	1039 41.000
42.00	25.00	90.0	35.1	25.0	8	1038 42.000	1039 42.000
44.00	25.00	90.0	35.1	25.0	8	1038 44.000	1039 44.000
46.00	25.00	90.0	35.1	25.0	8	1038 46.000	1039 46.000
47.00	25.00	90.0	35.1	25.0	8	1038 47.000	1039 47.000
48.00	25.00	90.0	35.1	25.0	8	1038 48.000	1039 48.000
50.00	25.00	90.0	35.1	25.0	8	1038 50.000	1039 50.000
52.00	25.00	90.0	35.1	25.0	8	1038 52.000	1039 52.000
53.00	25.00	90.0	35.1	25.0	8	1038 53.000	1039 53.000
54.00	25.00	90.0	35.1	25.0	8	1038 54.000	1039 54.000
56.00	25.00	90.0	35.1	25.0	8	1038 56.000	1039 56.000
58.00	25.00	90.0	35.1	25.0	8	1038 58.000	1039 58.000
59.00	32.00	95.0	36.1	25.0	8	1038 59.000	1039 59.000
60.00	32.00	95.0	36.1	25.0	8	1038 60.000	1039 60.000
62.00	32.00	95.0	36.1	25.0	8	1038 62.000	1039 62.000
64.00	32.00	95.0	36.1	25.0	8	1038 64.000	1039 64.000
65.00	32.00	95.0	36.1	25.0	8	1038 65.000	1039 65.000
66.00	32.00	95.0	36.1	25.0	10	1038 66.000	1039 66.000
68.00	32.00	95.0	36.1	25.0	10	1038 68.000	1039 68.000
70.00	32.00	95.0	36.1	25.0	10	1038 70.000	1039 70.000
71.00	32.00	95.0	36.1	25.0	10	1038 71.000	1039 71.000
72.00	32.00	95.0	36.1	25.0	10	1038 72.000	1039 72.000
74.00	32.00	95.0	36.1	25.0	10	1038 74.000	1039 74.000
76.00	32.00	95.0	36.1	25.0	10	1038 76.000	1039 76.000

High-performance reamers, H7 series

Article no. **1040**

for cutting data see page 60

Cermet | HR 500 GT S | WN | H7 | R | -HA

P	M	K	N	S	H
●		●			

H7 series in accordance with DIN 1420 • CM-assembled • extremely unequal flute spacing • central internal coolant supply, diffuser disc outlet • intermediate dimensions of Ø 40-76.2 mm possible • for increased projection, use hydraulic chuck art. no. 4290

High-performance reamers, H7 series

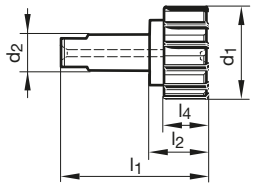
Article no. **1041**

for cutting data see page 60

Cermet | HR 500 GT D | WN | H7 | R | -HA

P	M	K	N	S	H
●		●			

H7 series in accordance with DIN 1420 • CM-assembled • extremely unequal flute spacing • central internal coolant supply, diffuser disc outlet • intermediate dimensions of Ø 40-76.2 mm possible • for increased projection, use hydraulic chuck art. no. 4290



d1 mm	d2 h6 mm	l1 mm	l2 mm	l4 mm	Z	Article no. 1040	Article no. 1041
41.00	25.00	90.0	35.1	25.0	8	1040 41.000	1041 41.000
42.00	25.00	90.0	35.1	25.0	8	1040 42.000	1041 42.000
44.00	25.00	90.0	35.1	25.0	8	1040 44.000	1041 44.000
46.00	25.00	90.0	35.1	25.0	8	1040 46.000	1041 46.000
47.00	25.00	90.0	35.1	25.0	8	1040 47.000	1041 47.000
48.00	25.00	90.0	35.1	25.0	8	1040 48.000	1041 48.000
50.00	25.00	90.0	35.1	25.0	8	1040 50.000	1041 50.000
52.00	25.00	90.0	35.1	25.0	8	1040 52.000	1041 52.000
53.00	25.00	90.0	35.1	25.0	8	1040 53.000	1041 53.000
54.00	25.00	90.0	35.1	25.0	8	1040 54.000	1041 54.000
56.00	25.00	90.0	35.1	25.0	8	1040 56.000	1041 56.000
58.00	25.00	90.0	35.1	25.0	8	1040 58.000	1041 58.000
59.00	32.00	95.0	36.1	25.0	8	1040 59.000	1041 59.000
60.00	32.00	95.0	36.1	25.0	8	1040 60.000	1041 60.000
62.00	32.00	95.0	36.1	25.0	8	1040 62.000	1041 62.000
64.00	32.00	95.0	36.1	25.0	8	1040 64.000	1041 64.000
65.00	32.00	95.0	36.1	25.0	8	1040 65.000	1041 65.000
66.00	32.00	95.0	36.1	25.0	10	1040 66.000	1041 66.000
68.00	32.00	95.0	36.1	25.0	10	1040 68.000	1041 68.000
70.00	32.00	95.0	36.1	25.0	10	1040 70.000	1041 70.000
71.00	32.00	95.0	36.1	25.0	10	1040 71.000	1041 71.000
72.00	32.00	95.0	36.1	25.0	10	1040 72.000	1041 72.000
74.00	32.00	95.0	36.1	25.0	10	1040 74.000	1041 74.000
76.00	32.00	95.0	36.1	25.0	10	1040 76.000	1041 76.000

THE SMART WAY TO DEBURR: **EWR 500**

Perfect results in cross holes

Better quality: Compared to deburring with conventional tools, the burr is not only knocked back, but cut off at the burr root. This ensures machining results that are almost completely burr-free.

More process reliability: Thanks to the radial deflection created by the cooling pressure, the gap between the reamer and the hole wall is closed. The burr is cut off flush with the workpiece without damaging the hole wall.

Increased efficiency: The deburring reamer ensures short machining times as it can be moved before and after the deburring operation, without coolant pressure and, as such, without making any contact in rapid traverse. This saves users time and costs.

2.000 – 12.000

- **Efficient & reliable deburring**
- **Cooling creates radial contact pressure,** which results in the tool sitting flush on the hole wall

Deburring reamers

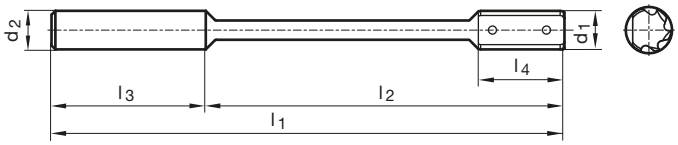
Article no. **4103**

VHM | a | EWR 500 | WN | R | HA

for cutting data see page 61

P	M	K	N	S	H
●	●	●	○	●	○

deburring without damage to the hole surface • short process times due to low feed rate • minimum cooling pressure 15 bar



Article no. **4103**

d1 mm	d2 mm	l1 mm	l2 mm	l3 mm	l4 mm	Order no.
2.97	4.00	100.0	72.0	28.0	12.0	4103 2.970
3.97	4.00	100.0	72.0	28.0	12.0	4103 3.970
4.97	6.00	120.0	84.0	36.0	12.0	4103 4.970
5.97	6.00	120.0	84.0	36.0	12.0	4103 5.970
7.97	8.00	130.0	94.0	36.0	16.0	4103 7.970
9.97	10.00	130.0	90.0	40.0	19.0	4103 9.970
11.97	12.00	130.0	85.0	45.0	19.0	4103 11.970

Onlineshop

- check prices and see if an item is in stock in real time
- download tool data
- automatic reordering thanks to subscription function

Individual authorisation management and maximum access security for your account

Personal purchasing conditions are stored in the system

Provision of CAD data and cutting values

Information on tool availability and stock information

Intelligent search function thanks to advanced search criteria and ordering via own material numbers

Detailed documentation and history of your order processes along with a watch list for future purchases

Easy forwarding of shopping carts for approval and release

OCI interface, data interface

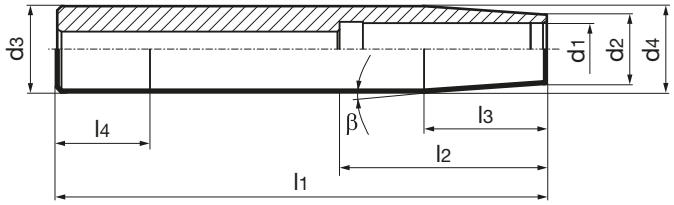
webshop.guehring.de/en/

Shrink fit extensions

Article no. **4719**

Product information:

- for clamping in hydraulic chucks or shrink fit chucks
- for carbide tool shanks d1 h6
- suitable for internal cooling
- we recommend the use of special cooling adaptors art. no. 4419



Article no.									4719
d1 mm	d2 mm	d3 mm	d4 mm	l1 mm	l2 mm	l3 mm	l4 mm	β °	Order no.
6	10	12	12	125	38	19.1	-	3	4719 6.012
8	12	14	14	125	38	19.1	-	3	4719 8.014
10	14	16	16	160	42	19.1	-	3	4719 10.116
12	16	20	20	160	47	38.2	-	3	4719 12.120
16	22	25	25	160	50	28.6	-	3	4719 16.225
20	27	32	32	160	52	47.7	-	3	4719 20.332
6	10	12	12	200	38	21.0	47	3	4719 6.312
8	12	14	14	200	38	21.0	47	3	4719 8.314
10	14	16	16	250	42	21.0	50	3	4719 10.316
12	16	20	20	250	47	40.1	52	3	4719 12.320
16	22	25	25	250	50	30.5	58	3	4719 16.325
20	27	32	32	250	52	49.6	62	3	4719 20.432

HSK-A hydraulic chucks, overlength

Article no. **4290**

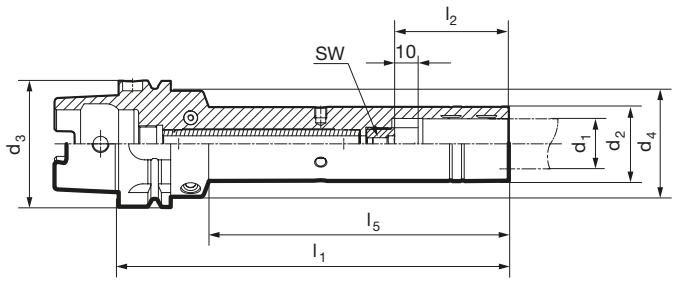
HSK-A

Product information:

- for high-performance reamers HR 500 GT with tang
- before clamping, position the reamer in the driver in the rotation direction

Scope of delivery:

- incl. setting screw art. no. 4900
- order hexagon clamping key, art. no. 4912 separately
- order coolant supply set, article no. 4949, separately



