GÜHRING

New Products and Additions
General Catalogue Edition 01

2025/01

New products

Edition 2025/01 to the General Catalogue Edition 01

new

ExclusiveLine micro-precision drill XL

High-performance micro drill for drilling depths up to 30xD

new

Solid carbide drill RT 100 U Micro

Micro-precision drill for maximum performance and cost-effectiveness

new

Solid carbide drill RT 100 AL Micro

Specialist for micro drilling in aluminum and non-ferrous metals

new

Solid carbide three-fluted drill FT 200 U

High feed drilling for reduced cycle times

new

Solid carbide drill RT 100 InoxPro

Drilling specialist for deep holes in stainless steels

new

Step drill RT 100 U

Simple & quick tapping size holes with 90° deburring

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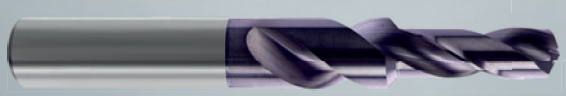

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new

BT 800 interchangeable head drill

Modular system for quick head changes & high cost-effectiveness

new

Indexable insert drill

50 % longer tool lives thanks to carbide & coating

new

EB 100 M STEEL solid carbide single-fluted deep hole drill

High-performance deep hole drilling in steel

new

EB 80 CROSS brazed single-fluted deep hole drill

Robust & flexible for precise, deep cross holes

new

Short shank tools

Designed for machining on micro-machining centres

new

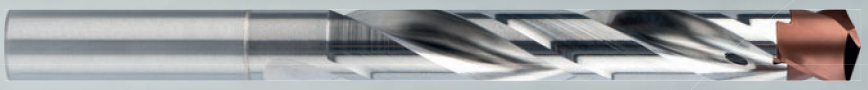
Solid carbide milling cutter RF 100 Sharp

Our sharpest milling cutter – now with corner radius

new

Solid carbide milling cutter RF 100 AL

For perfect surfaces in aluminium and plastics



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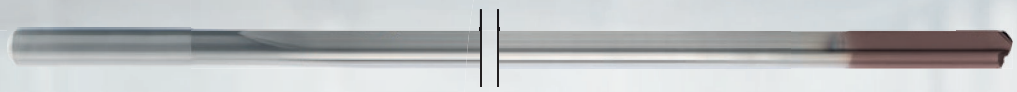

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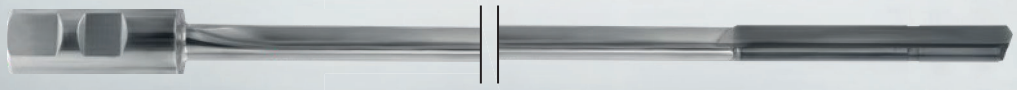

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new

Energy tap

The thread specialist for the energy sector

new

XF fluteless tap

Our material specialist for dimensionally accurate threads in steel

new

SC-TM-Z SP thread milling cutter

A complete thread in just two passes

new

High-performance reamer HR 500

Up to 50x faster than conventional reamers

new

Solid carbide deburring milling cutter EW 100 VR

Front and back deburrers with 90° chamfer angle

new

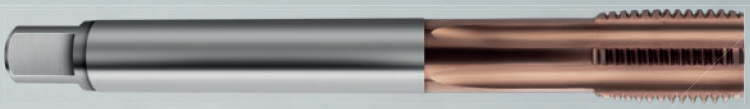
GÜHROSync tapping chuck

Innovative clamping technology especially for thread tapping and forming

new

208 grooving system

Process-reliable parting off in confined spaces



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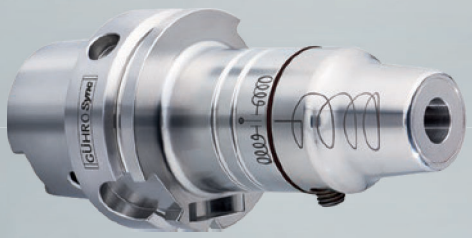

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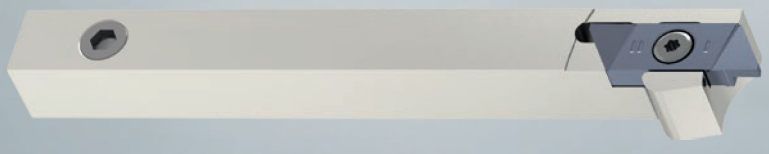

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New solutions for
your machining tasks

GÜHRING

Drilling tools

Precision knows no limits

Powerful innovations for special requirements

GÜHRING

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●	○	●	○	○	○		NEW	8xD	HA	FT 200 U	VHM	F	4.000 - 16.000	6591	28
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Drill head BT 800															
●	○	○	○	○	○		NEW			BT 800	VHM	F	10.000 - 26.000	8162	50
●	○	○					NEW			BT 800	VHM	PS	10.000 - 26.000	8163	52
Mounting key BT 800															
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P	M	K	N	S	H	Tool illustration		Drilling depth	Shank form	Type	Tool material	Surface	d1/mm	Article no.	Page
Indexable insert drills with internal cooling															
							+Ø	2xD	ISO 9766	GMD		Ni	14.000 - 60.000	28500	58
							+Ø	3xD	ISO 9766	GMD		Ni	14.000 - 60.000	28501	60
							+Ø	4xD	ISO 9766	GMD		Ni	14.000 - 60.000	28502	62
							+Ø	5xD	ISO 9766	GMD		Ni	14.000 - 60.000	28503	64
Indexable inserts SOLX, single-sided, peripheral															
•		•					+Ø			SOLX	VHM			28504	66
	•			•			+Ø			SOLX	VHM			28505	66
Indexable inserts XOLX, single-sided, central															
•		•					+Ø			XOLX	VHM			28508	67
	•			•			+Ø			XOLX	VHM			28509	67
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•	○	○	○	○	○		NEW	20xD	HA	EB 100 M STEEL	VHM	Y	2.000 - 12.000	6091	72
•	○	○	○	○	○		NEW	30xD	HA	EB 100 M STEEL	VHM	Y	2.000 - 12.000	6092	73
•	○	○	○	○	○		NEW	40xD	HA	EB 100 M STEEL	VHM	Y	2.000 - 10.319	6093	74
•	○	○	○	○	○		NEW	60xD	HA	EB 100 M STEEL	VHM	Y	2.000 - 7.144	6094	75
•	○	○	○	○	○		NEW	80xD	HA	EB 100 M STEEL	VHM	Y	2.000 - 5.556	6095	76
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•	•	○	○	○	○		NEW	GL 200	HB	EB 80 CROSS	HM	A	3.000 - 10.000	9190	80
•	•	○	○	○	○		NEW	GL 300	HB	EB 80 CROSS	HM	A	3.000 - 14.000	9191	80
•	•	○	○	○	○		NEW	GL 400	HB	EB 80 CROSS	HM	A	3.000 - 18.000	9192	81
•	•	○	○	○	○		NEW	GL 600	HB	EB 80 CROSS	HM	A	3.000 - 20.000	9193	82
•	•	○	○	○	○		NEW	GL 800	HB	EB 80 CROSS	HM	A	3.000 - 20.000	9194	83
•	•	○	○	○	○		NEW	GL 1000	HB	EB 80 CROSS	HM	A	3.000 - 20.000	9195	84
•	•	○	○	○	○		NEW	GL 1200	HB	EB 80 CROSS	HM	A	3.000 - 20.000	9196	85
•	•	○	○	○	○		NEW	GL 1400	HB	EB 80 CROSS	HM	A	4.000 - 20.000	9197	86
•	•	○	○	○	○		NEW	GL 1600	HB	EB 80 CROSS	HM	A	4.000 - 20.000	9198	87

ExclusiveLine
micro-precision drill XL

30xD deep hole drilling to the highest standard

The tool that raises the bar

The internally cooled 30xD twist drill from the Gühring ExclusiveLine is designed for deep hole drilling from a diameter of 1.0 mm.

It has been specially developed for universal applications with drilling depths up to 30xD in long-chipping and short-chipping materials. The tool's geometry is designed for reliable chip removal. We have achieved this thanks to an optimised point and flute profile geometry, double margin and a polished flute.

The HiPIMS Ferrox tip coating with an extra smooth surface reduces friction and supports consistently high performance for universal use.

The integrated internal cooling ensures effective heat dissipation at the cutting edge and contributes to process reliability and tool life stability.

x **Machining time** reduced by up to 40%
x **Tool life** increased by more than 100 parts

- X Drilling up to 30xD with standard tools available from stock
- X Significantly shorter machining times
- X Universal application in almost all long- and short-chipping materials

Tip coating
with Ferrox HiPIMS coating

High stability
thanks to double margin

30xD available in diameter range
Ø 1.00 – 3.00 mm

Optimal chip removal
thanks to reinforced core and polished flute

Application example

Component:	Nozzle, 42CrMo4+QT	
Tool:	#6494, Ø 1.3 mm, 30xD	
Customer target:	Precise & clean holes with high process reliability & longer tool life	
Difficulty:	Chip removal with increased parameters	
Cutting data:	**Gühring** v_c 80 m/min **n** 19,588 rpm **f** 0.039 mm/rev	**Competition** v_c 60 m/min **n** 14,691 rpm **f** 0.03 mm/rev
Tool life:	1,100 components	< 1,000 components

ExclusiveLine micro-precision drills XL with coolant ducts

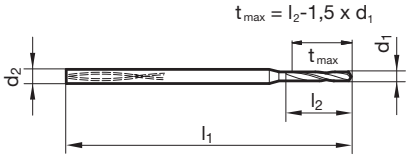
Article no. **6494**

cutting data see page 88

P	M	K	N	S	H
●	●	●	○	○	

NEW · VHM · A · N · 30xD · WN · 135° · h7 · R · HA

facet point grind • main cutting edge form straight • with main cutting edge preparation



Article no.	6494

d1 mm	d2 h6 mm	l1 mm	l2 mm	Order no.
1.000	3.0	70.0	33.0	6494 1.000
1.050	3.0	70.0	34.7	6494 1.050
1.100	3.0	70.0	36.3	6494 1.100
1.150	3.0	76.0	38.0	6494 1.150
1.190	3.0	76.0	39.3	6494 1.190
1.200	3.0	76.0	39.6	6494 1.200
1.250	3.0	76.0	41.3	6494 1.250
1.300	3.0	76.0	42.9	6494 1.300
1.350	3.0	83.0	44.6	6494 1.350
1.400	4.0	86.0	46.2	6494 1.400
1.450	4.0	86.0	47.9	6494 1.450
1.500	4.0	86.0	49.5	6494 1.500
1.550	4.0	86.0	51.2	6494 1.550
1.590	4.0	86.0	52.5	6494 1.590
1.600	4.0	86.0	52.8	6494 1.600
1.650	4.0	86.0	54.5	6494 1.650
1.700	4.0	99.0	56.1	6494 1.700
1.750	4.0	99.0	57.8	6494 1.750
1.800	4.0	99.0	59.4	6494 1.800
1.850	4.0	99.0	61.1	6494 1.850
1.900	4.0	99.0	62.7	6494 1.900
1.950	4.0	99.0	64.4	6494 1.950
1.980	4.0	99.0	65.4	6494 1.980
2.000	4.0	99.0	66.0	6494 2.000

Article no.	6494

d1 mm	d2 h6 mm	l1 mm	l2 mm	Order no.
2.050	4.0	99.0	67.7	6494 2.050
2.100	4.0	116.0	69.3	6494 2.100
2.150	4.0	116.0	71.0	6494 2.150
2.200	4.0	116.0	72.6	6494 2.200
2.250	4.0	116.0	74.3	6494 2.250
2.300	4.0	116.0	75.9	6494 2.300
2.320	4.0	116.0	76.6	6494 2.320
2.350	4.0	116.0	77.6	6494 2.350
2.380	4.0	116.0	78.6	6494 2.380
2.400	4.0	116.0	79.2	6494 2.400
2.450	4.0	116.0	80.9	6494 2.450
2.500	4.0	116.0	82.5	6494 2.500
2.550	4.0	116.0	84.2	6494 2.550
2.600	4.0	132.0	85.8	6494 2.600
2.650	4.0	132.0	87.5	6494 2.650
2.700	4.0	132.0	89.1	6494 2.700
2.750	4.0	132.0	90.8	6494 2.750
2.780	4.0	132.0	91.8	6494 2.780
2.800	4.0	132.0	92.4	6494 2.800
2.850	4.0	132.0	94.1	6494 2.850
2.900	4.0	132.0	95.7	6494 2.900
2.950	4.0	132.0	97.4	6494 2.950
3.000	4.0	132.0	99.0	6494 3.000

Micro-precision drills with coolant ducts

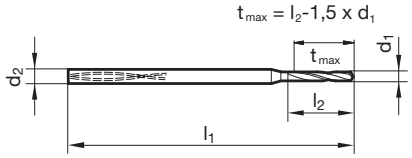
Article no. **6497**

cutting data see page 91

P	M	K	N	S	H
●	○	●	○	○	

NEW · VHM · A · RT 100 U · 5xD · WN · 140° · h7 · R · HA

Web thinning ≥ Ø 1,000 • facet point grind • main cutting edge form straight



Article no. **6497**

d1 mm	d2 h6 mm	l1 mm	l2 mm	Order no.
1.000	3.0	48.0	8.0	6497 1.000
1.020	3.0	48.0	8.5	6497 1.020
1.050	3.0	48.0	8.5	6497 1.050
1.100	3.0	48.0	9.0	6497 1.100
1.150	3.0	48.0	9.5	6497 1.150
1.180	3.0	48.0	9.5	6497 1.180
1.190	3.0	48.0	9.5	6497 1.190
1.200	3.0	48.0	10.0	6497 1.200
1.250	3.0	48.0	10.0	6497 1.250
1.280	3.0	48.0	10.5	6497 1.280
1.300	3.0	48.0	10.5	6497 1.300
1.350	3.0	48.0	11.0	6497 1.350
1.400	4.0	52.0	11.0	6497 1.400
1.450	4.0	52.0	12.0	6497 1.450
1.500	4.0	52.0	12.0	6497 1.500
1.550	4.0	52.0	12.0	6497 1.550
1.590	4.0	52.0	13.0	6497 1.590
1.600	4.0	52.0	13.0	6497 1.600
1.650	4.0	52.0	13.0	6497 1.650
1.700	4.0	56.0	14.0	6497 1.700
1.750	4.0	56.0	14.0	6497 1.750
1.800	4.0	56.0	14.0	6497 1.800
1.850	4.0	56.0	15.0	6497 1.850
1.900	4.0	56.0	15.0	6497 1.900
1.950	4.0	56.0	16.0	6497 1.950
1.980	4.0	56.0	16.0	6497 1.980
2.000	4.0	56.0	16.0	6497 2.000
2.050	4.0	56.0	16.0	6497 2.050
2.100	4.0	62.0	17.0	6497 2.100
2.150	4.0	62.0	17.0	6497 2.150

Article no. **6497**

d1 mm	d2 h6 mm	l1 mm	l2 mm	Order no.
2.200	4.0	62.0	18.0	6497 2.200
2.250	4.0	62.0	18.0	6497 2.250
2.300	4.0	62.0	18.0	6497 2.300
2.320	4.0	62.0	19.0	6497 2.320
2.350	4.0	62.0	19.0	6497 2.350
2.380	4.0	62.0	19.0	6497 2.380
2.400	4.0	62.0	19.0	6497 2.400
2.450	4.0	62.0	20.0	6497 2.450
2.500	4.0	62.0	20.0	6497 2.500
2.550	4.0	62.0	20.0	6497 2.550
2.600	4.0	66.0	21.0	6497 2.600
2.650	4.0	66.0	21.0	6497 2.650
2.700	4.0	66.0	22.0	6497 2.700
2.750	4.0	66.0	22.0	6497 2.750
2.780	4.0	66.0	22.0	6497 2.780
2.800	4.0	66.0	22.0	6497 2.800
2.850	4.0	66.0	23.0	6497 2.850
2.900	4.0	66.0	23.0	6497 2.900
2.950	4.0	66.0	24.0	6497 2.950
3.000	4.0	66.0	24.0	6497 3.000

ExclusiveLine micro-precision drills without coolant ducts short shank

Article no. **6161**

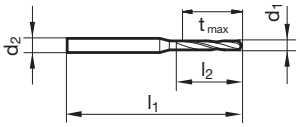
cutting data see page 89

P	M	K	N	S	H
●	●	●	○	○	

NEW | VHM | A | N | 4xD | WN | 140° | m7 | R | Cyl

facet point grind • main cutting edge form straight • ground cutting edge preparation

$t_{max} = l_2 - 1{,}5 \times d_1$



Article no.	6161

d1 mm	d2 h6 mm	l1 mm	l2 mm	Order no.
0.500	3.0	32.0	3.0	6161 0.500
0.550	3.0	32.0	3.3	6161 0.550
0.600	3.0	32.0	3.6	6161 0.600
0.650	3.0	32.0	3.9	6161 0.650
0.700	3.0	32.0	4.2	6161 0.700
0.750	3.0	32.0	4.5	6161 0.750
0.800	3.0	32.0	4.8	6161 0.800
0.850	3.0	32.0	5.1	6161 0.850
0.900	3.0	32.0	5.4	6161 0.900
0.950	3.0	32.0	5.7	6161 0.950
1.000	3.0	32.0	6.0	6161 1.000
1.050	3.0	32.0	6.3	6161 1.050
1.100	3.0	32.0	6.6	6161 1.100
1.150	3.0	32.0	6.9	6161 1.150
1.200	3.0	32.0	7.2	6161 1.200
1.250	3.0	35.0	7.5	6161 1.250
1.300	3.0	35.0	7.8	6161 1.300
1.350	3.0	35.0	8.1	6161 1.350
1.400	3.0	35.0	8.4	6161 1.400
1.450	3.0	35.0	8.7	6161 1.450
1.500	3.0	35.0	9.0	6161 1.500
1.550	3.0	35.0	9.3	6161 1.550
1.590	3.0	35.0	9.6	6161 1.590
1.600	3.0	35.0	9.6	6161 1.600
1.650	3.0	35.0	9.9	6161 1.650
1.700	3.0	35.0	10.2	6161 1.700
1.750	3.0	35.0	10.5	6161 1.750
1.800	3.0	35.0	10.8	6161 1.800
1.850	3.0	35.0	11.1	6161 1.850
1.900	3.0	35.0	11.4	6161 1.900

Article no.	6161

d1 mm	d2 h6 mm	l1 mm	l2 mm	Order no.
1.950	3.0	35.0	11.7	6161 1.950
1.980	4.0	39.0	12.0	6161 1.980
2.000	4.0	39.0	12.0	6161 2.000
2.050	4.0	39.0	12.3	6161 2.050
2.100	4.0	39.0	12.6	6161 2.100
2.150	4.0	39.0	12.9	6161 2.150
2.200	4.0	39.0	13.2	6161 2.200
2.250	4.0	39.0	13.5	6161 2.250
2.300	4.0	39.0	13.8	6161 2.300
2.350	4.0	39.0	14.1	6161 2.350
2.380	4.0	39.0	14.4	6161 2.380
2.400	4.0	39.0	14.4	6161 2.400
2.450	4.0	39.0	14.7	6161 2.450
2.500	4.0	42.0	15.0	6161 2.500
2.550	4.0	42.0	15.3	6161 2.550
2.600	4.0	42.0	15.6	6161 2.600
2.650	4.0	42.0	15.9	6161 2.650
2.700	4.0	42.0	16.2	6161 2.700
2.750	4.0	42.0	16.5	6161 2.750
2.780	4.0	42.0	16.8	6161 2.780
2.800	4.0	42.0	16.8	6161 2.800
2.850	4.0	42.0	17.1	6161 2.850
2.900	4.0	42.0	17.4	6161 2.900
2.950	4.0	42.0	17.7	6161 2.950
3.000	4.0	42.0	18.0	6161 3.000

ExclusiveLine micro-precision drills without coolant ducts short shank

Article no. **6162**

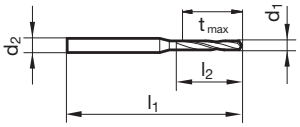
cutting data see page 90

P	M	K	N	S	H
●	●	●	○	○	

NEW · VHM · A · N · 7xD · WN · 140° · m7 · R · Cyl

facet point grind • main cutting edge form straight • ground cutting edge preparation

$t_{max} = l_2 - 1{,}5 \times d_1$



d1 mm	d2 h6 mm	l1 mm	l2 mm	Article no. 6162 Order no.
0.500	3.0	32.0	4.0	6162 0.500
0.550	3.0	32.0	4.4	6162 0.550
0.600	3.0	32.0	4.8	6162 0.600
0.650	3.0	32.0	5.2	6162 0.650
0.700	3.0	32.0	5.6	6162 0.700
0.750	3.0	32.0	6.0	6162 0.750
0.800	3.0	32.0	6.4	6162 0.800
0.850	3.0	35.0	6.8	6162 0.850
0.900	3.0	35.0	7.2	6162 0.900
0.950	3.0	35.0	7.6	6162 0.950
1.000	3.0	35.0	8.0	6162 1.000
1.050	3.0	35.0	8.4	6162 1.050
1.100	3.0	35.0	8.8	6162 1.100
1.150	3.0	35.0	9.2	6162 1.150
1.200	3.0	39.0	10.8	6162 1.200
1.250	3.0	39.0	11.3	6162 1.250
1.300	3.0	39.0	11.7	6162 1.300
1.350	3.0	39.0	12.2	6162 1.350
1.400	3.0	39.0	12.6	6162 1.400
1.450	3.0	39.0	13.1	6162 1.450
1.500	3.0	39.0	13.5	6162 1.500
1.550	3.0	39.0	14.0	6162 1.550
1.590	3.0	39.0	14.4	6162 1.590
1.600	3.0	39.0	14.4	6162 1.600
1.650	3.0	39.0	14.9	6162 1.650
1.700	3.0	42.0	15.3	6162 1.700
1.750	3.0	42.0	15.8	6162 1.750
1.800	3.0	42.0	16.2	6162 1.800
1.850	3.0	42.0	16.7	6162 1.850
1.900	3.0	42.0	17.1	6162 1.900

d1 mm	d2 h6 mm	l1 mm	l2 mm	Article no. 6162 Order no.
1.950	3.0	42.0	17.6	6162 1.950
1.980	4.0	46.0	18.0	6162 1.980
2.000	4.0	46.0	18.0	6162 2.000
2.050	4.0	46.0	18.5	6162 2.050
2.100	4.0	46.0	18.9	6162 2.100
2.150	4.0	46.0	19.4	6162 2.150
2.200	4.0	46.0	19.8	6162 2.200
2.250	4.0	46.0	20.3	6162 2.250
2.300	4.0	46.0	20.7	6162 2.300
2.350	4.0	46.0	21.2	6162 2.350
2.380	4.0	46.0	21.6	6162 2.380
2.400	4.0	46.0	21.6	6162 2.400
2.450	4.0	49.0	22.1	6162 2.450
2.500	4.0	49.0	22.5	6162 2.500
2.550	4.0	49.0	23.0	6162 2.550
2.600	4.0	49.0	23.4	6162 2.600
2.650	4.0	49.0	23.9	6162 2.650
2.700	4.0	49.0	24.3	6162 2.700
2.750	4.0	49.0	24.8	6162 2.750
2.780	4.0	49.0	25.2	6162 2.780
2.800	4.0	49.0	25.2	6162 2.800
2.850	4.0	52.0	25.7	6162 2.850
2.900	4.0	52.0	26.1	6162 2.900
2.950	4.0	52.0	26.6	6162 2.950
3.000	4.0	52.0	27.0	6162 3.000

RT 100 AL Micro

Material specialist for aluminium & non-ferrous metals

Process reliability & efficiency in everything from lead-free to high-strength

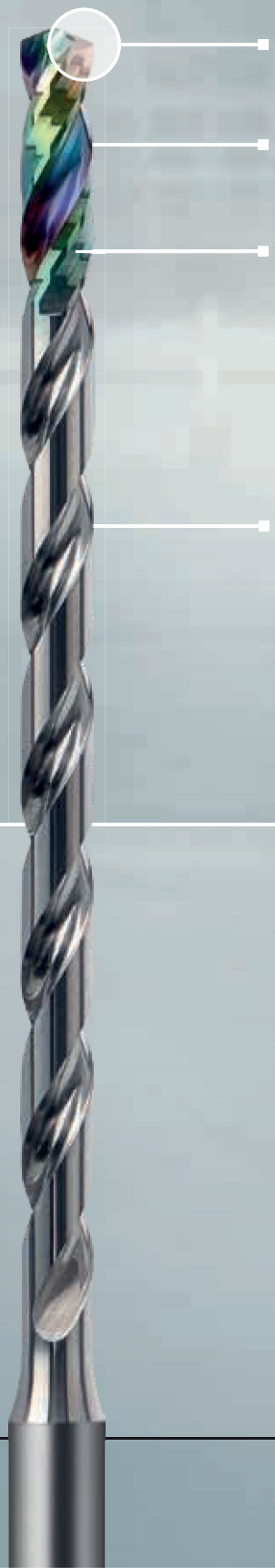
The RT 100 AL Micro raises the bar when it comes to high-performance machining of ISO-N materials.

Thanks to its innovative flute profile geometry, the micro-precision drill ensures controlled chip breakage at drilling depths of up to 15xD – even in tough and strong materials. The double margin ensures maximum running smoothness and stability, while the integrated internal cooling ensures effective heat dissipation directly at the cutting edge while the large chip space facilitates optimal chip removal. Another highlight is the ultra-thin Carbo+ coating: Specially developed for non-ferrous metals, this high-end coating reduces material adhesion to a minimum and ensures consistently high performance - even under the most demanding conditions.

x **Tool life** increased 3-times over

x **2.5x faster** per hole

- X Significantly shorter machining times
- X Process reliability in ISO-N materials thanks to optimised chip formation & chip removal
- X Helps to deliver maximum possible tool lives in aluminium and non-ferrous metals



Web thinning & flute profile optimised
for short chips

Innovative Carbo+ coating
minimises material adhesion

Double margin
for maximum stability

available in diameter range
Ø 0.5 – 3.0 (6xD) with and without internal cooling,
Ø 1.0 – 3.0 (10xD and 15xD) with internal cooling

Application example

Component:	Pneumatic manifold block, AlMgSi1	
Tool:	#8528, Ø 1.8mm, 10xD	
Customer target:	Reduced burr development, faster machining, longer tool lives	
Difficulty:	Chips are too long and tend to jam in competitors' tools	
Cutting data:	**Gühring** v_c 68 m/min **n** 12,000 rpm **f** 0.03 – 0.08 mm/rev	**Competition** v_c 68 m/min **n** 12,000 rpm **f** 0.03 – 0.08 mm/rev
Tool life:	3.000 min	800 min

Micro-precision drills without coolant ducts

Article no. **8525**

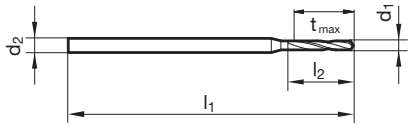
cutting data see page 92

NEW | VHM | Cb+ | RT 100 AL | 6xD | WN | 140° | m7 | R | HA

P	M	K	N	S	H
			●		

Web thinning ≥ Ø 0,500 • facet point grind • main cutting edge form concave • optimised cutting edge geometry
• Recommended use: For very soft ISO-N materials, pecking with steps of 0.50xD-1.00xD

$t_{max} = l_2\text{-}1{,}5 \times d_1$



Article no.	8525

d1 mm	d2 h6 mm	l1 mm	l2 mm	Order no.
0.500	3.0	38.0	4.5	8525 0.500
0.550	3.0	38.0	5.0	8525 0.550
0.600	3.0	38.0	5.4	8525 0.600
0.650	3.0	38.0	5.9	8525 0.650
0.660	3.0	38.0	6.0	8525 0.660
0.700	3.0	38.0	6.3	8525 0.700
0.740	3.0	38.0	6.7	8525 0.740
0.750	3.0	38.0	6.8	8525 0.750
0.790	3.0	38.0	7.2	8525 0.790
0.800	3.0	38.0	7.2	8525 0.800
0.820	3.0	38.0	7.4	8525 0.820
0.850	3.0	38.0	7.7	8525 0.850
0.900	3.0	38.0	8.1	8525 0.900
0.950	3.0	38.0	8.6	8525 0.950
1.000	3.0	48.0	9.0	8525 1.000
1.050	3.0	48.0	9.5	8525 1.050
1.100	3.0	48.0	9.9	8525 1.100
1.150	3.0	48.0	10.4	8525 1.150
1.190	3.0	48.0	10.8	8525 1.190
1.200	3.0	51.0	10.8	8525 1.200
1.250	3.0	51.0	11.3	8525 1.250
1.300	3.0	51.0	11.7	8525 1.300
1.350	3.0	51.0	12.2	8525 1.350
1.400	4.0	56.0	12.6	8525 1.400
1.450	4.0	56.0	13.1	8525 1.450
1.500	4.0	56.0	13.5	8525 1.500
1.550	4.0	56.0	14.0	8525 1.550
1.590	4.0	56.0	14.4	8525 1.590
1.600	4.0	56.0	14.4	8525 1.600
1.650	4.0	56.0	14.9	8525 1.650
1.700	4.0	61.0	15.3	8525 1.700
1.750	4.0	61.0	15.8	8525 1.750
1.800	4.0	61.0	16.2	8525 1.800
1.850	4.0	61.0	16.7	8525 1.850
1.900	4.0	61.0	17.1	8525 1.900
1.950	4.0	61.0	17.6	8525 1.950

Article no.	8525

d1 mm	d2 h6 mm	l1 mm	l2 mm	Order no.
1.980	4.0	61.0	17.9	8525 1.980
2.000	4.0	61.0	18.0	8525 2.000
2.050	4.0	61.0	18.5	8525 2.050
2.100	4.0	66.0	18.9	8525 2.100
2.150	4.0	66.0	19.4	8525 2.150
2.200	4.0	66.0	19.8	8525 2.200
2.250	4.0	66.0	20.3	8525 2.250
2.300	4.0	66.0	20.7	8525 2.300
2.320	4.0	66.0	20.9	8525 2.320
2.350	4.0	66.0	21.2	8525 2.350
2.380	4.0	66.0	21.5	8525 2.380
2.400	4.0	66.0	21.6	8525 2.400
2.450	4.0	66.0	22.1	8525 2.450
2.500	4.0	66.0	22.5	8525 2.500
2.550	4.0	66.0	23.0	8525 2.550
2.600	4.0	67.0	23.4	8525 2.600
2.650	4.0	67.0	23.9	8525 2.650
2.700	4.0	67.0	24.3	8525 2.700
2.750	4.0	67.0	24.8	8525 2.750
2.780	4.0	67.0	25.1	8525 2.780
2.800	4.0	67.0	25.2	8525 2.800
2.850	4.0	67.0	25.7	8525 2.850
2.900	4.0	67.0	26.1	8525 2.900
2.950	4.0	67.0	26.6	8525 2.950
3.000	4.0	67.0	27.0	8525 3.000

Micro-precision drills with coolant ducts

Article no. **8526**

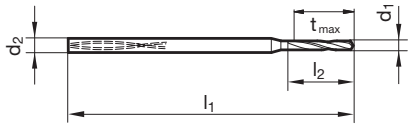
cutting data see page 92

P	M	K	N	S	H
			•		

NEW · VHM · Cb+ · RT 100 AL · 6xD · WN · 140° · m7 · R · HA

Web thinning ≥ Ø 1,000 • facet point grind • main cutting edge form concave • optimised cutting edge geometry • Recommended use: For very soft ISO-N materials, pecking with steps of 0.50xD-1.00xD

$t_{max} = l_2\text{-}1{,}5 \times d_1$



Article no.	8526

d1 mm	d2 h6 mm	l1 mm	l2 mm	Order no.
1.000	3.0	48.0	9.0	8526 1.000
1.050	3.0	48.0	9.5	8526 1.050
1.100	3.0	48.0	9.9	8526 1.100
1.150	3.0	48.0	10.4	8526 1.150
1.190	3.0	48.0	10.8	8526 1.190
1.200	3.0	51.0	10.8	8526 1.200
1.250	3.0	51.0	11.3	8526 1.250
1.300	3.0	51.0	11.7	8526 1.300
1.350	3.0	51.0	12.2	8526 1.350
1.400	4.0	56.0	12.6	8526 1.400
1.450	4.0	56.0	13.1	8526 1.450
1.500	4.0	56.0	13.5	8526 1.500
1.550	4.0	56.0	14.0	8526 1.550
1.590	4.0	56.0	14.4	8526 1.590
1.600	4.0	56.0	14.4	8526 1.600
1.650	4.0	56.0	14.9	8526 1.650
1.700	4.0	61.0	15.3	8526 1.700
1.750	4.0	61.0	15.8	8526 1.750
1.800	4.0	61.0	16.2	8526 1.800
1.850	4.0	61.0	16.7	8526 1.850
1.900	4.0	61.0	17.1	8526 1.900
1.950	4.0	61.0	17.6	8526 1.950
1.980	4.0	61.0	17.9	8526 1.980
2.000	4.0	61.0	18.0	8526 2.000

Article no.	8526

d1 mm	d2 h6 mm	l1 mm	l2 mm	Order no.
2.050	4.0	61.0	18.5	8526 2.050
2.100	4.0	66.0	18.9	8526 2.100
2.150	4.0	66.0	19.4	8526 2.150
2.200	4.0	66.0	19.8	8526 2.200
2.250	4.0	66.0	20.3	8526 2.250
2.300	4.0	66.0	20.7	8526 2.300
2.320	4.0	66.0	20.9	8526 2.320
2.350	4.0	66.0	21.2	8526 2.350
2.380	4.0	66.0	21.5	8526 2.380
2.400	4.0	66.0	21.6	8526 2.400
2.450	4.0	66.0	22.1	8526 2.450
2.500	4.0	66.0	22.5	8526 2.500
2.550	4.0	66.0	23.0	8526 2.550
2.600	4.0	71.0	23.4	8526 2.600
2.650	4.0	71.0	23.9	8526 2.650
2.700	4.0	71.0	24.3	8526 2.700
2.750	4.0	71.0	24.8	8526 2.750
2.780	4.0	71.0	25.1	8526 2.780
2.800	4.0	71.0	25.2	8526 2.800
2.850	4.0	71.0	25.7	8526 2.850
2.900	4.0	71.0	26.1	8526 2.900
2.950	4.0	71.0	26.6	8526 2.950
3.000	4.0	71.0	27.0	8526 3.000

Micro-precision drills with coolant ducts

Article no. **8527**

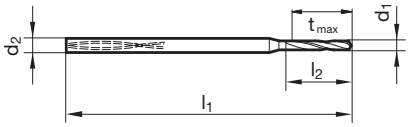
cutting data see page 93

P	M	K	N	S	H
			●		

NEW · VHM · Cb+ · RT 100 AL · 10xD · WN · 135° · h7 · R · HA

Web thinning ≥ Ø 1,000 • facet point grind • main cutting edge form concave • optimised cutting edge geometry • Recommended use: For very soft ISO-N materials, pecking with steps of 0.50xD-1.00xD

$t_{max} = l_2\text{-}1{,}5 \times d_1$



Article no.	8527

d1 mm	d2 h6 mm	l1 mm	l2 mm	Order no.
1.000	3.0	48.0	13.0	8527 1.000
1.050	3.0	48.0	13.7	8527 1.050
1.100	3.0	48.0	14.3	8527 1.100
1.150	3.0	48.0	15.0	8527 1.150
1.190	3.0	48.0	15.5	8527 1.190
1.200	3.0	51.0	15.6	8527 1.200
1.250	3.0	51.0	16.3	8527 1.250
1.300	3.0	51.0	16.9	8527 1.300
1.350	3.0	51.0	17.6	8527 1.350
1.400	4.0	56.0	18.2	8527 1.400
1.450	4.0	56.0	18.9	8527 1.450
1.500	4.0	56.0	19.5	8527 1.500
1.550	4.0	56.0	20.2	8527 1.550
1.590	4.0	56.0	20.7	8527 1.590
1.600	4.0	56.0	20.8	8527 1.600
1.650	4.0	56.0	21.5	8527 1.650
1.700	4.0	61.0	22.1	8527 1.700
1.750	4.0	61.0	22.8	8527 1.750
1.800	4.0	61.0	23.4	8527 1.800
1.850	4.0	61.0	24.1	8527 1.850
1.900	4.0	61.0	24.7	8527 1.900
1.950	4.0	61.0	25.4	8527 1.950
1.980	4.0	61.0	25.8	8527 1.980
2.000	4.0	61.0	26.0	8527 2.000

Article no.	8527

d1 mm	d2 h6 mm	l1 mm	l2 mm	Order no.
2.050	4.0	61.0	26.7	8527 2.050
2.100	4.0	66.0	27.3	8527 2.100
2.150	4.0	66.0	28.0	8527 2.150
2.200	4.0	66.0	28.6	8527 2.200
2.250	4.0	66.0	29.3	8527 2.250
2.300	4.0	66.0	29.9	8527 2.300
2.320	4.0	66.0	30.2	8527 2.320
2.350	4.0	66.0	30.6	8527 2.350
2.380	4.0	66.0	31.0	8527 2.380
2.400	4.0	66.0	31.2	8527 2.400
2.450	4.0	66.0	31.9	8527 2.450
2.500	4.0	66.0	32.5	8527 2.500
2.550	4.0	66.0	33.2	8527 2.550
2.600	4.0	71.0	33.8	8527 2.600
2.650	4.0	71.0	34.5	8527 2.650
2.700	4.0	71.0	35.1	8527 2.700
2.750	4.0	71.0	35.8	8527 2.750
2.780	4.0	71.0	36.2	8527 2.780
2.800	4.0	71.0	36.4	8527 2.800
2.850	4.0	71.0	37.1	8527 2.850
2.900	4.0	71.0	37.7	8527 2.900
2.950	4.0	71.0	38.4	8527 2.950
3.000	4.0	71.0	39.0	8527 3.000

Micro-precision drills with coolant ducts

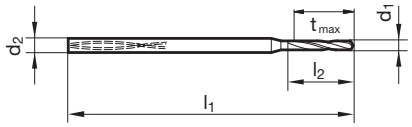
Article no. **8528**

cutting data see page 93

P	M	K	N	S	H
			•		

Web thinning ≥ Ø 1,000 • facet point grind • main cutting edge form concave • optimised cutting edge geometry • Recommended use: For very soft ISO-N materials, pecking with steps of 0.50xD-1.00xD

$t_{max} = l_2\text{-}1{,}5 \times d_1$



Article no.	8528

d1 mm	d2 h6 mm	l1 mm	l2 mm	Order no.
1.000	3.0	54.0	18.0	8528 1.000
1.050	3.0	54.0	18.9	8528 1.050
1.100	3.0	54.0	19.8	8528 1.100
1.150	3.0	54.0	20.7	8528 1.150
1.190	3.0	54.0	21.5	8528 1.190
1.200	3.0	58.0	21.6	8528 1.200
1.250	3.0	58.0	22.5	8528 1.250
1.300	3.0	58.0	23.4	8528 1.300
1.350	3.0	58.0	24.3	8528 1.350
1.400	4.0	64.0	25.2	8528 1.400
1.450	4.0	64.0	26.1	8528 1.450
1.500	4.0	64.0	27.0	8528 1.500
1.550	4.0	64.0	27.9	8528 1.550
1.590	4.0	64.0	28.7	8528 1.590
1.600	4.0	64.0	28.8	8528 1.600
1.650	4.0	64.0	29.7	8528 1.650
1.700	4.0	71.0	30.6	8528 1.700
1.750	4.0	71.0	31.5	8528 1.750
1.800	4.0	71.0	32.4	8528 1.800
1.850	4.0	71.0	33.3	8528 1.850
1.900	4.0	71.0	34.2	8528 1.900
1.950	4.0	71.0	35.1	8528 1.950
1.980	4.0	71.0	35.7	8528 1.980
2.000	4.0	71.0	36.0	8528 2.000

Article no.	8528

d1 mm	d2 h6 mm	l1 mm	l2 mm	Order no.
2.050	4.0	71.0	36.9	8528 2.050
2.100	4.0	79.0	37.8	8528 2.100
2.150	4.0	79.0	38.7	8528 2.150
2.200	4.0	79.0	39.6	8528 2.200
2.250	4.0	79.0	40.5	8528 2.250
2.300	4.0	79.0	41.4	8528 2.300
2.320	4.0	79.0	41.8	8528 2.320
2.350	4.0	79.0	42.3	8528 2.350
2.380	4.0	79.0	42.9	8528 2.380
2.400	4.0	79.0	43.2	8528 2.400
2.450	4.0	79.0	44.1	8528 2.450
2.500	4.0	79.0	45.0	8528 2.500
2.550	4.0	79.0	45.9	8528 2.550
2.600	4.0	87.0	46.8	8528 2.600
2.650	4.0	87.0	47.7	8528 2.650
2.700	4.0	87.0	48.6	8528 2.700
2.750	4.0	87.0	49.5	8528 2.750
2.780	4.0	87.0	50.1	8528 2.780
2.800	4.0	87.0	50.4	8528 2.800
2.850	4.0	87.0	51.3	8528 2.850
2.900	4.0	87.0	52.2	8528 2.900
2.950	4.0	87.0	53.1	8528 2.950
3.000	4.0	87.0	54.0	8528 3.000

FT 200 U

Maximum feed rates & top quality drilling results

High feed drill for reduced cycle times.

The 3-fluted FT 200 U solid carbide drill enables cost-efficient drilling up to and including 12xD without a prior piloting process.

Thanks to its pyramid tip properties combined with the in-house designed web thinning, it is able to achieve precise self centering and perfect material penetration. Thanks to the specially developed Spiropoint grind, the point angle is shaped like a funnel and enables high-precision spot drilling. The FT 200 U isable to achieve optimal chips with its modified flute profile that curls chips tightly and breaks them reliably. In combination with a sickle-shaped cutting edge, the hardening in the edge area and the material stress is significantly reduced.

x **Tool life** increased by more than 20 %

x **efficient drilling** up to 12xD, without piloting

- X Precise self-centring thanks to innovative tip geometry
- X Maximum possible hole quality on the component with simultaneously high tool lives
- X Cost-efficient machining thanks to high cutting data

3-fluted
Spiropoint tip

3 guide lands

Premium surfaces
on fluting, web thinning and drill point

Available in the diameter range
3xD, 5xD Ø 4.0 – 20.0 mm
8xD, 12xD Ø 4.0 – 16.0 mm

Application example

Component:	Transmission bell housing (truck), steel S355 J2G4	
Tool:	#6591, Ø 9.5 mm, 8xD	
Customer target:	Better performance than competitor's 3-fluted tool	
Difficulty:	Curved hole exit on component	
Cutting data:	**Gühring**	**Competition**
	v_c 90 m/min **f** 0.5 mm/rev	v_c 90 m/min **f** 0.5 mm/rev
Tool life:	17 parts	14 parts

Ratio drills with coolant ducts, 3-fluted

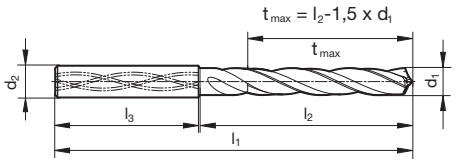
Article no. **6591**

cutting data see page 94

P	M	K	N	S	H
●	○	●	○	○	○

NEW · VHM · F · FT 200 U · 8xD · WN · 130° · m7 · R · HA

spiropoint grind • optimal centering • drilling without piloting • maximum performance



Article no. **6591**

d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	Order no.
4.000		6.0	91.0	51.0	36.0	6591 4.000
4.100		6.0	91.0	51.0	36.0	6591 4.100
4.200		6.0	91.0	51.0	36.0	6591 4.200
4.300		6.0	91.0	51.0	36.0	6591 4.300
4.370	11/64	6.0	91.0	51.0	36.0	6591 4.370
4.400		6.0	91.0	51.0	36.0	6591 4.400
4.500		6.0	91.0	51.0	36.0	6591 4.500
4.600		6.0	96.0	56.0	36.0	6591 4.600
4.700		6.0	96.0	56.0	36.0	6591 4.700
4.760	3/16	6.0	96.0	56.0	36.0	6591 4.760
4.800		6.0	96.0	56.0	36.0	6591 4.800
4.900		6.0	96.0	56.0	36.0	6591 4.900
5.000		6.0	96.0	56.0	36.0	6591 5.000
5.100		6.0	101.0	61.0	36.0	6591 5.100
5.160	13/64	6.0	101.0	61.0	36.0	6591 5.160
5.200		6.0	101.0	61.0	36.0	6591 5.200
5.300		6.0	101.0	61.0	36.0	6591 5.300
5.400		6.0	101.0	61.0	36.0	6591 5.400
5.500		6.0	101.0	61.0	36.0	6591 5.500
5.560	7/32	6.0	106.0	66.0	36.0	6591 5.560
5.600		6.0	106.0	66.0	36.0	6591 5.600
5.700		6.0	106.0	66.0	36.0	6591 5.700
5.800		6.0	106.0	66.0	36.0	6591 5.800
5.900		6.0	106.0	66.0	36.0	6591 5.900
5.950	15/64	6.0	106.0	66.0	36.0	6591 5.950
6.000		6.0	106.0	66.0	36.0	6591 6.000
6.100		8.0	126.0	86.0	36.0	6591 6.100
6.200		8.0	126.0	86.0	36.0	6591 6.200
6.300		8.0	126.0	86.0	36.0	6591 6.300
6.350	1/4	8.0	126.0	86.0	36.0	6591 6.350
6.400		8.0	126.0	86.0	36.0	6591 6.400
6.500		8.0	126.0	86.0	36.0	6591 6.500
6.600		8.0	126.0	86.0	36.0	6591 6.600
6.700		8.0	126.0	86.0	36.0	6591 6.700
6.750	17/64	8.0	126.0	86.0	36.0	6591 6.750
6.800		8.0	126.0	86.0	36.0	6591 6.800
6.900		8.0	126.0	86.0	36.0	6591 6.900
7.000		8.0	126.0	86.0	36.0	6591 7.000
7.100		8.0	126.0	86.0	36.0	6591 7.100
7.140	9/32	8.0	126.0	86.0	36.0	6591 7.140
7.200		8.0	126.0	86.0	36.0	6591 7.200
7.300		8.0	126.0	86.0	36.0	6591 7.300
7.400		8.0	126.0	86.0	36.0	6591 7.400
7.500		8.0	126.0	86.0	36.0	6591 7.500
7.540	19/64	8.0	126.0	86.0	36.0	6591 7.540
7.600		8.0	126.0	86.0	36.0	6591 7.600
7.700		8.0	126.0	86.0	36.0	6591 7.700
7.800		8.0	126.0	86.0	36.0	6591 7.800
7.900		8.0	126.0	86.0	36.0	6591 7.900
7.940	5/16	8.0	126.0	86.0	36.0	6591 7.940
8.000		8.0	126.0	86.0	36.0	6591 8.000
8.100		10.0	150.0	106.0	40.0	6591 8.100
8.200		10.0	150.0	106.0	40.0	6591 8.200
8.300		10.0	150.0	106.0	40.0	6591 8.300
8.330	21/64	10.0	150.0	106.0	40.0	6591 8.330
8.400		10.0	150.0	106.0	40.0	6591 8.400
8.500		10.0	150.0	106.0	40.0	6591 8.500
8.600		10.0	150.0	106.0	40.0	6591 8.600
8.700		10.0	150.0	106.0	40.0	6591 8.700
8.730	11/32	10.0	150.0	106.0	40.0	6591 8.730

Article no. **6591**

d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	Order no.
8.800		10.0	150.0	106.0	40.0	6591 8.800
8.900		10.0	150.0	106.0	40.0	6591 8.900
9.000		10.0	150.0	106.0	40.0	6591 9.000
9.100		10.0	150.0	106.0	40.0	6591 9.100
9.130	23/64	10.0	150.0	106.0	40.0	6591 9.130
9.200		10.0	150.0	106.0	40.0	6591 9.200
9.300		10.0	150.0	106.0	40.0	6591 9.300
9.400		10.0	150.0	106.0	40.0	6591 9.400
9.500		10.0	150.0	106.0	40.0	6591 9.500
9.520	3/8	10.0	150.0	106.0	40.0	6591 9.520
9.600		10.0	150.0	106.0	40.0	6591 9.600
9.700		10.0	150.0	106.0	40.0	6591 9.700
9.800		10.0	150.0	106.0	40.0	6591 9.800
9.900		10.0	150.0	106.0	40.0	6591 9.900
9.920	25/64	10.0	150.0	106.0	40.0	6591 9.920
10.000		10.0	150.0	106.0	40.0	6591 10.000
10.100		12.0	175.0	126.0	45.0	6591 10.100
10.200		12.0	175.0	126.0	45.0	6591 10.200
10.300		12.0	175.0	126.0	45.0	6591 10.300
10.320	13/32	12.0	175.0	126.0	45.0	6591 10.320
10.400		12.0	175.0	126.0	45.0	6591 10.400
10.500		12.0	175.0	126.0	45.0	6591 10.500
10.600		12.0	175.0	126.0	45.0	6591 10.600
10.700		12.0	175.0	126.0	45.0	6591 10.700
10.720	27/64	12.0	175.0	126.0	45.0	6591 10.720
10.800		12.0	175.0	126.0	45.0	6591 10.800
10.900		12.0	175.0	126.0	45.0	6591 10.900
11.000		12.0	175.0	126.0	45.0	6591 11.000
11.100		12.0	175.0	126.0	45.0	6591 11.100
11.110	7/16	12.0	175.0	126.0	45.0	6591 11.110
11.200		12.0	175.0	126.0	45.0	6591 11.200
11.300		12.0	175.0	126.0	45.0	6591 11.300
11.400		12.0	175.0	126.0	45.0	6591 11.400
11.500		12.0	175.0	126.0	45.0	6591 11.500
11.510	29/64	12.0	175.0	126.0	45.0	6591 11.510
11.600		12.0	175.0	126.0	45.0	6591 11.600
11.700		12.0	175.0	126.0	45.0	6591 11.700
11.800		12.0	175.0	126.0	45.0	6591 11.800
11.900		12.0	175.0	126.0	45.0	6591 11.900
11.910	15/32	12.0	175.0	126.0	45.0	6591 11.910
12.000		12.0	175.0	126.0	45.0	6591 12.000
12.500		14.0	195.0	146.0	45.0	6591 12.500
12.700	1/2	14.0	195.0	146.0	45.0	6591 12.700
13.000		14.0	195.0	146.0	45.0	6591 13.000
13.500		14.0	195.0	146.0	45.0	6591 13.500
14.000		14.0	195.0	146.0	45.0	6591 14.000
14.500		16.0	218.0	166.0	48.0	6591 14.500
15.000		16.0	218.0	166.0	48.0	6591 15.000
15.500		16.0	218.0	166.0	48.0	6591 15.500
16.000		16.0	218.0	166.0	48.0	6591 16.000

Ratio drills with coolant ducts, 3-fluted

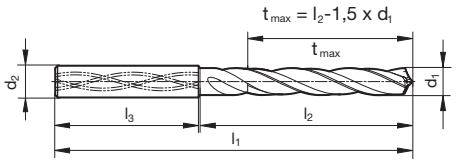
Article no. **6592**

cutting data see page 95

P	M	K	N	S	H
●	○	●	○	○	○

NEW · VHM · F · FT 200 U · 12xD · WN · 130° · h7 · R · HA

spiropoint grind • optimal centering • drilling without piloting • maximum performance



Article no. **6592**

d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	Order no.
4.000		6.0	109.0	69.0	36.0	6592 4.000
4.100		6.0	109.0	69.0	36.0	6592 4.100
4.200		6.0	109.0	69.0	36.0	6592 4.200
4.300		6.0	109.0	69.0	36.0	6592 4.300
4.370	11/64	6.0	109.0	69.0	36.0	6592 4.370
4.400		6.0	109.0	69.0	36.0	6592 4.400
4.500		6.0	109.0	69.0	36.0	6592 4.500
4.600		6.0	116.0	76.0	36.0	6592 4.600
4.700		6.0	116.0	76.0	36.0	6592 4.700
4.760	3/16	6.0	116.0	76.0	36.0	6592 4.760
4.800		6.0	116.0	76.0	36.0	6592 4.800
4.900		6.0	116.0	76.0	36.0	6592 4.900
5.000		6.0	116.0	76.0	36.0	6592 5.000
5.100		6.0	123.0	83.0	36.0	6592 5.100
5.160	13/64	6.0	123.0	83.0	36.0	6592 5.160
5.200		6.0	123.0	83.0	36.0	6592 5.200
5.300		6.0	123.0	83.0	36.0	6592 5.300
5.400		6.0	123.0	83.0	36.0	6592 5.400
5.500		6.0	123.0	83.0	36.0	6592 5.500
5.560	7/32	6.0	130.0	90.0	36.0	6592 5.560
5.600		6.0	130.0	90.0	36.0	6592 5.600
5.700		6.0	130.0	90.0	36.0	6592 5.700
5.800		6.0	130.0	90.0	36.0	6592 5.800
5.900		6.0	130.0	90.0	36.0	6592 5.900
5.950	15/64	6.0	130.0	90.0	36.0	6592 5.950
6.000		6.0	130.0	90.0	36.0	6592 6.000
6.100		8.0	158.0	118.0	36.0	6592 6.100
6.200		8.0	158.0	118.0	36.0	6592 6.200
6.300		8.0	158.0	118.0	36.0	6592 6.300
6.350	1/4	8.0	158.0	118.0	36.0	6592 6.350
6.400		8.0	158.0	118.0	36.0	6592 6.400
6.500		8.0	158.0	118.0	36.0	6592 6.500
6.600		8.0	158.0	118.0	36.0	6592 6.600
6.700		8.0	158.0	118.0	36.0	6592 6.700
6.750	17/64	8.0	158.0	118.0	36.0	6592 6.750
6.800		8.0	158.0	118.0	36.0	6592 6.800
6.900		8.0	158.0	118.0	36.0	6592 6.900
7.000		8.0	158.0	118.0	36.0	6592 7.000
7.100		8.0	158.0	118.0	36.0	6592 7.100
7.140	9/32	8.0	158.0	118.0	36.0	6592 7.140
7.200		8.0	158.0	118.0	36.0	6592 7.200
7.300		8.0	158.0	118.0	36.0	6592 7.300
7.400		8.0	158.0	118.0	36.0	6592 7.400
7.500		8.0	158.0	118.0	36.0	6592 7.500
7.540	19/64	8.0	158.0	118.0	36.0	6592 7.540
7.600		8.0	158.0	118.0	36.0	6592 7.600
7.700		8.0	158.0	118.0	36.0	6592 7.700
7.800		8.0	158.0	118.0	36.0	6592 7.800
7.900		8.0	158.0	118.0	36.0	6592 7.900
7.940	5/16	8.0	158.0	118.0	36.0	6592 7.940
8.000		8.0	158.0	118.0	36.0	6592 8.000
8.100		10.0	190.0	146.0	40.0	6592 8.100
8.200		10.0	190.0	146.0	40.0	6592 8.200
8.300		10.0	190.0	146.0	40.0	6592 8.300
8.330	21/64	10.0	190.0	146.0	40.0	6592 8.330
8.400		10.0	190.0	146.0	40.0	6592 8.400
8.500		10.0	190.0	146.0	40.0	6592 8.500
8.600		10.0	190.0	146.0	40.0	6592 8.600
8.700		10.0	190.0	146.0	40.0	6592 8.700
8.730	11/32	10.0	190.0	146.0	40.0	6592 8.730

Article no. **6592**

d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	Order no.
8.800		10.0	190.0	146.0	40.0	6592 8.800
8.900		10.0	190.0	146.0	40.0	6592 8.900
9.000		10.0	190.0	146.0	40.0	6592 9.000
9.100		10.0	190.0	146.0	40.0	6592 9.100
9.130	23/64	10.0	190.0	146.0	40.0	6592 9.130
9.200		10.0	190.0	146.0	40.0	6592 9.200
9.300		10.0	190.0	146.0	40.0	6592 9.300
9.400		10.0	190.0	146.0	40.0	6592 9.400
9.500		10.0	190.0	146.0	40.0	6592 9.500
9.520	3/8	10.0	190.0	146.0	40.0	6592 9.520
9.600		10.0	190.0	146.0	40.0	6592 9.600
9.700		10.0	190.0	146.0	40.0	6592 9.700
9.800		10.0	190.0	146.0	40.0	6592 9.800
9.900		10.0	190.0	146.0	40.0	6592 9.900
9.920	25/64	10.0	190.0	146.0	40.0	6592 9.920
10.000		10.0	190.0	146.0	40.0	6592 10.000
10.100		12.0	223.0	174.0	45.0	6592 10.100
10.200		12.0	223.0	174.0	45.0	6592 10.200
10.300		12.0	223.0	174.0	45.0	6592 10.300
10.320	13/32	12.0	223.0	174.0	45.0	6592 10.320
10.400		12.0	223.0	174.0	45.0	6592 10.400
10.500		12.0	223.0	174.0	45.0	6592 10.500
10.600		12.0	223.0	174.0	45.0	6592 10.600
10.700		12.0	223.0	174.0	45.0	6592 10.700
10.720	27/64	12.0	223.0	174.0	45.0	6592 10.720
10.800		12.0	223.0	174.0	45.0	6592 10.800
10.900		12.0	223.0	174.0	45.0	6592 10.900
11.000		12.0	223.0	174.0	45.0	6592 11.000
11.100		12.0	223.0	174.0	45.0	6592 11.100
11.110	7/16	12.0	223.0	174.0	45.0	6592 11.110
11.200		12.0	223.0	174.0	45.0	6592 11.200
11.300		12.0	223.0	174.0	45.0	6592 11.300
11.400		12.0	223.0	174.0	45.0	6592 11.400
11.500		12.0	223.0	174.0	45.0	6592 11.500
11.510	29/64	12.0	223.0	174.0	45.0	6592 11.510
11.600		12.0	223.0	174.0	45.0	6592 11.600
11.700		12.0	223.0	174.0	45.0	6592 11.700
11.800		12.0	223.0	174.0	45.0	6592 11.800
11.900		12.0	223.0	174.0	45.0	6592 11.900
11.910	15/32	12.0	223.0	174.0	45.0	6592 11.910
12.000		12.0	223.0	174.0	45.0	6592 12.000
12.500		14.0	251.0	202.0	45.0	6592 12.500
12.700	1/2	14.0	251.0	202.0	45.0	6592 12.700
13.000		14.0	251.0	202.0	45.0	6592 13.000
13.500		14.0	251.0	202.0	45.0	6592 13.500
14.000		14.0	251.0	202.0	45.0	6592 14.000
14.500		16.0	282.0	230.0	48.0	6592 14.500
15.000		16.0	282.0	230.0	48.0	6592 15.000
15.500		16.0	282.0	230.0	48.0	6592 15.500
16.000		16.0	282.0	230.0	48.0	6592 16.000

RT 100 InoxPro

Maximum productivity in INOX

The drilling specialist for stainless steels

The RT 100 InoxPro is our high-performance drilling specialist for deep holes in stainless steels and titanium alloys.

Our solid carbide drill delivers its exceptional performance thanks to its combination of carbide, geometry and coating specially tailored to this material group. Its special cutting edge profile, flute profile with tapered core and innovative drill point help to ensure extremely long tool lives. In addition, the premium treatment on the cutting edges combined with the Perrox tip coating guarantee ideal protection against wear. An adapted carbide grade also prevents cutting edge chipping.

x **Tool life** increased by over 300 %

x **Process time** reduced by 33 %

- X Outstanding performance in ISO material groups M and S
- X Process-reliable even with deep holes up to 12xD
- X Maximum surface quality on functional surfaces for perfect chip flow

Sickel-shaped cutting edge
for optimum chip formation

Ultra-smooth Perrox coating
for maximum wear protection

Premium surfaces in the flute
for best possible chip removal

Carbide with improved combination of hardness-toughness

Application example

Component:	Drive roller, X8CrNiS18-9 (1,4305)	
Tool:	#8518, Ø 10.8 mm, 10xD	
Customer target:	Increased process reliability	
Difficulty:	Risk of chip jams due to long, tough chips	
Cutting data:	**Gühring** v_c 70 m/min **f** 0.18 mm/rev	**Competition** v_c 60 m/min **f** 0.14 mm/rev
Tool life:	148 m	36 m

Ratio drills with coolant ducts

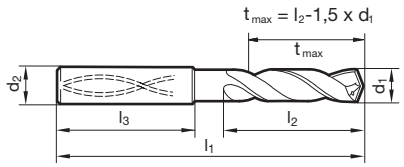
Article no. **8518**

cutting data see page 96

P	M	K	N	S	H
○	●			●	

NEW · VHM · INOX PRO · 12xD · WN · 135° · h7 · HA

maximum performance • optimised cutting edge geometry • main cutting edge is slightly concave • exceptional hole quality • pilot drilling required



Article no. **8518**

d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	Order no.
3.000		6.0	95.0	55.0	36.0	8518 3.000
3.100		6.0	95.0	55.0	36.0	8518 3.100
3.170	1/8	6.0	95.0	55.0	36.0	8518 3.170
3.200		6.0	95.0	55.0	36.0	8518 3.200
3.300		6.0	95.0	55.0	36.0	8518 3.300
3.400		6.0	95.0	55.0	36.0	8518 3.400
3.500		6.0	102.0	62.0	36.0	8518 3.500
3.570	9/64	6.0	102.0	62.0	36.0	8518 3.570
3.600		6.0	102.0	62.0	36.0	8518 3.600
3.700		6.0	102.0	62.0	36.0	8518 3.700
3.800		6.0	102.0	62.0	36.0	8518 3.800
3.900		6.0	102.0	62.0	36.0	8518 3.900
3.970	5/32	6.0	102.0	62.0	36.0	8518 3.970
4.000		6.0	102.0	62.0	36.0	8518 4.000
4.100		6.0	109.0	69.0	36.0	8518 4.100
4.200		6.0	109.0	69.0	36.0	8518 4.200
4.300		6.0	109.0	69.0	36.0	8518 4.300
4.370	11/64	6.0	109.0	69.0	36.0	8518 4.370
4.400		6.0	109.0	69.0	36.0	8518 4.400
4.500		6.0	116.0	76.0	36.0	8518 4.500
4.600		6.0	116.0	76.0	36.0	8518 4.600
4.700		6.0	116.0	76.0	36.0	8518 4.700
4.760	3/16	6.0	116.0	76.0	36.0	8518 4.760
4.800		6.0	116.0	76.0	36.0	8518 4.800
4.900		6.0	116.0	76.0	36.0	8518 4.900
5.000		6.0	116.0	76.0	36.0	8518 5.000
5.100		6.0	123.0	83.0	36.0	8518 5.100
5.160	13/64	6.0	123.0	83.0	36.0	8518 5.160
5.200		6.0	123.0	83.0	36.0	8518 5.200
5.300		6.0	123.0	83.0	36.0	8518 5.300
5.400		6.0	123.0	83.0	36.0	8518 5.400
5.500		6.0	130.0	90.0	36.0	8518 5.500
5.560	7/32	6.0	130.0	90.0	36.0	8518 5.560
5.600		6.0	130.0	90.0	36.0	8518 5.600
5.700		6.0	130.0	90.0	36.0	8518 5.700
5.800		6.0	130.0	90.0	36.0	8518 5.800
5.900		6.0	130.0	90.0	36.0	8518 5.900
5.950	15/64	6.0	130.0	90.0	36.0	8518 5.950
6.000		6.0	130.0	90.0	36.0	8518 6.000
6.100		8.0	158.0	118.0	36.0	8518 6.100
6.200		8.0	158.0	118.0	36.0	8518 6.200
6.300		8.0	158.0	118.0	36.0	8518 6.300
6.350	1/4	8.0	158.0	118.0	36.0	8518 6.350
6.400		8.0	158.0	118.0	36.0	8518 6.400
6.500		8.0	158.0	118.0	36.0	8518 6.500
6.600		8.0	158.0	118.0	36.0	8518 6.600
6.700		8.0	158.0	118.0	36.0	8518 6.700
6.750	17/64	8.0	158.0	118.0	36.0	8518 6.750
6.800		8.0	158.0	118.0	36.0	8518 6.800
6.900		8.0	158.0	118.0	36.0	8518 6.900
7.000		8.0	158.0	118.0	36.0	8518 7.000
7.100		8.0	158.0	118.0	36.0	8518 7.100
7.140	9/32	8.0	158.0	118.0	36.0	8518 7.140
7.200		8.0	158.0	118.0	36.0	8518 7.200
7.300		8.0	158.0	118.0	36.0	8518 7.300
7.400		8.0	158.0	118.0	36.0	8518 7.400
7.500		8.0	158.0	118.0	36.0	8518 7.500
7.540	19/64	8.0	158.0	118.0	36.0	8518 7.540
7.600		8.0	158.0	118.0	36.0	8518 7.600
7.700		8.0	158.0	118.0	36.0	8518 7.700
7.800		8.0	158.0	118.0	36.0	8518 7.800
7.900		8.0	158.0	118.0	36.0	8518 7.900
7.940	5/16	8.0	158.0	118.0	36.0	8518 7.940
8.000		8.0	158.0	118.0	36.0	8518 8.000
8.100		10.0	190.0	146.0	40.0	8518 8.100
8.200		10.0	190.0	146.0	40.0	8518 8.200

Article no. **8518**

d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	Order no.
8.300		10.0	190.0	146.0	40.0	8518 8.300
8.330	21/64	10.0	190.0	146.0	40.0	8518 8.330
8.400		10.0	190.0	146.0	40.0	8518 8.400
8.500		10.0	190.0	146.0	40.0	8518 8.500
8.600		10.0	190.0	146.0	40.0	8518 8.600
8.700		10.0	190.0	146.0	40.0	8518 8.700
8.730	11/32	10.0	190.0	146.0	40.0	8518 8.730
8.800		10.0	190.0	146.0	40.0	8518 8.800
8.900		10.0	190.0	146.0	40.0	8518 8.900
9.000		10.0	190.0	146.0	40.0	8518 9.000
9.100		10.0	190.0	146.0	40.0	8518 9.100
9.130	23/64	10.0	190.0	146.0	40.0	8518 9.130
9.200		10.0	190.0	146.0	40.0	8518 9.200
9.300		10.0	190.0	146.0	40.0	8518 9.300
9.400		10.0	190.0	146.0	40.0	8518 9.400
9.500		10.0	190.0	146.0	40.0	8518 9.500
9.520	3/8	10.0	190.0	146.0	40.0	8518 9.520
9.600		10.0	190.0	146.0	40.0	8518 9.600
9.700		10.0	190.0	146.0	40.0	8518 9.700
9.800		10.0	190.0	146.0	40.0	8518 9.800
9.900		10.0	190.0	146.0	40.0	8518 9.900
9.920	25/64	10.0	190.0	146.0	40.0	8518 9.920
10.000		10.0	190.0	146.0	40.0	8518 10.000
10.100		12.0	223.0	174.0	45.0	8518 10.100
10.200		12.0	223.0	174.0	45.0	8518 10.200
10.300		12.0	223.0	174.0	45.0	8518 10.300
10.320	13/32	12.0	223.0	174.0	45.0	8518 10.320
10.400		12.0	223.0	174.0	45.0	8518 10.400
10.500		12.0	223.0	174.0	45.0	8518 10.500
10.600		12.0	223.0	174.0	45.0	8518 10.600
10.700		12.0	223.0	174.0	45.0	8518 10.700
10.800		12.0	223.0	174.0	45.0	8518 10.800
10.900		12.0	223.0	174.0	45.0	8518 10.900
11.000		12.0	223.0	174.0	45.0	8518 11.000
11.100		12.0	223.0	174.0	45.0	8518 11.100
11.110	7/16	12.0	223.0	174.0	45.0	8518 11.110
11.200		12.0	223.0	174.0	45.0	8518 11.200
11.300		12.0	223.0	174.0	45.0	8518 11.300
11.400		12.0	223.0	174.0	45.0	8518 11.400
11.500		12.0	223.0	174.0	45.0	8518 11.500
11.600		12.0	223.0	174.0	45.0	8518 11.600
11.700		12.0	223.0	174.0	45.0	8518 11.700
11.800		12.0	223.0	174.0	45.0	8518 11.800
11.900		12.0	223.0	174.0	45.0	8518 11.900
11.910	15/32	12.0	223.0	174.0	45.0	8518 11.910
12.000		12.0	223.0	174.0	45.0	8518 12.000
12.200		14.0	251.0	202.0	45.0	8518 12.200
12.500		14.0	251.0	202.0	45.0	8518 12.500
12.700	1/2	14.0	251.0	202.0	45.0	8518 12.700
13.000		14.0	251.0	202.0	45.0	8518 13.000
13.500		14.0	251.0	202.0	45.0	8518 13.500
14.000		14.0	251.0	202.0	45.0	8518 14.000
14.200		16.0	282.0	230.0	48.0	8518 14.200
14.500		16.0	282.0	230.0	48.0	8518 14.500
15.000		16.0	282.0	230.0	48.0	8518 15.000
15.500		16.0	282.0	230.0	48.0	8518 15.500
15.800		16.0	282.0	230.0	48.0	8518 15.800
16.000		16.0	282.0	230.0	48.0	8518 16.000


NEW
inoxpro

RT 100 U step drill for tapping size holes

Core hole drilling & countersinking in one step

Step drill for tapping size holes with 3xD

The cutting edge diameter of the solid carbide RT 100 U step drill is matched to the desired thread - for standard-compliant threads and high process reliability.

This eliminates the need for special drill bits, which increases cost-effectiveness when producing tapping size holes with a 90° countersink.

What is more, you no longer need 90° countersinking tools, thereby reducing tool diversity and the associated costs in manufacturing. In addition, you need fewer spaces in machinery tool magazines. The tool delivers maximum process reliability thanks to tip and flute geometry that has proven successful in the RT 100 U.

x 14 % reduction in **machining time**

x **1 work step less**

- X No more expensive special step drills
- X Tapping size hole and 90° countersink are created in a single work step
- X Universal coating for optimum protection in many materials, especially steel and cast iron
- X Very high surface quality & minimised chatter marks on the component

Proven tip & flute geometry

NanoFire coating
for best possible wear protection

90° step for chamfering
without chatter marks

Available in 3xD for tapping size holes M4, M5, M6, M8, M10, M12, M14, M16
for both fluteless tapping and machine tapping

Application example

Component:	Threaded ring 42CrMo4	
Tool:	#6407, Ø 6.8 mm, tapping size hole for M8 thread	
Customer target:	Process-reliable and economical machining with standard tools	
Difficulty:	Limited tool magazine capacity in the machine	
Cutting data:	**Gühring** v_c 105 m/min **f** 0.2 mm/rev	**Competition** v_c 100 m/min **f** 0.18 mm/rev
Tool life:	3,000 holes	2,800 holes

Step ratio drill with coolant ducts

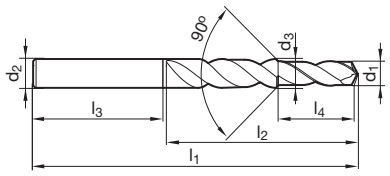
Article no. **6407**

cutting data see page 97

P	M	K	N	S	H
●	○	●	○	○	○

NEW · VHM · F · RT 100 U · 3xD · WN · 140° · m7 · R · HA

90° step drill for tapped core holes 3xD • core hole diameter for thread tapping according to DIN 336 and for fluteless tapping included • facet point grind • main cutting edge form straight • optimised cutting edge geometry • nominal diameter d3 for chamfering and countersinking, not suitable for full drilling



Article no. **6407**

d1 m7 mm	d2 h6 mm	d3 +0,013 mm	l1 mm	l2 mm	l3 mm	l4 mm	for thread	Order no.
3.30	6.000	6.000	66.00	28.00	36.000	11.40	M 4 Cutting	6407 3.300
3.70	6.000	6.000	66.00	28.00	36.000	11.40	M 4 Forming	6407 3.700
4.20	6.000	6.000	66.00	30.00	36.000	13.60	M 5 Cutting	6407 4.200
4.65	6.000	6.000	66.00	30.00	36.000	13.60	M 5 Forming	6407 4.650
5.00	8.000	8.000	79.00	30.00	36.000	16.50	M 6 Cutting	6407 5.000
5.55	8.000	8.000	79.00	30.00	36.000	16.50	M 6 Forming	6407 5.550
6.80	10.000	10.000	89.00	47.00	40.000	21.00	M 8 Cutting	6407 6.800
7.40	10.000	10.000	89.00	47.00	40.000	21.00	M 8 Forming	6407 7.400
8.50	12.000	12.000	102.00	55.00	45.000	25.50	M10 Cutting	6407 8.500
9.30	12.000	12.000	102.00	55.00	45.000	25.50	M10 Forming	6407 9.300
10.20	14.000	14.000	107.00	60.00	45.000	30.00	M12 Cutting	6407 10.200
11.20	14.000	14.000	107.00	60.00	45.000	30.00	M12 Forming	6407 11.200
12.00	16.000	16.000	115.00	65.00	48.000	34.50	M14 Cutting	6407 12.000
13.10	16.000	16.000	115.00	65.00	48.000	34.50	M14 Forming	6407 13.100
14.00	18.000	18.000	123.00	73.00	48.000	38.50	M16 Cutting	6407 14.000
15.10	18.000	18.000	123.00	73.00	48.000	38.50	M16 Forming	6407 15.100


RT
100
U
NEW

BT 800

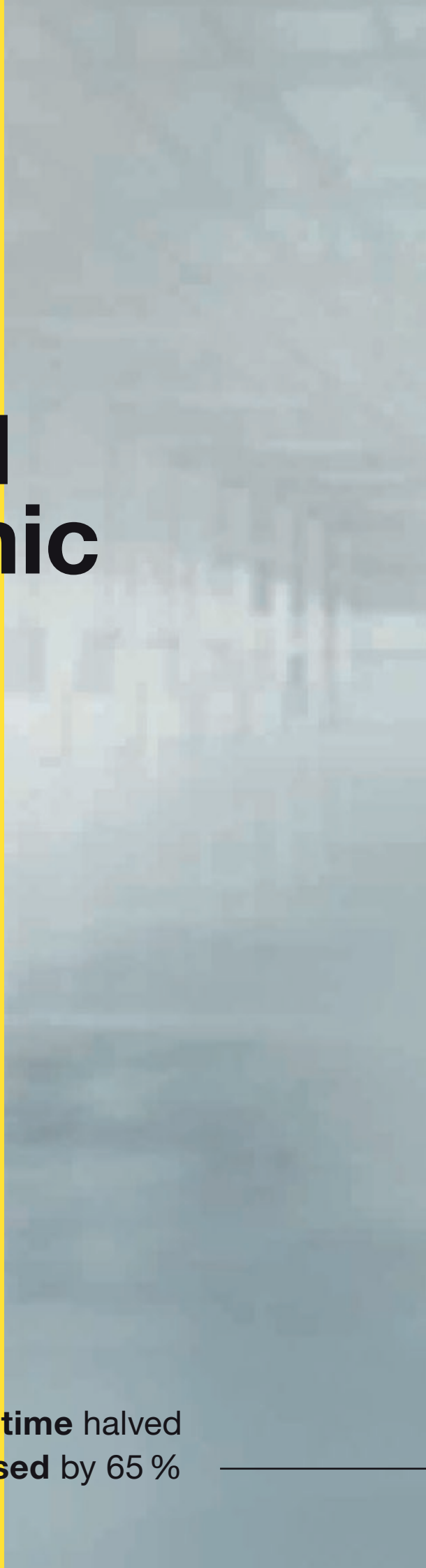
Quick head changes and high economic efficiency

Up to 50 % longer tool life compared to conventional modular drills.

Flexibility & wear resistance: the BT 800 combines the properties of carbide with the advantages of modular tools.