Article no. **4290**

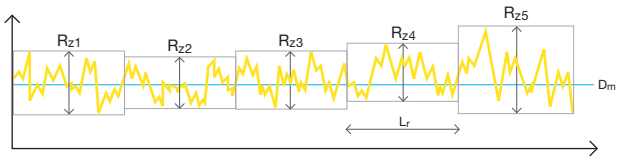
d3	d1 h6 mm	d2 mm	d4 mm	l1 mm	l2 mm	l5 mm	SW mm	Order no.
HSK-A 63	25.00	37.00	53.00	195.00	57.00	150.00	5.0	4290 25.063
HSK-A 63	25.00	37.00	53.00	295.00	57.00	250.00	5.0	4290 25.163
HSK-A 63	32.00	44.00	53.00	195.00	61.00	150.00	5.0	4290 32.063
HSK-A 63	32.00	44.00	53.00	295.00	61.00	250.00	5.0	4290 32.163

SURFACE FINISHES ACHIEVABLE

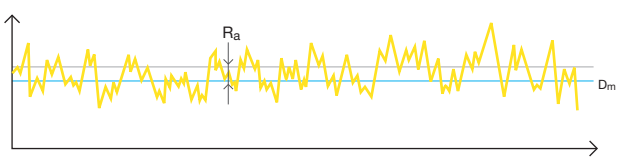
Material	VHM		HM -tipped		Cermet -tipped
	Uncoated	Coated	Uncoated	Coated	Uncoated
Mild steel S235 (1.0087) / S335 (1.0570)	≥ R_z 6.3 (R_a ≈1.8)	≥ R_z 4 (R_a ≈1.1)	≥ R_z 6.3 (R_a ≈1.8)	≥ R_z 4 (R_a ≈1.1)	≥ R_z 3.2 (R_a ≈0.85)
Case hardened steel C10 (1.0301) / 16MnCr5 (1.7131)	≥ R_z 6.3 (R_a ≈1.8)	≥ R_z 4 (R_a ≈1.1)	≥ R_z 6.3 (R_a ≈1.8)	≥ R_z 4 (R_a ≈1.1)	≥ R_z 3.2 (R_a ≈0.85)
Free-cutting steel 11SMnPb30 (10718) / 46S20 (1.0727)	≥ R_z 4 (R_a ≈1.1)	≥ R_z 3.2 (R_a ≈0.85)	≥ R_z 4 (R_a ≈1.1)	≥ R_z 3.2 (R_a ≈0.85)	≥ R_z 2.5 (R_a ≈0.7)
Tempered steel C45(1.0503) / 42CrMo4 (1.7225)	≥ R_z 6.3 (R_a ≈1.8)	≥ R_z 4 (R_a ≈1.1)	≥ R_z 6.3 (R_a ≈1.8)	≥ R_z 4 (R_a ≈1.1)	≥ R_z 3.2 (R_a ≈0.85)
Lamellar graphite cast iron EN-GJS-200 (0.6020) / EN-GJL-250	≥ R_z 12.5 (R_a ≈3.5)	≥ R_z 10 (R_a ≈2.9)	≥ R_z 12.5 (R_a ≈3.5)	≥ R_z 10 (R_a ≈2.9)	
Spheroidal graphite cast iron EN-GJS-400 (0.7040) / EN-GJS-600	≥ R_z 10 (R_a ≈2.9)	≥ R_z 8 (R_a ≈2)	≥ R_z 10 (R_a ≈2.9)	≥ R_z 8 (R_a ≈2)	≥ R_z 6.3 (Ra ≈1.8)
Vermicular graphite cast iron EN-GJV-250 / EN-GJV-400	≥ R_z 10 (R_a ≈2.9)	≥ R_z 8 (R_a ≈2)	≥ R_z 10 (R_a ≈2.9)	≥ R_z 8 (R_a ≈2)	≥ R_z 6.3 (Ra ≈1.8)
Stainless steel X5CrNiS18-9 (1.4305) / X5CrNi18-10	≥ R_z 6.3 (Ra ≈1.8)	≥ R_z 4 (R_a ≈1.1)	≥ R_z 6.3 (R_a ≈1.8)	≥ R_z 4 (R_a ≈1.1)	
Hardened steel ≤ 63 HRC		≥ R_z 3.2 (R_a ≈0.85)		≥ R_z 3.2 (R_a ≈0.85)	
Titanium (TiAl6V4 / 3.7165)	≥ R_z 8 (R_a ≈2)	≥ R_z 6.3 (R_a ≈1.8)	≥ R_z 8 (R_a ≈2)	≥ R_z 6.3 (R_a ≈1.8)	
Aluminium < 9% Si (AlMgSi7 / 3.2371)	≥ R_z 6.3 (R_a ≈1.8)		≥ R_z 6.3 (R_a ≈1.8)		
Aluminium > 9% Si (AlSi12 / 3.2585)	≥ R_z 8 (R_a ≈2)		≥ R_z 8 (R_a ≈2)		
Copper/brass (CuZn39Pb / 2.0380)	≥ R_z 3.2 (R_a ≈0.85)		≥ R_z 3.2 (R_a ≈0.85)		

Calculating the surface finish

R_z



R_a



HR 500

Machining group	a	f (mm/rev) with nom. Ø									
	v_c (m/min)	2	3	4	6	8	10	12	14	16	20
P1.1.1 Unalloyed steel, annealed, 0.15 % C, Rm 420 N/mm², 125 HB	180	0.30	0.50	0.65	1.20	1.55	1.90	2.05	2.15	2.30	2.50
P1.1.2 Unalloyed steel, heat-treated, 0.15 % C, Rm 420 N/mm², 125 HB	180	0.30	0.50	0.65	1.20	1.55	1.90	2.05	2.15	2.30	2.50
P1.1.3 Unalloyed steel, annealed, 0.45 % C, Rm 640 N/mm², 190 HB	180	0.30	0.50	0.65	1.20	1.55	1.90	2.05	2.15	2.30	2.50
P1.1.4 Unalloyed steel, heat-treated, 0.45 % C, Rm 640 N/mm², 190 HB	180	0.30	0.50	0.65	1.20	1.55	1.90	2.05	2.15	2.30	2.50
P1.1.5 Unalloyed steel, heat-treated, 0.45 % C, Rm 850 N/mm², 250 HB	162	0.30	0.50	0.65	1.20	1.55	1.90	2.05	2.15	2.30	2.50
P1.1.6 Unalloyed steel, annealed, 0.75 % C, Rm 915 N/mm², 270 HB	162	0.30	0.50	0.65	1.20	1.55	1.90	2.05	2.15	2.30	2.50
P1.1.7 Unalloyed steel, heat-treated, 0.75 % C, Rm 1020 N/mm², 300 HB	144	0.30	0.50	0.65	1.20	1.55	1.90	2.05	2.15	2.30	2.50
P2.1.1 Low-alloy steel, annealed, Rm 610 N/mm², 180 HB	180	0.30	0.45	0.60	1.15	1.45	1.75	1.90	2.05	2.15	2.35
P2.1.2 Low-alloy steel, heat-treated, Rm 930 N/mm², 275 HB	180	0.30	0.45	0.60	1.15	1.45	1.75	1.90	2.05	2.15	2.35
P2.1.3 Low-alloy steel, heat-treated, Rm 1020 N/mm², 300 HB	180	0.30	0.45	0.60	1.15	1.45	1.75	1.90	2.05	2.15	2.35
P2.1.4 Low-alloy steel, heat-treated, Rm 1190 N/mm², 350 HB	121	0.30	0.45	0.60	1.15	1.45	1.75	1.90	2.05	2.15	2.35
P3.1.1 High-alloy steel and tool steel, annealed, Rm 680 N/mm², 200 HB	180	0.25	0.40	0.60	1.05	1.35	1.65	1.80	1.90	2.00	2.20
P3.1.2 High-alloy steel and tool steel, hardened and tempered, Rm 1100 N/mm², 325 HB	121	0.25	0.40	0.60	1.05	1.35	1.65	1.80	1.90	2.00	2.20
M1.1.1 Stainless steel, ferritic/martensitic, with machining additives	80	0.10	0.20	0.25	0.45	0.60	0.70	0.75	0.80	0.85	0.95
M1.1.2 Stainless steel, ferritic/martensitic, annealed, Rm 680 N/mm², 200 HB	62	0.10	0.20	0.25	0.45	0.60	0.70	0.75	0.80	0.85	0.95
M1.1.3 Stainless steel, ferritic/martensitic, heat-treated, Rm 810 N/mm², 240 HB	62	0.10	0.20	0.25	0.45	0.60	0.70	0.75	0.80	0.85	0.95
M2.1.1 Stainless steel, austenitic, quenched, 180 HB	80	0.10	0.20	0.25	0.45	0.60	0.70	0.75	0.80	0.85	0.95
M2.2.1 Duplex steel, high-strength stainless steels	50	0.10	0.20	0.25	0.45	0.60	0.70	0.75	0.80	0.85	0.95
K1.1.1 Grey cast iron, pearlitic/ferritic, 180 HB	80	0.25	0.35	0.50	0.90	1.15	1.40	1.55	1.65	1.70	1.90
K1.1.2 Grey cast iron, pearlitic/martensitic, 260 HB	72	0.25	0.35	0.50	0.90	1.15	1.40	1.55	1.65	1.70	1.90
K1.2.1 Cast iron with spheroidal graphite, ferritic, 160 HB	96	0.25	0.35	0.50	0.90	1.15	1.40	1.55	1.65	1.70	1.90
K1.2.2 Cast iron with spheroidal graphite, pearlitic, 250 HB	96	0.25	0.35	0.50	0.90	1.15	1.40	1.55	1.65	1.70	1.90
K1.3.1 Malleable cast iron, ferritic, 130 HB	80	0.25	0.35	0.50	0.90	1.15	1.40	1.55	1.65	1.70	1.90
K1.3.2 Malleable cast iron, pearlitic, 230 HB	72	0.25	0.35	0.50	0.90	1.15	1.40	1.55	1.65	1.70	1.90
K2.1.1 Vermicular graphite cast iron (GJV)											
K2.2.1 Austenitic-ferritic spheroidal graphite cast iron (ADI)											
N1.1.1 Wrought aluminium alloys, non-hardened, 60 HB											
N1.1.2 Wrought aluminium alloys, hardened, 100 HB											
N2.1.1 Aluminium casting alloys, non-hardened, ≤ 12 % Si, 75 HB											
N2.1.2 Aluminium casting alloys, hardened, ≤ 12 % Si, 90 HB											
N2.1.3 Aluminium casting alloys, non-hardened, > 12 % Si, 130 HB											
N3.1.1 Copper and copper alloys: Free-machining alloy, Pb > 1 %											
N3.1.2 Copper and copper alloys: CuZn, CuSnZn											
N3.1.3 Copper and copper alloys: CuSn, lead-free copper and copper electrolyte											
N4.1.1 Non-metallic materials: Duroplastics, fibre-reinforced plastics	80	0.25	0.35	0.50	0.90	1.15	1.40	1.55	1.65	1.70	1.90
N4.1.2 Non-metallic materials: Hard rubber, wood, etc.	80	0.25	0.35	0.50	0.90	1.15	1.40	1.55	1.65	1.70	1.90
N4.1.3 Non-metallic materials: Graphite	48	0.25	0.35	0.50	0.90	1.15	1.40	1.55	1.65	1.70	1.90
S1.1.1 Heat-resistant alloys, Fe-based, annealed, 200 HB	40	0.10	0.20	0.25	0.45	0.60	0.70	0.75	0.80	0.85	0.95
S1.1.2 Heat-resistant alloys, Fe-based, hardened, 280 HB	40	0.10	0.20	0.25	0.45	0.60	0.70	0.75	0.80	0.85	0.95
S1.1.3 Heat-resistant alloys, Ni- or Co-based, annealed, 250 HB	40	0.10	0.20	0.25	0.45	0.60	0.70	0.75	0.80	0.85	0.95
S1.1.4 Heat-resistant alloys, Ni- or Co-based, hardened, 350 HB	40	0.10	0.20	0.25	0.45	0.60	0.70	0.75	0.80	0.85	0.95
S1.1.5 Heat-resistant alloys, Ni- or Co-based, cast, 320 HB	40	0.10	0.20	0.25	0.45	0.60	0.70	0.75	0.80	0.85	0.95
S2.1.1 Titanium alloys, pure titanium, Rm 400 N/mm²	40	0.10	0.20	0.25	0.45	0.60	0.70	0.75	0.80	0.85	0.95
S2.1.2 Titanium alloys, Alpha and Beta alloys, hardened, Rm 1050 N/mm²	40	0.10	0.20	0.25	0.45	0.60	0.70	0.75	0.80	0.85	0.95
H1.1.1 Hardened steel, hardened and tempered, < 55 HRC	30	0.05	0.10	0.15	0.25	0.30	0.40	0.40	0.45	0.45	0.50
H1.1.2 Hardened steel, hardened and tempered, < 60 HRC	24	0.05	0.10	0.15	0.25	0.30	0.40	0.40	0.45	0.45	0.50
H1.1.3 Hardened steel, hardened and tempered, > 60 HRC	15	0.05	0.10	0.15	0.25	0.30	0.40	0.40	0.45	0.45	0.50
H2.1.1 Chilled cast iron, 400 HB	40	0.10	0.20	0.25	0.45	0.60	0.70	0.75	0.80	0.85	0.95
H2.1.2 Chilled cast iron, hardened and tempered, < 55 HRC	40	0.10	0.20	0.25	0.45	0.60	0.70	0.75	0.80	0.85	0.95