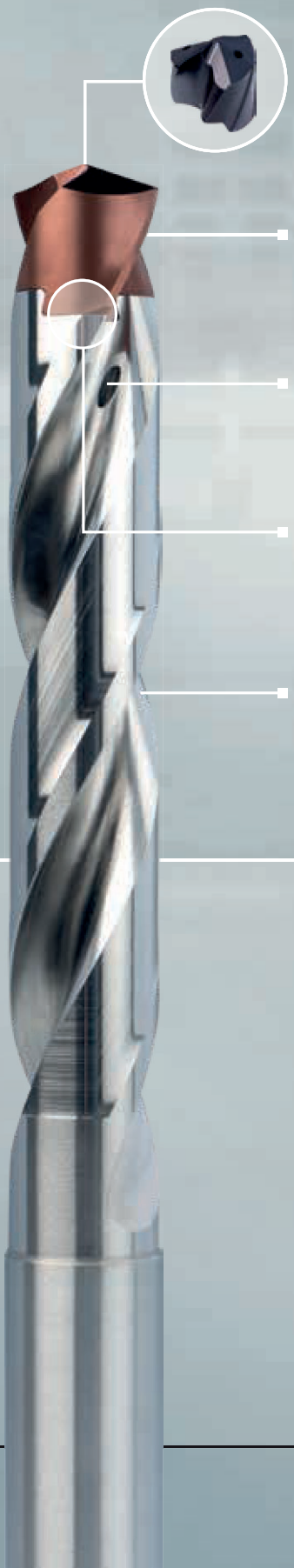
At the heart of the BT 800 is the wear-resistant bayonet connection, which ensures a precise and safe clamping mechanism and impresses with its easy handling, while also enabling quick head changes directly in the machine.

Simple, fast handling combined with a long tool life and high performance make the BT 800 the ideal choice for medium and large diameters. For shorter set-up times and more flexibility.



x **Machining time** halved
x **Tool life increased** by 65 %

- X High flexibility due to the use of different drill heads on a uniform carrier
- X Drill head with solid carbide performance offers an economical alternative to solid carbide drills
- X Minimisation of set-up times thanks to quick head change directly in the machine



Pilot drill head with internal cooling
for 4-way cooling

Drill head with Persistum coating
for steel processing

Coolant ducts with a maximum cross-section
ensure safe chip removal

Precise and secure clamping mechanism

Holder for the drill and pilot head
1.5xD, 3xD, 5xD, 8xD, 12xD;
Ø range 10.0 – 26.0 mm

Application example

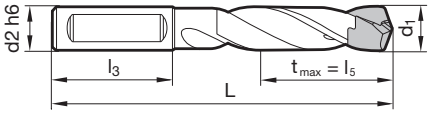
Component:	Ritzel, C45 (1.0503)	
Tool:	Holder #8152 (5xD) & drill head #8163 (Ø10 mm)	
Customer target:	Faster production with consistent levels of quality	
Difficulty:	Risk of head damage due to unsafe handling during assembly and disassembly of the competitor's tool	
Cutting data:	**Gühring**	**Competition**
	v_c 94 m/min **f** 0.32 mm/rev	v_c 54 m/min **f** 0.24 mm/rev
Tool life:	165 parts	100 parts

Drill head holder BT 800

Article no. **8150**

NEW | BT 800 | 1,5xD | WN | R | WN

especially high wear resistance • optimised coolant duct exit • mounting key art. no. 8170 included



Article no.						8150
Holder size	d1	d2 h6 mm	L mm	l3 mm	l5 mm	Order no.
100	10,000-10,499	12.000	82.5	45.0	15.8	8150 10.000
100	10,000-10,499	12.700	82.5	45.0	15.8	8150 10.005
105	10,500-10,999	12.000	84.0	45.0	16.5	8150 10.500
105	10,500-10,999	12.700	84.0	45.0	16.5	8150 10.505
110	11,000-11,499	12.000	85.5	45.0	17.3	8150 11.000
110	11,000-11,499	12.700	85.5	45.0	17.3	8150 11.005
115	11,500-11,999	12.000	87.0	45.0	18.0	8150 11.500
115	11,500-11,999	12.700	87.0	45.0	18.0	8150 11.505
120	12,000-12,499	12.000	88.5	45.0	18.8	8150 12.000
120	12,000-12,499	12.700	88.5	45.0	18.8	8150 12.005
125	12,500-12,999	14.000	90.0	45.0	19.5	8150 12.500
125	12,500-12,999	15.875	93.0	48.0	19.5	8150 12.505
130	13,000-13,499	14.000	91.5	45.0	20.3	8150 13.000
130	13,000-13,499	15.875	94.5	48.0	20.3	8150 13.005
135	13,500-13,999	14.000	93.0	45.0	21.0	8150 13.500
135	13,500-13,999	15.875	96.0	48.0	21.0	8150 13.505
140	14,000-14,499	14.000	94.5	45.0	21.8	8150 14.000
140	14,000-14,499	15.875	97.5	48.0	21.8	8150 14.005
145	14,500-14,999	16.000	99.0	48.0	22.5	8150 14.500
145	14,500-14,999	15.875	99.0	48.0	22.5	8150 14.505
150	15,000-15,499	16.000	100.5	48.0	23.3	8150 15.000
150	15,000-15,499	15.875	100.5	48.0	23.3	8150 15.005
155	15,500-15,999	16.000	102.0	48.0	24.0	8150 15.500
155	15,500-15,999	15.875	102.0	48.0	24.0	8150 15.505
160	16,000-16,499	16.000	103.5	48.0	24.8	8150 16.000
160	16,000-16,499	15.875	103.5	48.0	24.8	8150 16.005
165	16,500-16,999	18.000	105.0	48.0	25.5	8150 16.500
165	16,500-16,999	19.050	107.0	50.0	25.5	8150 16.505
170	17,000-17,499	18.000	106.5	48.0	26.3	8150 17.000
170	17,000-17,499	19.050	108.5	50.0	26.3	8150 17.005
175	17,500-17,999	18.000	108.0	48.0	27.0	8150 17.500
175	17,500-17,999	19.050	110.0	50.0	27.0	8150 17.505
180	18,000-18,499	18.000	109.5	48.0	27.8	8150 18.000
180	18,000-18,499	19.050	111.5	50.0	27.8	8150 18.005
185	18,500-18,999	20.000	113.0	50.0	28.5	8150 18.500
185	18,500-18,999	19.050	113.0	50.0	28.5	8150 18.505
190	19,000-19,499	20.000	114.5	50.0	29.3	8150 19.000
190	19,000-19,499	19.050	114.5	50.0	29.3	8150 19.005
195	19,500-19,999	20.000	116.0	50.0	30.0	8150 19.500
195	19,500-19,999	19.050	116.0	50.0	30.0	8150 19.505
200	20,000-20,499	20.000	117.5	50.0	30.8	8150 20.000
200	20,000-20,499	19.050	117.5	50.0	30.8	8150 20.005
205	20,500-20,999	25.000	129.0	56.0	31.5	8150 20.500
205	20,500-20,999	25.400	129.0	56.0	31.5	8150 20.505
210	21,000-21,499	25.000	130.5	56.0	32.3	8150 21.000
210	21,000-21,499	25.400	130.5	56.0	32.3	8150 21.005
215	21,500-21,999	25.000	131.0	56.0	33.0	8150 21.500
215	21,500-21,999	25.400	131.0	56.0	33.0	8150 21.505
220	22,000-22,499	25.000	132.5	56.0	33.8	8150 22.000
220	22,000-22,499	25.400	132.5	56.0	33.8	8150 22.005
225	22,500-22,999	25.000	133.0	56.0	34.5	8150 22.500
225	22,500-22,999	25.400	133.0	56.0	34.5	8150 22.505
230	23,000-23,499	25.000	134.5	56.0	35.3	8150 23.000
230	23,000-23,499	25.400	134.5	56.0	35.3	8150 23.005
235	23,500-23,999	25.000	134.0	56.0	36.0	8150 23.500
235	23,500-23,999	25.400	134.0	56.0	36.0	8150 23.505
240	24,000-24,499	25.000	135.5	56.0	36.8	8150 24.000
240	24,000-24,499	25.400	135.5	56.0	36.8	8150 24.005
245	24,500-24,999	25.000	137.0	56.0	37.5	8150 24.500
245	24,500-24,999	25.400	137.0	56.0	37.5	8150 24.505

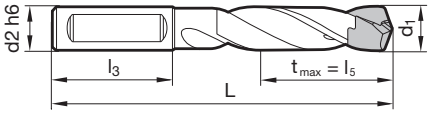
						Article no.	8150
Holder size	d1	d2 h6 mm	L mm	l3 mm	l5 mm	Order no.	
250	25,000-25,499	25.000	138.5	56.0	38.3	8150 25.000	
250	25,000-25,499	25.400	138.5	56.0	38.3	8150 25.005	
255	25,500-25,999	32.000	149.0	60.0	39.0	8150 25.500	
255	25,500-25,999	31.750	149.0	60.0	39.0	8150 25.505	
260	26,000-26,499	32.000	150.5	60.0	39.8	8150 26.000	
260	26,000-26,499	31.750	150.5	60.0	39.8	8150 26.005	

Drill head holder BT 800

Article no. **8151**

NEW | BT 800 | 3xD | WN | R | WN

especially high wear resistance • optimised coolant duct exit • mounting key art. no. 8170 included



Article no. **8151**

Holder size	d1	d2 h6 mm	L mm	l3 mm	l5 mm	Order no.
100	10,000-10,499	12.000	98.2	45.0	31.5	8151 10.000
100	10,000-10,499	12.700	98.2	45.0	31.5	8151 10.005
105	10,500-10,999	12.000	100.5	45.0	33.0	8151 10.500
105	10,500-10,999	12.700	100.5	45.0	33.0	8151 10.505
110	11,000-11,499	12.000	102.7	45.0	34.5	8151 11.000
110	11,000-11,499	12.700	102.7	45.0	34.5	8151 11.005
115	11,500-11,999	12.000	105.0	45.0	36.0	8151 11.500
115	11,500-11,999	12.700	105.0	45.0	36.0	8151 11.505
120	12,000-12,499	12.000	107.2	45.0	37.5	8151 12.000
120	12,000-12,499	12.700	107.2	45.0	37.5	8151 12.005
125	12,500-12,999	14.000	109.5	45.0	39.0	8151 12.500
125	12,500-12,999	15.875	112.5	48.0	39.0	8151 12.505
130	13,000-13,499	14.000	111.7	45.0	40.5	8151 13.000
130	13,000-13,499	15.875	114.7	48.0	40.5	8151 13.005
135	13,500-13,999	14.000	114.0	45.0	42.0	8151 13.500
135	13,500-13,999	15.875	117.0	48.0	42.0	8151 13.505
140	14,000-14,499	14.000	116.2	45.0	43.5	8151 14.000
140	14,000-14,499	15.875	119.2	48.0	43.5	8151 14.005
145	14,500-14,999	16.000	121.5	48.0	45.0	8151 14.500
145	14,500-14,999	15.875	121.5	48.0	45.0	8151 14.505
150	15,000-15,499	16.000	123.7	48.0	46.5	8151 15.000
150	15,000-15,499	15.875	123.7	48.0	46.5	8151 15.005
155	15,500-15,999	16.000	126.0	48.0	48.0	8151 15.500
155	15,500-15,999	15.875	126.0	48.0	48.0	8151 15.505
160	16,000-16,499	16.000	128.2	48.0	49.5	8151 16.000
160	16,000-16,499	15.875	128.2	48.0	49.5	8151 16.005
165	16,500-16,999	18.000	130.5	48.0	51.0	8151 16.500
165	16,500-16,999	19.050	132.5	50.0	51.0	8151 16.505
170	17,000-17,499	18.000	132.7	48.0	52.5	8151 17.000
170	17,000-17,499	19.050	134.7	50.0	52.5	8151 17.005
175	17,500-17,999	18.000	135.0	48.0	54.0	8151 17.500
175	17,500-17,999	19.050	137.0	50.0	54.0	8151 17.505
180	18,000-18,499	18.000	137.2	48.0	55.5	8151 18.000
180	18,000-18,499	19.050	139.2	50.0	55.5	8151 18.005
185	18,500-18,999	20.000	141.5	50.0	57.0	8151 18.500
185	18,500-18,999	19.050	141.5	50.0	57.0	8151 18.505
190	19,000-19,499	20.000	143.7	50.0	58.5	8151 19.000
190	19,000-19,499	19.050	143.7	50.0	58.5	8151 19.005
195	19,500-19,999	20.000	146.0	50.0	60.0	8151 19.500
195	19,500-19,999	19.050	146.0	50.0	60.0	8151 19.505
200	20,000-20,499	20.000	148.2	50.0	61.5	8151 20.000
200	20,000-20,499	19.050	148.2	50.0	61.5	8151 20.005
205	20,500-20,999	25.000	160.5	56.0	63.0	8151 20.500
205	20,500-20,999	25.400	160.5	56.0	63.0	8151 20.505
210	21,000-21,499	25.000	162.7	56.0	64.5	8151 21.000
210	21,000-21,499	25.400	162.7	56.0	64.5	8151 21.005
215	21,500-21,999	25.000	164.0	56.0	66.0	8151 21.500
215	21,500-21,999	25.400	164.0	56.0	66.0	8151 21.505
220	22,000-22,499	25.000	166.2	56.0	67.5	8151 22.000
220	22,000-22,499	25.400	166.2	56.0	67.5	8151 22.005
225	22,500-22,999	25.000	167.5	56.0	69.0	8151 22.500
225	22,500-22,999	25.400	167.5	56.0	69.0	8151 22.505
230	23,000-23,499	25.000	169.7	56.0	70.5	8151 23.000
230	23,000-23,499	25.400	169.7	56.0	70.5	8151 23.005
235	23,500-23,999	25.000	170.0	56.0	72.0	8151 23.500
235	23,500-23,999	25.400	170.0	56.0	72.0	8151 23.505
240	24,000-24,499	25.000	172.2	56.0	73.5	8151 24.000
240	24,000-24,499	25.400	172.2	56.0	73.5	8151 24.005
245	24,500-24,999	25.000	174.5	56.0	75.0	8151 24.500
245	24,500-24,999	25.400	174.5	56.0	75.0	8151 24.505

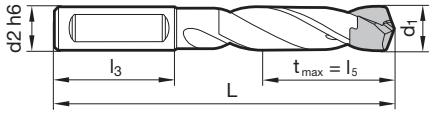
						Article no.	8151
Holder size	d1	d2 h6 mm	L mm	l3 mm	l5 mm	Order no.	
250	25,000-25,499	25.000	176.7	56.0	76.5	8151 25.000	
250	25,000-25,499	25.400	176.7	56.0	76.5	8151 25.005	
255	25,500-25,999	32.000	188.0	60.0	78.0	8151 25.500	
255	25,500-25,999	31.750	188.0	60.0	78.0	8151 25.505	
260	26,000-26,499	32.000	190.2	60.0	79.5	8151 26.000	
260	26,000-26,499	31.750	190.2	60.0	79.5	8151 26.005	

Drill head holder BT 800

Article no. **8152**

NEW | BT 800 | 5xD | WN | R | WN

especially high wear resistance • optimised coolant duct exit • mounting key art. no. 8170 included



Article no. **8152**

Holder size	d1	d2 h6 mm	L mm	l3 mm	l5 mm	Order no.
100	10,000-10,499	12.000	119.2	45.0	52.5	8152 10.000
100	10,000-10,499	12.700	119.2	45.0	52.5	8152 10.005
105	10,500-10,999	12.000	122.5	45.0	55.0	8152 10.500
105	10,500-10,999	12.700	122.5	45.0	55.0	8152 10.505
110	11,000-11,499	12.000	125.7	45.0	57.5	8152 11.000
110	11,000-11,499	12.700	125.7	45.0	57.5	8152 11.005
115	11,500-11,999	12.000	129.0	45.0	60.0	8152 11.500
115	11,500-11,999	12.700	129.0	45.0	60.0	8152 11.505
120	12,000-12,499	12.000	132.2	45.0	62.5	8152 12.000
120	12,000-12,499	12.700	132.2	45.0	62.5	8152 12.005
125	12,500-12,999	14.000	135.5	45.0	65.0	8152 12.500
125	12,500-12,999	15.875	138.5	48.0	65.0	8152 12.505
130	13,000-13,499	14.000	138.7	45.0	67.5	8152 13.000
130	13,000-13,499	15.875	141.7	48.0	67.5	8152 13.005
135	13,500-13,999	14.000	142.0	45.0	70.0	8152 13.500
135	13,500-13,999	15.875	145.0	48.0	70.0	8152 13.505
140	14,000-14,499	14.000	145.2	45.0	72.5	8152 14.000
140	14,000-14,499	15.875	148.2	48.0	72.5	8152 14.005
145	14,500-14,999	16.000	151.5	48.0	75.0	8152 14.500
145	14,500-14,999	15.875	151.5	48.0	75.0	8152 14.505
150	15,000-15,499	16.000	154.7	48.0	77.5	8152 15.000
150	15,000-15,499	15.875	154.7	48.0	77.5	8152 15.005
155	15,500-15,999	16.000	158.0	48.0	80.0	8152 15.500
155	15,500-15,999	15.875	158.0	48.0	80.0	8152 15.505
160	16,000-16,499	16.000	161.2	48.0	82.5	8152 16.000
160	16,000-16,499	15.875	161.2	48.0	82.5	8152 16.005
165	16,500-16,999	18.000	164.5	48.0	85.0	8152 16.500
165	16,500-16,999	19.050	166.5	50.0	85.0	8152 16.505
170	17,000-17,499	18.000	167.7	48.0	87.5	8152 17.000
170	17,000-17,499	19.050	169.7	50.0	87.5	8152 17.005
175	17,500-17,999	18.000	171.0	48.0	90.0	8152 17.500
175	17,500-17,999	19.050	173.0	50.0	90.0	8152 17.505
180	18,000-18,499	18.000	174.2	48.0	92.5	8152 18.000
180	18,000-18,499	19.050	176.2	50.0	92.5	8152 18.005
185	18,500-18,999	20.000	179.5	50.0	95.0	8152 18.500
185	18,500-18,999	19.050	179.5	50.0	95.0	8152 18.505
190	19,000-19,499	20.000	182.7	50.0	97.5	8152 19.000
190	19,000-19,499	19.050	182.7	50.0	97.5	8152 19.005
195	19,500-19,999	20.000	186.0	50.0	100.0	8152 19.500
195	19,500-19,999	19.050	186.0	50.0	100.0	8152 19.505
200	20,000-20,499	20.000	189.2	50.0	102.5	8152 20.000
200	20,000-20,499	19.050	189.2	50.0	102.5	8152 20.005
205	20,500-20,999	25.000	202.5	56.0	105.0	8152 20.500
205	20,500-20,999	25.400	202.5	56.0	105.0	8152 20.505
210	21,000-21,499	25.000	205.7	56.0	107.5	8152 21.000
210	21,000-21,499	25.400	205.7	56.0	107.5	8152 21.005
215	21,500-21,999	25.000	208.0	56.0	110.0	8152 21.500
215	21,500-21,999	25.400	208.0	56.0	110.0	8152 21.505
220	22,000-22,499	25.000	211.2	56.0	112.5	8152 22.000
220	22,000-22,499	25.400	211.2	56.0	112.5	8152 22.005
225	22,500-22,999	25.000	213.5	56.0	115.0	8152 22.500
225	22,500-22,999	25.400	213.5	56.0	115.0	8152 22.505
230	23,000-23,499	25.000	216.7	56.0	117.5	8152 23.000
230	23,000-23,499	25.400	216.7	56.0	117.5	8152 23.005
235	23,500-23,999	25.000	218.0	56.0	120.0	8152 23.500
235	23,500-23,999	25.400	218.0	56.0	120.0	8152 23.505
240	24,000-24,499	25.000	221.2	56.0	122.5	8152 24.000
240	24,000-24,499	25.400	221.2	56.0	122.5	8152 24.005
245	24,500-24,999	25.000	224.5	56.0	125.0	8152 24.500
245	24,500-24,999	25.400	224.5	56.0	125.0	8152 24.505

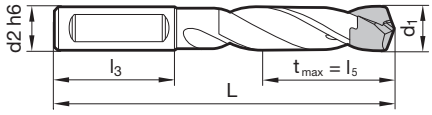
Article no.						8152
Holder size	d1	d2 h6 mm	L mm	l3 mm	l5 mm	Order no.
250	25,000-25,499	25.000	227.7	56.0	127.5	8152 25.000
250	25,000-25,499	25.400	227.7	56.0	127.5	8152 25.005
255	25,500-25,999	32.000	240.0	60.0	130.0	8152 25.500
255	25,500-25,999	31.750	240.0	60.0	130.0	8152 25.505
260	26,000-26,499	32.000	243.2	60.0	132.5	8152 26.000
260	26,000-26,499	31.750	243.2	60.0	132.5	8152 26.005

Drill head holder BT 800

Article no. **8153**

NEW | BT 800 | 8xD | WN | R | WN

especially high wear resistance • optimised coolant duct exit • mounting key art. no. 8170 included



Article no. **8153**

Holder size	d1	d2 h6 mm	L mm	l3 mm	l5 mm	Order no.
100	10,000-10,499	12.000	150.7	45.0	84.0	8153 10.000
100	10,000-10,499	12.700	150.7	45.0	84.0	8153 10.005
105	10,500-10,999	12.000	155.5	45.0	88.0	8153 10.500
105	10,500-10,999	12.700	155.5	45.0	88.0	8153 10.505
110	11,000-11,499	12.000	160.2	45.0	92.0	8153 11.000
110	11,000-11,499	12.700	160.2	45.0	92.0	8153 11.005
115	11,500-11,999	12.000	165.0	45.0	96.0	8153 11.500
115	11,500-11,999	12.700	165.0	45.0	96.0	8153 11.505
120	12,000-12,499	12.000	169.7	45.0	100.0	8153 12.000
120	12,000-12,499	12.700	169.7	45.0	100.0	8153 12.005
125	12,500-12,999	14.000	174.5	45.0	104.0	8153 12.500
125	12,500-12,999	15.875	177.5	48.0	104.0	8153 12.505
130	13,000-13,499	14.000	179.2	45.0	108.0	8153 13.000
130	13,000-13,499	15.875	182.2	48.0	108.0	8153 13.005
135	13,500-13,999	14.000	184.0	45.0	112.0	8153 13.500
135	13,500-13,999	15.875	187.0	48.0	112.0	8153 13.505
140	14,000-14,499	14.000	188.7	45.0	116.0	8153 14.000
140	14,000-14,499	15.875	191.7	48.0	116.0	8153 14.005
145	14,500-14,999	16.000	196.5	48.0	120.0	8153 14.500
145	14,500-14,999	15.875	196.5	48.0	120.0	8153 14.505
150	15,000-15,499	16.000	201.2	48.0	124.0	8153 15.000
150	15,000-15,499	15.875	201.2	48.0	124.0	8153 15.005
155	15,500-15,999	16.000	206.0	48.0	128.0	8153 15.500
155	15,500-15,999	15.875	206.0	48.0	128.0	8153 15.505
160	16,000-16,499	16.000	210.7	48.0	132.0	8153 16.000
160	16,000-16,499	15.875	210.7	48.0	132.0	8153 16.005
165	16,500-16,999	18.000	215.5	48.0	136.0	8153 16.500
165	16,500-16,999	19.050	217.5	50.0	136.0	8153 16.505
170	17,000-17,499	18.000	220.2	48.0	140.0	8153 17.000
170	17,000-17,499	19.050	222.2	50.0	140.0	8153 17.005
175	17,500-17,999	18.000	225.0	48.0	144.0	8153 17.500
175	17,500-17,999	19.050	227.0	50.0	144.0	8153 17.505
180	18,000-18,499	18.000	229.7	48.0	148.0	8153 18.000
180	18,000-18,499	19.050	231.7	50.0	148.0	8153 18.005
185	18,500-18,999	20.000	236.5	50.0	152.0	8153 18.500
185	18,500-18,999	19.050	236.5	50.0	152.0	8153 18.505
190	19,000-19,499	20.000	241.2	50.0	156.0	8153 19.000
190	19,000-19,499	19.050	241.2	50.0	156.0	8153 19.005
195	19,500-19,999	20.000	246.0	50.0	160.0	8153 19.500
195	19,500-19,999	19.050	246.0	50.0	160.0	8153 19.505
200	20,000-20,499	20.000	250.7	50.0	164.0	8153 20.000
200	20,000-20,499	19.050	250.7	50.0	164.0	8153 20.005
205	20,500-20,999	25.000	265.5	56.0	168.0	8153 20.500
205	20,500-20,999	25.400	265.5	56.0	168.0	8153 20.505
210	21,000-21,499	25.000	270.2	56.0	172.0	8153 21.000
210	21,000-21,499	25.400	270.2	56.0	172.0	8153 21.005
215	21,500-21,999	25.000	274.0	56.0	176.0	8153 21.500
215	21,500-21,999	25.400	274.0	56.0	176.0	8153 21.505
220	22,000-22,499	25.000	278.7	56.0	180.0	8153 22.000
220	22,000-22,499	25.400	278.7	56.0	180.0	8153 22.005
225	22,500-22,999	25.000	282.5	56.0	184.0	8153 22.500
225	22,500-22,999	25.400	282.5	56.0	184.0	8153 22.505
230	23,000-23,499	25.000	287.2	56.0	188.0	8153 23.000
230	23,000-23,499	25.400	287.2	56.0	188.0	8153 23.005
235	23,500-23,999	25.000	290.0	56.0	192.0	8153 23.500
235	23,500-23,999	25.400	290.0	56.0	192.0	8153 23.505
240	24,000-24,499	25.000	294.7	56.0	196.0	8153 24.000
240	24,000-24,499	25.400	294.7	56.0	196.0	8153 24.005
245	24,500-24,999	25.000	299.5	56.0	200.0	8153 24.500
245	24,500-24,999	25.400	299.5	56.0	200.0	8153 24.505

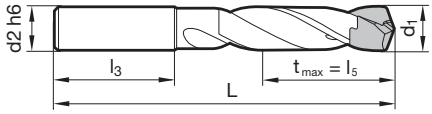
						Article no.	8153
Holder size	d1	d2 h6 mm	L mm	l3 mm	l5 mm	Order no.	
250	25,000-25,499	25.000	304.2	56.0	204.0	8153 25.000	
250	25,000-25,499	25.400	304.2	56.0	204.0	8153 25.005	
255	25,500-25,999	32.000	318.0	60.0	208.0	8153 25.500	
255	25,500-25,999	31.750	318.0	60.0	208.0	8153 25.505	
260	26,000-26,499	32.000	322.7	60.0	212.0	8153 26.000	
260	26,000-26,499	31.750	322.7	60.0	212.0	8153 26.005	

Drill head holder BT 800

Article no. **8154**

NEW | BT 800 | 12xD | WN | R | A

especially high wear resistance • optimised coolant duct exit • mounting key art. no. 8170 included



Article no.						8154
Holder size	d1	d2 h6 mm	L mm	l3 mm	l5 mm	Order no.
100	10,000-10,499	12.000	192.7	45.0	126.0	8154 10.000
100	10,000-10,499	12.700	192.7	45.0	126.0	8154 10.005
105	10,500-10,999	12.000	199.5	45.0	132.0	8154 10.500
105	10,500-10,999	12.700	199.5	45.0	132.0	8154 10.505
110	11,000-11,499	12.000	206.2	45.0	138.0	8154 11.000
110	11,000-11,499	12.700	206.2	45.0	138.0	8154 11.005
115	11,500-11,999	12.000	213.0	45.0	144.0	8154 11.500
115	11,500-11,999	12.700	213.0	45.0	144.0	8154 11.505
120	12,000-12,499	12.000	219.7	45.0	150.0	8154 12.000
120	12,000-12,499	12.700	219.7	45.0	150.0	8154 12.005
125	12,500-12,999	14.000	226.5	45.0	156.0	8154 12.500
125	12,500-12,999	15.875	229.5	48.0	156.0	8154 12.505
130	13,000-13,499	14.000	233.2	45.0	162.0	8154 13.000
130	13,000-13,499	15.875	236.2	48.0	162.0	8154 13.005
135	13,500-13,999	14.000	240.0	45.0	168.0	8154 13.500
135	13,500-13,999	15.875	243.0	48.0	168.0	8154 13.505
140	14,000-14,499	14.000	246.7	45.0	174.0	8154 14.000
140	14,000-14,499	15.875	249.7	48.0	174.0	8154 14.005
145	14,500-14,999	16.000	256.5	48.0	180.0	8154 14.500
145	14,500-14,999	15.875	256.5	48.0	180.0	8154 14.505
150	15,000-15,499	16.000	263.2	48.0	186.0	8154 15.000
150	15,000-15,499	15.875	263.2	48.0	186.0	8154 15.005
155	15,500-15,999	16.000	270.0	48.0	192.0	8154 15.500
155	15,500-15,999	15.875	270.0	48.0	192.0	8154 15.505
160	16,000-16,499	16.000	276.7	48.0	198.0	8154 16.000
160	16,000-16,499	15.875	276.7	48.0	198.0	8154 16.005
165	16,500-16,999	18.000	283.5	48.0	204.0	8154 16.500
165	16,500-16,999	19.050	285.5	50.0	204.0	8154 16.505
170	17,000-17,499	18.000	290.2	48.0	210.0	8154 17.000
170	17,000-17,499	19.050	292.2	50.0	210.0	8154 17.005
175	17,500-17,999	18.000	297.0	48.0	216.0	8154 17.500
175	17,500-17,999	19.050	299.0	50.0	216.0	8154 17.505
180	18,000-18,499	18.000	303.7	48.0	222.0	8154 18.000
180	18,000-18,499	19.050	305.7	50.0	222.0	8154 18.005
185	18,500-18,999	20.000	312.5	50.0	228.0	8154 18.500
185	18,500-18,999	19.050	312.5	50.0	228.0	8154 18.505
190	19,000-19,499	20.000	319.2	50.0	234.0	8154 19.000
190	19,000-19,499	19.050	319.2	50.0	234.0	8154 19.005
195	19,500-19,999	20.000	326.0	50.0	240.0	8154 19.500
195	19,500-19,999	19.050	326.0	50.0	240.0	8154 19.505
200	20,000-20,499	20.000	332.7	50.0	246.0	8154 20.000
200	20,000-20,499	19.050	332.7	50.0	246.0	8154 20.005
205	20,500-20,999	25.000	349.5	56.0	252.0	8154 20.500
205	20,500-20,999	25.400	349.5	56.0	252.0	8154 20.505
210	21,000-21,499	25.000	356.2	56.0	258.0	8154 21.000
210	21,000-21,499	25.400	356.2	56.0	258.0	8154 21.005
215	21,500-21,999	25.000	362.0	56.0	264.0	8154 21.500
215	21,500-21,999	25.400	362.0	56.0	264.0	8154 21.505
220	22,000-22,499	25.000	368.7	56.0	270.0	8154 22.000
220	22,000-22,499	25.400	368.7	56.0	270.0	8154 22.005
225	22,500-22,999	25.000	374.5	56.0	276.0	8154 22.500
225	22,500-22,999	25.400	374.5	56.0	276.0	8154 22.505
230	23,000-23,499	25.000	381.2	56.0	282.0	8154 23.000
230	23,000-23,499	25.400	381.2	56.0	282.0	8154 23.005
235	23,500-23,999	25.000	386.0	56.0	288.0	8154 23.500
235	23,500-23,999	25.400	386.0	56.0	288.0	8154 23.505
240	24,000-24,499	25.000	392.7	56.0	294.0	8154 24.000
240	24,000-24,499	25.400	392.7	56.0	294.0	8154 24.005
245	24,500-24,999	25.000	399.5	56.0	300.0	8154 24.500
245	24,500-24,999	25.400	399.5	56.0	300.0	8154 24.505

Article no.						8154
Holder size	d1	d2 h6 mm	L mm	l3 mm	l5 mm	Order no.
250	25,000-25,499	25.000	406.2	56.0	306.0	8154 25.000
250	25,000-25,499	25.400	406.2	56.0	306.0	8154 25.005
255	25,500-25,999	32.000	422.0	60.0	312.0	8154 25.500
255	25,500-25,999	31.750	422.0	60.0	312.0	8154 25.505
260	26,000-26,499	32.000	428.7	60.0	318.0	8154 26.000
260	26,000-26,499	31.750	428.7	60.0	318.0	8154 26.005

Drill head BT 800 for piloting

Article no. **8162**

cutting data see page 98

P	M	K	N	S	H
●	○	○	○	○	○

facet point grind • main cutting edge is slightly concave • exceptional hole quality • piloting in all materials • mounting key art. no. 8170 included with drill head holder or order separately

Article no. **8162**

Size	d1 mm	inch	l4 mm	h mm	Order no.
100	10.000		1.700	5.250	8162 10.000
100	10.100		1.700	5.250	8162 10.100
100	10.200		1.700	5.250	8162 10.200
100	10.300		1.700	5.250	8162 10.300
100	10.320	13/32	1.700	5.250	8162 10.320
100	10.400		1.700	5.250	8162 10.400
105	10.500		1.800	5.250	8162 10.500
105	10.600		1.800	5.250	8162 10.600
105	10.700		1.800	5.250	8162 10.700
105	10.720	27/64	1.800	5.250	8162 10.720
105	10.800		1.800	5.250	8162 10.800
105	10.900		1.800	5.250	8162 10.900
110	11.000		1.900	5.500	8162 11.000
110	11.100		1.900	5.500	8162 11.100
110	11.110	7/16	1.900	5.500	8162 11.110
110	11.200		1.900	5.500	8162 11.200
110	11.300		1.900	5.500	8162 11.300
110	11.400		1.900	5.500	8162 11.400
115	11.500		2.000	5.500	8162 11.500
115	11.510	29/64	2.000	5.500	8162 11.510
115	11.600		2.000	5.500	8162 11.600
115	11.700		2.000	5.500	8162 11.700
115	11.800		2.000	5.500	8162 11.800
115	11.900		2.000	5.500	8162 11.900
115	11.910	15/32	2.000	5.500	8162 11.910
120	12.000		2.100	6.000	8162 12.000
120	12.100		2.100	6.000	8162 12.100
120	12.200		2.100	6.000	8162 12.200
120	12.300	31/64	2.100	6.000	8162 12.300
120	12.400		2.100	6.000	8162 12.400
125	12.500		2.100	6.000	8162 12.500
125	12.600		2.100	6.000	8162 12.600
125	12.700	1/2	2.100	6.000	8162 12.700
125	12.800		2.100	6.000	8162 12.800
125	12.900		2.100	6.000	8162 12.900
130	13.000		2.200	6.250	8162 13.000
130	13.100	33/64	2.200	6.250	8162 13.100
130	13.200		2.200	6.250	8162 13.200
130	13.300		2.200	6.250	8162 13.300
130	13.400		2.200	6.250	8162 13.400
130	13.490	17/32	2.200	6.250	8162 13.490
135	13.500		2.300	6.250	8162 13.500
135	13.600		2.300	6.250	8162 13.600
135	13.700		2.300	6.250	8162 13.700
135	13.800		2.300	6.250	8162 13.800
135	13.890	35/64	2.300	6.250	8162 13.890
135	13.900		2.300	6.250	8162 13.900
140	14.000		2.400	6.750	8162 14.000
140	14.100		2.400	6.750	8162 14.100
140	14.200		2.400	6.750	8162 14.200
140	14.290	9/16	2.400	6.750	8162 14.290
140	14.300		2.400	6.750	8162 14.300
140	14.400		2.400	6.750	8162 14.400
145	14.500		2.500	6.750	8162 14.500
145	14.600		2.500	6.750	8162 14.600
145	14.680	37/64	2.500	6.750	8162 14.680
145	14.700		2.500	6.750	8162 14.700
145	14.800		2.500	6.750	8162 14.800
145	14.900		2.500	6.750	8162 14.900
150	15.000		2.500	7.000	8162 15.000
150	15.080	19/32	2.500	7.000	8162 15.080
150	15.100		2.500	7.000	8162 15.100
150	15.200		2.500	7.000	8162 15.200
150	15.300		2.500	7.000	8162 15.300
150	15.400		2.500	7.000	8162 15.400
150	15.480	39/64	2.500	7.000	8162 15.480

Article no. **8162**

Size	d1 mm	inch	l4 mm	h mm	Order no.
155	15.500		2.600	7.000	8162 15.500
155	15.600		2.600	7.000	8162 15.600
155	15.700		2.600	7.000	8162 15.700
155	15.800		2.600	7.000	8162 15.800
155	15.870	5/8	2.600	7.000	8162 15.870
155	15.900		2.600	7.000	8162 15.900
160	16.000		2.700	7.500	8162 16.000
160	16.100		2.700	7.500	8162 16.100
160	16.200		2.700	7.500	8162 16.200
160	16.270	41/64	2.700	7.500	8162 16.270
160	16.300		2.700	7.500	8162 16.300
160	16.400		2.700	7.500	8162 16.400
165	16.500		2.800	7.500	8162 16.500
165	16.600		2.800	7.500	8162 16.600
165	16.670	21/32	2.800	7.500	8162 16.670
165	16.700		2.800	7.500	8162 16.700
165	16.800		2.800	7.500	8162 16.800
165	16.900		2.800	7.500	8162 16.900
170	17.000		2.900	7.750	8162 17.000
170	17.070	43/64	2.900	7.750	8162 17.070
170	17.100		2.900	7.750	8162 17.100
170	17.200		2.900	7.750	8162 17.200
170	17.300		2.900	7.750	8162 17.300
170	17.400		2.900	7.750	8162 17.400
170	17.460	11/16	2.900	7.750	8162 17.460
175	17.500		3.000	7.750	8162 17.500
175	17.600		3.000	7.750	8162 17.600
175	17.700		3.000	7.750	8162 17.700
175	17.800		3.000	7.750	8162 17.800
175	17.860	45/64	3.000	7.750	8162 17.860
175	17.900		3.000	7.750	8162 17.900
180	18.000		3.100	8.750	8162 18.000
180	18.100		3.100	8.750	8162 18.100
180	18.200		3.100	8.750	8162 18.200
180	18.260	23/32	3.100	8.750	8162 18.260
180	18.300		3.100	8.750	8162 18.300
180	18.400		3.100	8.750	8162 18.400
185	18.500		3.200	8.750	8162 18.500
185	18.600		3.200	8.750	8162 18.600
185	18.650	47/64	3.200	8.750	8162 18.650
185	18.700		3.200	8.750	8162 18.700
185	18.800		3.200	8.750	8162 18.800
185	18.900		3.200	8.750	8162 18.900
190	19.000		3.200	8.750	8162 19.000
190	19.050	3/4	3.200	8.750	8162 19.050
190	19.100		3.200	8.750	8162 19.100
190	19.200		3.200	8.750	8162 19.200
190	19.250		3.200	8.750	8162 19.250
190	19.300		3.200	8.750	8162 19.300
190	19.400		3.200	8.750	8162 19.400
190	19.450	49/64	3.200	8.750	8162 19.450
195	19.500		3.300	8.750	8162 19.500
195	19.600		3.300	8.750	8162 19.600
195	19.700		3.300	8.750	8162 19.700
195	19.800		3.300	8.750	8162 19.800
195	19.840	25/32	3.300	8.750	8162 19.840
195	19.900		3.300	8.750	8162 19.900
200	20.000		3.400	9.500	8162 20.000
200	20.100		3.400	9.500	8162 20.100
200	20.200		3.400	9.500	8162 20.200
200	20.240	51/64	3.400	9.500	8162 20.240
200	20.300		3.400	9.500	8162 20.300
200	20.400		3.400	9.500	8162 20.400
205	20.500		3.500	9.500	8162 20.500
205	20.600		3.500	9.500	8162 20.600
205	20.640	13/16	3.500	9.500	8162 20.640