All the values stated are guide values. You can find detailed cutting values online in our Gühring Navigator at webnavigator.guehring.de/en

HR 500 Short

Machining group	a	f (mm/rev) with nom. Ø									
	v_c (m/min)	2	3	4	6	8	10	12	14	16	20
P1.1.1 Unalloyed steel, annealed, 0.15 % C, Rm 420 N/mm², 125 HB	180	0.30	0.50	0.65	1.20	1.55	1.90	2.05	2.15	2.30	2.50
P1.1.2 Unalloyed steel, heat-treated, 0.15 % C, Rm 420 N/mm², 125 HB	180	0.30	0.50	0.65	1.20	1.55	1.90	2.05	2.15	2.30	2.50
P1.1.3 Unalloyed steel, annealed, 0.45 % C, Rm 640 N/mm², 190 HB	180	0.30	0.50	0.65	1.20	1.55	1.90	2.05	2.15	2.30	2.50
P1.1.4 Unalloyed steel, heat-treated, 0.45 % C, Rm 640 N/mm², 190 HB	180	0.30	0.50	0.65	1.20	1.55	1.90	2.05	2.15	2.30	2.50
P1.1.5 Unalloyed steel, heat-treated, 0.45 % C, Rm 850 N/mm², 250 HB	162	0.30	0.50	0.65	1.20	1.55	1.90	2.05	2.15	2.30	2.50
P1.1.6 Unalloyed steel, annealed, 0.75 % C, Rm 915 N/mm², 270 HB	162	0.30	0.50	0.65	1.20	1.55	1.90	2.05	2.15	2.30	2.50
P1.1.7 Unalloyed steel, heat-treated, 0.75 % C, Rm 1020 N/mm², 300 HB	144	0.30	0.50	0.65	1.20	1.55	1.90	2.05	2.15	2.30	2.50
P2.1.1 Low-alloy steel, annealed, Rm 610 N/mm², 180 HB	180	0.30	0.45	0.60	1.15	1.45	1.75	1.90	2.05	2.15	2.35
P2.1.2 Low-alloy steel, heat-treated, Rm 930 N/mm², 275 HB	180	0.30	0.45	0.60	1.15	1.45	1.75	1.90	2.05	2.15	2.35
P2.1.3 Low-alloy steel, heat-treated, Rm 1020 N/mm², 300 HB	180	0.30	0.45	0.60	1.15	1.45	1.75	1.90	2.05	2.15	2.35
P2.1.4 Low-alloy steel, heat-treated, Rm 1190 N/mm², 350 HB	121	0.30	0.45	0.60	1.15	1.45	1.75	1.90	2.05	2.15	2.35
P3.1.1 High-alloy steel and tool steel, annealed, Rm 680 N/mm², 200 HB	180	0.25	0.40	0.60	1.05	1.35	1.65	1.80	1.90	2.00	2.20
P3.1.2 High-alloy steel and tool steel, hardened and tempered, Rm 1100 N/mm², 325 HB	121	0.25	0.40	0.60	1.05	1.35	1.65	1.80	1.90	2.00	2.20
M1.1.1 Stainless steel, ferritic/martensitic, with machining additives	80	0.10	0.20	0.25	0.45	0.60	0.70	0.75	0.80	0.85	0.95
M1.1.2 Stainless steel, ferritic/martensitic, annealed, Rm 680 N/mm², 200 HB	62	0.10	0.20	0.25	0.45	0.60	0.70	0.75	0.80	0.85	0.95
M1.1.3 Stainless steel, ferritic/martensitic, heat-treated, Rm 810 N/mm², 240 HB	62	0.10	0.20	0.25	0.45	0.60	0.70	0.75	0.80	0.85	0.95
M2.1.1 Stainless steel, austenitic, quenched, 180 HB	80	0.10	0.20	0.25	0.45	0.60	0.70	0.75	0.80	0.85	0.95
M2.2.1 Duplex steel, high-strength stainless steels	50	0.10	0.20	0.25	0.45	0.60	0.70	0.75	0.80	0.85	0.95
K1.1.1 Grey cast iron, pearlitic/ferritic, 180 HB	80	0.25	0.35	0.50	0.90	1.15	1.40	1.55	1.65	1.70	1.90
K1.1.2 Grey cast iron, pearlitic/martensitic, 260 HB	72	0.25	0.35	0.50	0.90	1.15	1.40	1.55	1.65	1.70	1.90
K1.2.1 Cast iron with spheroidal graphite, ferritic, 160 HB	96	0.25	0.35	0.50	0.90	1.15	1.40	1.55	1.65	1.70	1.90
K1.2.2 Cast iron with spheroidal graphite, pearlitic, 250 HB	96	0.25	0.35	0.50	0.90	1.15	1.40	1.55	1.65	1.70	1.90
K1.3.1 Malleable cast iron, ferritic, 130 HB	80	0.25	0.35	0.50	0.90	1.15	1.40	1.55	1.65	1.70	1.90
K1.3.2 Malleable cast iron, pearlitic, 230 HB	72	0.25	0.35	0.50	0.90	1.15	1.40	1.55	1.65	1.70	1.90
K2.1.1 Vermicular graphite cast iron (GJV)											
K2.2.1 Austenitic-ferritic spheroidal graphite cast iron (ADI)											
N1.1.1 Wrought aluminium alloys, non-hardened, 60 HB											
N1.1.2 Wrought aluminium alloys, hardened, 100 HB											
N2.1.1 Aluminium casting alloys, non-hardened, ≤ 12 % Si, 75 HB											
N2.1.2 Aluminium casting alloys, hardened, ≤ 12 % Si, 90 HB											
N2.1.3 Aluminium casting alloys, non-hardened, > 12 % Si, 130 HB											
N3.1.1 Copper and copper alloys: Free-machining alloy, Pb > 1 %											
N3.1.2 Copper and copper alloys: CuZn, CuSnZn											
N3.1.3 Copper and copper alloys: CuSn, lead-free copper and copper electrolyte											
N4.1.1 Non-metallic materials: Duroplastics, fibre-reinforced plastics	80	0.25	0.35	0.50	0.90	1.15	1.40	1.55	1.65	1.70	1.90
N4.1.2 Non-metallic materials: Hard rubber, wood, etc.	80	0.25	0.35	0.50	0.90	1.15	1.40	1.55	1.65	1.70	1.90
N4.1.3 Non-metallic materials: Graphite	48	0.25	0.35	0.50	0.90	1.15	1.40	1.55	1.65	1.70	1.90
S1.1.1 Heat-resistant alloys, Fe-based, annealed, 200 HB	40	0.10	0.20	0.25	0.45	0.60	0.70	0.75	0.80	0.85	0.95
S1.1.2 Heat-resistant alloys, Fe-based, hardened, 280 HB	40	0.10	0.20	0.25	0.45	0.60	0.70	0.75	0.80	0.85	0.95
S1.1.3 Heat-resistant alloys, Ni- or Co-based, annealed, 250 HB	40	0.10	0.20	0.25	0.45	0.60	0.70	0.75	0.80	0.85	0.95
S1.1.4 Heat-resistant alloys, Ni- or Co-based, hardened, 350 HB	40	0.10	0.20	0.25	0.45	0.60	0.70	0.75	0.80	0.85	0.95
S1.1.5 Heat-resistant alloys, Ni- or Co-based, cast, 320 HB	40	0.10	0.20	0.25	0.45	0.60	0.70	0.75	0.80	0.85	0.95
S2.1.1 Titanium alloys, pure titanium, Rm 400 N/mm²	40	0.10	0.20	0.25	0.45	0.60	0.70	0.75	0.80	0.85	0.95
S2.1.2 Titanium alloys, Alpha and Beta alloys, hardened, Rm 1050 N/mm²	40	0.10	0.20	0.25	0.45	0.60	0.70	0.75	0.80	0.85	0.95
H1.1.1 Hardened steel, hardened and tempered, < 55 HRC	30	0.05	0.10	0.15	0.25	0.30	0.40	0.40	0.45	0.45	0.50
H1.1.2 Hardened steel, hardened and tempered, < 60 HRC	24	0.05	0.10	0.15	0.25	0.30	0.40	0.40	0.45	0.45	0.50
H1.1.3 Hardened steel, hardened and tempered, > 60 HRC	15	0.05	0.10	0.15	0.25	0.30	0.40	0.40	0.45	0.45	0.50
H2.1.1 Chilled cast iron, 400 HB	40	0.10	0.20	0.25	0.45	0.60	0.70	0.75	0.80	0.85	0.95
H2.1.2 Chilled cast iron, hardened and tempered, < 55 HRC	40	0.10	0.20	0.25	0.45	0.60	0.70	0.75	0.80	0.85	0.95

HR 500 Alu

Machining group	Cb	f (mm/rev) with nom. Ø								
	v_c (m/min)	3	4	6	8	10	12	14	16	20
P1.1.1 Unalloyed steel, annealed, 0.15 % C, Rm 420 N/mm², 125 HB										
P1.1.2 Unalloyed steel, heat-treated, 0.15 % C, Rm 420 N/mm², 125 HB										
P1.1.3 Unalloyed steel, annealed, 0.45 % C, Rm 640 N/mm², 190 HB										
P1.1.4 Unalloyed steel, heat-treated, 0.45 % C, Rm 640 N/mm², 190 HB										
P1.1.5 Unalloyed steel, heat-treated, 0.45 % C, Rm 850 N/mm², 250 HB										
P1.1.6 Unalloyed steel, annealed, 0.75 % C, Rm 915 N/mm², 270 HB										
P1.1.7 Unalloyed steel, heat-treated, 0.75 % C, Rm 1020 N/mm², 300 HB										
P2.1.1 Low-alloy steel, annealed, Rm 610 N/mm², 180 HB										
P2.1.2 Low-alloy steel, heat-treated, Rm 930 N/mm², 275 HB										
P2.1.3 Low-alloy steel, heat-treated, Rm 1020 N/mm², 300 HB										
P2.1.4 Low-alloy steel, heat-treated, Rm 1190 N/mm², 350 HB										
P3.1.1 High-alloy steel and tool steel, annealed, Rm 680 N/mm², 200 HB										
P3.1.2 High-alloy steel and tool steel, hardened and tempered, Rm 1100 N/mm², 325 HB										
M1.1.1 Stainless steel, ferritic/martensitic, with machining additives										
M1.1.2 Stainless steel, ferritic/martensitic, annealed, Rm 680 N/mm², 200 HB										
M1.1.3 Stainless steel, ferritic/martensitic, heat-treated, Rm 810 N/mm², 240 HB										
M2.1.1 Stainless steel, austenitic, quenched, 180 HB										
M2.2.1 Duplex steel, high-strength stainless steels										
K1.1.1 Grey cast iron, pearlitic/ferritic, 180 HB										
K1.1.2 Grey cast iron, pearlitic/martensitic, 260 HB										
K1.2.1 Cast iron with spheroidal graphite, ferritic, 160 HB										
K1.2.2 Cast iron with spheroidal graphite, pearlitic, 250 HB										
K1.3.1 Malleable cast iron, ferritic, 130 HB										
K1.3.2 Malleable cast iron, pearlitic, 230 HB										
K2.1.1 Vermicular graphite cast iron (GJV)										
K2.2.1 Austenitic-ferritic spheroidal graphite cast iron (ADI)										
N1.1.1 Wrought aluminium alloys, non-hardened, 60 HB	220	0.55	0.75	1.35	1.75	2.15	2.30	2.45	2.60	2.85
N1.1.2 Wrought aluminium alloys, hardened, 100 HB	220	0.55	0.75	1.35	1.75	2.15	2.30	2.45	2.60	2.85
N2.1.1 Aluminium casting alloys, non-hardened, ≤ 12 % Si, 75 HB	220	0.55	0.75	1.35	1.75	2.15	2.30	2.45	2.60	2.85
N2.1.2 Aluminium casting alloys, hardened, ≤ 12 % Si, 90 HB	200	0.55	0.75	1.35	1.75	2.15	2.30	2.45	2.60	2.85
N2.1.3 Aluminium casting alloys, non-hardened, > 12 % Si, 130 HB	200	0.55	0.75	1.35	1.75	2.15	2.30	2.45	2.60	2.85
N3.1.1 Copper and copper alloys: Free-machining alloy, Pb > 1 %										
N3.1.2 Copper and copper alloys: CuZn, CuSnZn										
N3.1.3 Copper and copper alloys: CuSn, lead-free copper and copper electrolyte										
N4.1.1 Non-metallic materials: Duroplastics, fibre-reinforced plastics										
N4.1.2 Non-metallic materials: Hard rubber, wood, etc.										
N4.1.3 Non-metallic materials: Graphite										
S1.1.1 Heat-resistant alloys, Fe-based, annealed, 200 HB										
S1.1.2 Heat-resistant alloys, Fe-based, hardened, 280 HB										
S1.1.3 Heat-resistant alloys, Ni- or Co-based, annealed, 250 HB										
S1.1.4 Heat-resistant alloys, Ni- or Co-based, hardened, 350 HB										
S1.1.5 Heat-resistant alloys, Ni- or Co-based, cast, 320 HB										
S2.1.1 Titanium alloys, pure titanium, Rm 400 N/mm²										
S2.1.2 Titanium alloys, Alpha and Beta alloys, hardened, Rm 1050 N/mm²										
H1.1.1 Hardened steel, hardened and tempered, < 55 HRC										
H1.1.2 Hardened steel, hardened and tempered, < 60 HRC										
H1.1.3 Hardened steel, hardened and tempered, > 60 HRC										
H2.1.1 Chilled cast iron, 400 HB										
H2.1.2 Chilled cast iron, hardened and tempered, < 55 HRC										

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HR 500 Cast

Machining group	Y	f (mm/rev) with nom. Ø								
	v_c (m/min)	3	4	6	8	10	12	14	16	20
P1.1.1 Unalloyed steel, annealed, 0.15 % C, Rm 420 N/mm², 125 HB										
P1.1.2 Unalloyed steel, heat-treated, 0.15 % C, Rm 420 N/mm², 125 HB										
P1.1.3 Unalloyed steel, annealed, 0.45 % C, Rm 640 N/mm², 190 HB										
P1.1.4 Unalloyed steel, heat-treated, 0.45 % C, Rm 640 N/mm², 190 HB										
P1.1.5 Unalloyed steel, heat-treated, 0.45 % C, Rm 850 N/mm², 250 HB										
P1.1.6 Unalloyed steel, annealed, 0.75 % C, Rm 915 N/mm², 270 HB										
P1.1.7 Unalloyed steel, heat-treated, 0.75 % C, Rm 1020 N/mm², 300 HB										
P2.1.1 Low-alloy steel, annealed, Rm 610 N/mm², 180 HB										
P2.1.2 Low-alloy steel, heat-treated, Rm 930 N/mm², 275 HB										
P2.1.3 Low-alloy steel, heat-treated, Rm 1020 N/mm², 300 HB										
P2.1.4 Low-alloy steel, heat-treated, Rm 1190 N/mm², 350 HB										
P3.1.1 High-alloy steel and tool steel, annealed, Rm 680 N/mm², 200 HB										
P3.1.2 High-alloy steel and tool steel, hardened and tempered, Rm 1100 N/mm², 325 HB										
M1.1.1 Stainless steel, ferritic/martensitic, with machining additives										
M1.1.2 Stainless steel, ferritic/martensitic, annealed, Rm 680 N/mm², 200 HB										
M1.1.3 Stainless steel, ferritic/martensitic, heat-treated, Rm 810 N/mm², 240 HB										
M2.1.1 Stainless steel, austenitic, quenched, 180 HB										
M2.2.1 Duplex steel, high-strength stainless steels										
K1.1.1 Grey cast iron, pearlitic/ferritic, 180 HB	200	0.55	0.75	1.35	1.75	2.15	2.30	2.45	2.60	2.85
K1.1.2 Grey cast iron, pearlitic/martensitic, 260 HB	200	0.55	0.75	1.35	1.75	2.15	2.30	2.45	2.60	2.85
K1.2.1 Cast iron with spheroidal graphite, ferritic, 160 HB	220	0.20	0.25	0.45	0.60	0.70	0.75	0.80	0.85	0.95
K1.2.2 Cast iron with spheroidal graphite, pearlitic, 250 HB	220	0.20	0.25	0.45	0.60	0.70	0.75	0.80	0.85	0.95
K1.3.1 Malleable cast iron, ferritic, 130 HB	100	0.20	0.25	0.45	0.60	0.70	0.75	0.80	0.85	0.95
K1.3.2 Malleable cast iron, pearlitic, 230 HB	80	0.20	0.25	0.45	0.60	0.70	0.75	0.80	0.85	0.95
K2.1.1 Vermicular graphite cast iron (GJV)	80	0.35	0.50	0.90	1.15	1.40	1.55	1.65	1.70	1.90
K2.2.1 Austenitic-ferritic spheroidal graphite cast iron (ADI)	80	0.35	0.50	0.90	1.15	1.40	1.55	1.65	1.70	1.90
N1.1.1 Wrought aluminium alloys, non-hardened, 60 HB										
N1.1.2 Wrought aluminium alloys, hardened, 100 HB										
N2.1.1 Aluminium casting alloys, non-hardened, ≤ 12 % Si, 75 HB										
N2.1.2 Aluminium casting alloys, hardened, ≤ 12 % Si, 90 HB										
N2.1.3 Aluminium casting alloys, non-hardened, > 12 % Si, 130 HB										
N3.1.1 Copper and copper alloys: Free-machining alloy, Pb > 1 %										
N3.1.2 Copper and copper alloys: CuZn, CuSnZn										
N3.1.3 Copper and copper alloys: CuSn, lead-free copper and copper electrolyte										
N4.1.1 Non-metallic materials: Duroplastics, fibre-reinforced plastics										
N4.1.2 Non-metallic materials: Hard rubber, wood, etc.										
N4.1.3 Non-metallic materials: Graphite										
S1.1.1 Heat-resistant alloys, Fe-based, annealed, 200 HB										
S1.1.2 Heat-resistant alloys, Fe-based, hardened, 280 HB										
S1.1.3 Heat-resistant alloys, Ni- or Co-based, annealed, 250 HB										
S1.1.4 Heat-resistant alloys, Ni- or Co-based, hardened, 350 HB										
S1.1.5 Heat-resistant alloys, Ni- or Co-based, cast, 320 HB										
S2.1.1 Titanium alloys, pure titanium, Rm 400 N/mm²										
S2.1.2 Titanium alloys, Alpha and Beta alloys, hardened, Rm 1050 N/mm²										
H1.1.1 Hardened steel, hardened and tempered, < 55 HRC										
H1.1.2 Hardened steel, hardened and tempered, < 60 HRC										
H1.1.3 Hardened steel, hardened and tempered, > 60 HRC										
H2.1.1 Chilled cast iron, 400 HB										
H2.1.2 Chilled cast iron, hardened and tempered, < 55 HRC										