Article no. **8162**

Size	d1 mm	inch	l4 mm	h mm	Order no.
205	20.700		3.500	9.500	8162 20.700
205	20.800		3.500	9.500	8162 20.800
205	20.900		3.500	9.500	8162 20.900
210	21.000		3.600	9.500	8162 21.000
210	21.030	53/64	3.600	9.500	8162 21.030
210	21.100		3.600	9.500	8162 21.100
210	21.200		3.600	9.500	8162 21.200
210	21.300		3.600	9.500	8162 21.300
210	21.400		3.600	9.500	8162 21.400
210	21.430	27/32	3.600	9.500	8162 21.430
215	21.500		3.700	9.500	8162 21.500
215	21.600		3.700	9.500	8162 21.600
215	21.700		3.700	9.500	8162 21.700
215	21.800		3.700	9.500	8162 21.800
215	21.830	55/64	3.700	9.500	8162 21.830
215	21.900		3.700	9.500	8162 21.900
220	22.000		3.700	10.250	8162 22.000
220	22.100		3.700	10.250	8162 22.100
220	22.200		3.700	10.250	8162 22.200
220	22.220	7/8	3.700	10.250	8162 22.220
220	22.300		3.700	10.250	8162 22.300
220	22.400		3.700	10.250	8162 22.400
225	22.500		3.800	10.250	8162 22.500
225	22.600		3.800	10.250	8162 22.600
225	22.620	57/64	3.800	10.250	8162 22.620
225	22.700		3.800	10.250	8162 22.700
225	22.800		3.800	10.250	8162 22.800
225	22.900		3.800	10.250	8162 22.900
230	23.000		3.900	10.250	8162 23.000
230	23.020	29/32	3.900	10.250	8162 23.020
230	23.100		3.900	10.250	8162 23.100
230	23.200		3.900	10.250	8162 23.200
230	23.300		3.900	10.250	8162 23.300
230	23.400		3.900	10.250	8162 23.400
230	23.420	59/64	3.900	10.250	8162 23.420
235	23.500		4.000	10.250	8162 23.500

Article no. **8162**

Size	d1 mm	inch	l4 mm	h mm	Order no.
235	23.600		4.000	10.250	8162 23.600
235	23.700		4.000	10.250	8162 23.700
235	23.800		4.000	10.250	8162 23.800
235	23.810	15/16	4.000	10.250	8162 23.810
235	23.900		4.000	10.250	8162 23.900
240	24.000		4.100	11.000	8162 24.000
240	24.100		4.100	11.000	8162 24.100
240	24.200		4.100	11.000	8162 24.200
240	24.210	61/64	4.100	11.000	8162 24.210
240	24.300		4.100	11.000	8162 24.300
240	24.400		4.100	11.000	8162 24.400
245	24.500		4.200	11.000	8162 24.500
245	24.600		4.200	11.000	8162 24.600
245	24.610	31/32	4.200	11.000	8162 24.610
245	24.700		4.200	11.000	8162 24.700
245	24.800		4.200	11.000	8162 24.800
245	24.900		4.200	11.000	8162 24.900
250	25.000	63/64	4.200	11.000	8162 25.000
250	25.100		4.200	11.000	8162 25.100
250	25.200		4.200	11.000	8162 25.200
250	25.300		4.200	11.000	8162 25.300
250	25.400	1	4.200	11.000	8162 25.400
255	25.500		4.300	11.000	8162 25.500
255	25.600		4.300	11.000	8162 25.600
255	25.700		4.300	11.000	8162 25.700
255	25.800	1 1/64	4.300	11.000	8162 25.800
255	25.900		4.300	11.000	8162 25.900
260	26.000		4.400	12.000	8162 26.000

Drill head BT 800

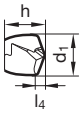
Article no. **8163**

cutting data see page 99-101

P	M	K	N	S	H
●	○	○			

NEW · VHM · PS · BT 800 · WN · 140° · h7 · R

facet point grind • main cutting edge is slightly concave • exceptional hole quality • mounting key art. no. 8170 included with drill head holder or order separately



Article no. **8163**

Size	d1 mm	inch	l4 mm	h mm	Order no.
100	10.000		1.900	5.250	8163 10.000
100	10.100		1.900	5.250	8163 10.100
100	10.200		1.900	5.250	8163 10.200
100	10.300		1.900	5.250	8163 10.300
100	10.320	13/32	1.900	5.250	8163 10.320
100	10.400		1.900	5.250	8163 10.400
105	10.500		2.000	5.250	8163 10.500
105	10.600		2.000	5.250	8163 10.600
105	10.700		2.000	5.250	8163 10.700
105	10.720	27/64	2.000	5.250	8163 10.720
105	10.800		2.000	5.250	8163 10.800
105	10.900		2.000	5.250	8163 10.900
110	11.000		2.100	5.500	8163 11.000
110	11.100		2.100	5.500	8163 11.100
110	11.110	7/16	2.100	5.500	8163 11.110
110	11.200		2.100	5.500	8163 11.200
110	11.300		2.100	5.500	8163 11.300
110	11.400		2.100	5.500	8163 11.400
115	11.500		2.200	5.500	8163 11.500
115	11.510	29/64	2.200	5.500	8163 11.510
115	11.600		2.200	5.500	8163 11.600
115	11.700		2.200	5.500	8163 11.700
115	11.800		2.200	5.500	8163 11.800
115	11.900		2.200	5.500	8163 11.900
115	11.910	15/32	2.200	5.500	8163 11.910
120	12.000		2.300	6.000	8163 12.000
120	12.100		2.300	6.000	8163 12.100
120	12.200		2.300	6.000	8163 12.200
120	12.300	31/64	2.300	6.000	8163 12.300
120	12.400		2.300	6.000	8163 12.400
125	12.500		2.400	6.000	8163 12.500
125	12.600		2.400	6.000	8163 12.600
125	12.700	1/2	2.400	6.000	8163 12.700
125	12.800		2.400	6.000	8163 12.800
125	12.900		2.400	6.000	8163 12.900
130	13.000		2.500	6.250	8163 13.000
130	13.100	33/64	2.500	6.250	8163 13.100
130	13.200		2.500	6.250	8163 13.200
130	13.300		2.500	6.250	8163 13.300
130	13.400		2.500	6.250	8163 13.400
130	13.490	17/32	2.500	6.250	8163 13.490
135	13.500		2.600	6.250	8163 13.500
135	13.600		2.600	6.250	8163 13.600
135	13.700		2.600	6.250	8163 13.700
135	13.800		2.600	6.250	8163 13.800
135	13.890	35/64	2.600	6.250	8163 13.890
135	13.900		2.600	6.250	8163 13.900
140	14.000		2.700	6.750	8163 14.000
140	14.100		2.700	6.750	8163 14.100
140	14.200		2.700	6.750	8163 14.200
140	14.290	9/16	2.700	6.750	8163 14.290
140	14.300		2.700	6.750	8163 14.300
140	14.400		2.700	6.750	8163 14.400
145	14.500		2.800	6.750	8163 14.500
145	14.600		2.800	6.750	8163 14.600
145	14.680	37/64	2.800	6.750	8163 14.680
145	14.700		2.800	6.750	8163 14.700
145	14.800		2.800	6.750	8163 14.800
145	14.900		2.800	6.750	8163 14.900
150	15.000		2.900	7.000	8163 15.000
150	15.080	19/32	2.900	7.000	8163 15.080
150	15.100		2.900	7.000	8163 15.100
150	15.200		2.900	7.000	8163 15.200
150	15.300		2.900	7.000	8163 15.300
150	15.400		2.900	7.000	8163 15.400
150	15.480	39/64	2.900	7.000	8163 15.480

Article no. **8163**

Size	d1 mm	inch	l4 mm	h mm	Order no.
155	15.500		3.000	7.000	8163 15.500
155	15.600		3.000	7.000	8163 15.600
155	15.700		3.000	7.000	8163 15.700
155	15.800		3.000	7.000	8163 15.800
155	15.870	5/8	3.000	7.000	8163 15.870
155	15.900		3.000	7.000	8163 15.900
160	16.000		3.100	7.500	8163 16.000
160	16.100		3.100	7.500	8163 16.100
160	16.200		3.100	7.500	8163 16.200
160	16.270	41/64	3.100	7.500	8163 16.270
160	16.300		3.100	7.500	8163 16.300
160	16.400		3.100	7.500	8163 16.400
165	16.500		3.200	7.500	8163 16.500
165	16.600		3.200	7.500	8163 16.600
165	16.670	21/32	3.200	7.500	8163 16.670
165	16.700		3.200	7.500	8163 16.700
165	16.800		3.200	7.500	8163 16.800
165	16.900		3.200	7.500	8163 16.900
170	17.000		3.300	7.750	8163 17.000
170	17.070	43/64	3.300	7.750	8163 17.070
170	17.100		3.300	7.750	8163 17.100
170	17.200		3.300	7.750	8163 17.200
170	17.300		3.300	7.750	8163 17.300
170	17.400		3.300	7.750	8163 17.400
170	17.460	11/16	3.300	7.750	8163 17.460
175	17.500		3.400	7.750	8163 17.500
175	17.600		3.400	7.750	8163 17.600
175	17.700		3.400	7.750	8163 17.700
175	17.800		3.400	7.750	8163 17.800
175	17.860	45/64	3.400	7.750	8163 17.860
175	17.900		3.400	7.750	8163 17.900
180	18.000		3.500	8.750	8163 18.000
180	18.100		3.500	8.750	8163 18.100
180	18.200		3.500	8.750	8163 18.200
180	18.260	23/32	3.500	8.750	8163 18.260
180	18.300		3.500	8.750	8163 18.300
180	18.400		3.500	8.750	8163 18.400
185	18.500		3.600	8.750	8163 18.500
185	18.600		3.600	8.750	8163 18.600
185	18.650	47/64	3.600	8.750	8163 18.650
185	18.700		3.600	8.750	8163 18.700
185	18.800		3.600	8.750	8163 18.800
185	18.900		3.600	8.750	8163 18.900
190	19.000		3.700	8.750	8163 19.000
190	19.050	3/4	3.700	8.750	8163 19.050
190	19.100		3.700	8.750	8163 19.100
190	19.200		3.700	8.750	8163 19.200
190	19.250		3.700	8.750	8163 19.250
190	19.300		3.700	8.750	8163 19.300
190	19.400		3.700	8.750	8163 19.400
190	19.450	49/64	3.700	8.750	8163 19.450
195	19.500		3.800	8.750	8163 19.500
195	19.600		3.800	8.750	8163 19.600
195	19.700		3.800	8.750	8163 19.700
195	19.800		3.800	8.750	8163 19.800
195	19.840	25/32	3.800	8.750	8163 19.840
195	19.900		3.800	8.750	8163 19.900
200	20.000		3.900	9.500	8163 20.000
200	20.100		3.900	9.500	8163 20.100
200	20.200		3.900	9.500	8163 20.200
200	20.240	51/64	3.900	9.500	8163 20.240
200	20.300		3.900	9.500	8163 20.300
200	20.400		3.900	9.500	8163 20.400
205	20.500		4.000	9.500	8163 20.500
205	20.600		4.000	9.500	8163 20.600
205	20.640	13/16	4.000	9.500	8163 20.640

Article no. **8163**

Size	d1 mm	inch	l4 mm	h mm	Order no.
205	20.700		4.000	9.500	8163 20.700
205	20.800		4.000	9.500	8163 20.800
205	20.900		4.000	9.500	8163 20.900
210	21.000		4.100	9.500	8163 21.000
210	21.030	53/64	4.100	9.500	8163 21.030
210	21.100		4.100	9.500	8163 21.100
210	21.200		4.100	9.500	8163 21.200
210	21.300		4.100	9.500	8163 21.300
210	21.400		4.100	9.500	8163 21.400
210	21.430	27/32	4.100	9.500	8163 21.430
215	21.500		4.200	9.500	8163 21.500
215	21.600		4.200	9.500	8163 21.600
215	21.700		4.200	9.500	8163 21.700
215	21.800		4.200	9.500	8163 21.800
215	21.830	55/64	4.200	9.500	8163 21.830
215	21.900		4.200	9.500	8163 21.900
220	22.000		4.300	10.250	8163 22.000
220	22.100		4.300	10.250	8163 22.100
220	22.200		4.300	10.250	8163 22.200
220	22.220	7/8	4.300	10.250	8163 22.220
220	22.300		4.300	10.250	8163 22.300
220	22.400		4.300	10.250	8163 22.400
225	22.500		4.400	10.250	8163 22.500
225	22.600		4.400	10.250	8163 22.600
225	22.620	57/64	4.400	10.250	8163 22.620
225	22.700		4.400	10.250	8163 22.700
225	22.800		4.400	10.250	8163 22.800
225	22.900		4.400	10.250	8163 22.900
230	23.000		4.500	10.250	8163 23.000
230	23.020	29/32	4.500	10.250	8163 23.020
230	23.100		4.500	10.250	8163 23.100
230	23.200		4.500	10.250	8163 23.200
230	23.300		4.500	10.250	8163 23.300
230	23.400		4.500	10.250	8163 23.400
230	23.420	59/64	4.500	10.250	8163 23.420
235	23.500		4.500	10.250	8163 23.500

Article no. **8163**

Size	d1 mm	inch	l4 mm	h mm	Order no.
235	23.600		4.500	10.250	8163 23.600
235	23.700		4.500	10.250	8163 23.700
235	23.800		4.500	10.250	8163 23.800
235	23.810	15/16	4.500	10.250	8163 23.810
235	23.900		4.500	10.250	8163 23.900
240	24.000		4.600	11.000	8163 24.000
240	24.100		4.600	11.000	8163 24.100
240	24.200		4.600	11.000	8163 24.200
240	24.210	61/64	4.600	11.000	8163 24.210
240	24.300		4.600	11.000	8163 24.300
240	24.400		4.600	11.000	8163 24.400
245	24.500		4.700	11.000	8163 24.500
245	24.600		4.700	11.000	8163 24.600
245	24.610	31/32	4.700	11.000	8163 24.610
245	24.700		4.700	11.000	8163 24.700
245	24.800		4.700	11.000	8163 24.800
245	24.900		4.700	11.000	8163 24.900
250	25.000	63/64	4.800	11.000	8163 25.000
250	25.100		4.800	11.000	8163 25.100
250	25.200		4.800	11.000	8163 25.200
250	25.300		4.800	11.000	8163 25.300
250	25.400	1	4.800	11.000	8163 25.400
255	25.500		4.900	11.000	8163 25.500
255	25.600		4.900	11.000	8163 25.600
255	25.700		4.900	11.000	8163 25.700
255	25.800	1 1/64	4.900	11.000	8163 25.800
255	25.900		4.900	11.000	8163 25.900
260	26.000		5.000	12.000	8163 26.000

Mounting key BT 800

NEW WN

Article no.	8170

Size	Order no.
10,0-10,99	8170 10.000
11,0-11,99	8170 11.000
12,0-12,99	8170 12.000
13,0-13,99	8170 13.000
14,0-14,99	8170 14.000
15,0-15,99	8170 15.000
16,0-16,99	8170 16.000
17,0-17,99	8170 17.000
18,0-18,99	8170 18.000
19,0-19,99	8170 19.000
20,0-20,99	8170 20.000
21,0-21,99	8170 21.000
22,0-22,99	8170 22.000
23,0-23,99	8170 23.000
24,0-24,99	8170 24.000
25,0-25,99	8170 25.000
26,0-26,99	8170 26.000


BT
800
NEW

Indexable insert drill

50 % longer tool lives thanks to carbide & coating

Best possible machining results for demanding holes

The new indexable insert drill type GMD is characterised by an extensive portfolio of holders with economical inserts.

Thanks to different carbide grades and and coatings for the tougher central indexable insert and the more wear-resistant peripheral indexable insert, you can achieve the best possible surfaces and maximum tool lives.

Furthermore, the unique geometry of the central indexable inserts ensure good self-centring. The perfect combination of indexable inserts and high-quality tool holders makes the indexable insert drill a reliable solution for the best possible machining results.

x **Tool life** increased by 50 %

- X Good self-centring thanks to special geometry of the central cutting insert
- X Different carbide grades for the central (tough) and peripheral (wear-resistant) inserts

User-friendly **Torx Plus screw**

Powerful **HiPIMS coating**

Nickel-plated surface
for optimum protection against wear

High-strength material
for a long tool life

Available in the diameter range
2xD | 3xD | 4xD | 5xD, Ø 14.0 – 60.0 mm

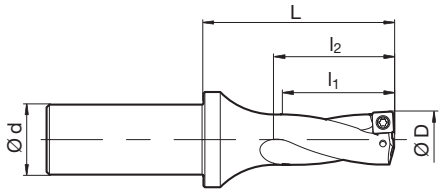
Application example

Component:	Injection mould, tool steel (X33CrS16)	
Tool:	#28502, Ø 28 mm	
Customer target:	Process reliability, increased tool life	
Difficulty:	Chip removal at 4xD drilling depth	
Cutting data:	**Gühring** v_c 170 m/min **f** 0.18 mm/rev	**Competition** v_c 140 m/min **f** 0.12 mm/rev
Tool life:	60 min	40 min

Indexable insert drills with internal cooling

Article no. **28500**

for indexable inserts type SOLX and XOLX • order Torx Plus wrench art. no. 28901 separately



	D mm	d h6 mm	l1 mm	l2 mm	L mm	Size	Code no.	Description
	14.00	20.00	28.00	31.00	51.00	05	14.000	GMD.140.028.R.20.05.XS.2D
	14.50	20.00	29.00	32.00	52.00	05	14.500	GMD.145.029.R.20.05.XS.2D
	15.00	20.00	30.00	33.00	53.00	05	15.000	GMD.150.030.R.20.05.XS.2D
	15.50	20.00	31.00	34.00	54.00	05	15.500	GMD.155.031.R.20.05.XS.2D
	16.00	20.00	32.00	35.00	55.00	05	16.000	GMD.160.032.R.20.05.XS.2D
	16.50	25.00	33.00	36.00	61.00	06	16.500	GMD.165.033.R.25.06.XS.2D
	17.00	25.00	34.00	37.00	62.00	06	17.000	GMD.170.034.R.25.06.XS.2D
	17.50	25.00	35.00	38.00	63.00	06	17.500	GMD.175.035.R.25.06.XS.2D
	18.00	25.00	36.00	39.00	64.00	06	18.000	GMD.180.036.R.25.06.XS.2D
	18.50	25.00	37.00	40.00	65.00	06	18.500	GMD.185.037.R.25.06.XS.2D
	19.00	25.00	38.00	41.00	66.00	06	19.000	GMD.190.038.R.25.06.XS.2D
	19.50	25.00	39.00	42.00	67.00	06	19.500	GMD.195.039.R.25.06.XS.2D
	20.00	25.00	40.00	43.00	68.00	07	20.000	GMD.200.040.R.25.07.XS.2D
	20.50	25.00	41.00	44.00	69.00	07	20.500	GMD.205.041.R.25.07.XS.2D
	21.00	25.00	42.00	45.00	70.00	07	21.000	GMD.210.042.R.25.07.XS.2D
	21.50	25.00	43.00	46.00	71.00	07	21.500	GMD.215.043.R.25.07.XS.2D
	22.00	25.00	44.00	47.00	72.00	07	22.000	GMD.220.044.R.25.07.XS.2D
	22.50	25.00	45.00	48.00	73.00	07	22.500	GMD.225.045.R.25.07.XS.2D
	23.00	25.00	46.00	49.00	74.00	07	23.000	GMD.230.046.R.25.07.XS.2D
	23.50	25.00	47.00	50.00	75.00	07	23.500	GMD.235.047.R.25.07.XS.2D
	24.00	32.00	48.00	51.00	81.00	09	24.000	GMD.240.048.R.32.09.XS.2D
	24.50	32.00	49.00	52.00	82.00	09	24.500	GMD.245.049.R.32.09.XS.2D
	25.00	32.00	50.00	53.00	83.00	09	25.000	GMD.250.050.R.32.09.XS.2D
	25.50	32.00	51.00	54.00	84.00	09	25.500	GMD.255.051.R.32.09.XS.2D
	26.00	32.00	52.00	55.00	85.00	09	26.000	GMD.260.052.R.32.09.XS.2D
	26.50	32.00	53.00	56.00	86.00	09	26.500	GMD.265.053.R.32.09.XS.2D
	27.00	32.00	54.00	57.00	87.00	09	27.000	GMD.270.054.R.32.09.XS.2D
	27.50	32.00	55.00	58.00	88.00	09	27.500	GMD.275.055.R.32.09.XS.2D
	28.00	32.00	56.00	59.00	89.00	09	28.000	GMD.280.056.R.32.09.XS.2D
	28.50	32.00	57.00	60.00	90.00	09	28.500	GMD.285.057.R.32.09.XS.2D
	29.00	32.00	58.00	61.00	91.00	09	29.000	GMD.290.058.R.32.09.XS.2D
	29.50	32.00	59.00	62.00	92.00	09	29.500	GMD.295.059.R.32.09.XS.2D
	30.00	32.00	62.00	65.00	95.00	11	30.000	GMD.300.060.R.32.11.XS.2D
	31.00	32.00	64.00	67.00	97.00	11	31.000	GMD.310.062.R.32.11.XS.2D
	32.00	32.00	66.00	69.00	99.00	11	32.000	GMD.320.064.R.32.11.XS.2D
	33.00	32.00	68.00	71.00	101.00	11	33.000	GMD.330.066.R.32.11.XS.2D
	34.00	32.00	70.00	73.00	103.00	11	34.000	GMD.340.068.R.32.11.XS.2D
	35.00	32.00	72.00	75.00	105.00	11	35.000	GMD.350.070.R.32.11.XS.2D
	36.00	40.00	74.00	77.00	112.00	13	36.000	GMD.360.072.R.40.13.XS.2D
	37.00	40.00	76.00	79.00	114.00	13	37.000	GMD.370.074.R.40.13.XS.2D
	38.00	40.00	78.00	81.00	116.00	13	38.000	GMD.380.076.R.40.13.XS.2D
	39.00	40.00	80.00	83.00	118.00	13	39.000	GMD.390.078.R.40.13.XS.2D
	40.00	40.00	82.00	85.00	120.00	13	40.000	GMD.400.080.R.40.13.XS.2D
	41.00	40.00	84.00	87.00	122.00	13	41.000	GMD.410.082.R.40.13.XS.2D
	42.00	40.00	86.00	89.00	124.00	13	42.000	GMD.420.084.R.40.13.XS.2D
	43.00	40.00	88.00	91.00	126.00	15	43.000	GMD.430.086.R.40.15.XS.2D
	44.00	40.00	90.00	93.00	128.00	15	44.000	GMD.440.088.R.40.15.XS.2D
	45.00	40.00	92.00	95.00	130.00	15	45.000	GMD.450.090.R.40.15.XS.2D
	46.00	40.00	94.00	97.00	132.00	15	46.000	GMD.460.092.R.40.15.XS.2D
	47.00	40.00	96.00	99.00	134.00	15	47.000	GMD.470.094.R.40.15.XS.2D
	48.00	40.00	98.00	101.00	136.00	15	48.000	GMD.480.096.R.40.15.XS.2D
	49.00	40.00	100.00	103.00	138.00	15	49.000	GMD.490.098.R.40.15.XS.2D
	50.00	40.00	102.00	105.00	140.00	15	50.000	GMD.500.100.R.40.15.XS.2D
NEW	51.00	40.00	104.00	107.00	142.00	18	51.000	GMD.510.104.R.40.18.XS.2D
NEW	52.00	40.00	106.00	109.00	144.00	18	52.000	GMD.520.106.R.40.18.XS.2D
NEW	53.00	40.00	108.00	111.00	146.00	18	53.000	GMD.530.108.R.40.18.XS.2D
NEW	54.00	40.00	110.00	113.00	148.00	18	54.000	GMD.540.110.R.40.18.XS.2D
NEW	55.00	40.00	112.00	115.00	150.00	18	55.000	GMD.550.112.R.40.18.XS.2D
NEW	56.00	40.00	114.00	117.00	152.00	18	56.000	GMD.560.114.R.40.18.XS.2D
NEW	57.00	40.00	116.00	119.00	154.00	18	57.000	GMD.570.116.R.40.18.XS.2D

Article no. **28500**

	D mm	d h6 mm	l1 mm	l2 mm	L mm	Size	Code no.	Description
NEW	58.00	40.00	118.00	121.00	156.00	18	58.000	GMD.580.118.R.40.18.XS.2D
NEW	59.00	40.00	120.00	123.00	158.00	18	59.000	GMD.590.120.R.40.18.XS.2D
NEW	60.00	40.00	122.00	125.00	160.00	18	60.000	GMD.600.122.R.40.18.XS.2D

Spare parts

Article no. 28900	Clamping screw Size	Torque Nm	Description
Code 6.200	M2.0x4.4 06IP	0.6	use for indexable insert size 05, XOLX and SOLX
Code 6.220	M2.2x5.4 06IP	0.6	use for indexable insert size 06, XOLX and SOLX
Code 8.250	M2.5x6.5 08IP	1.2	use for indexable insert size 07, XOLX and SOLX
Code 8.300	M3.0x7.0 08IP	1.2	use for indexable insert size 09, XOLX and SOLX
Code 15.350	M3.5x8.0 15IP	3.0	use for indexable insert size 11, XOLX and SOLX
Code 15.400	M4.0x10 15IP	3.0	use for indexable insert size 13, XOLX and SOLX
Code 20.500	M5.0x12.5 20IP	5.0	use for indexable insert sizes 15 and 18, XOLX and SOLX

Article no. 28901	Torx Plus wrench Size
Code 6.000	T-handle Torx Plus wrench 06IP
Code 8.000	T-handle Torx Plus wrench 08IP
Code 15.000	T-handle Torx Plus wrench 15IP
Code 20.000	T-handle Torx Plus wrench 20IP

Article no. 4915	Torque wrenches Size	Torque Nm
Code 6.000	1/4"	0.5-2
Code 8.000	1/4“	2-8

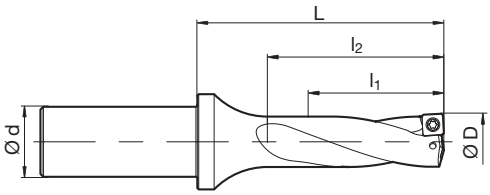
Article no. 4960	Interchangeable blade Size	Overall length
Code 6.000	06IP	175
Code 8.000	08IP	175
Code 15.000	15IP	175
Code 20.000	20IP	175

Shank Ø d	Shank length Ls	IC connection thread
20	50	BSPT-1/8
25	56	BSPT-1/8
32	60	BSPT-1/4
40	70	BSPT-1/4

Indexable insert drills with internal cooling

Article no. **28501**

for indexable inserts type SOLX and XOLX • order Torx Plus wrench art. no. 28901 separately



	D mm	d h6 mm	l1 mm	l2 mm	L mm	Size	Article no. 28501 Code no.	Description
	14.00	20.00	42.00	45.00	65.00	05	14.000	GMD.140.042.R.20.05.XS.3D
	14.50	20.00	44.00	47.00	67.00	05	14.500	GMD.145.043.R.20.05.XS.3D
	15.00	20.00	45.00	48.00	68.00	05	15.000	GMD.150.045.R.20.05.XS.3D
	15.50	20.00	47.00	50.00	70.00	05	15.500	GMD.155.046.R.20.05.XS.3D
	16.00	20.00	48.00	51.00	71.00	05	16.000	GMD.160.048.R.20.05.XS.3D
	16.50	25.00	50.00	53.00	78.00	06	16.500	GMD.165.049.R.25.06.XS.3D
	17.00	25.00	51.00	54.00	79.00	06	17.000	GMD.170.051.R.25.06.XS.3D
	17.50	25.00	53.00	56.00	81.00	06	17.500	GMD.175.052.R.25.06.XS.3D
	18.00	25.00	54.00	57.00	82.00	06	18.000	GMD.180.054.R.25.06.XS.3D
	18.50	25.00	56.00	59.00	84.00	06	18.500	GMD.185.055.R.25.06.XS.3D
	19.00	25.00	57.00	60.00	85.00	06	19.000	GMD.190.057.R.25.06.XS.3D
	19.50	25.00	59.00	62.00	87.00	06	19.500	GMD.195.058.R.25.06.XS.3D
	20.00	25.00	60.00	63.00	88.00	07	20.000	GMD.200.060.R.25.07.XS.3D
	20.50	25.00	62.00	65.00	90.00	07	20.500	GMD.205.061.R.25.07.XS.3D
	21.00	25.00	63.00	66.00	91.00	07	21.000	GMD.210.063.R.25.07.XS.3D
	21.50	25.00	65.00	68.00	93.00	07	21.500	GMD.215.064.R.25.07.XS.3D
	22.00	25.00	66.00	69.00	94.00	07	22.000	GMD.220.066.R.25.07.XS.3D
	22.50	25.00	68.00	71.00	96.00	07	22.500	GMD.225.067.R.25.07.XS.3D
	23.00	25.00	69.00	72.00	97.00	07	23.000	GMD.230.069.R.25.07.XS.3D
	23.50	25.00	71.00	74.00	99.00	07	23.500	GMD.235.070.R.25.07.XS.3D
	24.00	32.00	72.00	75.00	105.00	09	24.000	GMD.240.072.R.32.09.XS.3D
	24.50	32.00	74.00	52.00	107.00	09	24.500	GMD.245.073.R.32.09.XS.3D
	25.00	32.00	75.00	78.00	108.00	09	25.000	GMD.250.075.R.32.09.XS.3D
	25.50	32.00	77.00	80.00	110.00	09	25.500	GMD.255.076.R.32.09.XS.3D
	26.00	32.00	78.00	81.00	111.00	09	26.000	GMD.260.078.R.32.09.XS.3D
	26.50	32.00	80.00	83.00	113.00	09	26.500	GMD.265.079.R.32.09.XS.3D
	27.00	32.00	81.00	84.00	114.00	09	27.000	GMD.270.081.R.32.09.XS.3D
	27.50	32.00	83.00	86.00	116.00	09	27.500	GMD.275.082.R.32.09.XS.3D
	28.00	32.00	84.00	87.00	117.00	09	28.000	GMD.280.084.R.32.09.XS.3D
	28.50	32.00	86.00	89.00	119.00	09	28.500	GMD.285.085.R.32.09.XS.3D
	29.00	32.00	87.00	90.00	120.00	09	29.000	GMD.290.087.R.32.09.XS.3D
	29.50	32.00	89.00	92.00	122.00	09	29.500	GMD.295.088.R.32.09.XS.3D
	30.00	32.00	92.00	95.00	125.00	11	30.000	GMD.300.090.R.32.11.XS.3D
	31.00	32.00	95.00	98.00	128.00	11	31.000	GMD.310.093.R.32.11.XS.3D
	32.00	32.00	98.00	101.00	131.00	11	32.000	GMD.320.096.R.32.11.XS.3D
	33.00	32.00	101.00	104.00	134.00	11	33.000	GMD.330.099.R.32.11.XS.3D
	34.00	32.00	104.00	107.00	137.00	11	34.000	GMD.340.102.R.32.11.XS.3D
	35.00	32.00	107.00	110.00	140.00	11	35.000	GMD.350.105.R.32.11.XS.3D
	36.00	40.00	110.00	113.00	148.00	13	36.000	GMD.360.108.R.40.13.XS.3D
	37.00	40.00	113.00	116.00	151.00	13	37.000	GMD.370.111.R.40.13.XS.3D
	38.00	40.00	116.00	119.00	154.00	13	38.000	GMD.380.114.R.40.13.XS.3D
	39.00	40.00	119.00	122.00	157.00	13	39.000	GMD.390.117.R.40.13.XS.3D
	40.00	40.00	122.00	125.00	160.00	13	40.000	GMD.400.120.R.40.13.XS.3D
	41.00	40.00	125.00	128.00	163.00	13	41.000	GMD.410.123.R.40.13.XS.3D
	42.00	40.00	128.00	131.00	166.00	13	42.000	GMD.420.126.R.40.13.XS.3D
	43.00	40.00	131.00	134.00	169.00	15	43.000	GMD.430.126.R.40.15.XS.3D
	44.00	40.00	134.00	137.00	172.00	15	44.000	GMD.440.132.R.40.15.XS.3D
	45.00	40.00	137.00	140.00	175.00	15	45.000	GMD.450.135.R.40.15.XS.3D
	46.00	40.00	140.00	143.00	178.00	15	46.000	GMD.460.138.R.40.15.XS.3D
	47.00	40.00	143.00	146.00	181.00	15	47.000	GMD.470.141.R.40.15.XS.3D
	48.00	40.00	146.00	149.00	184.00	15	48.000	GMD.480.144.R.40.15.XS.3D
	49.00	40.00	149.00	152.00	187.00	15	49.000	GMD.490.147.R.40.15.XS.3D
	50.00	40.00	150.00	155.00	190.00	15	50.000	GMD.500.150.R.40.15.XS.3D
NEW	51.00	40.00	155.00	158.00	193.00	18	51.000	GMD.510.155.R.40.18.XS.3D
NEW	52.00	40.00	158.00	161.00	196.00	18	52.000	GMD.520.158.R.40.18.XS.3D
NEW	53.00	40.00	161.00	164.00	199.00	18	53.000	GMD.530.161.R.40.18.XS.3D
NEW	54.00	40.00	164.00	167.00	202.00	18	54.000	GMD.540.164.R.40.18.XS.3D
NEW	55.00	40.00	167.00	170.00	205.00	18	55.000	GMD.550.167.R.40.18.XS.3D
NEW	56.00	40.00	170.00	173.00	208.00	18	56.000	GMD.560.170.R.40.18.XS.3D
NEW	57.00	40.00	173.00	176.00	211.00	18	57.000	GMD.570.173.R.40.18.XS.3D

Article no. **28501**

	D mm	d h6 mm	l1 mm	l2 mm	L mm	Size	Code no.	Description
NEW	58.00	40.00	176.00	179.00	214.00	18	58.000	GMD.580.176.R.40.18.XS.3D
NEW	59.00	40.00	179.00	182.00	217.00	18	59.000	GMD.590.179.R.40.18.XS.3D
NEW	60.00	40.00	182.00	185.00	220.00	18	60.000	GMD.600.182.R.40.18.XS.3D

Spare parts

Article no. 28900	Clamping screw Size	Torque Nm	Description
Code 6.200	M2.0x4.4 06IP	0.6	use for indexable insert size 05, XOLX and SOLX
Code 6.220	M2.2x5.4 06IP	0.6	use for indexable insert size 06, XOLX and SOLX
Code 8.250	M2.5x6.5 08IP	1.2	use for indexable insert size 07, XOLX and SOLX
Code 8.300	M3.0x7.0 08IP	1.2	use for indexable insert size 09, XOLX and SOLX
Code 15.350	M3.5x8.0 15IP	3.0	use for indexable insert size 11, XOLX and SOLX
Code 15.400	M4.0x10 15IP	3.0	use for indexable insert size 13, XOLX and SOLX
Code 20.500	M5.0x12.5 20IP	5.0	use for indexable insert sizes 15 and 18, XOLX and SOLX

Article no. 28901	Torx Plus wrench Size
Code 6.000	T-handle Torx Plus wrench 06IP
Code 8.000	T-handle Torx Plus wrench 08IP
Code 15.000	T-handle Torx Plus wrench 15IP
Code 20.000	T-handle Torx Plus wrench 20IP

Article no. 4915	Torque wrenches Size	Torque Nm
Code 6.000	1/4"	0.5-2
Code 8.000	1/4“	2-8

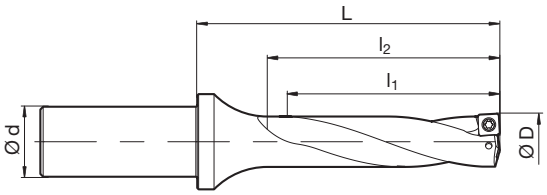
Article no. 4960	Interchangeable blade Size	Overall length
Code 6.000	06IP	175
Code 8.000	08IP	175
Code 15.000	15IP	175
Code 20.000	20IP	175

Shank Ø d	Shank length Ls	IC connection thread
20	50	BSPT-1/8
25	56	BSPT-1/8
32	60	BSPT-1/4
40	70	BSPT-1/4

Indexable insert drills with internal cooling

Article no. **28502**

for indexable inserts type SOLX and XOLX • order Torx Plus wrench art. no. 28901 separately



	D mm	d h6 mm	l1 mm	l2 mm	L mm	Size	Code no.	Description
	14.00	20.00	56.00	59.00	79.00	05	14.000	GMD.140.056.R.20.05.XS.4D
	14.50	20.00	58.00	61.00	81.00	05	14.500	GMD.145.058.R.20.05.XS.4D
	15.00	20.00	60.00	63.00	83.00	05	15.000	GMD.150.060.R.20.05.XS.4D
	15.50	20.00	62.00	65.00	85.00	05	15.500	GMD.155.062.R.20.05.XS.4D
	16.00	20.00	64.00	67.00	87.00	05	16.000	GMD.160.064.R.20.05.XS.4D
	16.50	25.00	66.00	69.00	94.00	06	16.500	GMD.165.066.R.25.06.XS.4D
	17.00	25.00	68.00	71.00	96.00	06	17.000	GMD.170.068.R.25.06.XS.4D
	17.50	25.00	70.00	73.00	98.00	06	17.500	GMD.175.070.R.25.06.XS.4D
	18.00	25.00	72.00	75.00	100.00	06	18.000	GMD.180.072.R.25.06.XS.4D
	18.50	25.00	74.00	77.00	103.00	06	18.500	GMD.185.074.R.25.06.XS.4D
	19.00	25.00	76.00	79.00	104.00	06	19.000	GMD.190.076.R.25.06.XS.4D
	19.50	25.00	78.00	81.00	106.00	06	19.500	GMD.195.078.R.25.06.XS.4D
	20.00	25.00	80.00	83.00	108.00	07	20.000	GMD.200.080.R.25.07.XS.4D
	20.50	25.00	82.00	85.00	110.00	07	20.500	GMD.205.082.R.25.07.XS.4D
	21.00	25.00	84.00	87.00	113.00	07	21.000	GMD.210.084.R.25.07.XS.4D
	21.50	25.00	86.00	89.00	114.00	07	21.500	GMD.215.086.R.25.07.XS.4D
	22.00	25.00	88.00	91.00	116.00	07	22.000	GMD.220.088.R.25.07.XS.4D
	22.50	25.00	90.00	93.00	118.00	07	22.500	GMD.225.090.R.25.07.XS.4D
	23.00	25.00	92.00	95.00	120.00	07	23.000	GMD.230.092.R.25.07.XS.4D
	23.50	25.00	94.00	97.00	122.00	07	23.500	GMD.235.094.R.25.07.XS.4D
	24.00	32.00	96.00	99.00	129.00	09	24.000	GMD.240.096.R.32.09.XS.4D
	24.50	32.00	98.00	101.00	131.00	09	24.500	GMD.245.098.R.32.09.XS.4D
	25.00	32.00	100.00	103.00	133.00	09	25.000	GMD.250.100.R.32.09.XS.4D
	25.50	32.00	102.00	105.00	135.00	09	25.500	GMD.255.102.R.32.09.XS.4D
	26.00	32.00	104.00	107.00	137.00	09	26.000	GMD.260.104.R.32.09.XS.4D
	26.50	32.00	106.00	109.00	139.00	09	26.500	GMD.265.106.R.32.09.XS.4D
	27.00	32.00	108.00	111.00	141.00	09	27.000	GMD.270.108.R.32.09.XS.4D
	27.50	32.00	110.00	113.00	143.00	09	27.500	GMD.275.110.R.32.09.XS.4D
	28.00	32.00	112.00	115.00	145.00	09	28.000	GMD.280.112.R.32.09.XS.4D
	28.50	32.00	114.00	117.00	147.00	09	28.500	GMD.285.114.R.32.09.XS.4D
	29.00	32.00	116.00	119.00	149.00	09	29.000	GMD.290.116.R.32.09.XS.4D
	29.50	32.00	118.00	121.00	151.00	09	29.500	GMD.295.118.R.32.09.XS.4D
	30.00	32.00	122.00	125.00	155.00	11	30.000	GMD.300.120.R.32.11.XS.4D
	31.00	32.00	126.00	129.00	159.00	11	31.000	GMD.310.124.R.32.11.XS.4D
	32.00	32.00	130.00	133.00	163.00	11	32.000	GMD.320.128.R.32.11.XS.4D
	33.00	32.00	134.00	137.00	167.00	11	33.000	GMD.330.132.R.32.11.XS.4D
	34.00	32.00	138.00	141.00	171.00	11	34.000	GMD.340.136.R.32.11.XS.4D
	35.00	32.00	142.00	145.00	175.00	11	35.000	GMD.350.140.R.32.11.XS.4D
	36.00	40.00	146.00	149.00	184.00	13	36.000	GMD.360.144.R.40.13.XS.4D
	37.00	40.00	150.00	153.00	188.00	13	37.000	GMD.370.148.R.40.13.XS.4D
	38.00	40.00	152.00	157.00	192.00	13	38.000	GMD.380.152.R.40.13.XS.4D
	39.00	40.00	156.00	161.00	196.00	13	39.000	GMD.390.156.R.40.13.XS.4D
	40.00	40.00	160.00	165.00	200.00	13	40.000	GMD.400.160.R.40.13.XS.4D
	41.00	40.00	164.00	169.00	204.00	13	41.000	GMD.410.164.R.40.13.XS.4D
	42.00	40.00	168.00	173.00	208.00	13	42.000	GMD.420.168.R.40.13.XS.4D
	43.00	40.00	172.00	177.00	212.00	15	43.000	GMD.430.172.R.40.15.XS.4D
	44.00	40.00	176.00	181.00	216.00	15	44.000	GMD.440.176.R.40.15.XS.4D
	45.00	40.00	180.00	185.00	220.00	15	45.000	GMD.450.180.R.40.15.XS.4D
	46.00	40.00	184.00	189.00	224.00	15	46.000	GMD.460.184.R.40.15.XS.4D
	47.00	40.00	188.00	193.00	228.00	15	47.000	GMD.470.188.R.40.15.XS.4D
	48.00	40.00	192.00	197.00	232.00	15	48.000	GMD.480.192.R.40.15.XS.4D
	49.00	40.00	196.00	201.00	236.00	15	49.000	GMD.490.196.R.40.15.XS.4D
	50.00	40.00	200.00	205.00	240.00	15	50.000	GMD.500.200.R.40.15.XS.4D
NEW	51.00	40.00	204.00	209.00	244.00	18	51.000	GMD.510.204.R.40.18.XS.4D
NEW	52.00	40.00	208.00	213.00	248.00	18	52.000	GMD.520.208.R.40.18.XS.4D
NEW	53.00	40.00	212.00	217.00	252.00	18	53.000	GMD.530.212.R.40.18.XS.4D
NEW	54.00	40.00	216.00	221.00	256.00	18	54.000	GMD.540.216.R.40.18.XS.4D
NEW	55.00	40.00	220.00	225.00	260.00	18	55.000	GMD.550.220.R.40.18.XS.4D
NEW	56.00	40.00	224.00	229.00	264.00	18	56.000	GMD.560.224.R.40.18.XS.4D
NEW	57.00	40.00	228.00	233.00	268.00	18	57.000	GMD.570.228.R.40.18.XS.4D

Article no. **28502**

	D mm	d h6 mm	l1 mm	l2 mm	L mm	Size	Code no.	Description
NEW	58.00	40.00	232.00	237.00	272.00	18	58.000	GMD.580.232.R.40.18.XS.4D
NEW	59.00	40.00	236.00	241.00	276.00	18	59.000	GMD.590.236.R.40.18.XS.4D
NEW	60.00	40.00	240.00	245.00	280.00	18	60.000	GMD.600.240.R.40.18.XS.4D

Spare parts

Article no. 28900	Clamping screw Size	Torque Nm	Description
Code 6.200	M2.0x4.4 06IP	0.6	use for indexable insert size 05, XOLX and SOLX
Code 6.220	M2.2x5.4 06IP	0.6	use for indexable insert size 06, XOLX and SOLX
Code 8.250	M2.5x6.5 08IP	1.2	use for indexable insert size 07, XOLX and SOLX
Code 8.300	M3.0x7.0 08IP	1.2	use for indexable insert size 09, XOLX and SOLX
Code 15.350	M3.5x8.0 15IP	3.0	use for indexable insert size 11, XOLX and SOLX
Code 15.400	M4.0x10 15IP	3.0	use for indexable insert size 13, XOLX and SOLX
Code 20.500	M5.0x12.5 20IP	5.0	use for indexable insert sizes 15 and 18, XOLX and SOLX

Article no. 28901	Torx Plus wrench Size
Code 6.000	T-handle Torx Plus wrench 06IP
Code 8.000	T-handle Torx Plus wrench 08IP
Code 15.000	T-handle Torx Plus wrench 15IP
Code 20.000	T-handle Torx Plus wrench 20IP

Article no. 4915	Torque wrenches Size	Torque Nm
Code 6.000	1/4"	0.5-2
Code 8.000	1/4“	2-8

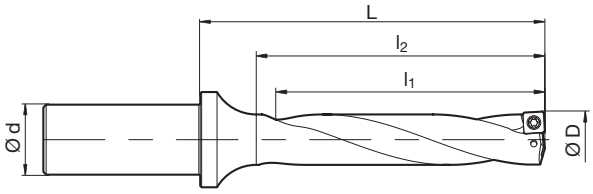
Article no. 4960	Interchangeable blade Size	Overall length
Code 6.000	06IP	175
Code 8.000	08IP	175
Code 15.000	15IP	175
Code 20.000	20IP	175

Shank Ø d	Shank length Ls	IC connection thread
20	50	BSPT-1/8
25	56	BSPT-1/8
32	60	BSPT-1/4
40	70	BSPT-1/4

Indexable insert drills with internal cooling

Article no. **28503**

for indexable inserts type SOLX and XOLX • order Torx Plus wrench art. no. 28901 separately



	D mm	d h6 mm	l1 mm	l2 mm	L mm	Size	Code no.	Description
	14.00	20.00	70.00	73.00	88.00	05	14.000	GMD.140.070.R.20.05.XS.5D
	14.50	20.00	73.00	76.00	91.00	05	14.500	GMD.145.072.R.20.05.XS.5D
	15.00	20.00	75.00	78.00	93.00	05	15.000	GMD.150.075.R.20.05.XS.5D
	15.50	20.00	78.00	81.00	96.00	05	15.500	GMD.155.077.R.20.05.XS.5D
	16.00	20.00	80.00	83.00	98.00	05	16.000	GMD.160.080.R.20.05.XS.5D
	16.50	25.00	83.00	86.00	100.00	06	16.500	GMD.165.082.R.25.06.XS.5D
	17.00	25.00	85.00	88.00	108.00	06	17.000	GMD.170.085.R.25.06.XS.5D
	17.50	25.00	88.00	91.00	111.00	06	17.500	GMD.175.087.R.25.06.XS.5D
	18.00	25.00	90.00	93.00	113.00	06	18.000	GMD.180.090.R.25.06.XS.5D
	18.50	25.00	93.00	96.00	116.00	06	18.500	GMD.185.092.R.25.06.XS.5D
	19.00	25.00	95.00	98.00	118.00	06	19.000	GMD.190.095.R.25.06.XS.5D
	19.50	25.00	98.00	101.00	121.00	06	19.500	GMD.195.097.R.25.06.XS.5D
	20.00	25.00	100.00	103.00	123.00	07	20.000	GMD.200.100.R.25.07.XS.5D
	20.50	25.00	103.00	106.00	126.00	07	20.500	GMD.205.102.R.25.07.XS.5D
	21.00	25.00	105.00	108.00	128.00	07	21.000	GMD.210.105.R.25.07.XS.5D
	21.50	25.00	108.00	111.00	131.00	07	21.500	GMD.215.107.R.25.07.XS.5D
	22.00	25.00	110.00	113.00	133.00	07	22.000	GMD.220.110.R.25.07.XS.5D
	22.50	25.00	113.00	116.00	136.00	07	22.500	GMD.225.112.R.25.07.XS.5D
	23.00	25.00	115.00	118.00	138.00	07	23.000	GMD.230.115.R.25.07.XS.5D
	23.50	25.00	118.00	121.00	141.00	07	23.500	GMD.235.117.R.25.07.XS.5D
	24.00	32.00	120.00	123.00	148.00	09	24.000	GMD.240.120.R.32.09.XS.5D
	24.50	32.00	123.00	126.00	151.00	09	24.500	GMD.245.122.R.32.09.XS.5D
	25.00	32.00	125.00	128.00	153.00	09	25.000	GMD.250.125.R.32.09.XS.5D
	25.50	32.00	128.00	131.00	156.00	09	25.500	GMD.255.127.R.32.09.XS.5D
	26.00	32.00	130.00	133.00	158.00	09	26.000	GMD.260.130.R.32.09.XS.5D
	26.50	32.00	133.00	136.00	161.00	09	26.500	GMD.265.132.R.32.09.XS.5D
	27.00	32.00	135.00	138.00	163.00	09	27.000	GMD.270.135.R.32.09.XS.5D
	27.50	32.00	138.00	141.00	166.00	09	27.500	GMD.275.137.R.32.09.XS.5D
	28.00	32.00	140.00	143.00	168.00	09	28.000	GMD.280.140.R.32.09.XS.5D
	28.50	32.00	143.00	146.00	171.00	09	28.500	GMD.285.142.R.32.09.XS.5D
	29.00	32.00	145.00	148.00	173.00	09	29.000	GMD.290.145.R.32.09.XS.5D
	29.50	32.00	148.00	151.00	176.00	09	29.500	GMD.295.147.R.32.09.XS.5D
	30.00	32.00	150.00	155.00	180.00	11	30.000	GMD.300.150.R.32.11.XS.5D
	31.00	32.00	155.00	160.00	185.00	11	31.000	GMD.310.155.R.32.11.XS.5D
	32.00	32.00	160.00	165.00	190.00	11	32.000	GMD.320.160.R.32.11.XS.5D
	33.00	32.00	165.00	170.00	195.00	11	33.000	GMD.330.165.R.32.11.XS.5D
	34.00	32.00	170.00	175.00	200.00	11	34.000	GMD.340.170.R.32.11.XS.5D
	35.00	32.00	175.00	180.00	205.00	11	35.000	GMD.350.175.R.32.11.XS.5D
	36.00	40.00	180.00	185.00	215.00	13	36.000	GMD.360.180.R.40.13.XS.5D
	37.00	40.00	185.00	190.00	220.00	13	37.000	GMD.370.185.R.40.13.XS.5D
	38.00	40.00	190.00	195.00	225.00	13	38.000	GMD.380.190.R.40.13.XS.5D
	39.00	40.00	195.00	200.00	230.00	13	39.000	GMD.390.195.R.40.13.XS.5D
	40.00	40.00	200.00	205.00	235.00	13	40.000	GMD.400.200.R.40.13.XS.5D
	41.00	40.00	205.00	210.00	240.00	13	41.000	GMD.410.205.R.40.13.XS.5D
	42.00	40.00	210.00	215.00	245.00	13	42.000	GMD.420.210.R.40.13.XS.5D
	43.00	40.00	215.00	220.00	250.00	15	43.000	GMD.430.215.R.40.15.XS.5D
	44.00	40.00	220.00	225.00	255.00	15	44.000	GMD.440.220.R.40.15.XS.5D
	45.00	40.00	225.00	230.00	260.00	15	45.000	GMD.450.225.R.40.15.XS.5D
	46.00	40.00	230.00	235.00	265.00	15	46.000	GMD.460.230.R.40.15.XS.5D
	47.00	40.00	235.00	240.00	270.00	15	47.000	GMD.470.235.R.40.15.XS.5D
	48.00	40.00	240.00	245.00	275.00	15	48.000	GMD.480.240.R.40.15.XS.5D
	49.00	40.00	245.00	250.00	280.00	15	49.000	GMD.490.245.R.40.15.XS.5D
	50.00	40.00	250.00	255.00	285.00	15	50.000	GMD.500.250.R.40.15.XS.5D
NEW	51.00	40.00	257.00	260.00	290.00	18	51.000	GMD.510.257.R.40.18.XS.5D
NEW	52.00	40.00	262.00	265.00	295.00	18	52.000	GMD.520.262.R.40.18.XS.5D
NEW	53.00	40.00	267.00	270.00	300.00	18	53.000	GMD.530.267.R.40.18.XS.5D
NEW	54.00	40.00	272.00	275.00	305.00	18	54.000	GMD.540.272.R.40.18.XS.5D
NEW	55.00	40.00	277.00	280.00	310.00	18	55.000	GMD.550.277.R.40.18.XS.5D
NEW	56.00	40.00	282.00	285.00	315.00	18	56.000	GMD.560.282.R.40.18.XS.5D
NEW	57.00	40.00	287.00	290.00	320.00	18	57.000	GMD.570.287.R.40.18.XS.5D

Article no. **28503**

	D mm	d h6 mm	l1 mm	l2 mm	L mm	Size	Code no.	Description
NEW	58.00	40.00	292.00	295.00	325.00	18	58.000	GMD.580.292.R.40.18.XS.5D
NEW	59.00	40.00	297.00	300.00	330.00	18	59.000	GMD.590.297.R.40.18.XS.5D
NEW	60.00	40.00	302.00	305.00	335.00	18	60.000	GMD.600.302.R.40.18.XS.5D

Spare parts

Article no. 28900	Clamping screw Size	Torque Nm	Description
Code 6.200	M2.0x4.4 06IP	0.6	use for indexable insert size 05, XOLX and SOLX
Code 6.220	M2.2x5.4 06IP	0.6	use for indexable insert size 06, XOLX and SOLX
Code 8.250	M2.5x6.5 08IP	1.2	use for indexable insert size 07, XOLX and SOLX
Code 8.300	M3.0x7.0 08IP	1.2	use for indexable insert size 09, XOLX and SOLX
Code 15.350	M3.5x8.0 15IP	3.0	use for indexable insert size 11, XOLX and SOLX
Code 15.400	M4.0x10 15IP	3.0	use for indexable insert size 13, XOLX and SOLX
Code 20.500	M5.0x12.5 20IP	5.0	use for indexable insert sizes 15 and 18, XOLX and SOLX

Article no. 28901	Torx Plus wrench Size
Code 6.000	T-handle Torx Plus wrench 06IP
Code 8.000	T-handle Torx Plus wrench 08IP
Code 15.000	T-handle Torx Plus wrench 15IP
Code 20.000	T-handle Torx Plus wrench 20IP

Article no. 4915	Torque wrenches Size	Torque Nm
Code 6.000	1/4"	0.5-2
Code 8.000	1/4“	2-8

Article no. 4960	Interchangeable blade Size	Overall length
Code 6.000	06IP	175
Code 8.000	08IP	175
Code 15.000	15IP	175
Code 20.000	20IP	175

Shank Ø d	Shank length Ls	IC connection thread
20	50	BSPT-1/8
25	56	BSPT-1/8
32	60	BSPT-1/4
40	70	BSPT-1/4

Indexable inserts SOLX, single-sided, peripheral

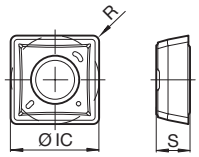
Article no. **28504**

cutting data see page 102

P	M	K	N	S	H
●		●			

+Ø VHM SOLX WN

4 usable cutting edges • stable cutting edge • type PK2011



Article no. **28504**

	IC mm	R mm	S mm	Size	Code no.	Description
	5.1	0.4	2.5	05	5.000	SOLX 050204
	6.2	0.5	2.6	06	6.000	SOLX 060205
	7.5	0.8	2.9	07	7.000	SOLX 07T208
	9.2	0.8	3.5	09	9.000	SOLX 090308
	11.0	0.8	4.2	11	11.000	SOLX 11T308
	13.0	1.0	4.7	13	13.000	SOLX 130410
	15.2	1.0	5.3	15	15.000	SOLX 150510
NEW	18.2	1.0	5.5	18	18.000	SOLX 180510

Indexable inserts SOLX, single-sided, peripheral

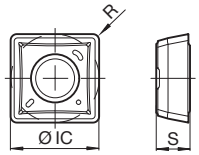
Article no. **28505**

cutting data see page 103

P	M	K	N	S	H
	●			●	

+Ø VHM SOLX WN

4 usable cutting edges • soft cut • type MS2011



Article no. **28505**

	IC mm	R mm	S mm	Size	Code no.	Description
	5.1	0.4	2.5	05	5.000	SOLX 050204
	6.2	0.5	2.6	06	6.000	SOLX 060205
	7.5	0.8	2.9	07	7.000	SOLX 07T208
	9.2	0.8	3.5	09	9.000	SOLX 090308
	11.0	0.8	4.2	11	11.000	SOLX 11T308
	13.0	1.0	4.7	13	13.000	SOLX 130410
	15.2	1.0	5.3	15	15.000	SOLX 150510
NEW	18.2	1.0	5.5	18	18.000	SOLX 180510

Indexable inserts XOLX, single-sided, central

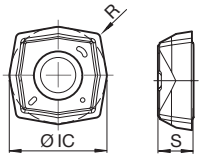
Article no. **28508**

+Ø VHM XOLX WN

4 usable cutting edges • stable cutting edge • type PK3021

cutting data see page 102

P	M	K	N	S	H
•		•			



Article no. **28508**

	IC mm	R mm	S mm	Size	Code no.	Description
	5.4	0.4	2.5	05	5.000	XOLX 050204
	6.6	0.4	2.5	06	6.000	XOLX 060204
	7.8	0.5	2.9	07	7.000	XOLX 07T205
	9.6	0.5	3.5	09	9.000	XOLX 090305
	11.4	0.6	4.2	11	11.000	XOLX 11T306
	13.6	0.6	4.7	13	13.000	XOLX 130406
	15.9	0.8	5.3	15	15.000	XOLX 150508
NEW	18.9	0.8	5.5	18	18.000	XOLX 180508

Indexable inserts XOLX, single-sided, central

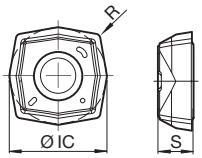
Article no. **28509**

+Ø VHM XOLX WN

4 usable cutting edges • soft cut • type MS3021

cutting data see page 103

P	M	K	N	S	H
	•			•	



Article no. **28509**

	IC mm	R mm	S mm	Size	Code no.	Description
	5.4	0.4	2.5	05	5.000	XOLX 050204
	6.6	0.4	2.5	06	6.000	XOLX 060204
	7.8	0.5	2.9	07	7.000	XOLX 07T205
	9.6	0.5	3.5	09	9.000	XOLX 090305
	11.4	0.6	4.2	11	11.000	XOLX 11T306
	13.6	0.6	4.7	13	13.000	XOLX 130406
	15.9	0.8	5.3	15	15.000	XOLX 150508
NEW	18.9	0.8	5.5	18	18.000	XOLX 180508

Clamping screws

Article no. **28900**

WN

Article no. **28900**

d1	l1 mm	Size	Order no.
M 2	4.30	06IP	28900 6.200
M 2.2	5.40	06IP	28900 6.220
M 2.5	6.50	08IP	28900 8.250
M 3	7.00	08IP	28900 8.300
M 3.5	8.00	15IP	28900 15.350
M 4	10.00	15IP	28900 15.400
M 5	12.50	20IP	28900 20.500


NEW

EB 100 M STEEL

Greater performance thanks to HPC geometry

Our new material specialist for steel materials in ISO group P

The EB 100 M STEEL is a solid carbide deep drilling tool for maximum feed rates, long tool lives and excellent chip control for steel materials in ISO group P.

The innovative HPC tip geometry with defined cutting edge rounding and the wear-resistant Signum coating ensure controlled chip removal, even at large drilling depths. Thanks to the optimised microgeometry of the cutting edges and the new Gühring kidney shaped coolant ducts, the EB 100 M STEEL achieves up to five times higher feed rates with maximum hole quality on a consistent basis. Regardless of the cooling medium used, the special finish to the coating increases tool life by up to 25%.

x 3.7 x faster **machining time**

x **Drilling path** reduced by 75 %

- X Tool life increased by up to 25% in ISO group P
- X Process-reliable deep hole drilling with up to 5 times the feed rate
- X Maximum hole qualities over the entire tool life, even under MQL

New kidney-shaped coolant ducts
for greater stability at highest possible flow rates

HPC tip geometry
with defined cutting edge rounding

Signum coating
with optimised layer smoothing

Available for drilling depths
20xD, 30xD, 40xD, 60xD and 80xD

Application example

Component:	Directional valve block C22E, EN 10083-2, drilling depth 156 mm	
Tool:	#6094, Ø 3,000 mm, 60xD	
Customer target:	Higher tool performance with the same tool life	
Difficulty:	Minimal deviation of the drilling centerline	
Cutting data:	**Gühring** v_c 70 m/min **f** 0.075 mm/rev	**Competition** v_c 70 m/min **f** 0.020 mm/rev
Machining time:	17 sec. per hole	63 sec. per hole
Hole centerline deviation:	0.02 – 0.04 mm	0.08 – 0.12 mm

Single-fluted gun drills EB 100 M STEEL

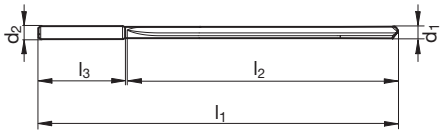
Article no. **6091**

NEW | VHM | EB 100 M STEEL | 20xD | WN | h5 | HA

solid carbide shank with MQL shank end • adapted circumferential shape • HPC tip geometry

cutting data see page 104

P	M	K	N	S	H
●	○	○	○	○	○



Article no. **6091**

d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	Order no.
2.000		4.0	92.0	56.0	28.0	6091 2.000
2.100		4.0	95.0	60.0	28.0	6091 2.100
2.200		4.0	97.0	62.0	28.0	6091 2.200
2.300		4.0	99.0	64.0	28.0	6091 2.300
2.381	3/32	4.0	101.0	66.0	28.0	6091 2.380
2.400		4.0	102.0	67.0	28.0	6091 2.400
2.500		4.0	104.0	70.0	28.0	6091 2.500
2.600		4.0	107.0	73.0	28.0	6091 2.600
2.700		4.0	109.0	75.0	28.0	6091 2.700
2.778	7/64	4.0	111.0	77.0	28.0	6091 2.780
2.800		4.0	111.0	77.0	28.0	6091 2.800
2.900		4.0	114.0	80.0	28.0	6091 2.900
3.000		4.0	116.0	83.0	28.0	6091 3.000
3.100		4.0	119.0	86.0	28.0	6091 3.100
3.175	1/8	4.0	120.0	87.0	28.0	6091 3.170
3.200		4.0	121.0	88.0	28.0	6091 3.200
3.300		4.0	123.0	90.0	28.0	6091 3.300
3.400		4.0	126.0	93.0	28.0	6091 3.400
3.500		4.0	128.0	96.0	28.0	6091 3.500
3.572	9/64	4.0	130.0	98.0	28.0	6091 3.570
3.600		4.0	131.0	99.0	28.0	6091 3.600
3.700		4.0	133.0	101.0	28.0	6091 3.700
3.800		4.0	135.0	103.0	28.0	6091 3.800
3.900		4.0	138.0	106.0	28.0	6091 3.900
3.969	5/32	4.0	139.0	108.0	28.0	6091 3.970
4.000		4.0	140.0	109.0	28.0	6091 4.000
4.100		6.0	151.0	109.0	36.0	6091 4.100
4.200		6.0	153.0	111.0	36.0	6091 4.200
4.300		6.0	155.0	113.0	36.0	6091 4.300
4.366	11/64	6.0	157.0	115.0	36.0	6091 4.370
4.400		6.0	158.0	116.0	36.0	6091 4.400
4.500		6.0	160.0	118.0	36.0	6091 4.500
4.600		6.0	162.0	121.0	36.0	6091 4.600
4.700		6.0	165.0	124.0	36.0	6091 4.700
4.763	3/16	6.0	166.0	125.0	36.0	6091 4.760
4.800		6.0	167.0	126.0	36.0	6091 4.800
4.900		6.0	169.0	128.0	36.0	6091 4.900
5.000		6.0	172.0	131.0	36.0	6091 5.000
5.100		6.0	174.0	133.0	36.0	6091 5.100
5.159	13/64	6.0	175.0	134.0	36.0	6091 5.160

Article no. **6091**

d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	Order no.
5.200		6.0	176.0	136.0	36.0	6091 5.200
5.300		6.0	178.0	138.0	36.0	6091 5.300
5.500		6.0	183.0	143.0	36.0	6091 5.500
5.556	7/32	6.0	184.0	144.0	36.0	6091 5.560
5.953	15/64	6.0	194.0	155.0	36.0	6091 5.950
6.000		6.0	195.0	156.0	36.0	6091 6.000
6.100		8.0	208.0	165.0	36.0	6091 6.100
6.200		8.0	210.0	167.0	36.0	6091 6.200
6.300		8.0	213.0	170.0	36.0	6091 6.300
6.350	1/4	8.0	214.0	172.0	36.0	6091 6.350
6.500		8.0	217.0	175.0	36.0	6091 6.500
6.747	17/64	8.0	223.0	181.0	36.0	6091 6.750
7.000		8.0	229.0	188.0	36.0	6091 7.000
7.100		8.0	231.0	190.0	36.0	6091 7.100
7.144	9/32	8.0	232.0	191.0	36.0	6091 7.140
7.200		8.0	234.0	193.0	36.0	6091 7.200
7.300		8.0	236.0	195.0	36.0	6091 7.300
7.500		8.0	241.0	201.0	36.0	6091 7.500
7.541	19/64	8.0	241.0	201.0	36.0	6091 7.540
7.938	5/16	8.0	251.0	211.0	36.0	6091 7.940
8.000		8.0	252.0	213.0	36.0	6091 8.000
8.334	21/64	10.0	267.0	221.0	40.0	6091 8.330
8.500		10.0	271.0	226.0	40.0	6091 8.500
8.731	11/32	10.0	276.0	231.0	40.0	6091 8.730
9.000		10.0	282.0	237.0	40.0	6091 9.000
9.128	23/64	10.0	285.0	241.0	40.0	6091 9.130
9.500		10.0	294.0	250.0	40.0	6091 9.500
9.525	3/8	10.0	294.0	250.0	40.0	6091 9.530
9.922	25/64	10.0	304.0	261.0	40.0	6091 9.920
10.000		10.0	306.0	263.0	40.0	6091 10.000
10.319	13/32	12.0	321.0	270.0	45.0	6091 10.320
10.500		12.0	325.0	275.0	45.0	6091 10.500
10.716	27/64	12.0	330.0	280.0	45.0	6091 10.720
11.000		12.0	337.0	288.0	45.0	6091 11.000
11.113	7/16	12.0	339.0	290.0	45.0	6091 11.110
11.500		12.0	348.0	299.0	45.0	6091 11.500
11.509	29/64	12.0	349.0	300.0	45.0	6091 11.510
11.906	15/32	12.0	358.0	310.0	45.0	6091 11.910
12.000		12.0	360.0	312.0	45.0	6091 12.000

Single-fluted gun drills EB 100 M STEEL

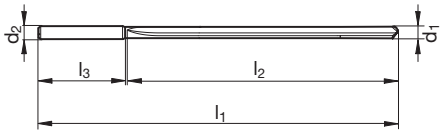
Article no. **6092**

NEW | VHM | EB 100 M STEEL | 30xD | WN | h5 | HA

solid carbide shank with MQL shank end • adapted circumferential shape • HPC tip geometry

cutting data see page 104

P	M	K	N	S	H
●	○	○	○	○	○



Article no. **6092**

d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	Order no.
2.000		4.0	112.0	76.0	28.0	6092 2.000
2.100		4.0	116.0	81.0	28.0	6092 2.100
2.200		4.0	119.0	84.0	28.0	6092 2.200
2.300		4.0	122.0	87.0	28.0	6092 2.300
2.381	3/32	4.0	125.0	90.0	28.0	6092 2.380
2.400		4.0	126.0	91.0	28.0	6092 2.400
2.500		4.0	129.0	95.0	28.0	6092 2.500
2.600		4.0	133.0	99.0	28.0	6092 2.600
2.700		4.0	136.0	102.0	28.0	6092 2.700
2.778	7/64	4.0	139.0	105.0	28.0	6092 2.780
2.800		4.0	139.0	105.0	28.0	6092 2.800
2.900		4.0	143.0	109.0	28.0	6092 2.900
3.000		4.0	146.0	113.0	28.0	6092 3.000
3.100		4.0	150.0	117.0	28.0	6092 3.100
3.175	1/8	4.0	152.0	119.0	28.0	6092 3.170
3.200		4.0	153.0	120.0	28.0	6092 3.200
3.300		4.0	156.0	123.0	28.0	6092 3.300
3.400		4.0	160.0	127.0	28.0	6092 3.400
3.500		4.0	163.0	131.0	28.0	6092 3.500
3.572	9/64	4.0	166.0	134.0	28.0	6092 3.570
3.600		4.0	167.0	135.0	28.0	6092 3.600
3.700		4.0	170.0	138.0	28.0	6092 3.700
3.800		4.0	173.0	141.0	28.0	6092 3.800
3.900		4.0	177.0	145.0	28.0	6092 3.900
3.969	5/32	4.0	179.0	148.0	28.0	6092 3.970
4.000		4.0	180.0	149.0	28.0	6092 4.000
4.100		6.0	192.0	150.0	36.0	6092 4.100
4.200		6.0	195.0	153.0	36.0	6092 4.200
4.300		6.0	198.0	156.0	36.0	6092 4.300
4.366	11/64	6.0	200.0	158.0	36.0	6092 4.370
4.400		6.0	202.0	160.0	36.0	6092 4.400
4.500		6.0	205.0	163.0	36.0	6092 4.500
4.600		6.0	208.0	167.0	36.0	6092 4.600
4.700		6.0	212.0	171.0	36.0	6092 4.700
4.763	3/16	6.0	214.0	173.0	36.0	6092 4.760
4.800		6.0	215.0	174.0	36.0	6092 4.800
4.900		6.0	218.0	177.0	36.0	6092 4.900
5.000		6.0	222.0	181.0	36.0	6092 5.000
5.100		6.0	225.0	184.0	36.0	6092 5.100
5.159	13/64	6.0	227.0	186.0	36.0	6092 5.160

Article no. **6092**

d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	Order no.
5.200		6.0	228.0	188.0	36.0	6092 5.200
5.300		6.0	231.0	191.0	36.0	6092 5.300
5.500		6.0	238.0	198.0	36.0	6092 5.500
5.556	7/32	6.0	240.0	200.0	36.0	6092 5.560
5.953	15/64	6.0	253.0	214.0	36.0	6092 5.950
6.000		6.0	255.0	216.0	36.0	6092 6.000
6.100		8.0	269.0	226.0	36.0	6092 6.100
6.200		8.0	272.0	229.0	36.0	6092 6.200
6.300		8.0	276.0	233.0	36.0	6092 6.300
6.350	1/4	8.0	277.0	235.0	36.0	6092 6.350
6.500		8.0	282.0	240.0	36.0	6092 6.500
6.747	17/64	8.0	291.0	249.0	36.0	6092 6.750
7.000		8.0	299.0	258.0	36.0	6092 7.000
7.100		8.0	302.0	261.0	36.0	6092 7.100
7.144	9/32	8.0	304.0	263.0	36.0	6092 7.140
7.200		8.0	306.0	265.0	36.0	6092 7.200
7.300		8.0	309.0	268.0	36.0	6092 7.300
7.500		8.0	316.0	276.0	36.0	6092 7.500
7.541	19/64	8.0	317.0	277.0	36.0	6092 7.540
7.938	5/16	8.0	330.0	290.0	36.0	6092 7.940
8.000		8.0	332.0	293.0	36.0	6092 8.000
8.334	21/64	10.0	350.0	304.0	40.0	6092 8.330
8.500		10.0	356.0	311.0	40.0	6092 8.500
8.731	11/32	10.0	363.0	318.0	40.0	6092 8.730
9.000		10.0	372.0	327.0	40.0	6092 9.000
9.128	23/64	10.0	377.0	333.0	40.0	6092 9.130
9.500		10.0	389.0	345.0	40.0	6092 9.500
9.525	3/8	10.0	390.0	346.0	40.0	6092 9.530
9.922	25/64	10.0	403.0	360.0	40.0	6092 9.920
10.000		10.0	406.0	363.0	40.0	6092 10.000
10.319	13/32	12.0	424.0	373.0	45.0	6092 10.320
10.500		12.0	430.0	380.0	45.0	6092 10.500
10.716	27/64	12.0	437.0	387.0	45.0	6092 10.720
11.000		12.0	447.0	398.0	45.0	6092 11.000
11.113	7/16	12.0	451.0	401.0	45.0	6092 11.110
11.500		12.0	464.0	414.0	45.0	6092 11.500
11.509	29/64	12.0	465.0	415.0	45.0	6092 11.510
11.906	15/32	12.0	478.0	429.0	45.0	6092 11.910
12.000		12.0	481.0	432.0	45.0	6092 12.000