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HR 500 G, Carbide-tipped

Machining group	a	f (mm/rev) with nom. Ø				
	v_c (m/min)	22	26	30	35	40
P1.1.1 Unalloyed steel, annealed, 0.15 % C, Rm 420 N/mm², 125 HB	30	1.00	1.05	1.10	1.20	1.25
P1.1.2 Unalloyed steel, heat-treated, 0.15 % C, Rm 420 N/mm², 125 HB	30	1.00	1.05	1.10	1.20	1.25
P1.1.3 Unalloyed steel, annealed, 0.45 % C, Rm 640 N/mm², 190 HB	30	1.00	1.05	1.10	1.20	1.25
P1.1.4 Unalloyed steel, heat-treated, 0.45 % C, Rm 640 N/mm², 190 HB	30	1.00	1.05	1.10	1.20	1.25
P1.1.5 Unalloyed steel, heat-treated, 0.45 % C, Rm 850 N/mm², 250 HB	27	1.00	1.05	1.10	1.20	1.25
P1.1.6 Unalloyed steel, annealed, 0.75 % C, Rm 915 N/mm², 270 HB	27	1.00	1.05	1.10	1.20	1.25
P1.1.7 Unalloyed steel, heat-treated, 0.75 % C, Rm 1020 N/mm², 300 HB	24	1.00	1.05	1.10	1.20	1.25
P2.1.1 Low-alloy steel, annealed, Rm 610 N/mm², 180 HB	30	1.00	1.05	1.10	1.20	1.25
P2.1.2 Low-alloy steel, heat-treated, Rm 930 N/mm², 275 HB	30	1.00	1.05	1.10	1.20	1.25
P2.1.3 Low-alloy steel, heat-treated, Rm 1020 N/mm², 300 HB	30	1.00	1.05	1.10	1.20	1.25
P2.1.4 Low-alloy steel, heat-treated, Rm 1190 N/mm², 350 HB	20	1.00	1.05	1.10	1.20	1.25
P3.1.1 High-alloy steel and tool steel, annealed, Rm 680 N/mm², 200 HB	30	1.00	1.05	1.10	1.20	1.25
P3.1.2 High-alloy steel and tool steel, hardened and tempered, Rm 1100 N/mm², 325 HB	20	1.00	1.05	1.10	1.20	1.25
M1.1.1 Stainless steel, ferritic/martensitic, with machining additives	40	1.00	1.05	1.10	1.20	1.25
M1.1.2 Stainless steel, ferritic/martensitic, annealed, Rm 680 N/mm², 200 HB	31	1.00	1.05	1.10	1.20	1.25
M1.1.3 Stainless steel, ferritic/martensitic, heat-treated, Rm 810 N/mm², 240 HB	31	1.00	1.05	1.10	1.20	1.25
M2.1.1 Stainless steel, austenitic, quenched, 180 HB	20	1.00	1.05	1.10	1.20	1.25
M2.2.1 Duplex steel, high-strength stainless steels	13	1.00	1.05	1.10	1.20	1.25
K1.1.1 Grey cast iron, pearlitic/ferritic, 180 HB	60	1.95	2.10	2.25	2.35	2.50
K1.1.2 Grey cast iron, pearlitic/martensitic, 260 HB	54	1.95	2.10	2.25	2.35	2.50
K1.2.1 Cast iron with spheroidal graphite, ferritic, 160 HB	72	1.95	2.10	2.25	2.35	2.50
K1.2.2 Cast iron with spheroidal graphite, pearlitic, 250 HB	72	1.95	2.10	2.25	2.35	2.50
K1.3.1 Malleable cast iron, ferritic, 130 HB	60	1.95	2.10	2.25	2.35	2.50
K1.3.2 Malleable cast iron, pearlitic, 230 HB	54	1.95	2.10	2.25	2.35	2.50
K2.1.1 Vermicular graphite cast iron (GJV)						
K2.2.1 Austenitic-ferritic spheroidal graphite cast iron (ADI)						
N1.1.1 Wrought aluminium alloys, non-hardened, 60 HB						
N1.1.2 Wrought aluminium alloys, hardened, 100 HB						
N2.1.1 Aluminium casting alloys, non-hardened, ≤ 12 % Si, 75 HB						
N2.1.2 Aluminium casting alloys, hardened, ≤ 12 % Si, 90 HB						
N2.1.3 Aluminium casting alloys, non-hardened, > 12 % Si, 130 HB						
N3.1.1 Copper and copper alloys: Free-machining alloy, Pb > 1 %						
N3.1.2 Copper and copper alloys: CuZn, CuSnZn						
N3.1.3 Copper and copper alloys: CuSn, lead-free copper and copper electrolyte						
N4.1.1 Non-metallic materials: Duroplastics, fibre-reinforced plastics	80	1.00	1.05	1.10	1.20	1.25
N4.1.2 Non-metallic materials: Hard rubber, wood, etc.	80	1.00	1.05	1.10	1.20	1.25
N4.1.3 Non-metallic materials: Graphite	48	1.00	1.05	1.10	1.20	1.25
S1.1.1 Heat-resistant alloys, Fe-based, annealed, 200 HB	20	0.50	0.55	0.60	0.65	0.65
S1.1.2 Heat-resistant alloys, Fe-based, hardened, 280 HB	20	0.50	0.55	0.60	0.65	0.65
S1.1.3 Heat-resistant alloys, Ni- or Co-based, annealed, 250 HB	20	0.50	0.55	0.60	0.65	0.65
S1.1.4 Heat-resistant alloys, Ni- or Co-based, hardened, 350 HB	20	0.50	0.55	0.60	0.65	0.65
S1.1.5 Heat-resistant alloys, Ni- or Co-based, cast, 320 HB	20	0.50	0.55	0.60	0.65	0.65
S2.1.1 Titanium alloys, pure titanium, Rm 400 N/mm²	20	0.50	0.55	0.60	0.65	0.65
S2.1.2 Titanium alloys, Alpha and Beta alloys, hardened, Rm 1050 N/mm²	20	0.50	0.55	0.60	0.65	0.65
H1.1.1 Hardened steel, hardened and tempered, < 55 HRC						
H1.1.2 Hardened steel, hardened and tempered, < 60 HRC						
H1.1.3 Hardened steel, hardened and tempered, > 60 HRC						
H2.1.1 Chilled cast iron, 400 HB						
H2.1.2 Chilled cast iron, hardened and tempered, < 55 HRC						

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HR 500 G, Cermet-tipped

Machining group	◯	f (mm/rev) with nom. Ø									
	v_c (m/min)	6	8	10	14	18	20	26	30	35	40
P1.1.1 Unalloyed steel, annealed, 0.15 % C, Rm 420 N/mm², 125 HB	130	0.90	1.15	1.40	1.65	1.80	1.90	2.10	2.25	2.35	2.50
P1.1.2 Unalloyed steel, heat-treated, 0.15 % C, Rm 420 N/mm², 125 HB	130	0.90	1.15	1.40	1.65	1.80	1.90	2.10	2.25	2.35	2.50
P1.1.3 Unalloyed steel, annealed, 0.45 % C, Rm 640 N/mm², 190 HB	130	0.90	1.15	1.40	1.65	1.80	1.90	2.10	2.25	2.35	2.50
P1.1.4 Unalloyed steel, heat-treated, 0.45 % C, Rm 640 N/mm², 190 HB	130	0.90	1.15	1.40	1.65	1.80	1.90	2.10	2.25	2.35	2.50
P1.1.5 Unalloyed steel, heat-treated, 0.45 % C, Rm 850 N/mm², 250 HB	117	0.90	1.15	1.40	1.65	1.80	1.90	2.10	2.25	2.35	2.50
P1.1.6 Unalloyed steel, annealed, 0.75 % C, Rm 915 N/mm², 270 HB	117	0.90	1.15	1.40	1.65	1.80	1.90	2.10	2.25	2.35	2.50
P1.1.7 Unalloyed steel, heat-treated, 0.75 % C, Rm 1020 N/mm², 300 HB	104	0.90	1.15	1.40	1.65	1.80	1.90	2.10	2.25	2.35	2.50
P2.1.1 Low-alloy steel, annealed, Rm 610 N/mm², 180 HB	130	0.90	1.15	1.40	1.65	1.80	1.90	2.10	2.25	2.35	2.50
P2.1.2 Low-alloy steel, heat-treated, Rm 930 N/mm², 275 HB	130	0.90	1.15	1.40	1.65	1.80	1.90	2.10	2.25	2.35	2.50
P2.1.3 Low-alloy steel, heat-treated, Rm 1020 N/mm², 300 HB	130	0.90	1.15	1.40	1.65	1.80	1.90	2.10	2.25	2.35	2.50
P2.1.4 Low-alloy steel, heat-treated, Rm 1190 N/mm², 350 HB	87	0.90	1.15	1.40	1.65	1.80	1.90	2.10	2.25	2.35	2.50
P3.1.1 High-alloy steel and tool steel, annealed, Rm 680 N/mm², 200 HB	130	0.90	1.15	1.40	1.65	1.80	1.90	2.10	2.25	2.35	2.50
P3.1.2 High-alloy steel and tool steel, hardened and tempered, Rm 1100 N/mm², 325 HB	87	0.90	1.15	1.40	1.65	1.80	1.90	2.10	2.25	2.35	2.50
M1.1.1 Stainless steel, ferritic/martensitic, with machining additives											
M1.1.2 Stainless steel, ferritic/martensitic, annealed, Rm 680 N/mm², 200 HB											
M1.1.3 Stainless steel, ferritic/martensitic, heat-treated, Rm 810 N/mm², 240 HB											
M2.1.1 Stainless steel, austenitic, quenched, 180 HB											
M2.2.1 Duplex steel, high-strength stainless steels											
K1.1.1 Grey cast iron, pearlitic/ferritic, 180 HB											
K1.1.2 Grey cast iron, pearlitic/martensitic, 260 HB											
K1.2.1 Cast iron with spheroidal graphite, ferritic, 160 HB	160	0.60	0.80	0.95	1.10	1.20	1.25	1.40	1.50	1.60	1.65
K1.2.2 Cast iron with spheroidal graphite, pearlitic, 250 HB	160	0.60	0.80	0.95	1.10	1.20	1.25	1.40	1.50	1.60	1.65
K1.3.1 Malleable cast iron, ferritic, 130 HB											
K1.3.2 Malleable cast iron, pearlitic, 230 HB											
K2.1.1 Vermicular graphite cast iron (GJV)											
K2.2.1 Austenitic-ferritic spheroidal graphite cast iron (ADI)											
N1.1.1 Wrought aluminium alloys, non-hardened, 60 HB											
N1.1.2 Wrought aluminium alloys, hardened, 100 HB											
N2.1.1 Aluminium casting alloys, non-hardened, ≤ 12 % Si, 75 HB											
N2.1.2 Aluminium casting alloys, hardened, ≤ 12 % Si, 90 HB											
N2.1.3 Aluminium casting alloys, non-hardened, > 12 % Si, 130 HB											
N3.1.1 Copper and copper alloys: Free-machining alloy, Pb > 1 %											
N3.1.2 Copper and copper alloys: CuZn, CuSnZn											
N3.1.3 Copper and copper alloys: CuSn, lead-free copper and copper electrolyte											
N4.1.1 Non-metallic materials: Duroplastics, fibre-reinforced plastics											
N4.1.2 Non-metallic materials: Hard rubber, wood, etc.											
N4.1.3 Non-metallic materials: Graphite											
S1.1.1 Heat-resistant alloys, Fe-based, annealed, 200 HB											
S1.1.2 Heat-resistant alloys, Fe-based, hardened, 280 HB											
S1.1.3 Heat-resistant alloys, Ni- or Co-based, annealed, 250 HB											
S1.1.4 Heat-resistant alloys, Ni- or Co-based, hardened, 350 HB											
S1.1.5 Heat-resistant alloys, Ni- or Co-based, cast, 320 HB											
S2.1.1 Titanium alloys, pure titanium, Rm 400 N/mm²											
S2.1.2 Titanium alloys, Alpha and Beta alloys, hardened, Rm 1050 N/mm²											
H1.1.1 Hardened steel, hardened and tempered, < 55 HRC											
H1.1.2 Hardened steel, hardened and tempered, < 60 HRC											
H1.1.3 Hardened steel, hardened and tempered, > 60 HRC											
H2.1.1 Chilled cast iron, 400 HB											
H2.1.2 Chilled cast iron, hardened and tempered, < 55 HRC											