Single-fluted gun drills EB 100 M STEEL

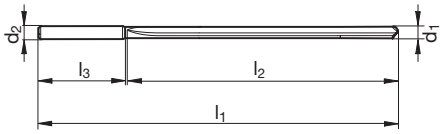
Article no. **6093**

NEW | VHM | EB 100 M STEEL | 40xD | WN | h5 | HA

solid carbide shank with MQL shank end • adapted circumferential shape • HPC tip geometry

cutting data see page 104

P	M	K	N	S	H
●	○	○	○	○	○



Article no. **6093**

d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	Order no.
2.000		4.0	132.0	96.0	28.0	6093 2.000
2.100		4.0	137.0	102.0	28.0	6093 2.100
2.200		4.0	141.0	106.0	28.0	6093 2.200
2.300		4.0	145.0	110.0	28.0	6093 2.300
2.381	3/32	4.0	149.0	114.0	28.0	6093 2.380
2.400		4.0	150.0	115.0	28.0	6093 2.400
2.500		4.0	154.0	120.0	28.0	6093 2.500
2.600		4.0	159.0	125.0	28.0	6093 2.600
2.700		4.0	163.0	129.0	28.0	6093 2.700
2.778	7/64	4.0	166.0	132.0	28.0	6093 2.780
2.800		4.0	167.0	133.0	28.0	6093 2.800
2.900		4.0	172.0	138.0	28.0	6093 2.900
3.000		4.0	176.0	143.0	28.0	6093 3.000
3.100		4.0	181.0	148.0	28.0	6093 3.100
3.175	1/8	4.0	184.0	151.0	28.0	6093 3.170
3.200		4.0	185.0	152.0	28.0	6093 3.200
3.300		4.0	189.0	156.0	28.0	6093 3.300
3.400		4.0	194.0	161.0	28.0	6093 3.400
3.500		4.0	198.0	166.0	28.0	6093 3.500
3.572	9/64	4.0	201.0	169.0	28.0	6093 3.570
3.600		4.0	203.0	171.0	28.0	6093 3.600
3.700		4.0	207.0	175.0	28.0	6093 3.700
3.800		4.0	211.0	179.0	28.0	6093 3.800
3.900		4.0	216.0	184.0	28.0	6093 3.900
3.969	5/32	4.0	219.0	188.0	28.0	6093 3.970
4.000		4.0	220.0	189.0	28.0	6093 4.000
4.100		6.0	233.0	191.0	36.0	6093 4.100
4.200		6.0	237.0	195.0	36.0	6093 4.200
4.300		6.0	241.0	199.0	36.0	6093 4.300
4.366	11/64	6.0	244.0	202.0	36.0	6093 4.370
4.400		6.0	246.0	204.0	36.0	6093 4.400
4.500		6.0	250.0	208.0	36.0	6093 4.500
4.600		6.0	254.0	213.0	36.0	6093 4.600
4.700		6.0	259.0	218.0	36.0	6093 4.700
4.763	3/16	6.0	261.0	220.0	36.0	6093 4.760
4.800		6.0	263.0	222.0	36.0	6093 4.800

Article no. **6093**

d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	Order no.
4.900		6.0	267.0	226.0	36.0	6093 4.900
5.000		6.0	272.0	231.0	36.0	6093 5.000
5.100		6.0	276.0	235.0	36.0	6093 5.100
5.159	13/64	6.0	278.0	237.0	36.0	6093 5.160
5.200		6.0	280.0	240.0	36.0	6093 5.200
5.300		6.0	284.0	244.0	36.0	6093 5.300
5.500		6.0	293.0	253.0	36.0	6093 5.500
5.556	7/32	6.0	296.0	256.0	36.0	6093 5.560
5.953	15/64	6.0	313.0	274.0	36.0	6093 5.950
6.000		6.0	315.0	276.0	36.0	6093 6.000
6.100		8.0	330.0	287.0	36.0	6093 6.100
6.200		8.0	334.0	291.0	36.0	6093 6.200
6.300		8.0	339.0	296.0	36.0	6093 6.300
6.350	1/4	8.0	341.0	299.0	36.0	6093 6.350
6.500		8.0	347.0	305.0	36.0	6093 6.500
6.747	17/64	8.0	358.0	316.0	36.0	6093 6.750
7.000		8.0	369.0	328.0	36.0	6093 7.000
7.100		8.0	373.0	332.0	36.0	6093 7.100
7.144	9/32	8.0	375.0	334.0	36.0	6093 7.140
7.200		8.0	378.0	337.0	36.0	6093 7.200
7.300		8.0	382.0	341.0	36.0	6093 7.300
7.500		8.0	391.0	351.0	36.0	6093 7.500
7.541	19/64	8.0	392.0	352.0	36.0	6093 7.540
7.938	5/16	8.0	409.0	369.0	36.0	6093 7.940
8.000		8.0	412.0	373.0	36.0	6093 8.000
8.334	21/64	10.0	434.0	388.0	40.0	6093 8.330
8.500		10.0	441.0	396.0	40.0	6093 8.500
8.731	11/32	10.0	452.0	406.0	40.0	6093 8.730
9.000		10.0	463.0	417.0	40.0	6093 9.000
9.128	23/64	10.0	469.0	424.0	40.0	6093 9.130
9.500		10.0	485.0	440.0	40.0	6093 9.500
9.525	3/8	10.0	486.0	441.0	40.0	6093 9.530
9.922	25/64	10.0	503.0	459.0	40.0	6093 9.920
10.000		10.0	507.0	463.0	40.0	6093 10.000
10.319	13/32	12.0	528.0	476.0	45.0	6093 10.320

Single-fluted gun drills EB 100 M STEEL

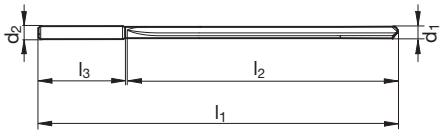
Article no. **6094**

cutting data see page 104

P	M	K	N	S	H
●	○	○	○	○	○

NEW · VHM · EB 100 M STEEL · 60xD · WN · h5 · HA

solid carbide shank with MQL shank end • adapted circumferential shape • HPC tip geometry



Article no. **6094**

d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	Order no.
2.000		4.0	172.0	136.0	28.0	6094 2.000
2.100		4.0	179.0	144.0	28.0	6094 2.100
2.200		4.0	185.0	150.0	28.0	6094 2.200
2.300		4.0	191.0	156.0	28.0	6094 2.300
2.381	3/32	4.0	197.0	162.0	28.0	6094 2.380
2.400		4.0	198.0	163.0	28.0	6094 2.400
2.500		4.0	204.0	170.0	28.0	6094 2.500
2.600		4.0	211.0	177.0	28.0	6094 2.600
2.700		4.0	217.0	183.0	28.0	6094 2.700
2.778	7/64	4.0	222.0	188.0	28.0	6094 2.780
2.800		4.0	223.0	189.0	28.0	6094 2.800
2.900		4.0	230.0	196.0	28.0	6094 2.900
3.000		4.0	236.0	203.0	28.0	6094 3.000
3.100		4.0	243.0	210.0	28.0	6094 3.100
3.175	1/8	4.0	247.0	214.0	28.0	6094 3.170
3.200		4.0	249.0	216.0	28.0	6094 3.200
3.300		4.0	255.0	222.0	28.0	6094 3.300
3.400		4.0	262.0	229.0	28.0	6094 3.400
3.500		4.0	268.0	236.0	28.0	6094 3.500
3.572	9/64	4.0	273.0	241.0	28.0	6094 3.570
3.600		4.0	275.0	243.0	28.0	6094 3.600
3.700		4.0	281.0	249.0	28.0	6094 3.700
3.800		4.0	287.0	255.0	28.0	6094 3.800
3.900		4.0	294.0	262.0	28.0	6094 3.900
3.969	5/32	4.0	298.0	267.0	28.0	6094 3.970
4.000		4.0	300.0	269.0	28.0	6094 4.000
4.100		6.0	315.0	273.0	36.0	6094 4.100
4.200		6.0	321.0	279.0	36.0	6094 4.200

Article no. **6094**

d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	Order no.
4.300		6.0	327.0	285.0	36.0	6094 4.300
4.366	11/64	6.0	331.0	289.0	36.0	6094 4.370
4.400		6.0	334.0	292.0	36.0	6094 4.400
4.500		6.0	340.0	298.0	36.0	6094 4.500
4.600		6.0	346.0	305.0	36.0	6094 4.600
4.700		6.0	353.0	312.0	36.0	6094 4.700
4.763	3/16	6.0	357.0	316.0	36.0	6094 4.760
4.800		6.0	359.0	318.0	36.0	6094 4.800
4.900		6.0	365.0	324.0	36.0	6094 4.900
5.000		6.0	372.0	331.0	36.0	6094 5.000
5.100		6.0	378.0	337.0	36.0	6094 5.100
5.159	13/64	6.0	382.0	341.0	36.0	6094 5.160
5.200		6.0	384.0	344.0	36.0	6094 5.200
5.300		6.0	390.0	350.0	36.0	6094 5.300
5.500		6.0	403.0	363.0	36.0	6094 5.500
5.556	7/32	6.0	407.0	367.0	36.0	6094 5.560
5.953	15/64	6.0	432.0	393.0	36.0	6094 5.950
6.000		6.0	435.0	396.0	36.0	6094 6.000
6.100		8.0	453.0	409.0	36.0	6094 6.100
6.200		8.0	459.0	415.0	36.0	6094 6.200
6.300		8.0	466.0	422.0	36.0	6094 6.300
6.350	1/4	8.0	469.0	426.0	36.0	6094 6.350
6.500		8.0	478.0	435.0	36.0	6094 6.500
6.747	17/64	8.0	494.0	451.0	36.0	6094 6.750
7.000		8.0	510.0	468.0	36.0	6094 7.000
7.100		8.0	516.0	474.0	36.0	6094 7.100
7.144	9/32	8.0	519.0	477.0	36.0	6094 7.140

Single-fluted gun drills EB 100 M STEEL

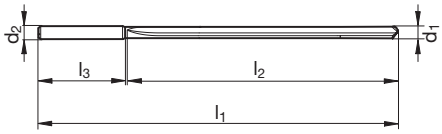
Article no. **6095**

NEW | VHM | EB 100 M STEEL | 80xD | WN | h5 | HA

solid carbide shank with MQL shank end • adapted circumferential shape • HPC tip geometry

cutting data see page 104

P	M	K	N	S	H
●	○	○	○	○	○



Article no. **6095**

d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	Order no.
2.000		4.0	212.0	176.0	28.0	6095 2.000
2.100		4.0	221.0	186.0	28.0	6095 2.100
2.200		4.0	229.0	194.0	28.0	6095 2.200
2.300		4.0	237.0	202.0	28.0	6095 2.300
2.381	3/32	4.0	244.0	209.0	28.0	6095 2.380
2.400		4.0	246.0	211.0	28.0	6095 2.400
2.500		4.0	254.0	220.0	28.0	6095 2.500
2.600		4.0	263.0	229.0	28.0	6095 2.600
2.700		4.0	271.0	237.0	28.0	6095 2.700
2.778	7/64	4.0	278.0	244.0	28.0	6095 2.780
2.800		4.0	279.0	245.0	28.0	6095 2.800
2.900		4.0	288.0	254.0	28.0	6095 2.900
3.000		4.0	296.0	263.0	28.0	6095 3.000
3.100		4.0	305.0	272.0	28.0	6095 3.100
3.175	1/8	4.0	311.0	278.0	28.0	6095 3.170
3.200		4.0	313.0	280.0	28.0	6095 3.200
3.300		4.0	321.0	288.0	28.0	6095 3.300
3.400		4.0	330.0	297.0	28.0	6095 3.400
3.500		4.0	338.0	306.0	28.0	6095 3.500
3.572	9/64	4.0	344.0	312.0	28.0	6095 3.570
3.600		4.0	347.0	315.0	28.0	6095 3.600
3.700		4.0	355.0	323.0	28.0	6095 3.700

Article no. **6095**

d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	Order no.
3.800		4.0	363.0	331.0	28.0	6095 3.800
3.900		4.0	372.0	340.0	28.0	6095 3.900
3.969	5/32	4.0	377.0	346.0	28.0	6095 3.970
4.000		4.0	380.0	349.0	28.0	6095 4.000
4.100		6.0	397.0	355.0	36.0	6095 4.100
4.200		6.0	405.0	363.0	36.0	6095 4.200
4.300		6.0	413.0	371.0	36.0	6095 4.300
4.366	11/64	6.0	419.0	377.0	36.0	6095 4.370
4.400		6.0	422.0	380.0	36.0	6095 4.400
4.500		6.0	430.0	388.0	36.0	6095 4.500
4.600		6.0	438.0	397.0	36.0	6095 4.600
4.700		6.0	448.0	406.0	36.0	6095 4.700
4.763	3/16	6.0	453.0	411.0	36.0	6095 4.760
4.800		6.0	456.0	414.0	36.0	6095 4.800
4.900		6.0	464.0	422.0	36.0	6095 4.900
5.000		6.0	473.0	431.0	36.0	6095 5.000
5.100		6.0	481.0	439.0	36.0	6095 5.100
5.159	13/64	6.0	486.0	444.0	36.0	6095 5.160
5.200		6.0	489.0	448.0	36.0	6095 5.200
5.300		6.0	497.0	456.0	36.0	6095 5.300
5.500		6.0	514.0	473.0	36.0	6095 5.500
5.556	7/32	6.0	519.0	478.0	36.0	6095 5.560


NEW
EB 80
CROSS

EB 80 CROSS

Reliable in gaps and cross holes

Specialist for gaps and cross holes

The EB 80 Cross is our solution for demanding deep hole drilling with gaps-process-reliable, precise and for universal application in all ISO groups.

Thanks to its extended carbide head with with combined cutting edge and guide, additional corner chamfer and hardened tube, the tool remains dimensionally stable and precise, even under the most difficult conditions. The optimised tool geometry ensures process-secure drilling, maximum straightness and hole quality up to IT6, even with multiple interruptions.

The result? Up to 50% longer tool lives and straightness of holes down to just 0.05 mm per 100 mm of machining depth – consistent over the entire tool life.

x **31,8 % faster** per hole

x **10 more holes** per tool

- X Increased tool life by up to 50% in applications with gaps in all ISO groups
- X Improved drilling and spot drilling stability thanks to optimised tool design
- X Process-secure deep hole drilling for multiple drilling operations thanks to additional corner chamfer

Tip geometry
with corner chamfer

Cylindrical guide part
allows for optimum straightness of holes
and the best possible tool guidance

Available in nine different total tool lengths
200 – 1,600 mm

Improved tool stability
thanks to hardened tubes

Application example

Component:	Press tool 40CrMnNiMo8-6-4 (1.2738), drilling depth 516 mm	
Tool:	#9194, Ø 12,000 mm, 600 mm	
Customer target:	Reliable increase in tool performance	
Difficulty:	Cutting edge load due to cross holes and coolant loss	
Cutting data:	**Gühring** v_c 55 m/min **f** 0.040 mm/rev	**Competition** v_c 50 m/min **f** 0.030 mm/rev
Tool life:	8 m (15 holes per tool)	3 m (5 holes per tool)
Machining time:	9 Minuten pro Bohrung	13 Minuten pro Bohrung

EB 80 CROSS single-fluted gun drills

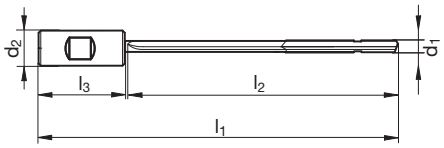
Article no. **9190**

cutting data see page 105

P	M	K	N	S	H
●	●	○	○	○	○

NEW · HM · A · EB 80 CROSS · GL 200 · WN · h5 · R · HB

adapted circumferential shape • with additional guide part • ideal for gaps



Article no. **9190**

d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	Order no.
3.000		16.0	200.0	149.0	48.0	9190 3.000
3.020		16.0	200.0	149.0	48.0	9190 3.020
3.500		16.0	200.0	149.0	48.0	9190 3.500
4.000		16.0	200.0	149.0	48.0	9190 4.000
4.020		16.0	200.0	149.0	48.0	9190 4.020
4.500		16.0	200.0	149.0	48.0	9190 4.500
5.000		16.0	200.0	149.0	48.0	9190 5.000
5.020		16.0	200.0	149.0	48.0	9190 5.020
5.500		16.0	200.0	149.0	48.0	9190 5.500
6.000		16.0	200.0	149.0	48.0	9190 6.000
6.020		16.0	200.0	149.0	48.0	9190 6.020
6.250		16.0	200.0	149.0	48.0	9190 6.250

Article no. **9190**

d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	Order no.
6.500		16.0	200.0	149.0	48.0	9190 6.500
7.000		16.0	200.0	149.0	48.0	9190 7.000
7.500		16.0	200.0	149.0	48.0	9190 7.500
8.000		16.0	200.0	149.0	48.0	9190 8.000
8.020		16.0	200.0	149.0	48.0	9190 8.020
8.500		16.0	200.0	149.0	48.0	9190 8.500
9.000		16.0	200.0	149.0	48.0	9190 9.000
9.420		16.0	200.0	149.0	48.0	9190 9.420
9.500		16.0	200.0	149.0	48.0	9190 9.500
10.000		16.0	200.0	149.0	48.0	9190 10.000

EB 80 CROSS single-fluted gun drills

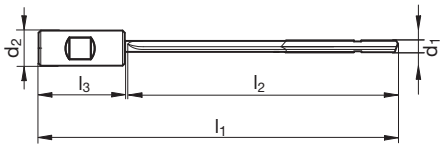
Article no. **9191**

cutting data see page 105

P	M	K	N	S	H
●	●	○	○	○	○

NEW · HM · A · EB 80 CROSS · GL 300 · WN · h5 · R · HB

adapted circumferential shape • with additional guide part • ideal for gaps



Article no. **9191**

d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	Order no.
3.000		16.0	300.0	249.0	48.0	9191 3.000
3.020		16.0	300.0	249.0	48.0	9191 3.020
3.500		16.0	300.0	249.0	48.0	9191 3.500
4.000		16.0	300.0	249.0	48.0	9191 4.000
4.020		16.0	300.0	249.0	48.0	9191 4.020
4.500		16.0	300.0	249.0	48.0	9191 4.500
5.000		16.0	300.0	249.0	48.0	9191 5.000
5.020		16.0	300.0	249.0	48.0	9191 5.020
5.500		16.0	300.0	249.0	48.0	9191 5.500
6.000		16.0	300.0	249.0	48.0	9191 6.000
6.020		16.0	300.0	249.0	48.0	9191 6.020
6.250		16.0	300.0	249.0	48.0	9191 6.250
6.500		16.0	300.0	249.0	48.0	9191 6.500
7.000		16.0	300.0	249.0	48.0	9191 7.000
7.500		16.0	300.0	249.0	48.0	9191 7.500
8.000		16.0	300.0	249.0	48.0	9191 8.000
8.020		16.0	300.0	249.0	48.0	9191 8.020
8.500		16.0	300.0	249.0	48.0	9191 8.500

Article no. **9191**

d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	Order no.
9.000		16.0	300.0	249.0	48.0	9191 9.000
9.420		16.0	300.0	249.0	48.0	9191 9.420
9.500		16.0	300.0	249.0	48.0	9191 9.500
10.000		16.0	300.0	249.0	48.0	9191 10.000
10.020		16.0	300.0	249.0	48.0	9191 10.020
10.500		16.0	300.0	249.0	48.0	9191 10.500
11.000		25.0	300.0	241.0	56.0	9191 11.000
11.500		25.0	300.0	241.0	56.0	9191 11.500
12.000		25.0	300.0	241.0	56.0	9191 12.000
12.020		25.0	300.0	241.0	56.0	9191 12.020
12.500		25.0	300.0	241.0	56.0	9191 12.500
12.600		25.0	300.0	241.0	56.0	9191 12.600
13.000		25.0	300.0	241.0	56.0	9191 13.000
13.500		25.0	300.0	241.0	56.0	9191 13.500
14.000		25.0	300.0	241.0	56.0	9191 14.000

EB 80 CROSS single-fluted gun drills

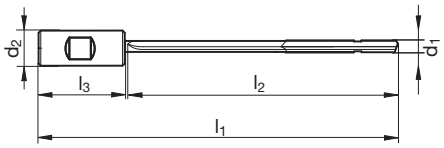
Article no. **9192**

NEW | HM | A | EB 80 CROSS | GL 400 | WN | h5 | R | HB

adapted circumferential shape • with additional guide part • ideal for gaps

cutting data see page 105

P	M	K	N	S	H
●	●	○	○	○	○



Article no. **9192**

d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	Order no.
3.000		16.0	400.0	349.0	48.0	9192 3.000
3.020		16.0	400.0	349.0	48.0	9192 3.020
3.500		16.0	400.0	349.0	48.0	9192 3.500
4.000		16.0	400.0	349.0	48.0	9192 4.000
4.020		16.0	400.0	349.0	48.0	9192 4.020
4.500		16.0	400.0	349.0	48.0	9192 4.500
5.000		16.0	400.0	349.0	48.0	9192 5.000
5.020		16.0	400.0	349.0	48.0	9192 5.020
5.500		16.0	400.0	349.0	48.0	9192 5.500
6.000		16.0	400.0	349.0	48.0	9192 6.000
6.020		16.0	400.0	349.0	48.0	9192 6.020
6.250		16.0	400.0	349.0	48.0	9192 6.250
6.500		16.0	400.0	349.0	48.0	9192 6.500
7.000		16.0	400.0	349.0	48.0	9192 7.000
7.500		16.0	400.0	349.0	48.0	9192 7.500
8.000		16.0	400.0	349.0	48.0	9192 8.000
8.020		16.0	400.0	349.0	48.0	9192 8.020
8.500		16.0	400.0	349.0	48.0	9192 8.500
9.000		16.0	400.0	349.0	48.0	9192 9.000
9.420		16.0	400.0	349.0	48.0	9192 9.420
9.500		16.0	400.0	349.0	48.0	9192 9.500
10.000		16.0	400.0	349.0	48.0	9192 10.000
10.020		16.0	400.0	349.0	48.0	9192 10.020
10.500		16.0	400.0	349.0	48.0	9192 10.500

Article no. **9192**

d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	Order no.
11.000		25.0	400.0	341.0	56.0	9192 11.000
11.500		25.0	400.0	341.0	56.0	9192 11.500
12.000		25.0	400.0	341.0	56.0	9192 12.000
12.020		25.0	400.0	341.0	56.0	9192 12.020
12.500		25.0	400.0	341.0	56.0	9192 12.500
12.600		25.0	400.0	341.0	56.0	9192 12.600
13.000		25.0	400.0	341.0	56.0	9192 13.000
13.500		25.0	400.0	341.0	56.0	9192 13.500
14.000		25.0	400.0	341.0	56.0	9192 14.000
14.500		25.0	400.0	341.0	56.0	9192 14.500
15.000		25.0	400.0	341.0	56.0	9192 15.000
15.500		25.0	400.0	341.0	56.0	9192 15.500
16.000		25.0	400.0	341.0	56.0	9192 16.000
16.500		25.0	400.0	341.0	56.0	9192 16.500
17.000		25.0	400.0	341.0	56.0	9192 17.000
17.500		25.0	400.0	341.0	56.0	9192 17.500
18.000		25.0	400.0	341.0	56.0	9192 18.000

EB 80 CROSS single-fluted gun drills

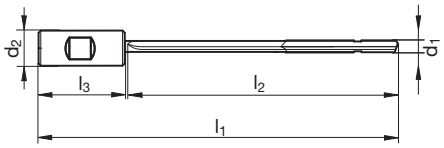
Article no. **9193**

cutting data see page 105

P	M	K	N	S	H
●	●	○	○	○	○

NEW · HM · A · EB 80 CROSS · GL 600 · WN · h5 · R · HB

adapted circumferential shape • with additional guide part • ideal for gaps



Article no. **9193**

d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	Order no.
3.000		16.0	600.0	549.0	48.0	9193 3.000
3.020		16.0	600.0	549.0	48.0	9193 3.020
3.500		16.0	600.0	549.0	48.0	9193 3.500
4.000		16.0	600.0	549.0	48.0	9193 4.000
4.020		16.0	600.0	549.0	48.0	9193 4.020
4.500		16.0	600.0	549.0	48.0	9193 4.500
5.000		16.0	600.0	549.0	48.0	9193 5.000
5.020		16.0	600.0	549.0	48.0	9193 5.020
5.500		16.0	600.0	549.0	48.0	9193 5.500
6.000		16.0	600.0	549.0	48.0	9193 6.000
6.020		16.0	600.0	549.0	48.0	9193 6.020
6.250		16.0	600.0	549.0	48.0	9193 6.250
6.500		16.0	600.0	549.0	48.0	9193 6.500
7.000		16.0	600.0	549.0	48.0	9193 7.000
7.500		16.0	600.0	549.0	48.0	9193 7.500
8.000		16.0	600.0	549.0	48.0	9193 8.000
8.020		16.0	600.0	549.0	48.0	9193 8.020
8.500		16.0	600.0	549.0	48.0	9193 8.500
9.000		16.0	600.0	549.0	48.0	9193 9.000
9.420		16.0	600.0	549.0	48.0	9193 9.420
9.500		16.0	600.0	549.0	48.0	9193 9.500
10.000		16.0	600.0	549.0	48.0	9193 10.000
10.020		16.0	600.0	549.0	48.0	9193 10.020
10.500		16.0	600.0	549.0	48.0	9193 10.500

Article no. **9193**

d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	Order no.
11.000		25.0	600.0	541.0	56.0	9193 11.000
11.500		25.0	600.0	541.0	56.0	9193 11.500
12.000		25.0	600.0	541.0	56.0	9193 12.000
12.020		25.0	600.0	541.0	56.0	9193 12.020
12.500		25.0	600.0	541.0	56.0	9193 12.500
12.600		25.0	600.0	541.0	56.0	9193 12.600
13.000		25.0	600.0	541.0	56.0	9193 13.000
13.500		25.0	600.0	541.0	56.0	9193 13.500
14.000		25.0	600.0	541.0	56.0	9193 14.000
14.500		25.0	600.0	541.0	56.0	9193 14.500
15.000		25.0	600.0	541.0	56.0	9193 15.000
15.500		25.0	600.0	541.0	56.0	9193 15.500
16.000		25.0	600.0	541.0	56.0	9193 16.000
16.500		25.0	600.0	541.0	56.0	9193 16.500
17.000		25.0	600.0	541.0	56.0	9193 17.000
17.500		25.0	600.0	541.0	56.0	9193 17.500
18.000		25.0	600.0	541.0	56.0	9193 18.000
18.500		25.0	600.0	541.0	56.0	9193 18.500
19.000		25.0	600.0	541.0	56.0	9193 19.000
19.500		25.0	600.0	541.0	56.0	9193 19.500
20.000		25.0	600.0	541.0	56.0	9193 20.000

EB 80 CROSS single-fluted gun drills

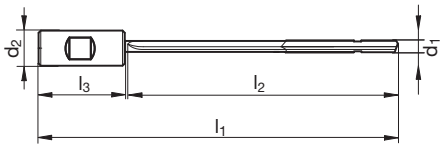
Article no. **9194**

cutting data see page 105

P	M	K	N	S	H
●	●	○	○	○	○

NEW · HM · A · EB 80 CROSS · GL 800 · WN · h5 · R · HB

adapted circumferential shape • with additional guide part • ideal for gaps



Article no. **9194**

d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	Order no.
3.000		16.0	800.0	749.0	48.0	9194 3.000
3.020		16.0	800.0	749.0	48.0	9194 3.020
3.500		16.0	800.0	749.0	48.0	9194 3.500
4.000		16.0	800.0	749.0	48.0	9194 4.000
4.020		16.0	800.0	749.0	48.0	9194 4.020
4.500		16.0	800.0	749.0	48.0	9194 4.500
5.000		16.0	800.0	749.0	48.0	9194 5.000
5.020		16.0	800.0	749.0	48.0	9194 5.020
5.500		16.0	800.0	749.0	48.0	9194 5.500
6.000		16.0	800.0	749.0	48.0	9194 6.000
6.020		16.0	800.0	749.0	48.0	9194 6.020
6.250		16.0	800.0	749.0	48.0	9194 6.250
6.500		16.0	800.0	749.0	48.0	9194 6.500
7.000		16.0	800.0	749.0	48.0	9194 7.000
7.500		16.0	800.0	749.0	48.0	9194 7.500
8.000		16.0	800.0	749.0	48.0	9194 8.000
8.020		16.0	800.0	749.0	48.0	9194 8.020
8.500		16.0	800.0	749.0	48.0	9194 8.500
9.000		16.0	800.0	749.0	48.0	9194 9.000
9.420		16.0	800.0	749.0	48.0	9194 9.420
9.500		16.0	800.0	749.0	48.0	9194 9.500
10.000		16.0	800.0	749.0	48.0	9194 10.000
10.020		16.0	800.0	749.0	48.0	9194 10.020
10.500		16.0	800.0	749.0	48.0	9194 10.500

Article no. **9194**

d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	Order no.
11.000		25.0	800.0	741.0	56.0	9194 11.000
11.500		25.0	800.0	741.0	56.0	9194 11.500
12.000		25.0	800.0	741.0	56.0	9194 12.000
12.020		25.0	800.0	741.0	56.0	9194 12.020
12.500		25.0	800.0	741.0	56.0	9194 12.500
12.600		25.0	800.0	741.0	56.0	9194 12.600
13.000		25.0	800.0	741.0	56.0	9194 13.000
13.500		25.0	800.0	741.0	56.0	9194 13.500
14.000		25.0	800.0	741.0	56.0	9194 14.000
14.500		25.0	800.0	741.0	56.0	9194 14.500
15.000		25.0	800.0	741.0	56.0	9194 15.000
15.500		25.0	800.0	741.0	56.0	9194 15.500
16.000		25.0	800.0	741.0	56.0	9194 16.000
16.500		25.0	800.0	741.0	56.0	9194 16.500
17.000		25.0	800.0	741.0	56.0	9194 17.000
17.500		25.0	800.0	741.0	56.0	9194 17.500
18.000		25.0	800.0	741.0	56.0	9194 18.000
18.500		25.0	800.0	741.0	56.0	9194 18.500
19.000		25.0	800.0	741.0	56.0	9194 19.000
19.500		25.0	800.0	741.0	56.0	9194 19.500
20.000		25.0	800.0	741.0	56.0	9194 20.000

EB 80 CROSS single-fluted gun drills

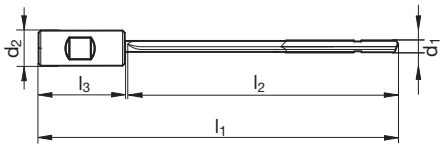
Article no. **9195**

NEW | HM | A | EB 80 CROSS | GL 1000 | WN | h5 | R | HB

adapted circumferential shape • with additional guide part • ideal for gaps

cutting data see page 105

P	M	K	N	S	H
●	●	○	○	○	○



Article no. **9195**

d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	Order no.
3.000		16.0	1000.0	949.0	48.0	9195 3.000
3.020		16.0	1000.0	949.0	48.0	9195 3.020
3.500		16.0	1000.0	949.0	48.0	9195 3.500
4.000		16.0	1000.0	949.0	48.0	9195 4.000
4.020		16.0	1000.0	949.0	48.0	9195 4.020
4.500		16.0	1000.0	949.0	48.0	9195 4.500
5.000		16.0	1000.0	949.0	48.0	9195 5.000
5.020		16.0	1000.0	949.0	48.0	9195 5.020
5.500		16.0	1000.0	949.0	48.0	9195 5.500
6.000		16.0	1000.0	949.0	48.0	9195 6.000
6.020		16.0	1000.0	949.0	48.0	9195 6.020
6.250		16.0	1000.0	949.0	48.0	9195 6.250
6.500		16.0	1000.0	949.0	48.0	9195 6.500
7.000		16.0	1000.0	949.0	48.0	9195 7.000
7.500		16.0	1000.0	949.0	48.0	9195 7.500
8.000		16.0	1000.0	949.0	48.0	9195 8.000
8.020		16.0	1000.0	949.0	48.0	9195 8.020
8.500		16.0	1000.0	949.0	48.0	9195 8.500
9.000		16.0	1000.0	949.0	48.0	9195 9.000
9.420		16.0	1000.0	949.0	48.0	9195 9.420
9.500		16.0	1000.0	949.0	48.0	9195 9.500
10.000		16.0	1000.0	949.0	48.0	9195 10.000
10.020		16.0	1000.0	949.0	48.0	9195 10.020
10.500		16.0	1000.0	949.0	48.0	9195 10.500

Article no. **9195**

d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	Order no.
11.000		25.0	1000.0	941.0	56.0	9195 11.000
11.500		25.0	1000.0	941.0	56.0	9195 11.500
12.000		25.0	1000.0	941.0	56.0	9195 12.000
12.020		25.0	1000.0	941.0	56.0	9195 12.020
12.500		25.0	1000.0	941.0	56.0	9195 12.500
12.600		25.0	1000.0	941.0	56.0	9195 12.600
13.000		25.0	1000.0	941.0	56.0	9195 13.000
13.500		25.0	1000.0	941.0	56.0	9195 13.500
14.000		25.0	1000.0	941.0	56.0	9195 14.000
14.500		25.0	1000.0	941.0	56.0	9195 14.500
15.000		25.0	1000.0	941.0	56.0	9195 15.000
15.500		25.0	1000.0	941.0	56.0	9195 15.500
16.000		25.0	1000.0	941.0	56.0	9195 16.000
16.500		25.0	1000.0	941.0	56.0	9195 16.500
17.000		25.0	1000.0	941.0	56.0	9195 17.000
17.500		25.0	1000.0	941.0	56.0	9195 17.500
18.000		25.0	1000.0	941.0	56.0	9195 18.000
18.500		25.0	1000.0	941.0	56.0	9195 18.500
19.000		25.0	1000.0	941.0	56.0	9195 19.000
19.500		25.0	1000.0	941.0	56.0	9195 19.500
20.000		25.0	1000.0	941.0	56.0	9195 20.000

EB 80 CROSS single-fluted gun drills

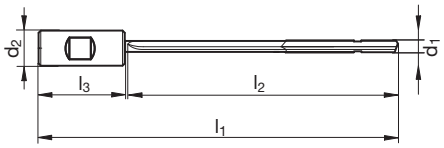
Article no. **9196**

NEW | HM | A | EB 80 CROSS | GL 1200 | WN | h5 | R | HB

adapted circumferential shape • with additional guide part • ideal for gaps

cutting data see page 105

P	M	K	N	S	H
●	●	○	○	○	○



Article no. **9196**

d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	Order no.
3.000		16.0	1200.0	1149.0	48.0	9196 3.000
3.020		16.0	1200.0	1149.0	48.0	9196 3.020
3.500		16.0	1200.0	1149.0	48.0	9196 3.500
4.000		16.0	1200.0	1149.0	48.0	9196 4.000
4.020		16.0	1200.0	1149.0	48.0	9196 4.020
4.500		16.0	1200.0	1149.0	48.0	9196 4.500
5.000		16.0	1200.0	1149.0	48.0	9196 5.000
5.020		16.0	1200.0	1149.0	48.0	9196 5.020
5.500		16.0	1200.0	1149.0	48.0	9196 5.500
6.000		16.0	1200.0	1149.0	48.0	9196 6.000
6.020		16.0	1200.0	1149.0	48.0	9196 6.020
6.250		16.0	1200.0	1149.0	48.0	9196 6.250
6.500		16.0	1200.0	1149.0	48.0	9196 6.500
7.000		16.0	1200.0	1149.0	48.0	9196 7.000
7.500		16.0	1200.0	1149.0	48.0	9196 7.500
8.000		16.0	1200.0	1149.0	48.0	9196 8.000
8.020		16.0	1200.0	1149.0	48.0	9196 8.020
8.500		16.0	1200.0	1149.0	48.0	9196 8.500
9.000		16.0	1200.0	1149.0	48.0	9196 9.000
9.420		16.0	1200.0	1149.0	48.0	9196 9.420
9.500		16.0	1200.0	1149.0	48.0	9196 9.500
10.000		16.0	1200.0	1149.0	48.0	9196 10.000
10.020		16.0	1200.0	1149.0	48.0	9196 10.020
10.500		16.0	1200.0	1149.0	48.0	9196 10.500

Article no. **9196**

d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	Order no.
11.000		25.0	1200.0	1141.0	56.0	9196 11.000
11.500		25.0	1200.0	1141.0	56.0	9196 11.500
12.000		25.0	1200.0	1141.0	56.0	9196 12.000
12.020		25.0	1200.0	1141.0	56.0	9196 12.020
12.500		25.0	1200.0	1141.0	56.0	9196 12.500
12.600		25.0	1200.0	1141.0	56.0	9196 12.600
13.000		25.0	1200.0	1141.0	56.0	9196 13.000
13.500		25.0	1200.0	1141.0	56.0	9196 13.500
14.000		25.0	1200.0	1141.0	56.0	9196 14.000
14.500		25.0	1200.0	1141.0	56.0	9196 14.500
15.000		25.0	1200.0	1141.0	56.0	9196 15.000
15.500		25.0	1200.0	1141.0	56.0	9196 15.500
16.000		25.0	1200.0	1141.0	56.0	9196 16.000
16.500		25.0	1200.0	1141.0	56.0	9196 16.500
17.000		25.0	1200.0	1141.0	56.0	9196 17.000
17.500		25.0	1200.0	1141.0	56.0	9196 17.500
18.000		25.0	1200.0	1141.0	56.0	9196 18.000
18.500		25.0	1200.0	1141.0	56.0	9196 18.500
19.000		25.0	1200.0	1141.0	56.0	9196 19.000
19.500		25.0	1200.0	1141.0	56.0	9196 19.500
20.000		25.0	1200.0	1141.0	56.0	9196 20.000

EB 80 CROSS single-fluted gun drills

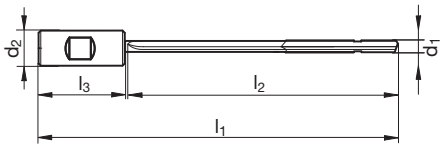
Article no. **9197**

cutting data see page 105

P	M	K	N	S	H
●	●	○	○	○	○

NEW · HM · A · EB 80 CROSS · GL 1400 · WN · h5 · R · HB

adapted circumferential shape • with additional guide part • ideal for gaps



Article no. **9197**

d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	Order no.
4.000		16.0	1400.0	1349.0	48.0	9197 4.000
4.020		16.0	1400.0	1349.0	48.0	9197 4.020
4.500		16.0	1400.0	1349.0	48.0	9197 4.500
5.000		16.0	1400.0	1349.0	48.0	9197 5.000
5.020		16.0	1400.0	1349.0	48.0	9197 5.020
5.500		16.0	1400.0	1349.0	48.0	9197 5.500
6.000		16.0	1400.0	1349.0	48.0	9197 6.000
6.020		16.0	1400.0	1349.0	48.0	9197 6.020
6.250		16.0	1400.0	1349.0	48.0	9197 6.250
6.500		16.0	1400.0	1349.0	48.0	9197 6.500
7.000		16.0	1400.0	1349.0	48.0	9197 7.000
7.500		16.0	1400.0	1349.0	48.0	9197 7.500
8.000		16.0	1400.0	1349.0	48.0	9197 8.000
8.020		16.0	1400.0	1349.0	48.0	9197 8.020
8.500		16.0	1400.0	1349.0	48.0	9197 8.500
9.000		16.0	1400.0	1349.0	48.0	9197 9.000
9.420		16.0	1400.0	1349.0	48.0	9197 9.420
9.500		16.0	1400.0	1349.0	48.0	9197 9.500
10.000		16.0	1400.0	1349.0	48.0	9197 10.000
10.020		16.0	1400.0	1349.0	48.0	9197 10.020
10.500		16.0	1400.0	1349.0	48.0	9197 10.500
11.000		25.0	1400.0	1341.0	56.0	9197 11.000
11.500		25.0	1400.0	1341.0	56.0	9197 11.500
12.000		25.0	1400.0	1341.0	56.0	9197 12.000

Article no. **9197**

d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	Order no.
12.020		25.0	1400.0	1341.0	56.0	9197 12.020
12.500		25.0	1400.0	1341.0	56.0	9197 12.500
12.600		25.0	1400.0	1341.0	56.0	9197 12.600
13.000		25.0	1400.0	1341.0	56.0	9197 13.000
13.500		25.0	1400.0	1341.0	56.0	9197 13.500
14.000		25.0	1400.0	1341.0	56.0	9197 14.000
14.500		25.0	1400.0	1341.0	56.0	9197 14.500
15.000		25.0	1400.0	1341.0	56.0	9197 15.000
15.500		25.0	1400.0	1341.0	56.0	9197 15.500
16.000		25.0	1400.0	1341.0	56.0	9197 16.000
16.500		25.0	1400.0	1341.0	56.0	9197 16.500
17.000		25.0	1400.0	1341.0	56.0	9197 17.000
17.500		25.0	1400.0	1341.0	56.0	9197 17.500
18.000		25.0	1400.0	1341.0	56.0	9197 18.000
18.500		25.0	1400.0	1341.0	56.0	9197 18.500
19.000		25.0	1400.0	1341.0	56.0	9197 19.000
19.500		25.0	1400.0	1341.0	56.0	9197 19.500
20.000		25.0	1400.0	1341.0	56.0	9197 20.000

EB 80 CROSS single-fluted gun drills

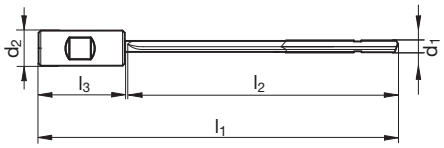
Article no. **9198**

NEW | HM | A | EB 80 CROSS | GL 1600 | WN | h5 | R | HB

adapted circumferential shape • with additional guide part • ideal for gaps

cutting data see page 105

P	M	K	N	S	H
●	●	○	○	○	○



Article no. **9198**

d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	Order no.
4.000		16.0	1600.0	1549.0	48.0	9198 4.000
4.020		16.0	1600.0	1549.0	48.0	9198 4.020
4.500		16.0	1600.0	1549.0	48.0	9198 4.500
5.000		16.0	1600.0	1549.0	48.0	9198 5.000
5.020		16.0	1600.0	1549.0	48.0	9198 5.020
5.500		16.0	1600.0	1549.0	48.0	9198 5.500
6.000		16.0	1600.0	1549.0	48.0	9198 6.000
6.020		16.0	1600.0	1549.0	48.0	9198 6.020
6.250		16.0	1600.0	1549.0	48.0	9198 6.250
6.500		16.0	1600.0	1549.0	48.0	9198 6.500
7.000		16.0	1600.0	1549.0	48.0	9198 7.000
7.500		16.0	1600.0	1549.0	48.0	9198 7.500
8.000		16.0	1600.0	1549.0	48.0	9198 8.000
8.020		16.0	1600.0	1549.0	48.0	9198 8.020
8.500		16.0	1600.0	1549.0	48.0	9198 8.500
9.000		16.0	1600.0	1549.0	48.0	9198 9.000
9.420		16.0	1600.0	1549.0	48.0	9198 9.420
9.500		16.0	1600.0	1549.0	48.0	9198 9.500
10.000		16.0	1600.0	1549.0	48.0	9198 10.000
10.020		16.0	1600.0	1549.0	48.0	9198 10.020
10.500		16.0	1600.0	1549.0	48.0	9198 10.500
11.000		25.0	1600.0	1541.0	56.0	9198 11.000
11.500		25.0	1600.0	1541.0	56.0	9198 11.500
12.000		25.0	1600.0	1541.0	56.0	9198 12.000

Article no. **9198**

d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	Order no.
12.020		25.0	1600.0	1541.0	56.0	9198 12.020
12.500		25.0	1600.0	1541.0	56.0	9198 12.500
12.600		25.0	1600.0	1541.0	56.0	9198 12.600
13.000		25.0	1600.0	1541.0	56.0	9198 13.000
13.500		25.0	1600.0	1541.0	56.0	9198 13.500
14.000		25.0	1600.0	1541.0	56.0	9198 14.000
14.500		25.0	1600.0	1541.0	56.0	9198 14.500
15.000		25.0	1600.0	1541.0	56.0	9198 15.000
15.500		25.0	1600.0	1541.0	56.0	9198 15.500
16.000		25.0	1600.0	1541.0	56.0	9198 16.000
16.500		25.0	1600.0	1541.0	56.0	9198 16.500
17.000		25.0	1600.0	1541.0	56.0	9198 17.000
17.500		25.0	1600.0	1541.0	56.0	9198 17.500
18.000		25.0	1600.0	1541.0	56.0	9198 18.000
18.500		25.0	1600.0	1541.0	56.0	9198 18.500
19.000		25.0	1600.0	1541.0	56.0	9198 19.000
19.500		25.0	1600.0	1541.0	56.0	9198 19.500
20.000		25.0	1600.0	1541.0	56.0	9198 20.000

ExclusiveLine micro-precision drills XL with coolant ducts, 30xD

Machining group	A	f (mm/rev) with nom. Ø				
	v_c (m/min)	0.5	1	2	2.5	3
P1.1.1 Unalloyed steel, annealed, 0.15 % C, Rm 420 N/mm², 125 HB	100	0.0340	0.0505	0.0675	0.0845	0.1015
P1.1.2 Unalloyed steel, heat-treated, 0.15 % C, Rm 420 N/mm², 125 HB	90	0.0305	0.0455	0.0610	0.0760	0.0910
P1.1.3 Unalloyed steel, annealed, 0.45 % C, Rm 640 N/mm², 190 HB	90	0.0305	0.0455	0.0610	0.0760	0.0910
P1.1.4 Unalloyed steel, heat-treated, 0.45 % C, Rm 640 N/mm², 190 HB	85	0.0285	0.0430	0.0575	0.0715	0.0860
P1.1.5 Unalloyed steel, heat-treated, 0.45 % C, Rm 850 N/mm², 250 HB	85	0.0285	0.0430	0.0575	0.0715	0.0860
P1.1.6 Unalloyed steel, annealed, 0.75 % C, Rm 915 N/mm², 270 HB	80	0.0270	0.0405	0.0540	0.0675	0.0810
P1.1.7 Unalloyed steel, heat-treated, 0.75 % C, Rm 1020 N/mm², 300 HB	75	0.0255	0.0380	0.0505	0.0635	0.0760
P2.1.1 Low-alloy steel, annealed, Rm 610 N/mm², 180 HB	90	0.0265	0.0395	0.0525	0.0655	0.0790
P2.1.2 Low-alloy steel, heat-treated, Rm 930 N/mm², 275 HB	90	0.0265	0.0395	0.0525	0.0655	0.0790
P2.1.3 Low-alloy steel, heat-treated, Rm 1020 N/mm², 300 HB	75	0.0225	0.0335	0.0445	0.0560	0.0670
P2.1.4 Low-alloy steel, heat-treated, Rm 1190 N/mm², 350 HB	70	0.0195	0.0295	0.0395	0.0490	0.0590
P3.1.1 High-alloy steel and tool steel, annealed, Rm 680 N/mm², 200 HB	80	0.0190	0.0280	0.0375	0.0470	0.0565
P3.1.2 High-alloy steel and tool steel, hardened and tempered, Rm 1100 N/mm², 325 HB	70	0.0160	0.0240	0.0320	0.0400	0.0480
M1.1.1 Stainless steel, ferritic/martensitic, with machining additives	55	0.0150	0.0225	0.0300	0.0375	0.0450
M1.1.2 Stainless steel, ferritic/martensitic, annealed, Rm 680 N/mm², 200 HB	50	0.0135	0.0205	0.0270	0.0340	0.0405
M1.1.3 Stainless steel, ferritic/martensitic, heat-treated, Rm 810 N/mm², 240 HB	45	0.0130	0.0190	0.0255	0.0320	0.0385
M2.1.1 Stainless steel, austenitic, quenched, 180 HB	55	0.0150	0.0225	0.0300	0.0375	0.0450
M2.2.1 Duplex steel, high-strength stainless steels	45	0.0130	0.0190	0.0255	0.0320	0.0385
K1.1.1 Grey cast iron, pearlitic/ferritic, 180 HB	140	0.0450	0.0675	0.0900	0.1125	0.1350
K1.1.2 Grey cast iron, pearlitic/martensitic, 260 HB	120	0.0385	0.0575	0.0765	0.0955	0.1145
K1.2.1 Cast iron with spheroidal graphite, ferritic, 160 HB	120	0.0385	0.0575	0.0765	0.0955	0.1145
K1.2.2 Cast iron with spheroidal graphite, pearlitic, 250 HB	120	0.0385	0.0575	0.0765	0.0955	0.1145
K1.3.1 Malleable cast iron, ferritic, 130 HB	110	0.0360	0.0540	0.0720	0.0900	0.1080
K1.3.2 Malleable cast iron, pearlitic, 230 HB	110	0.0360	0.0540	0.0720	0.0900	0.1080
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	135	0.0450	0.0675	0.0900	0.1125	0.1350
N1.1.2 Wrought aluminium alloys, hardened, 100 HB	135	0.0450	0.0675	0.0900	0.1125	0.1350
N2.1.1 Aluminium casting alloys, non-hardened, ≤ 12 % Si, 75 HB	135	0.0600	0.0900	0.1200	0.1500	0.1800
N2.1.2 Aluminium casting alloys, hardened, ≤ 12 % Si, 90 HB	135	0.0600	0.0900	0.1200	0.1500	0.1800
N2.1.3 Aluminium casting alloys, non-hardened, > 12 % Si, 130 HB	115	0.0510	0.0765	0.1020	0.1275	0.1530
N3.1.1 Copper and copper alloys: Free-machining alloy, Pb > 1 %	130	0.0265	0.0395	0.0525	0.0655	0.0790
N3.1.2 Copper and copper alloys: CuZn, CuSnZn	110	0.0225	0.0335	0.0445	0.0560	0.0670
N3.1.3 Copper and copper alloys: CuSn, lead-free copper and copper electrolyte	105	0.0210	0.0315	0.0420	0.0525	0.0630
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	40	0.0115	0.0170	0.0225	0.0280	0.0340
S1.1.2 Heat-resistant alloys, Fe-based, hardened, 280 HB	30	0.0090	0.0135	0.0180	0.0225	0.0270
S1.1.3 Heat-resistant alloys, Ni- or Co-based, annealed, 250 HB	35	0.0115	0.0170	0.0225	0.0280	0.0340
S1.1.4 Heat-resistant alloys, Ni- or Co-based, hardened, 350 HB	20	0.0080	0.0120	0.0160	0.0195	0.0235
S1.1.5 Heat-resistant alloys, Ni- or Co-based, cast, 320 HB	25	0.0080	0.0120	0.0160	0.0195	0.0235
S2.1.1 Titanium alloys, pure titanium, Rm 400 N/mm²	35	0.0090	0.0135	0.0180	0.0225	0.0270
S2.1.2 Titanium alloys, Alpha and Beta alloys, hardened, Rm 1050 N/mm²	25	0.0070	0.0110	0.0145	0.0180	0.0215
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 navigator.guehring.de/en.

ExclusiveLine micro-precision drills without coolant ducts short shank, 4xD

Machining group	A	f (mm/rev) with nom. Ø					
	v_c (m/min)	0.5	1	1.5	2	2.5	3
P1.1.1 Unalloyed steel, annealed, 0.15 % C, Rm 420 N/mm², 125 HB	110	0.1535	0.3070	0.4605	0.6140	0.7675	0.9210
P1.1.2 Unalloyed steel, heat-treated, 0.15 % C, Rm 420 N/mm², 125 HB	100	0.1380	0.2765	0.4145	0.5525	0.6910	0.8290
P1.1.3 Unalloyed steel, annealed, 0.45 % C, Rm 640 N/mm², 190 HB	100	0.1380	0.2765	0.4145	0.5525	0.6910	0.8290
P1.1.4 Unalloyed steel, heat-treated, 0.45 % C, Rm 640 N/mm², 190 HB	95	0.1305	0.2610	0.3915	0.5220	0.6525	0.7830
P1.1.5 Unalloyed steel, heat-treated, 0.45 % C, Rm 850 N/mm², 250 HB	95	0.1305	0.2610	0.3915	0.5220	0.6525	0.7830
P1.1.6 Unalloyed steel, annealed, 0.75 % C, Rm 915 N/mm², 270 HB	90	0.1230	0.2455	0.3685	0.4910	0.6140	0.7370
P1.1.7 Unalloyed steel, heat-treated, 0.75 % C, Rm 1020 N/mm², 300 HB	85	0.1150	0.2305	0.3455	0.4605	0.5755	0.6910
P2.1.1 Low-alloy steel, annealed, Rm 610 N/mm², 180 HB	90	0.1200	0.2400	0.3600	0.4800	0.6000	0.7200
P2.1.2 Low-alloy steel, heat-treated, Rm 930 N/mm², 275 HB	90	0.1200	0.2400	0.3600	0.4800	0.6000	0.7200
P2.1.3 Low-alloy steel, heat-treated, Rm 1020 N/mm², 300 HB	75	0.1020	0.2040	0.3060	0.4080	0.5100	0.6120
P2.1.4 Low-alloy steel, heat-treated, Rm 1190 N/mm², 350 HB	70	0.0900	0.1800	0.2700	0.3600	0.4500	0.5400
P3.1.1 High-alloy steel and tool steel, annealed, Rm 680 N/mm², 200 HB	60	0.0960	0.1920	0.2880	0.3840	0.4800	0.5760
P3.1.2 High-alloy steel and tool steel, hardened and tempered, Rm 1100 N/mm², 325 HB	50	0.0815	0.1630	0.2450	0.3265	0.4080	0.4895
M1.1.1 Stainless steel, ferritic/martensitic, with machining additives	45	0.0765	0.1530	0.2295	0.3060	0.3825	0.4590
M1.1.2 Stainless steel, ferritic/martensitic, annealed, Rm 680 N/mm², 200 HB	40	0.0690	0.1375	0.2065	0.2755	0.3440	0.4130
M1.1.3 Stainless steel, ferritic/martensitic, heat-treated, Rm 810 N/mm², 240 HB	40	0.0650	0.1300	0.1950	0.2600	0.3250	0.3900
M2.1.1 Stainless steel, austenitic, quenched, 180 HB	40	0.0480	0.0960	0.1440	0.1920	0.2400	0.2880
M2.2.1 Duplex steel, high-strength stainless steels	35	0.0410	0.0815	0.1225	0.1630	0.2040	0.2450
K1.1.1 Grey cast iron, pearlitic/ferritic, 180 HB	100	0.1535	0.3070	0.4605	0.6140	0.7675	0.9210
K1.1.2 Grey cast iron, pearlitic/martensitic, 260 HB	85	0.1305	0.2610	0.3915	0.5220	0.6525	0.7830
K1.2.1 Cast iron with spheroidal graphite, ferritic, 160 HB	85	0.1305	0.2610	0.3915	0.5220	0.6525	0.7830
K1.2.2 Cast iron with spheroidal graphite, pearlitic, 250 HB	85	0.1305	0.2610	0.3915	0.5220	0.6525	0.7830
K1.3.1 Malleable cast iron, ferritic, 130 HB	80	0.1230	0.2455	0.3685	0.4910	0.6140	0.7370
K1.3.2 Malleable cast iron, pearlitic, 230 HB	80	0.1230	0.2455	0.3685	0.4910	0.6140	0.7370
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	180	0.1920	0.3840	0.5760	0.7680	0.9600	1.1520
N1.1.2 Wrought aluminium alloys, hardened, 100 HB	180	0.1920	0.3840	0.5760	0.7680	0.9600	1.1520
N2.1.1 Aluminium casting alloys, non-hardened, ≤ 12 % Si, 75 HB	160	0.1920	0.3840	0.5760	0.7680	0.9600	1.1520
N2.1.2 Aluminium casting alloys, hardened, ≤ 12 % Si, 90 HB	160	0.1920	0.3840	0.5760	0.7680	0.9600	1.1520
N2.1.3 Aluminium casting alloys, non-hardened, > 12 % Si, 130 HB	135	0.1630	0.3265	0.4895	0.6530	0.8160	0.9790
N3.1.1 Copper and copper alloys: Free-machining alloy, Pb > 1 %	120	0.1535	0.3070	0.4605	0.6140	0.7675	0.9210
N3.1.2 Copper and copper alloys: CuZn, CuSnZn	100	0.1305	0.2610	0.3915	0.5220	0.6525	0.7830
N3.1.3 Copper and copper alloys: CuSn, lead-free copper and copper electrolyte	95	0.1230	0.2455	0.3685	0.4910	0.6140	0.7370
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	35	0.0605	0.1210	0.1815	0.2420	0.3025	0.3630
S1.1.2 Heat-resistant alloys, Fe-based, hardened, 280 HB	30	0.0485	0.0970	0.1450	0.1935	0.2420	0.2905
S1.1.3 Heat-resistant alloys, Ni- or Co-based, annealed, 250 HB	30	0.0605	0.1210	0.1815	0.2420	0.3025	0.3630
S1.1.4 Heat-resistant alloys, Ni- or Co-based, hardened, 350 HB	20	0.0425	0.0845	0.1270	0.1695	0.2120	0.2540
S1.1.5 Heat-resistant alloys, Ni- or Co-based, cast, 320 HB	20	0.0425	0.0845	0.1270	0.1695	0.2120	0.2540
S2.1.1 Titanium alloys, pure titanium, Rm 400 N/mm²	35	0.0605	0.1210	0.1815	0.2420	0.3025	0.3630
S2.1.2 Titanium alloys, Alpha and Beta alloys, hardened, Rm 1050 N/mm²	25	0.0485	0.0970	0.1450	0.1935	0.2420	0.2905
H1.1.1 Hardened steel, hardened and tempered, < 55 HRC	40	0.0480	0.0960	0.1440	0.1920	0.2400	0.2880
H1.1.2 Hardened steel, hardened and tempered, < 60 HRC	25	0.0385	0.0770	0.1150	0.1535	0.1920	0.2305
H1.1.3 Hardened steel, hardened and tempered, > 60 HRC	25	0.0360	0.0720	0.1080	0.1440	0.1800	0.2160
H2.1.1 Chilled cast iron, 400 HB	30	0.0480	0.0960	0.1440	0.1920	0.2400	0.2880
H2.1.2 Chilled cast iron, hardened and tempered, < 55 HRC	20	0.0335	0.0670	0.1010	0.1345	0.1680	0.2015

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

ExclusiveLine micro-precision drills without coolant ducts short shank, 7xD

Machining group	A	f (mm/rev) with nom. Ø					
	v_c (m/min)	0.5	1	1.5	2	2.5	3
P1.1.1 Unalloyed steel, annealed, 0.15 % C, Rm 420 N/mm², 125 HB	110	0.1535	0.3070	0.4605	0.6140	0.7675	0.9210
P1.1.2 Unalloyed steel, heat-treated, 0.15 % C, Rm 420 N/mm², 125 HB	100	0.1380	0.2765	0.4145	0.5525	0.6910	0.8290
P1.1.3 Unalloyed steel, annealed, 0.45 % C, Rm 640 N/mm², 190 HB	100	0.1380	0.2765	0.4145	0.5525	0.6910	0.8290
P1.1.4 Unalloyed steel, heat-treated, 0.45 % C, Rm 640 N/mm², 190 HB	95	0.1305	0.2610	0.3915	0.5220	0.6525	0.7830
P1.1.5 Unalloyed steel, heat-treated, 0.45 % C, Rm 850 N/mm², 250 HB	95	0.1305	0.2610	0.3915	0.5220	0.6525	0.7830
P1.1.6 Unalloyed steel, annealed, 0.75 % C, Rm 915 N/mm², 270 HB	90	0.1230	0.2455	0.3685	0.4910	0.6140	0.7370
P1.1.7 Unalloyed steel, heat-treated, 0.75 % C, Rm 1020 N/mm², 300 HB	85	0.1150	0.2305	0.3455	0.4605	0.5755	0.6910
P2.1.1 Low-alloy steel, annealed, Rm 610 N/mm², 180 HB	90	0.1200	0.2400	0.3600	0.4800	0.6000	0.7200
P2.1.2 Low-alloy steel, heat-treated, Rm 930 N/mm², 275 HB	90	0.1200	0.2400	0.3600	0.4800	0.6000	0.7200
P2.1.3 Low-alloy steel, heat-treated, Rm 1020 N/mm², 300 HB	75	0.1020	0.2040	0.3060	0.4080	0.5100	0.6120
P2.1.4 Low-alloy steel, heat-treated, Rm 1190 N/mm², 350 HB	70	0.0900	0.1800	0.2700	0.3600	0.4500	0.5400
P3.1.1 High-alloy steel and tool steel, annealed, Rm 680 N/mm², 200 HB	60	0.0960	0.1920	0.2880	0.3840	0.4800	0.5760
P3.1.2 High-alloy steel and tool steel, hardened and tempered, Rm 1100 N/mm², 325 HB	50	0.0815	0.1630	0.2450	0.3265	0.4080	0.4895
M1.1.1 Stainless steel, ferritic/martensitic, with machining additives	45	0.0765	0.1530	0.2295	0.3060	0.3825	0.4590
M1.1.2 Stainless steel, ferritic/martensitic, annealed, Rm 680 N/mm², 200 HB	40	0.0690	0.1375	0.2065	0.2755	0.3440	0.4130
M1.1.3 Stainless steel, ferritic/martensitic, heat-treated, Rm 810 N/mm², 240 HB	40	0.0650	0.1300	0.1950	0.2600	0.3250	0.3900
M2.1.1 Stainless steel, austenitic, quenched, 180 HB	40	0.0480	0.0960	0.1440	0.1920	0.2400	0.2880
M2.2.1 Duplex steel, high-strength stainless steels	35	0.0410	0.0815	0.1225	0.1630	0.2040	0.2450
K1.1.1 Grey cast iron, pearlitic/ferritic, 180 HB	100	0.1535	0.3070	0.4605	0.6140	0.7675	0.9210
K1.1.2 Grey cast iron, pearlitic/martensitic, 260 HB	85	0.1305	0.2610	0.3915	0.5220	0.6525	0.7830
K1.2.1 Cast iron with spheroidal graphite, ferritic, 160 HB	85	0.1305	0.2610	0.3915	0.5220	0.6525	0.7830
K1.2.2 Cast iron with spheroidal graphite, pearlitic, 250 HB	85	0.1305	0.2610	0.3915	0.5220	0.6525	0.7830
K1.3.1 Malleable cast iron, ferritic, 130 HB	80	0.1230	0.2455	0.3685	0.4910	0.6140	0.7370
K1.3.2 Malleable cast iron, pearlitic, 230 HB	80	0.1230	0.2455	0.3685	0.4910	0.6140	0.7370
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	180	0.1920	0.3840	0.5760	0.7680	0.9600	1.1520
N1.1.2 Wrought aluminium alloys, hardened, 100 HB	180	0.1920	0.3840	0.5760	0.7680	0.9600	1.1520
N2.1.1 Aluminium casting alloys, non-hardened, ≤ 12 % Si, 75 HB	160	0.1920	0.3840	0.5760	0.7680	0.9600	1.1520
N2.1.2 Aluminium casting alloys, hardened, ≤ 12 % Si, 90 HB	160	0.1920	0.3840	0.5760	0.7680	0.9600	1.1520
N2.1.3 Aluminium casting alloys, non-hardened, > 12 % Si, 130 HB	135	0.1630	0.3265	0.4895	0.6530	0.8160	0.9790
N3.1.1 Copper and copper alloys: Free-machining alloy, Pb > 1 %	120	0.1535	0.3070	0.4605	0.6140	0.7675	0.9210
N3.1.2 Copper and copper alloys: CuZn, CuSnZn	100	0.1305	0.2610	0.3915	0.5220	0.6525	0.7830
N3.1.3 Copper and copper alloys: CuSn, lead-free copper and copper electrolyte	95	0.1230	0.2455	0.3685	0.4910	0.6140	0.7370
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	35	0.0605	0.1210	0.1815	0.2420	0.3025	0.3630
S1.1.2 Heat-resistant alloys, Fe-based, hardened, 280 HB	30	0.0485	0.0970	0.1450	0.1935	0.2420	0.2905
S1.1.3 Heat-resistant alloys, Ni- or Co-based, annealed, 250 HB	30	0.0605	0.1210	0.1815	0.2420	0.3025	0.3630
S1.1.4 Heat-resistant alloys, Ni- or Co-based, hardened, 350 HB	20	0.0425	0.0845	0.1270	0.1695	0.2120	0.2540
S1.1.5 Heat-resistant alloys, Ni- or Co-based, cast, 320 HB	20	0.0425	0.0845	0.1270	0.1695	0.2120	0.2540
S2.1.1 Titanium alloys, pure titanium, Rm 400 N/mm²	35	0.0605	0.1210	0.1815	0.2420	0.3025	0.3630
S2.1.2 Titanium alloys, Alpha and Beta alloys, hardened, Rm 1050 N/mm²	25	0.0485	0.0970	0.1450	0.1935	0.2420	0.2905
H1.1.1 Hardened steel, hardened and tempered, < 55 HRC	40	0.0480	0.0960	0.1440	0.1920	0.2400	0.2880
H1.1.2 Hardened steel, hardened and tempered, < 60 HRC	25	0.0385	0.0770	0.1150	0.1535	0.1920	0.2305
H1.1.3 Hardened steel, hardened and tempered, > 60 HRC	25	0.0360	0.0720	0.1080	0.1440	0.1800	0.2160
H2.1.1 Chilled cast iron, 400 HB	30	0.0480	0.0960	0.1440	0.1920	0.2400	0.2880
H2.1.2 Chilled cast iron, hardened and tempered, < 55 HRC	20	0.0335	0.0670	0.1010	0.1345	0.1680	0.2015

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

Micro-precision drills with coolant ducts, RT 100 U

Machining group	A	f (mm/rev) with nom. Ø				
	v_c (m/min)	1	1.5	2	2.5	3
P1.1.1 Unalloyed steel, annealed, 0.15 % C, Rm 420 N/mm², 125 HB	110	0.0700	0.1050	0.1400	0.1750	0.2100
P1.1.2 Unalloyed steel, heat-treated, 0.15 % C, Rm 420 N/mm², 125 HB	100	0.0630	0.0945	0.1260	0.1575	0.1890
P1.1.3 Unalloyed steel, annealed, 0.45 % C, Rm 640 N/mm², 190 HB	100	0.0630	0.0945	0.1260	0.1575	0.1890
P1.1.4 Unalloyed steel, heat-treated, 0.45 % C, Rm 640 N/mm², 190 HB	95	0.0595	0.0895	0.1190	0.1490	0.1785
P1.1.5 Unalloyed steel, heat-treated, 0.45 % C, Rm 850 N/mm², 250 HB	95	0.0595	0.0895	0.1190	0.1490	0.1785
P1.1.6 Unalloyed steel, annealed, 0.75 % C, Rm 915 N/mm², 270 HB	90	0.0560	0.0840	0.1120	0.1400	0.1680
P1.1.7 Unalloyed steel, heat-treated, 0.75 % C, Rm 1020 N/mm², 300 HB	85	0.0525	0.0790	0.1050	0.1315	0.1575
P2.1.1 Low-alloy steel, annealed, Rm 610 N/mm², 180 HB	110	0.0450	0.0675	0.0900	0.1125	0.1350
P2.1.2 Low-alloy steel, heat-treated, Rm 930 N/mm², 275 HB	110	0.0450	0.0675	0.0900	0.1125	0.1350
P2.1.3 Low-alloy steel, heat-treated, Rm 1020 N/mm², 300 HB	95	0.0385	0.0575	0.0765	0.0955	0.1145
P2.1.4 Low-alloy steel, heat-treated, Rm 1190 N/mm², 350 HB	85	0.0340	0.0505	0.0675	0.0845	0.1015
P3.1.1 High-alloy steel and tool steel, annealed, Rm 680 N/mm², 200 HB	65	0.0500	0.0750	0.1000	0.1250	0.1500
P3.1.2 High-alloy steel and tool steel, hardened and tempered, Rm 1100 N/mm², 325 HB	55	0.0425	0.0640	0.0850	0.1065	0.1275
M1.1.1 Stainless steel, ferritic/martensitic, with machining additives	80	0.0180	0.0270	0.0360	0.0450	0.0540
M1.1.2 Stainless steel, ferritic/martensitic, annealed, Rm 680 N/mm², 200 HB	70	0.0160	0.0245	0.0325	0.0405	0.0485
M1.1.3 Stainless steel, ferritic/martensitic, heat-treated, Rm 810 N/mm², 240 HB	70	0.0155	0.0230	0.0305	0.0380	0.0460
M2.1.1 Stainless steel, austenitic, quenched, 180 HB	60	0.0150	0.0225	0.0300	0.0375	0.0450
M2.2.1 Duplex steel, high-strength stainless steels	50	0.0130	0.0190	0.0255	0.0320	0.0385
K1.1.1 Grey cast iron, pearlitic/ferritic, 180 HB	120	0.0500	0.0750	0.1000	0.1250	0.1500
K1.1.2 Grey cast iron, pearlitic/martensitic, 260 HB	100	0.0425	0.0640	0.0850	0.1065	0.1275
K1.2.1 Cast iron with spheroidal graphite, ferritic, 160 HB	100	0.0425	0.0640	0.0850	0.1065	0.1275
K1.2.2 Cast iron with spheroidal graphite, pearlitic, 250 HB	100	0.0425	0.0640	0.0850	0.1065	0.1275
K1.3.1 Malleable cast iron, ferritic, 130 HB	95	0.0400	0.0600	0.0800	0.1000	0.1200
K1.3.2 Malleable cast iron, pearlitic, 230 HB	95	0.0400	0.0600	0.0800	0.1000	0.1200
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	140	0.1000	0.1500	0.2000	0.2500	0.3000
N1.1.2 Wrought aluminium alloys, hardened, 100 HB	140	0.1000	0.1500	0.2000	0.2500	0.3000
N2.1.1 Aluminium casting alloys, non-hardened, ≤ 12 % Si, 75 HB	125	0.0380	0.0570	0.0760	0.0950	0.1140
N2.1.2 Aluminium casting alloys, hardened, ≤ 12 % Si, 90 HB	125	0.0380	0.0570	0.0760	0.0950	0.1140
N2.1.3 Aluminium casting alloys, non-hardened, > 12 % Si, 130 HB	105	0.0325	0.0485	0.0645	0.0805	0.0970
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	30	0.1000	0.1500	0.2000	0.2500	0.3000
S1.1.2 Heat-resistant alloys, Fe-based, hardened, 280 HB	25	0.0800	0.1200	0.1600	0.2000	0.2400
S1.1.3 Heat-resistant alloys, Ni- or Co-based, annealed, 250 HB	25	0.1000	0.1500	0.2000	0.2500	0.3000
S1.1.4 Heat-resistant alloys, Ni- or Co-based, hardened, 350 HB	15	0.0700	0.1050	0.1400	0.1750	0.2100
S1.1.5 Heat-resistant alloys, Ni- or Co-based, cast, 320 HB	20	0.0700	0.1050	0.1400	0.1750	0.2100
S2.1.1 Titanium alloys, pure titanium, Rm 400 N/mm²	30	0.1000	0.1500	0.2000	0.2500	0.3000
S2.1.2 Titanium alloys, Alpha and Beta alloys, hardened, Rm 1050 N/mm²	25	0.0800	0.1200	0.1600	0.2000	0.2400
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 navigator.guehring.de/en.

Micro-precision drills with coolant ducts, RT 100 AL, 6xD

Machining group		f (mm/rev) with nom. Ø					
	v_c (m/min)	0.5	1	1.5	2	2.5	3
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	200	0.0500	0.1000	0.1500	0.2000	0.2500	0.3000
N1.1.2 Wrought aluminium alloys, hardened, 100 HB	200	0.0500	0.1000	0.1500	0.2000	0.2500	0.3000
N2.1.1 Aluminium casting alloys, non-hardened, ≤ 12 % Si, 75 HB	200	0.0750	0.1500	0.2250	0.3000	0.3750	0.4500
N2.1.2 Aluminium casting alloys, hardened, ≤ 12 % Si, 90 HB	200	0.0750	0.1500	0.2250	0.3000	0.3750	0.4500
N2.1.3 Aluminium casting alloys, non-hardened, > 12 % Si, 130 HB	170	0.0640	0.1275	0.1915	0.2550	0.3185	0.3825
N3.1.1 Copper and copper alloys: Free-machining alloy, Pb > 1 %	175	0.0350	0.0700	0.1050	0.1400	0.1750	0.2100
N3.1.2 Copper and copper alloys: CuZn, CuSnZn	150	0.0300	0.0595	0.0895	0.1190	0.1490	0.1785
N3.1.3 Copper and copper alloys: CuSn, lead-free copper and copper electrolyte	140	0.0280	0.0560	0.0840	0.1120	0.1400	0.1680
N4.1.1 Non-metallic materials: Duroplastics, fibre-reinforced plastics	175	0.0500	0.1000	0.1500	0.2000	0.2500	0.3000
N4.1.2 Non-metallic materials: Hard rubber, wood, etc.	175	0.0500	0.1000	0.1500	0.2000	0.2500	0.3000
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							

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

Micro-precision drills with coolant ducts, RT 100 AL, 10–15xD

Machining group		f (mm/rev) with nom. Ø				
	v_c (m/min)	1	1.5	2	2.5	3
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	200	0.0700	0.1050	0.1400	0.1750	0.2100
N1.1.2 Wrought aluminium alloys, hardened, 100 HB	200	0.0700	0.1050	0.1400	0.1750	0.2100
N2.1.1 Aluminium casting alloys, non-hardened, ≤ 12 % Si, 75 HB	200	0.0800	0.1200	0.1600	0.2000	0.2400
N2.1.2 Aluminium casting alloys, hardened, ≤ 12 % Si, 90 HB	200	0.0800	0.1200	0.1600	0.2000	0.2400
N2.1.3 Aluminium casting alloys, non-hardened, > 12 % Si, 130 HB	170	0.0680	0.1020	0.1360	0.1700	0.2040
N3.1.1 Copper and copper alloys: Free-machining alloy, Pb > 1 %	175	0.0500	0.0750	0.1000	0.1250	0.1500
N3.1.2 Copper and copper alloys: CuZn, CuSnZn	150	0.0425	0.0640	0.0850	0.1065	0.1275
N3.1.3 Copper and copper alloys: CuSn, lead-free copper and copper electrolyte	140	0.0400	0.0600	0.0800	0.1000	0.1200
N4.1.1 Non-metallic materials: Duroplastics, fibre-reinforced plastics	175	0.0700	0.1050	0.1400	0.1750	0.2100
N4.1.2 Non-metallic materials: Hard rubber, wood, etc.	175	0.0700	0.1050	0.1400	0.1750	0.2100
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						

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

Ratio drills with coolant ducts, 3-fluted, FT 200 U, 8xD

Machining group	F	f (mm/rev) with nom. Ø						
	v_c (m/min)	4	6	8	10	12	14	16
P1.1.1 Unalloyed steel, annealed, 0.15 % C, Rm 420 N/mm², 125 HB	180	0.300	0.410	0.510	0.605	0.695	0.785	0.865
P1.1.2 Unalloyed steel, heat-treated, 0.15 % C, Rm 420 N/mm², 125 HB	160	0.270	0.370	0.460	0.545	0.625	0.705	0.780
P1.1.3 Unalloyed steel, annealed, 0.45 % C, Rm 640 N/mm², 190 HB	160	0.270	0.370	0.460	0.545	0.625	0.705	0.780
P1.1.4 Unalloyed steel, heat-treated, 0.45 % C, Rm 640 N/mm², 190 HB	155	0.255	0.350	0.435	0.515	0.590	0.665	0.735
P1.1.5 Unalloyed steel, heat-treated, 0.45 % C, Rm 850 N/mm², 250 HB	155	0.255	0.350	0.435	0.515	0.590	0.665	0.735
P1.1.6 Unalloyed steel, annealed, 0.75 % C, Rm 915 N/mm², 270 HB	145	0.240	0.330	0.410	0.485	0.555	0.625	0.695
P1.1.7 Unalloyed steel, heat-treated, 0.75 % C, Rm 1020 N/mm², 300 HB	135	0.225	0.310	0.385	0.455	0.520	0.585	0.650
P2.1.1 Low-alloy steel, annealed, Rm 610 N/mm², 180 HB	130	0.305	0.410	0.515	0.610	0.700	0.785	0.870
P2.1.2 Low-alloy steel, heat-treated, Rm 930 N/mm², 275 HB	130	0.305	0.410	0.515	0.610	0.700	0.785	0.870
P2.1.3 Low-alloy steel, heat-treated, Rm 1020 N/mm², 300 HB	110	0.260	0.350	0.435	0.515	0.595	0.665	0.740
P2.1.4 Low-alloy steel, heat-treated, Rm 1190 N/mm², 350 HB	100	0.225	0.310	0.385	0.455	0.525	0.590	0.650
P3.1.1 High-alloy steel and tool steel, annealed, Rm 680 N/mm², 200 HB	80	0.190	0.260	0.325	0.385	0.440	0.495	0.550
P3.1.2 High-alloy steel and tool steel, hardened and tempered, Rm 1100 N/mm², 325 HB	70	0.165	0.220	0.275	0.325	0.375	0.420	0.465
M1.1.1 Stainless steel, ferritic/martensitic, with machining additives	60	0.095	0.130	0.160	0.190	0.220	0.250	0.275
M1.1.2 Stainless steel, ferritic/martensitic, annealed, Rm 680 N/mm², 200 HB	55	0.085	0.115	0.145	0.175	0.200	0.225	0.245
M1.1.3 Stainless steel, ferritic/martensitic, heat-treated, Rm 810 N/mm², 240 HB	50	0.080	0.110	0.140	0.165	0.185	0.210	0.235
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	130	0.300	0.410	0.510	0.605	0.695	0.785	0.865
K1.1.2 Grey cast iron, pearlitic/martensitic, 260 HB	110	0.255	0.350	0.435	0.515	0.590	0.665	0.735
K1.2.1 Cast iron with spheroidal graphite, ferritic, 160 HB	110	0.255	0.350	0.435	0.515	0.590	0.665	0.735
K1.2.2 Cast iron with spheroidal graphite, pearlitic, 250 HB	105	0.240	0.330	0.410	0.485	0.555	0.625	0.695
K1.3.1 Malleable cast iron, ferritic, 130 HB	105	0.240	0.330	0.410	0.485	0.555	0.625	0.695
K1.3.2 Malleable cast iron, pearlitic, 230 HB	90	0.210	0.290	0.360	0.425	0.485	0.550	0.605
K2.1.1 Vermicular graphite cast iron (GJV)	90	0.240	0.325	0.405	0.480	0.550	0.620	0.685
K2.2.1 Austenitic-ferritic spheroidal graphite cast iron (ADI)	70	0.180	0.245	0.305	0.360	0.415	0.465	0.515
N1.1.1 Wrought aluminium alloys, non-hardened, 60 HB	180	0.190	0.260	0.325	0.385	0.440	0.495	0.550
N1.1.2 Wrought aluminium alloys, hardened, 100 HB	180	0.190	0.260	0.325	0.385	0.440	0.495	0.550
N2.1.1 Aluminium casting alloys, non-hardened, ≤ 12 % Si, 75 HB	160	0.190	0.260	0.325	0.385	0.440	0.495	0.550
N2.1.2 Aluminium casting alloys, hardened, ≤ 12 % Si, 90 HB	160	0.190	0.260	0.325	0.385	0.440	0.495	0.550
N2.1.3 Aluminium casting alloys, non-hardened, > 12 % Si, 130 HB	135	0.165	0.220	0.275	0.325	0.375	0.420	0.465
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	40	0.060	0.080	0.100	0.120	0.140	0.155	0.175
S1.1.2 Heat-resistant alloys, Fe-based, hardened, 280 HB	30	0.050	0.065	0.080	0.095	0.110	0.125	0.140
S1.1.3 Heat-resistant alloys, Ni- or Co-based, annealed, 250 HB	35	0.060	0.080	0.100	0.120	0.140	0.155	0.175
S1.1.4 Heat-resistant alloys, Ni- or Co-based, hardened, 350 HB	20	0.040	0.055	0.070	0.085	0.095	0.110	0.120
S1.1.5 Heat-resistant alloys, Ni- or Co-based, cast, 320 HB	25	0.040	0.055	0.070	0.085	0.095	0.110	0.120
S2.1.1 Titanium alloys, pure titanium, Rm 400 N/mm²	60	0.095	0.130	0.160	0.190	0.220	0.250	0.275
S2.1.2 Titanium alloys, Alpha and Beta alloys, hardened, Rm 1050 N/mm²	45	0.075	0.105	0.130	0.155	0.175	0.200	0.220
H1.1.1 Hardened steel, hardened and tempered, < 55 HRC	35	0.050	0.065	0.080	0.095	0.110	0.125	0.135
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 navigator.guehring.de/en.