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HR 500 T

Machining group	a	f (mm/rev) with nom. Ø									
	v_c (m/min)	14	16	18	20	22	24	28	32	38	42
P1.1.1 Unalloyed steel, annealed, 0.15 % C, Rm 420 N/mm², 125 HB	180	2.15	2.30	2.40	2.50	2.60	2.70	2.90	3.05	3.25	3.40
P1.1.2 Unalloyed steel, heat-treated, 0.15 % C, Rm 420 N/mm², 125 HB	180	2.15	2.30	2.40	2.50	2.60	2.70	2.90	3.05	3.25	3.40
P1.1.3 Unalloyed steel, annealed, 0.45 % C, Rm 640 N/mm², 190 HB	180	2.15	2.30	2.40	2.50	2.60	2.70	2.90	3.05	3.25	3.40
P1.1.4 Unalloyed steel, heat-treated, 0.45 % C, Rm 640 N/mm², 190 HB	180	2.15	2.30	2.40	2.50	2.60	2.70	2.90	3.05	3.25	3.40
P1.1.5 Unalloyed steel, heat-treated, 0.45 % C, Rm 850 N/mm², 250 HB	162	2.15	2.30	2.40	2.50	2.60	2.70	2.90	3.05	3.25	3.40
P1.1.6 Unalloyed steel, annealed, 0.75 % C, Rm 915 N/mm², 270 HB	162	2.15	2.30	2.40	2.50	2.60	2.70	2.90	3.05	3.25	3.40
P1.1.7 Unalloyed steel, heat-treated, 0.75 % C, Rm 1020 N/mm², 300 HB	144	2.15	2.30	2.40	2.50	2.60	2.70	2.90	3.05	3.25	3.40
P2.1.1 Low-alloy steel, annealed, Rm 610 N/mm², 180 HB	180	2.05	2.15	2.25	2.35	2.45	2.55	2.70	2.85	3.05	3.20
P2.1.2 Low-alloy steel, heat-treated, Rm 930 N/mm², 275 HB	180	2.05	2.15	2.25	2.35	2.45	2.55	2.70	2.85	3.05	3.20
P2.1.3 Low-alloy steel, heat-treated, Rm 1020 N/mm², 300 HB	180	2.05	2.15	2.25	2.35	2.45	2.55	2.70	2.85	3.05	3.20
P2.1.4 Low-alloy steel, heat-treated, Rm 1190 N/mm², 350 HB	121	2.05	2.15	2.25	2.35	2.45	2.55	2.70	2.85	3.05	3.20
P3.1.1 High-alloy steel and tool steel, annealed, Rm 680 N/mm², 200 HB	180	1.90	2.00	2.10	2.20	2.30	2.35	2.50	2.65	2.85	3.00
P3.1.2 High-alloy steel and tool steel, hardened and tempered, Rm 1100 N/mm², 325 HB	121	1.90	2.00	2.10	2.20	2.30	2.35	2.50	2.65	2.85	3.00
M1.1.1 Stainless steel, ferritic/martensitic, with machining additives	80	0.80	0.85	0.90	0.95	1.00	1.00	1.10	1.15	1.25	1.30
M1.1.2 Stainless steel, ferritic/martensitic, annealed, Rm 680 N/mm², 200 HB	62	0.80	0.85	0.90	0.95	1.00	1.00	1.10	1.15	1.25	1.30
M1.1.3 Stainless steel, ferritic/martensitic, heat-treated, Rm 810 N/mm², 240 HB	62	0.80	0.85	0.90	0.95	1.00	1.00	1.10	1.15	1.25	1.30
M2.1.1 Stainless steel, austenitic, quenched, 180 HB	80	0.80	0.85	0.90	0.95	1.00	1.00	1.10	1.15	1.25	1.30
M2.2.1 Duplex steel, high-strength stainless steels	50	0.80	0.85	0.90	0.95	1.00	1.00	1.10	1.15	1.25	1.30
K1.1.1 Grey cast iron, pearlitic/ferritic, 180 HB	80	1.65	1.70	1.80	1.90	1.95	2.05	2.15	2.30	2.45	2.55
K1.1.2 Grey cast iron, pearlitic/martensitic, 260 HB	72	1.65	1.70	1.80	1.90	1.95	2.05	2.15	2.30	2.45	2.55
K1.2.1 Cast iron with spheroidal graphite, ferritic, 160 HB	96	1.65	1.70	1.80	1.90	1.95	2.05	2.15	2.30	2.45	2.55
K1.2.2 Cast iron with spheroidal graphite, pearlitic, 250 HB	96	1.65	1.70	1.80	1.90	1.95	2.05	2.15	2.30	2.45	2.55
K1.3.1 Malleable cast iron, ferritic, 130 HB	80	1.65	1.70	1.80	1.90	1.95	2.05	2.15	2.30	2.45	2.55
K1.3.2 Malleable cast iron, pearlitic, 230 HB	72	1.65	1.70	1.80	1.90	1.95	2.05	2.15	2.30	2.45	2.55
K2.1.1 Vermicular graphite cast iron (GJV)											
K2.2.1 Austenitic-ferritic spheroidal graphite cast iron (ADI)											
N1.1.1 Wrought aluminium alloys, non-hardened, 60 HB											
N1.1.2 Wrought aluminium alloys, hardened, 100 HB											
N2.1.1 Aluminium casting alloys, non-hardened, ≤ 12 % Si, 75 HB											
N2.1.2 Aluminium casting alloys, hardened, ≤ 12 % Si, 90 HB											
N2.1.3 Aluminium casting alloys, non-hardened, > 12 % Si, 130 HB											
N3.1.1 Copper and copper alloys: Free-machining alloy, Pb > 1 %											
N3.1.2 Copper and copper alloys: CuZn, CuSnZn											
N3.1.3 Copper and copper alloys: CuSn, lead-free copper and copper electrolyte											
N4.1.1 Non-metallic materials: Duroplastics, fibre-reinforced plastics	80	1.65	1.70	1.80	1.90	1.95	2.05	2.15	2.30	2.45	2.55
N4.1.2 Non-metallic materials: Hard rubber, wood, etc.	80	1.65	1.70	1.80	1.90	1.95	2.05	2.15	2.30	2.45	2.55
N4.1.3 Non-metallic materials: Graphite	48	1.65	1.70	1.80	1.90	1.95	2.05	2.15	2.30	2.45	2.55
S1.1.1 Heat-resistant alloys, Fe-based, annealed, 200 HB	40	0.80	0.85	0.90	0.95	1.00	1.00	1.10	1.15	1.25	1.30
S1.1.2 Heat-resistant alloys, Fe-based, hardened, 280 HB	40	0.80	0.85	0.90	0.95	1.00	1.00	1.10	1.15	1.25	1.30
S1.1.3 Heat-resistant alloys, Ni- or Co-based, annealed, 250 HB	40	0.80	0.85	0.90	0.95	1.00	1.00	1.10	1.15	1.25	1.30
S1.1.4 Heat-resistant alloys, Ni- or Co-based, hardened, 350 HB	40	0.80	0.85	0.90	0.95	1.00	1.00	1.10	1.15	1.25	1.30
S1.1.5 Heat-resistant alloys, Ni- or Co-based, cast, 320 HB	40	0.80	0.85	0.90	0.95	1.00	1.00	1.10	1.15	1.25	1.30
S2.1.1 Titanium alloys, pure titanium, Rm 400 N/mm²	40	0.80	0.85	0.90	0.95	1.00	1.00	1.10	1.15	1.25	1.30
S2.1.2 Titanium alloys, Alpha and Beta alloys, hardened, Rm 1050 N/mm²	40	0.80	0.85	0.90	0.95	1.00	1.00	1.10	1.15	1.25	1.30
H1.1.1 Hardened steel, hardened and tempered, < 55 HRC	30	0.45	0.45	0.50	0.50	0.50	0.55	0.60	0.60	0.65	0.70
H1.1.2 Hardened steel, hardened and tempered, < 60 HRC	24	0.45	0.45	0.50	0.50	0.50	0.55	0.60	0.60	0.65	0.70
H1.1.3 Hardened steel, hardened and tempered, > 60 HRC	15	0.45	0.45	0.50	0.50	0.50	0.55	0.60	0.60	0.65	0.70
H2.1.1 Chilled cast iron, 400 HB	40	0.80	0.85	0.90	0.95	1.00	1.00	1.10	1.15	1.25	1.30
H2.1.2 Chilled cast iron, hardened and tempered, < 55 HRC	40	0.80	0.85	0.90	0.95	1.00	1.00	1.10	1.15	1.25	1.30

HR 500 GT, Carbide-tipped

Machining group	a	f (mm/rev) with nom. Ø								
	v_c (m/min)	40	45	50	55	60	65	70	75	80
P1.1.1 Unalloyed steel, annealed, 0.15 % C, Rm 420 N/mm², 125 HB	30	1.25	1.30	1.35	1.45	1.50	1.55	1.60	1.60	1.65
P1.1.2 Unalloyed steel, heat-treated, 0.15 % C, Rm 420 N/mm², 125 HB	30	1.25	1.30	1.35	1.45	1.50	1.55	1.60	1.60	1.65
P1.1.3 Unalloyed steel, annealed, 0.45 % C, Rm 640 N/mm², 190 HB	30	1.25	1.30	1.35	1.45	1.50	1.55	1.60	1.60	1.65
P1.1.4 Unalloyed steel, heat-treated, 0.45 % C, Rm 640 N/mm², 190 HB	30	1.25	1.30	1.35	1.45	1.50	1.55	1.60	1.60	1.65
P1.1.5 Unalloyed steel, heat-treated, 0.45 % C, Rm 850 N/mm², 250 HB	27	1.25	1.30	1.35	1.45	1.50	1.55	1.60	1.60	1.65
P1.1.6 Unalloyed steel, annealed, 0.75 % C, Rm 915 N/mm², 270 HB	27	1.25	1.30	1.35	1.45	1.50	1.55	1.60	1.60	1.65
P1.1.7 Unalloyed steel, heat-treated, 0.75 % C, Rm 1020 N/mm², 300 HB	24	1.25	1.30	1.35	1.45	1.50	1.55	1.60	1.60	1.65
P2.1.1 Low-alloy steel, annealed, Rm 610 N/mm², 180 HB	30	1.25	1.30	1.35	1.45	1.50	1.55	1.60	1.60	1.65
P2.1.2 Low-alloy steel, heat-treated, Rm 930 N/mm², 275 HB	30	1.25	1.30	1.35	1.45	1.50	1.55	1.60	1.60	1.65
P2.1.3 Low-alloy steel, heat-treated, Rm 1020 N/mm², 300 HB	30	1.25	1.30	1.35	1.45	1.50	1.55	1.60	1.60	1.65
P2.1.4 Low-alloy steel, heat-treated, Rm 1190 N/mm², 350 HB	20	1.25	1.30	1.35	1.45	1.50	1.55	1.60	1.60	1.65
P3.1.1 High-alloy steel and tool steel, annealed, Rm 680 N/mm², 200 HB	30	1.25	1.30	1.35	1.45	1.50	1.55	1.60	1.60	1.65
P3.1.2 High-alloy steel and tool steel, hardened and tempered, Rm 1100 N/mm², 325 HB	20	1.25	1.30	1.35	1.45	1.50	1.55	1.60	1.60	1.65
M1.1.1 Stainless steel, ferritic/martensitic, with machining additives	40	1.25	1.30	1.35	1.45	1.50	1.55	1.60	1.60	1.65
M1.1.2 Stainless steel, ferritic/martensitic, annealed, Rm 680 N/mm², 200 HB	31	1.25	1.30	1.35	1.45	1.50	1.55	1.60	1.60	1.65
M1.1.3 Stainless steel, ferritic/martensitic, heat-treated, Rm 810 N/mm², 240 HB	31	1.25	1.30	1.35	1.45	1.50	1.55	1.60	1.60	1.65
M2.1.1 Stainless steel, austenitic, quenched, 180 HB	20	1.25	1.30	1.35	1.45	1.50	1.55	1.60	1.60	1.65
M2.2.1 Duplex steel, high-strength stainless steels	13	1.25	1.30	1.35	1.45	1.50	1.55	1.60	1.60	1.65
K1.1.1 Grey cast iron, pearlitic/ferritic, 180 HB	60	2.50	2.65	2.75	2.85	2.95	3.05	3.15	3.25	3.35
K1.1.2 Grey cast iron, pearlitic/martensitic, 260 HB	54	2.50	2.65	2.75	2.85	2.95	3.05	3.15	3.25	3.35
K1.2.1 Cast iron with spheroidal graphite, ferritic, 160 HB	72	2.50	2.65	2.75	2.85	2.95	3.05	3.15	3.25	3.35
K1.2.2 Cast iron with spheroidal graphite, pearlitic, 250 HB	72	2.50	2.65	2.75	2.85	2.95	3.05	3.15	3.25	3.35
K1.3.1 Malleable cast iron, ferritic, 130 HB	60	2.50	2.65	2.75	2.85	2.95	3.05	3.15	3.25	3.35
K1.3.2 Malleable cast iron, pearlitic, 230 HB	54	2.50	2.65	2.75	2.85	2.95	3.05	3.15	3.25	3.35
K2.1.1 Vermicular graphite cast iron (GJV)										
K2.2.1 Austenitic-ferritic spheroidal graphite cast iron (ADI)										
N1.1.1 Wrought aluminium alloys, non-hardened, 60 HB										
N1.1.2 Wrought aluminium alloys, hardened, 100 HB										
N2.1.1 Aluminium casting alloys, non-hardened, ≤ 12 % Si, 75 HB										
N2.1.2 Aluminium casting alloys, hardened, ≤ 12 % Si, 90 HB										
N2.1.3 Aluminium casting alloys, non-hardened, > 12 % Si, 130 HB										
N3.1.1 Copper and copper alloys: Free-machining alloy, Pb > 1 %										
N3.1.2 Copper and copper alloys: CuZn, CuSnZn										
N3.1.3 Copper and copper alloys: CuSn, lead-free copper and copper electrolyte										
N4.1.1 Non-metallic materials: Duroplastics, fibre-reinforced plastics	80	1.25	1.30	1.35	1.45	1.50	1.55	1.60	1.60	1.65
N4.1.2 Non-metallic materials: Hard rubber, wood, etc.	80	1.25	1.30	1.35	1.45	1.50	1.55	1.60	1.60	1.65
N4.1.3 Non-metallic materials: Graphite	48	1.25	1.30	1.35	1.45	1.50	1.55	1.60	1.60	1.65
S1.1.1 Heat-resistant alloys, Fe-based, annealed, 200 HB	20	0.65	0.70	0.75	0.75	0.80	0.80	0.85	0.85	0.90
S1.1.2 Heat-resistant alloys, Fe-based, hardened, 280 HB	20	0.65	0.70	0.75	0.75	0.80	0.80	0.85	0.85	0.90
S1.1.3 Heat-resistant alloys, Ni- or Co-based, annealed, 250 HB	20	0.65	0.70	0.75	0.75	0.80	0.80	0.85	0.85	0.90
S1.1.4 Heat-resistant alloys, Ni- or Co-based, hardened, 350 HB	20	0.65	0.70	0.75	0.75	0.80	0.80	0.85	0.85	0.90
S1.1.5 Heat-resistant alloys, Ni- or Co-based, cast, 320 HB	20	0.65	0.70	0.75	0.75	0.80	0.80	0.85	0.85	0.90
S2.1.1 Titanium alloys, pure titanium, Rm 400 N/mm²	20	0.65	0.70	0.75	0.75	0.80	0.80	0.85	0.85	0.90
S2.1.2 Titanium alloys, Alpha and Beta alloys, hardened, Rm 1050 N/mm²	20	0.65	0.70	0.75	0.75	0.80	0.80	0.85	0.85	0.90
H1.1.1 Hardened steel, hardened and tempered, < 55 HRC										
H1.1.2 Hardened steel, hardened and tempered, < 60 HRC										
H1.1.3 Hardened steel, hardened and tempered, > 60 HRC										
H2.1.1 Chilled cast iron, 400 HB										
H2.1.2 Chilled cast iron, hardened and tempered, < 55 HRC										

All the values stated are guide values. You can find detailed cutting values online in our Gühring Navigator at webnavigator.guehring.de/en

HR 500 GT, Cermet-tipped

Machining group	◯	f (mm/rev) with nom. Ø								
	v_c (m/min)	40	45	50	55	60	65	70	75	80
P1.1.1 Unalloyed steel, annealed, 0.15 % C, Rm 420 N/mm², 125 HB	130	2.50	2.65	2.75	2.85	2.95	3.05	3.15	3.25	3.35
P1.1.2 Unalloyed steel, heat-treated, 0.15 % C, Rm 420 N/mm², 125 HB	130	2.50	2.65	2.75	2.85	2.95	3.05	3.15	3.25	3.35
P1.1.3 Unalloyed steel, annealed, 0.45 % C, Rm 640 N/mm², 190 HB	130	2.50	2.65	2.75	2.85	2.95	3.05	3.15	3.25	3.35
P1.1.4 Unalloyed steel, heat-treated, 0.45 % C, Rm 640 N/mm², 190 HB	130	2.50	2.65	2.75	2.85	2.95	3.05	3.15	3.25	3.35
P1.1.5 Unalloyed steel, heat-treated, 0.45 % C, Rm 850 N/mm², 250 HB	117	2.50	2.65	2.75	2.85	2.95	3.05	3.15	3.25	3.35
P1.1.6 Unalloyed steel, annealed, 0.75 % C, Rm 915 N/mm², 270 HB	117	2.50	2.65	2.75	2.85	2.95	3.05	3.15	3.25	3.35
P1.1.7 Unalloyed steel, heat-treated, 0.75 % C, Rm 1020 N/mm², 300 HB	104	2.50	2.65	2.75	2.85	2.95	3.05	3.15	3.25	3.35
P2.1.1 Low-alloy steel, annealed, Rm 610 N/mm², 180 HB	130	2.50	2.65	2.75	2.85	2.95	3.05	3.15	3.25	3.35
P2.1.2 Low-alloy steel, heat-treated, Rm 930 N/mm², 275 HB	130	2.50	2.65	2.75	2.85	2.95	3.05	3.15	3.25	3.35
P2.1.3 Low-alloy steel, heat-treated, Rm 1020 N/mm², 300 HB	130	2.50	2.65	2.75	2.85	2.95	3.05	3.15	3.25	3.35
P2.1.4 Low-alloy steel, heat-treated, Rm 1190 N/mm², 350 HB	87	2.50	2.65	2.75	2.85	2.95	3.05	3.15	3.25	3.35
P3.1.1 High-alloy steel and tool steel, annealed, Rm 680 N/mm², 200 HB	130	2.50	2.65	2.75	2.85	2.95	3.05	3.15	3.25	3.35
P3.1.2 High-alloy steel and tool steel, hardened and tempered, Rm 1100 N/mm², 325 HB	87	2.50	2.65	2.75	2.85	2.95	3.05	3.15	3.25	3.35
M1.1.1 Stainless steel, ferritic/martensitic, with machining additives										
M1.1.2 Stainless steel, ferritic/martensitic, annealed, Rm 680 N/mm², 200 HB										
M1.1.3 Stainless steel, ferritic/martensitic, heat-treated, Rm 810 N/mm², 240 HB										
M2.1.1 Stainless steel, austenitic, quenched, 180 HB										
M2.2.1 Duplex steel, high-strength stainless steels										
K1.1.1 Grey cast iron, pearlitic/ferritic, 180 HB										
K1.1.2 Grey cast iron, pearlitic/martensitic, 260 HB										
K1.2.1 Cast iron with spheroidal graphite, ferritic, 160 HB	160	1.25	1.30	1.35	1.45	1.50	1.55	1.60	1.60	1.65
K1.2.2 Cast iron with spheroidal graphite, pearlitic, 250 HB	160	1.25	1.30	1.35	1.45	1.50	1.55	1.60	1.60	1.65
K1.3.1 Malleable cast iron, ferritic, 130 HB										
K1.3.2 Malleable cast iron, pearlitic, 230 HB										
K2.1.1 Vermicular graphite cast iron (GJV)										
K2.2.1 Austenitic-ferritic spheroidal graphite cast iron (ADI)										
N1.1.1 Wrought aluminium alloys, non-hardened, 60 HB										
N1.1.2 Wrought aluminium alloys, hardened, 100 HB										
N2.1.1 Aluminium casting alloys, non-hardened, ≤ 12 % Si, 75 HB										
N2.1.2 Aluminium casting alloys, hardened, ≤ 12 % Si, 90 HB										
N2.1.3 Aluminium casting alloys, non-hardened, > 12 % Si, 130 HB										
N3.1.1 Copper and copper alloys: Free-machining alloy, Pb > 1 %										
N3.1.2 Copper and copper alloys: CuZn, CuSnZn										
N3.1.3 Copper and copper alloys: CuSn, lead-free copper and copper electrolyte										
N4.1.1 Non-metallic materials: Duroplastics, fibre-reinforced plastics										
N4.1.2 Non-metallic materials: Hard rubber, wood, etc.										
N4.1.3 Non-metallic materials: Graphite										
S1.1.1 Heat-resistant alloys, Fe-based, annealed, 200 HB										
S1.1.2 Heat-resistant alloys, Fe-based, hardened, 280 HB										
S1.1.3 Heat-resistant alloys, Ni- or Co-based, annealed, 250 HB										
S1.1.4 Heat-resistant alloys, Ni- or Co-based, hardened, 350 HB										
S1.1.5 Heat-resistant alloys, Ni- or Co-based, cast, 320 HB										
S2.1.1 Titanium alloys, pure titanium, Rm 400 N/mm²										
S2.1.2 Titanium alloys, Alpha and Beta alloys, hardened, Rm 1050 N/mm²										
H1.1.1 Hardened steel, hardened and tempered, < 55 HRC										
H1.1.2 Hardened steel, hardened and tempered, < 60 HRC										
H1.1.3 Hardened steel, hardened and tempered, > 60 HRC										
H2.1.1 Chilled cast iron, 400 HB										
H2.1.2 Chilled cast iron, hardened and tempered, < 55 HRC										

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EWR 500

Machining group	v_c (m/min)	f (mm/rev) with nom. Ø						
		2.97	3.97	4.97	5.97	7.97	9.97	11.97
P1.1.1 Unalloyed steel, annealed, 0.15 % C, Rm 420 N/mm², 125 HB	150	0.05	0.05	0.10	0.15	0.15	0.20	0.25
P1.1.2 Unalloyed steel, heat-treated, 0.15 % C, Rm 420 N/mm², 125 HB	150	0.05	0.05	0.10	0.15	0.15	0.20	0.25
P1.1.3 Unalloyed steel, annealed, 0.45 % C, Rm 640 N/mm², 190 HB	150	0.05	0.05	0.10	0.15	0.15	0.20	0.25
P1.1.4 Unalloyed steel, heat-treated, 0.45 % C, Rm 640 N/mm², 190 HB	150	0.05	0.05	0.10	0.15	0.15	0.20	0.25
P1.1.5 Unalloyed steel, heat-treated, 0.45 % C, Rm 850 N/mm², 250 HB	135	0.05	0.05	0.10	0.15	0.15	0.20	0.25
P1.1.6 Unalloyed steel, annealed, 0.75 % C, Rm 915 N/mm², 270 HB	135	0.05	0.05	0.10	0.15	0.15	0.20	0.25
P1.1.7 Unalloyed steel, heat-treated, 0.75 % C, Rm 1020 N/mm², 300 HB	120	0.05	0.05	0.10	0.15	0.15	0.20	0.25
P2.1.1 Low-alloy steel, annealed, Rm 610 N/mm², 180 HB	150	0.05	0.05	0.10	0.10	0.15	0.20	0.20
P2.1.2 Low-alloy steel, heat-treated, Rm 930 N/mm², 275 HB	150	0.05	0.05	0.10	0.10	0.15	0.20	0.20
P2.1.3 Low-alloy steel, heat-treated, Rm 1020 N/mm², 300 HB	150	0.05	0.05	0.10	0.10	0.15	0.20	0.20
P2.1.4 Low-alloy steel, heat-treated, Rm 1190 N/mm², 350 HB	100	0.05	0.05	0.10	0.10	0.15	0.20	0.20
P3.1.1 High-alloy steel and tool steel, annealed, Rm 680 N/mm², 200 HB	150	0.05	0.05	0.10	0.10	0.15	0.20	0.20
P3.1.2 High-alloy steel and tool steel, hardened and tempered, Rm 1100 N/mm², 325 HB	100	0.05	0.05	0.10	0.10	0.15	0.20	0.20
M1.1.1 Stainless steel, ferritic/martensitic, with machining additives	120	0.05	0.05	0.10	0.10	0.15	0.20	0.20
M1.1.2 Stainless steel, ferritic/martensitic, annealed, Rm 680 N/mm², 200 HB	95	0.05	0.05	0.10	0.10	0.15	0.20	0.20
M1.1.3 Stainless steel, ferritic/martensitic, heat-treated, Rm 810 N/mm², 240 HB	95	0.05	0.05	0.10	0.10	0.15	0.20	0.20
M2.1.1 Stainless steel, austenitic, quenched, 180 HB	120	0.05	0.05	0.05	0.10	0.10	0.15	0.15
M2.2.1 Duplex steel, high-strength stainless steels	75	0.05	0.05	0.05	0.10	0.10	0.15	0.15
K1.1.1 Grey cast iron, pearlitic/ferritic, 180 HB	150	0.05	0.10	0.10	0.15	0.20	0.25	0.25
K1.1.2 Grey cast iron, pearlitic/martensitic, 260 HB	135	0.05	0.10	0.10	0.15	0.20	0.25	0.25
K1.2.1 Cast iron with spheroidal graphite, ferritic, 160 HB	180	0.05	0.10	0.10	0.15	0.20	0.25	0.25
K1.2.2 Cast iron with spheroidal graphite, pearlitic, 250 HB	180	0.05	0.10	0.10	0.15	0.20	0.25	0.25
K1.3.1 Malleable cast iron, ferritic, 130 HB	150	0.05	0.10	0.10	0.15	0.20	0.25	0.25
K1.3.2 Malleable cast iron, pearlitic, 230 HB	135	0.05	0.10	0.10	0.15	0.20	0.25	0.25
K2.1.1 Vermicular graphite cast iron (GJV)	150	0.05	0.10	0.10	0.15	0.20	0.25	0.25
K2.2.1 Austenitic-ferritic spheroidal graphite cast iron (ADI)	115	0.05	0.10	0.10	0.15	0.20	0.25	0.25
N1.1.1 Wrought aluminium alloys, non-hardened, 60 HB	150	0.05	0.05	0.10	0.15	0.15	0.20	0.25
N1.1.2 Wrought aluminium alloys, hardened, 100 HB	150	0.05	0.05	0.10	0.15	0.15	0.20	0.25
N2.1.1 Aluminium casting alloys, non-hardened, ≤ 12 % Si, 75 HB	150	0.05	0.05	0.10	0.15	0.15	0.20	0.25
N2.1.2 Aluminium casting alloys, hardened, ≤ 12 % Si, 90 HB	115	0.05	0.05	0.10	0.15	0.15	0.20	0.25
N2.1.3 Aluminium casting alloys, non-hardened, > 12 % Si, 130 HB	115	0.05	0.05	0.10	0.15	0.15	0.20	0.25
N3.1.1 Copper and copper alloys: Free-machining alloy, Pb > 1 %	150	0.05	0.05	0.10	0.15	0.15	0.20	0.25
N3.1.2 Copper and copper alloys: CuZn, CuSnZn	150	0.05	0.05	0.10	0.15	0.15	0.20	0.25
N3.1.3 Copper and copper alloys: CuSn, lead-free copper and copper electrolyte	150	0.05	0.05	0.10	0.15	0.15	0.20	0.25
N4.1.1 Non-metallic materials: Duroplastics, fibre-reinforced plastics	150	0.05	0.05	0.10	0.15	0.15	0.20	0.25
N4.1.2 Non-metallic materials: Hard rubber, wood, etc.	150	0.05	0.05	0.10	0.15	0.15	0.20	0.25
N4.1.3 Non-metallic materials: Graphite	90	0.05	0.05	0.10	0.15	0.15	0.20	0.25
S1.1.1 Heat-resistant alloys, Fe-based, annealed, 200 HB	100	0.05	0.05	0.10	0.10	0.15	0.20	0.20
S1.1.2 Heat-resistant alloys, Fe-based, hardened, 280 HB	100	0.05	0.05	0.10	0.10	0.15	0.20	0.20
S1.1.3 Heat-resistant alloys, Ni- or Co-based, annealed, 250 HB	100	0.05	0.05	0.10	0.10	0.15	0.20	0.20
S1.1.4 Heat-resistant alloys, Ni- or Co-based, hardened, 350 HB	100	0.05	0.05	0.10	0.10	0.15	0.20	0.20
S1.1.5 Heat-resistant alloys, Ni- or Co-based, cast, 320 HB	100	0.05	0.05	0.10	0.10	0.15	0.20	0.20
S2.1.1 Titanium alloys, pure titanium, Rm 400 N/mm²	100	0.05	0.05	0.10	0.10	0.15	0.20	0.20
S2.1.2 Titanium alloys, Alpha and Beta alloys, hardened, Rm 1050 N/mm²	100	0.05	0.05	0.10	0.10	0.15	0.20	0.20
H1.1.1 Hardened steel, hardened and tempered, < 55 HRC								
H1.1.2 Hardened steel, hardened and tempered, < 60 HRC								
H1.1.3 Hardened steel, hardened and tempered, > 60 HRC								
H2.1.1 Chilled cast iron, 400 HB								
H2.1.2 Chilled cast iron, hardened and tempered, < 55 HRC								

All the values stated are guide values. You can find detailed cutting values online in our Gühring Navigator at webnavigator.guehring.de/en

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