Ratio drills with coolant ducts, 3-fluted, FT 200 U, 12xD

Machining group		f (mm/rev) with nom. Ø						
	v_c (m/min)	4	6	8	10	12	14	16
P1.1.1 Unalloyed steel, annealed, 0.15 % C, Rm 420 N/mm², 125 HB	160	0.300	0.410	0.510	0.605	0.695	0.785	0.865
P1.1.2 Unalloyed steel, heat-treated, 0.15 % C, Rm 420 N/mm², 125 HB	145	0.270	0.370	0.460	0.545	0.625	0.705	0.780
P1.1.3 Unalloyed steel, annealed, 0.45 % C, Rm 640 N/mm², 190 HB	145	0.270	0.370	0.460	0.545	0.625	0.705	0.780
P1.1.4 Unalloyed steel, heat-treated, 0.45 % C, Rm 640 N/mm², 190 HB	135	0.255	0.350	0.435	0.515	0.590	0.665	0.735
P1.1.5 Unalloyed steel, heat-treated, 0.45 % C, Rm 850 N/mm², 250 HB	135	0.255	0.350	0.435	0.515	0.590	0.665	0.735
P1.1.6 Unalloyed steel, annealed, 0.75 % C, Rm 915 N/mm², 270 HB	130	0.240	0.330	0.410	0.485	0.555	0.625	0.695
P1.1.7 Unalloyed steel, heat-treated, 0.75 % C, Rm 1020 N/mm², 300 HB	120	0.225	0.310	0.385	0.455	0.520	0.585	0.650
P2.1.1 Low-alloy steel, annealed, Rm 610 N/mm², 180 HB	110	0.300	0.410	0.510	0.605	0.695	0.785	0.865
P2.1.2 Low-alloy steel, heat-treated, Rm 930 N/mm², 275 HB	110	0.300	0.410	0.510	0.605	0.695	0.785	0.865
P2.1.3 Low-alloy steel, heat-treated, Rm 1020 N/mm², 300 HB	95	0.255	0.350	0.435	0.515	0.590	0.665	0.735
P2.1.4 Low-alloy steel, heat-treated, Rm 1190 N/mm², 350 HB	85	0.225	0.310	0.385	0.455	0.520	0.585	0.650
P3.1.1 High-alloy steel and tool steel, annealed, Rm 680 N/mm², 200 HB	80	0.190	0.260	0.325	0.385	0.440	0.495	0.550
P3.1.2 High-alloy steel and tool steel, hardened and tempered, Rm 1100 N/mm², 325 HB	70	0.165	0.220	0.275	0.325	0.375	0.420	0.465
M1.1.1 Stainless steel, ferritic/martensitic, with machining additives	60	0.095	0.130	0.160	0.190	0.220	0.250	0.275
M1.1.2 Stainless steel, ferritic/martensitic, annealed, Rm 680 N/mm², 200 HB	55	0.085	0.115	0.145	0.175	0.200	0.225	0.245
M1.1.3 Stainless steel, ferritic/martensitic, heat-treated, Rm 810 N/mm², 240 HB	50	0.080	0.110	0.140	0.165	0.185	0.210	0.235
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	120	0.300	0.410	0.510	0.605	0.695	0.785	0.865
K1.1.2 Grey cast iron, pearlitic/martensitic, 260 HB	100	0.255	0.350	0.435	0.515	0.590	0.665	0.735
K1.2.1 Cast iron with spheroidal graphite, ferritic, 160 HB	100	0.255	0.350	0.435	0.515	0.590	0.665	0.735
K1.2.2 Cast iron with spheroidal graphite, pearlitic, 250 HB	95	0.240	0.330	0.410	0.485	0.555	0.625	0.695
K1.3.1 Malleable cast iron, ferritic, 130 HB	95	0.240	0.330	0.410	0.485	0.555	0.625	0.695
K1.3.2 Malleable cast iron, pearlitic, 230 HB	85	0.210	0.290	0.360	0.425	0.485	0.550	0.605
K2.1.1 Vermicular graphite cast iron (GJV)	90	0.240	0.325	0.405	0.480	0.550	0.620	0.685
K2.2.1 Austenitic-ferritic spheroidal graphite cast iron (ADI)	70	0.180	0.245	0.305	0.360	0.415	0.465	0.515
N1.1.1 Wrought aluminium alloys, non-hardened, 60 HB	100	0.190	0.260	0.325	0.385	0.440	0.495	0.550
N1.1.2 Wrought aluminium alloys, hardened, 100 HB	100	0.190	0.260	0.325	0.385	0.440	0.495	0.550
N2.1.1 Aluminium casting alloys, non-hardened, ≤ 12 % Si, 75 HB	90	0.190	0.260	0.325	0.385	0.440	0.495	0.550
N2.1.2 Aluminium casting alloys, hardened, ≤ 12 % Si, 90 HB	90	0.190	0.260	0.325	0.385	0.440	0.495	0.550
N2.1.3 Aluminium casting alloys, non-hardened, > 12 % Si, 130 HB	75	0.165	0.220	0.275	0.325	0.375	0.420	0.465
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	40	0.060	0.080	0.100	0.120	0.140	0.155	0.175
S1.1.2 Heat-resistant alloys, Fe-based, hardened, 280 HB	30	0.050	0.065	0.080	0.095	0.110	0.125	0.140
S1.1.3 Heat-resistant alloys, Ni- or Co-based, annealed, 250 HB	35	0.060	0.080	0.100	0.120	0.140	0.155	0.175
S1.1.4 Heat-resistant alloys, Ni- or Co-based, hardened, 350 HB	20	0.040	0.055	0.070	0.085	0.095	0.110	0.120
S1.1.5 Heat-resistant alloys, Ni- or Co-based, cast, 320 HB	25	0.040	0.055	0.070	0.085	0.095	0.110	0.120
S2.1.1 Titanium alloys, pure titanium, Rm 400 N/mm²	60	0.095	0.130	0.160	0.190	0.220	0.250	0.275
S2.1.2 Titanium alloys, Alpha and Beta alloys, hardened, Rm 1050 N/mm²	45	0.075	0.105	0.130	0.155	0.175	0.200	0.220
H1.1.1 Hardened steel, hardened and tempered, < 55 HRC	35	0.050	0.065	0.080	0.095	0.110	0.125	0.135
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 navigator.guehring.de/en.

Ratio drills with coolant ducts RT 100 InoxPro. 12xD

Machining group		f (mm/rev) with nom. Ø							
	v_c (m/min)	3	4	6	8	10	12	14	16
P1.1.1 Unalloyed steel. annealed. 0.15 % C. Rm 420 N/mm². 125 HB	140	0.125	0.155	0.210	0.260	0.305	0.355	0.395	0.440
P1.1.2 Unalloyed steel. heat-treated. 0.15 % C. Rm 420 N/mm². 125 HB	125	0.110	0.140	0.185	0.235	0.275	0.315	0.355	0.395
P1.1.3 Unalloyed steel. annealed. 0.45 % C. Rm 640 N/mm². 190 HB	125	0.110	0.140	0.185	0.235	0.275	0.315	0.355	0.395
P1.1.4 Unalloyed steel. heat-treated. 0.45 % C. Rm 640 N/mm². 190 HB	120	0.105	0.130	0.175	0.220	0.260	0.300	0.335	0.375
P1.1.5 Unalloyed steel. heat-treated. 0.45 % C. Rm 850 N/mm². 250 HB	120	0.105	0.130	0.175	0.220	0.260	0.300	0.335	0.375
P1.1.6 Unalloyed steel. annealed. 0.75 % C. Rm 915 N/mm². 270 HB	110	0.100	0.120	0.165	0.205	0.245	0.280	0.315	0.350
P1.1.7 Unalloyed steel. heat-treated. 0.75 % C. Rm 1020 N/mm². 300 HB	105	0.090	0.115	0.155	0.195	0.230	0.265	0.295	0.330
P2.1.1 Low-alloy steel. annealed. Rm 610 N/mm². 180 HB	115	0.095	0.120	0.165	0.205	0.240	0.275	0.310	0.345
P2.1.2 Low-alloy steel. heat-treated. Rm 930 N/mm². 275 HB	115	0.095	0.120	0.165	0.205	0.240	0.275	0.310	0.345
P2.1.3 Low-alloy steel. heat-treated. Rm 1020 N/mm². 300 HB	100	0.080	0.100	0.140	0.170	0.205	0.235	0.265	0.290
P2.1.4 Low-alloy steel. heat-treated. Rm 1190 N/mm². 350 HB	85	0.070	0.090	0.120	0.150	0.180	0.205	0.230	0.255
P3.1.1 High-alloy steel and tool steel. annealed. Rm 680 N/mm². 200 HB	75	0.075	0.095	0.130	0.160	0.190	0.220	0.250	0.275
P3.1.2 High-alloy steel and tool steel. hardened and tempered. Rm 1100 N/mm². 325 HB	65	0.065	0.080	0.110	0.140	0.165	0.185	0.210	0.235
M1.1.1 Stainless steel. ferritic/martensitic. with machining additives	100	0.075	0.095	0.130	0.160	0.190	0.220	0.250	0.275
M1.1.2 Stainless steel. ferritic/martensitic. annealed. Rm 680 N/mm². 200 HB	90	0.070	0.085	0.115	0.145	0.175	0.200	0.225	0.245
M1.1.3 Stainless steel. ferritic/martensitic. heat-treated. Rm 810 N/mm². 240 HB	85	0.065	0.080	0.110	0.140	0.165	0.185	0.210	0.235
M2.1.1 Stainless steel. austenitic. quenched. 180 HB	80	0.060	0.075	0.105	0.130	0.155	0.175	0.200	0.220
M2.2.1 Duplex steel. high-strength stainless steels	70	0.050	0.065	0.090	0.110	0.130	0.150	0.170	0.185
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									
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	45	0.050	0.060	0.080	0.100	0.120	0.140	0.155	0.175
S1.1.2 Heat-resistant alloys. Fe-based. hardened. 280 HB	35	0.040	0.050	0.065	0.080	0.095	0.110	0.125	0.140
S1.1.3 Heat-resistant alloys. Ni- or Co-based. annealed. 250 HB	40	0.050	0.060	0.080	0.100	0.120	0.140	0.155	0.175
S1.1.4 Heat-resistant alloys. Ni- or Co-based. hardened. 350 HB	25	0.035	0.040	0.055	0.070	0.085	0.095	0.110	0.120
S1.1.5 Heat-resistant alloys. Ni- or Co-based. cast. 320 HB	25	0.035	0.040	0.055	0.070	0.085	0.095	0.110	0.120
S2.1.1 Titanium alloys. pure titanium. Rm 400 N/mm²	60	0.075	0.095	0.130	0.160	0.190	0.220	0.250	0.275
S2.1.2 Titanium alloys. Alpha and Beta alloys. hardened. Rm 1050 N/mm²	45	0.060	0.075	0.105	0.130	0.155	0.175	0.200	0.220
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 navigator.guehring.de/en.

Step drill for tapped core holes, RT 100 U

Machining group		f (mm/rev) with Ø d1							
	F								
	v_c (m/min)	3	4	6	8	10	12	14	16
P1.1.1 Unalloyed steel, annealed, 0.15 % C, Rm 420 N/mm², 125 HB	145	0.155	0.190	0.260	0.325	0.385	0.440	0.495	0.550
P1.1.2 Unalloyed steel, heat-treated, 0.15 % C, Rm 420 N/mm², 125 HB	130	0.140	0.170	0.235	0.290	0.345	0.395	0.445	0.495
P1.1.3 Unalloyed steel, annealed, 0.45 % C, Rm 640 N/mm², 190 HB	130	0.140	0.170	0.235	0.290	0.345	0.395	0.445	0.495
P1.1.4 Unalloyed steel, heat-treated, 0.45 % C, Rm 640 N/mm², 190 HB	125	0.130	0.165	0.220	0.275	0.325	0.375	0.420	0.465
P1.1.5 Unalloyed steel, heat-treated, 0.45 % C, Rm 850 N/mm², 250 HB	125	0.130	0.165	0.220	0.275	0.325	0.375	0.420	0.465
P1.1.6 Unalloyed steel, annealed, 0.75 % C, Rm 915 N/mm², 270 HB	115	0.125	0.155	0.210	0.260	0.305	0.355	0.395	0.440
P1.1.7 Unalloyed steel, heat-treated, 0.75 % C, Rm 1020 N/mm², 300 HB	110	0.115	0.145	0.195	0.245	0.290	0.330	0.370	0.410
P2.1.1 Low-alloy steel, annealed, Rm 610 N/mm², 180 HB	120	0.125	0.155	0.210	0.260	0.305	0.355	0.395	0.440
P2.1.2 Low-alloy steel, heat-treated, Rm 930 N/mm², 275 HB	120	0.125	0.155	0.210	0.260	0.305	0.355	0.395	0.440
P2.1.3 Low-alloy steel, heat-treated, Rm 1020 N/mm², 300 HB	100	0.105	0.130	0.175	0.220	0.260	0.300	0.335	0.375
P2.1.4 Low-alloy steel, heat-treated, Rm 1190 N/mm², 350 HB	90	0.090	0.115	0.155	0.195	0.230	0.265	0.295	0.330
P3.1.1 High-alloy steel and tool steel, annealed, Rm 680 N/mm², 200 HB	80	0.095	0.120	0.165	0.205	0.240	0.275	0.310	0.345
P3.1.2 High-alloy steel and tool steel, hardened and tempered, Rm 1100 N/mm², 325 HB	70	0.080	0.100	0.140	0.170	0.205	0.235	0.265	0.290
M1.1.1 Stainless steel, ferritic/martensitic, with machining additives	60	0.075	0.095	0.130	0.160	0.190	0.220	0.250	0.275
M1.1.2 Stainless steel, ferritic/martensitic, annealed, Rm 680 N/mm², 200 HB	55	0.070	0.085	0.115	0.145	0.175	0.200	0.225	0.245
M1.1.3 Stainless steel, ferritic/martensitic, heat-treated, Rm 810 N/mm², 240 HB	50	0.065	0.080	0.110	0.140	0.165	0.185	0.210	0.235
M2.1.1 Stainless steel, austenitic, quenched, 180 HB	55	0.040	0.050	0.065	0.080	0.095	0.110	0.125	0.135
M2.2.1 Duplex steel, high-strength stainless steels	45	0.035	0.040	0.055	0.070	0.080	0.095	0.105	0.115
K1.1.1 Grey cast iron, pearlitic/ferritic, 180 HB	110	0.155	0.190	0.260	0.325	0.385	0.440	0.495	0.550
K1.1.2 Grey cast iron, pearlitic/martensitic, 260 HB	95	0.130	0.165	0.220	0.275	0.325	0.375	0.420	0.465
K1.2.1 Cast iron with spheroidal graphite, ferritic, 160 HB	95	0.130	0.165	0.220	0.275	0.325	0.375	0.420	0.465
K1.2.2 Cast iron with spheroidal graphite, pearlitic, 250 HB	90	0.125	0.155	0.210	0.260	0.305	0.355	0.395	0.440
K1.3.1 Malleable cast iron, ferritic, 130 HB	90	0.125	0.155	0.210	0.260	0.305	0.355	0.395	0.440
K1.3.2 Malleable cast iron, pearlitic, 230 HB	75	0.110	0.135	0.180	0.225	0.270	0.310	0.345	0.385
K2.1.1 Vermicular graphite cast iron (GJV)	90	0.155	0.190	0.260	0.325	0.385	0.440	0.495	0.550
K2.2.1 Austenitic-ferritic spheroidal graphite cast iron (ADI)	70	0.115	0.145	0.195	0.245	0.290	0.330	0.370	0.410
N1.1.1 Wrought aluminium alloys, non-hardened, 60 HB	185	0.155	0.190	0.260	0.325	0.385	0.440	0.495	0.550
N1.1.2 Wrought aluminium alloys, hardened, 100 HB	185	0.155	0.190	0.260	0.325	0.385	0.440	0.495	0.550
N2.1.1 Aluminium casting alloys, non-hardened, ≤ 12 % Si, 75 HB	170	0.155	0.190	0.260	0.325	0.385	0.440	0.495	0.550
N2.1.2 Aluminium casting alloys, hardened, ≤ 12 % Si, 90 HB	170	0.155	0.190	0.260	0.325	0.385	0.440	0.495	0.550
N2.1.3 Aluminium casting alloys, non-hardened, > 12 % Si, 130 HB	145	0.130	0.165	0.220	0.275	0.325	0.375	0.420	0.465
N3.1.1 Copper and copper alloys: Free-machining alloy, Pb > 1 %	130	0.125	0.155	0.210	0.260	0.305	0.355	0.395	0.440
N3.1.2 Copper and copper alloys: CuZn, CuSnZn	110	0.105	0.130	0.175	0.220	0.260	0.300	0.335	0.375
N3.1.3 Copper and copper alloys: CuSn, lead-free copper and copper electrolyte	105	0.100	0.120	0.165	0.205	0.245	0.280	0.315	0.350
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	40	0.060	0.075	0.105	0.130	0.155	0.175	0.200	0.220
S1.1.2 Heat-resistant alloys, Fe-based, hardened, 280 HB	30	0.050	0.060	0.085	0.105	0.120	0.140	0.160	0.175
S1.1.3 Heat-resistant alloys, Ni- or Co-based, annealed, 250 HB	35	0.060	0.075	0.105	0.130	0.155	0.175	0.200	0.220
S1.1.4 Heat-resistant alloys, Ni- or Co-based, hardened, 350 HB	20	0.045	0.055	0.075	0.090	0.105	0.125	0.140	0.155
S1.1.5 Heat-resistant alloys, Ni- or Co-based, cast, 320 HB	25	0.045	0.055	0.075	0.090	0.105	0.125	0.140	0.155
S2.1.1 Titanium alloys, pure titanium, Rm 400 N/mm²	40	0.060	0.075	0.105	0.130	0.155	0.175	0.200	0.220
S2.1.2 Titanium alloys, Alpha and Beta alloys, hardened, Rm 1050 N/mm²	30	0.050	0.060	0.085	0.105	0.120	0.140	0.160	0.175
H1.1.1 Hardened steel, hardened and tempered, < 55 HRC	45	0.040	0.050	0.065	0.080	0.095	0.110	0.125	0.135
H1.1.2 Hardened steel, hardened and tempered, < 60 HRC	30	0.030	0.040	0.050	0.065	0.075	0.090	0.100	0.110
H1.1.3 Hardened steel, hardened and tempered, > 60 HRC	25	0.030	0.035	0.050	0.060	0.070	0.085	0.095	0.105
H2.1.1 Chilled cast iron, 400 HB	40	0.050	0.060	0.080	0.100	0.120	0.140	0.155	0.175
H2.1.2 Chilled cast iron, hardened and tempered, < 55 HRC	30	0.035	0.040	0.055	0.070	0.085	0.095	0.110	0.120

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

Drill head BT 800 for piloting, with tool holder ≤ 3xD

Machining group	F	f (mm/rev) with nom. Ø							
	v_c (m/min)	10	12	14	16	18	20	22	26
P1.1.1 Unalloyed steel, annealed, 0.15 % C, Rm 420 N/mm², 125 HB	130	0.240	0.275	0.310	0.345	0.375	0.405	0.435	0.495
P1.1.2 Unalloyed steel, heat-treated, 0.15 % C, Rm 420 N/mm², 125 HB	115	0.215	0.250	0.280	0.310	0.340	0.365	0.395	0.445
P1.1.3 Unalloyed steel, annealed, 0.45 % C, Rm 640 N/mm², 190 HB	115	0.215	0.250	0.280	0.310	0.340	0.365	0.395	0.445
P1.1.4 Unalloyed steel, heat-treated, 0.45 % C, Rm 640 N/mm², 190 HB	110	0.205	0.235	0.265	0.290	0.320	0.345	0.370	0.420
P1.1.5 Unalloyed steel, heat-treated, 0.45 % C, Rm 850 N/mm², 250 HB	110	0.205	0.235	0.265	0.290	0.320	0.345	0.370	0.420
P1.1.6 Unalloyed steel, annealed, 0.75 % C, Rm 915 N/mm², 270 HB	105	0.190	0.220	0.250	0.275	0.300	0.325	0.350	0.395
P1.1.7 Unalloyed steel, heat-treated, 0.75 % C, Rm 1020 N/mm², 300 HB	100	0.180	0.205	0.230	0.255	0.280	0.305	0.330	0.370
P2.1.1 Low-alloy steel, annealed, Rm 610 N/mm², 180 HB	110	0.240	0.275	0.310	0.345	0.375	0.405	0.435	0.495
P2.1.2 Low-alloy steel, heat-treated, Rm 930 N/mm², 275 HB	110	0.240	0.275	0.310	0.345	0.375	0.405	0.435	0.495
P2.1.3 Low-alloy steel, heat-treated, Rm 1020 N/mm², 300 HB	95	0.205	0.235	0.265	0.290	0.320	0.345	0.370	0.420
P2.1.4 Low-alloy steel, heat-treated, Rm 1190 N/mm², 350 HB	85	0.180	0.205	0.230	0.255	0.280	0.305	0.330	0.370
P3.1.1 High-alloy steel and tool steel, annealed, Rm 680 N/mm², 200 HB	60	0.190	0.220	0.250	0.275	0.300	0.325	0.350	0.395
P3.1.2 High-alloy steel and tool steel, hardened and tempered, Rm 1100 N/mm², 325 HB	50	0.165	0.185	0.210	0.235	0.255	0.275	0.295	0.335
M1.1.1 Stainless steel, ferritic/martensitic, with machining additives	55	0.155	0.175	0.200	0.220	0.240	0.260	0.280	0.315
M1.1.2 Stainless steel, ferritic/martensitic, annealed, Rm 680 N/mm², 200 HB	50	0.140	0.160	0.180	0.195	0.215	0.235	0.250	0.285
M1.1.3 Stainless steel, ferritic/martensitic, heat-treated, Rm 810 N/mm², 240 HB	45	0.130	0.150	0.170	0.185	0.205	0.220	0.235	0.270
M2.1.1 Stainless steel, austenitic, quenched, 180 HB	40	0.155	0.175	0.200	0.220	0.240	0.260	0.280	0.315
M2.2.1 Duplex steel, high-strength stainless steels	35	0.130	0.150	0.170	0.185	0.205	0.220	0.235	0.270
K1.1.1 Grey cast iron, pearlitic/ferritic, 180 HB	100	0.240	0.275	0.310	0.345	0.375	0.405	0.435	0.495
K1.1.2 Grey cast iron, pearlitic/martensitic, 260 HB	85	0.205	0.235	0.265	0.290	0.320	0.345	0.370	0.420
K1.2.1 Cast iron with spheroidal graphite, ferritic, 160 HB	85	0.205	0.235	0.265	0.290	0.320	0.345	0.370	0.420
K1.2.2 Cast iron with spheroidal graphite, pearlitic, 250 HB	80	0.190	0.220	0.250	0.275	0.300	0.325	0.350	0.395
K1.3.1 Malleable cast iron, ferritic, 130 HB	80	0.190	0.220	0.250	0.275	0.300	0.325	0.350	0.395
K1.3.2 Malleable cast iron, pearlitic, 230 HB	70	0.170	0.195	0.215	0.240	0.265	0.285	0.305	0.345
K2.1.1 Vermicular graphite cast iron (GJV)	80	0.190	0.220	0.250	0.275	0.300	0.325	0.350	0.395
K2.2.1 Austenitic-ferritic spheroidal graphite cast iron (ADI)	60	0.145	0.165	0.185	0.205	0.225	0.245	0.260	0.300
N1.1.1 Wrought aluminium alloys, non-hardened, 60 HB	200	0.305	0.355	0.395	0.440	0.480	0.520	0.560	0.635
N1.1.2 Wrought aluminium alloys, hardened, 100 HB	200	0.305	0.355	0.395	0.440	0.480	0.520	0.560	0.635
N2.1.1 Aluminium casting alloys, non-hardened, ≤ 12 % Si, 75 HB	180	0.305	0.355	0.395	0.440	0.480	0.520	0.560	0.635
N2.1.2 Aluminium casting alloys, hardened, ≤ 12 % Si, 90 HB	180	0.305	0.355	0.395	0.440	0.480	0.520	0.560	0.635
N2.1.3 Aluminium casting alloys, non-hardened, > 12 % Si, 130 HB	155	0.260	0.300	0.335	0.375	0.410	0.440	0.475	0.540
N3.1.1 Copper and copper alloys: Free-machining alloy, Pb > 1 %	140	0.240	0.275	0.310	0.345	0.375	0.405	0.435	0.495
N3.1.2 Copper and copper alloys: CuZn, CuSnZn	120	0.205	0.235	0.265	0.290	0.320	0.345	0.370	0.420
N3.1.3 Copper and copper alloys: CuSn, lead-free copper and copper electrolyte	110	0.190	0.220	0.250	0.275	0.300	0.325	0.350	0.395
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	35	0.095	0.110	0.125	0.135	0.150	0.165	0.175	0.200
S1.1.2 Heat-resistant alloys, Fe-based, hardened, 280 HB	30	0.075	0.090	0.100	0.110	0.120	0.130	0.140	0.160
S1.1.3 Heat-resistant alloys, Ni- or Co-based, annealed, 250 HB	30	0.095	0.110	0.125	0.135	0.150	0.165	0.175	0.200
S1.1.4 Heat-resistant alloys, Ni- or Co-based, hardened, 350 HB	20	0.065	0.075	0.085	0.095	0.105	0.115	0.120	0.140
S1.1.5 Heat-resistant alloys, Ni- or Co-based, cast, 320 HB	20	0.065	0.075	0.085	0.095	0.105	0.115	0.120	0.140
S2.1.1 Titanium alloys, pure titanium, Rm 400 N/mm²	40	0.120	0.140	0.155	0.175	0.190	0.205	0.220	0.250
S2.1.2 Titanium alloys, Alpha and Beta alloys, hardened, Rm 1050 N/mm²	30	0.095	0.110	0.125	0.140	0.150	0.165	0.175	0.200
H1.1.1 Hardened steel, hardened and tempered, < 55 HRC	25	0.095	0.110	0.125	0.135	0.150	0.165	0.175	0.200
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	90	0.240	0.275	0.310	0.345	0.375	0.405	0.435	0.495
H2.1.2 Chilled cast iron, hardened and tempered, < 55 HRC	65	0.170	0.195	0.215	0.240	0.265	0.285	0.305	0.345

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

Drill head BT 800, with tool holder ≤ 5xD

Machining group		f (mm/rev) with nom. Ø							
	PS								
	v_c (m/min)	10	12	14	16	18	20	22	26
P1.1.1 Unalloyed steel, annealed, 0.15 % C, Rm 420 N/mm², 125 HB	135	0.240	0.275	0.310	0.345	0.375	0.405	0.435	0.495
P1.1.2 Unalloyed steel, heat-treated, 0.15 % C, Rm 420 N/mm², 125 HB	120	0.215	0.250	0.280	0.310	0.340	0.365	0.395	0.445
P1.1.3 Unalloyed steel, annealed, 0.45 % C, Rm 640 N/mm², 190 HB	120	0.215	0.250	0.280	0.310	0.340	0.365	0.395	0.445
P1.1.4 Unalloyed steel, heat-treated, 0.45 % C, Rm 640 N/mm², 190 HB	115	0.205	0.235	0.265	0.290	0.320	0.345	0.370	0.420
P1.1.5 Unalloyed steel, heat-treated, 0.45 % C, Rm 850 N/mm², 250 HB	115	0.205	0.235	0.265	0.290	0.320	0.345	0.370	0.420
P1.1.6 Unalloyed steel, annealed, 0.75 % C, Rm 915 N/mm², 270 HB	110	0.190	0.220	0.250	0.275	0.300	0.325	0.350	0.395
P1.1.7 Unalloyed steel, heat-treated, 0.75 % C, Rm 1020 N/mm², 300 HB	100	0.180	0.205	0.230	0.255	0.280	0.305	0.330	0.370
P2.1.1 Low-alloy steel, annealed, Rm 610 N/mm², 180 HB	115	0.240	0.275	0.310	0.345	0.375	0.405	0.435	0.495
P2.1.2 Low-alloy steel, heat-treated, Rm 930 N/mm², 275 HB	115	0.240	0.275	0.310	0.345	0.375	0.405	0.435	0.495
P2.1.3 Low-alloy steel, heat-treated, Rm 1020 N/mm², 300 HB	100	0.205	0.235	0.265	0.290	0.320	0.345	0.370	0.420
P2.1.4 Low-alloy steel, heat-treated, Rm 1190 N/mm², 350 HB	85	0.180	0.205	0.230	0.255	0.280	0.305	0.330	0.370
P3.1.1 High-alloy steel and tool steel, annealed, Rm 680 N/mm², 200 HB	65	0.190	0.220	0.250	0.275	0.300	0.325	0.350	0.395
P3.1.2 High-alloy steel and tool steel, hardened and tempered, Rm 1100 N/mm², 325 HB	55	0.165	0.185	0.210	0.235	0.255	0.275	0.295	0.335
M1.1.1 Stainless steel, ferritic/martensitic, with machining additives	55	0.155	0.175	0.200	0.220	0.240	0.260	0.280	0.315
M1.1.2 Stainless steel, ferritic/martensitic, annealed, Rm 680 N/mm², 200 HB	50	0.140	0.160	0.180	0.195	0.215	0.235	0.250	0.285
M1.1.3 Stainless steel, ferritic/martensitic, heat-treated, Rm 810 N/mm², 240 HB	45	0.130	0.150	0.170	0.185	0.205	0.220	0.235	0.270
M2.1.1 Stainless steel, austenitic, quenched, 180 HB	40	0.155	0.175	0.200	0.220	0.240	0.260	0.280	0.315
M2.2.1 Duplex steel, high-strength stainless steels	35	0.130	0.150	0.170	0.185	0.205	0.220	0.235	0.270
K1.1.1 Grey cast iron, pearlitic/ferritic, 180 HB	100	0.240	0.275	0.310	0.345	0.375	0.405	0.435	0.495
K1.1.2 Grey cast iron, pearlitic/martensitic, 260 HB	85	0.205	0.235	0.265	0.290	0.320	0.345	0.370	0.420
K1.2.1 Cast iron with spheroidal graphite, ferritic, 160 HB	85	0.205	0.235	0.265	0.290	0.320	0.345	0.370	0.420
K1.2.2 Cast iron with spheroidal graphite, pearlitic, 250 HB	80	0.190	0.220	0.250	0.275	0.300	0.325	0.350	0.395
K1.3.1 Malleable cast iron, ferritic, 130 HB	80	0.190	0.220	0.250	0.275	0.300	0.325	0.350	0.395
K1.3.2 Malleable cast iron, pearlitic, 230 HB	70	0.170	0.195	0.215	0.240	0.265	0.285	0.305	0.345
K2.1.1 Vermicular graphite cast iron (GJV)	80	0.190	0.220	0.250	0.275	0.300	0.325	0.350	0.395
K2.2.1 Austenitic-ferritic spheroidal graphite cast iron (ADI)	60	0.145	0.165	0.185	0.205	0.225	0.245	0.260	0.300
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									

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

Drill head BT 800, with tool holder 8xD

Machining group		f (mm/rev) with nom. Ø							
	v_c (m/min)	10	12	14	16	18	20	22	26
P1.1.1 Unalloyed steel, annealed, 0.15 % C, Rm 420 N/mm², 125 HB	120	0.205	0.235	0.265	0.295	0.325	0.350	0.375	0.425
P1.1.2 Unalloyed steel, heat-treated, 0.15 % C, Rm 420 N/mm², 125 HB	105	0.185	0.215	0.240	0.265	0.290	0.315	0.340	0.385
P1.1.3 Unalloyed steel, annealed, 0.45 % C, Rm 640 N/mm², 190 HB	105	0.185	0.215	0.240	0.265	0.290	0.315	0.340	0.385
P1.1.4 Unalloyed steel, heat-treated, 0.45 % C, Rm 640 N/mm², 190 HB	100	0.175	0.200	0.225	0.250	0.275	0.295	0.320	0.365
P1.1.5 Unalloyed steel, heat-treated, 0.45 % C, Rm 850 N/mm², 250 HB	100	0.175	0.200	0.225	0.250	0.275	0.295	0.320	0.365
P1.1.6 Unalloyed steel, annealed, 0.75 % C, Rm 915 N/mm², 270 HB	95	0.165	0.190	0.215	0.235	0.260	0.280	0.300	0.340
P1.1.7 Unalloyed steel, heat-treated, 0.75 % C, Rm 1020 N/mm², 300 HB	90	0.155	0.180	0.200	0.220	0.240	0.260	0.280	0.320
P2.1.1 Low-alloy steel, annealed, Rm 610 N/mm², 180 HB	100	0.205	0.235	0.265	0.295	0.325	0.350	0.375	0.425
P2.1.2 Low-alloy steel, heat-treated, Rm 930 N/mm², 275 HB	100	0.205	0.235	0.265	0.295	0.325	0.350	0.375	0.425
P2.1.3 Low-alloy steel, heat-treated, Rm 1020 N/mm², 300 HB	85	0.175	0.200	0.225	0.250	0.275	0.295	0.320	0.365
P2.1.4 Low-alloy steel, heat-treated, Rm 1190 N/mm², 350 HB	75	0.155	0.180	0.200	0.220	0.240	0.260	0.280	0.320
P3.1.1 High-alloy steel and tool steel, annealed, Rm 680 N/mm², 200 HB	55	0.165	0.190	0.215	0.235	0.260	0.280	0.300	0.340
P3.1.2 High-alloy steel and tool steel, hardened and tempered, Rm 1100 N/mm², 325 HB	50	0.140	0.160	0.180	0.200	0.220	0.240	0.255	0.290
M1.1.1 Stainless steel, ferritic/martensitic, with machining additives	50	0.130	0.150	0.170	0.190	0.205	0.225	0.240	0.270
M1.1.2 Stainless steel, ferritic/martensitic, annealed, Rm 680 N/mm², 200 HB	45	0.120	0.135	0.155	0.170	0.185	0.200	0.215	0.245
M1.1.3 Stainless steel, ferritic/martensitic, heat-treated, Rm 810 N/mm², 240 HB	40	0.110	0.130	0.145	0.160	0.175	0.190	0.205	0.230
M2.1.1 Stainless steel, austenitic, quenched, 180 HB	35	0.130	0.150	0.170	0.190	0.205	0.225	0.240	0.270
M2.2.1 Duplex steel, high-strength stainless steels	30	0.110	0.130	0.145	0.160	0.175	0.190	0.205	0.230
K1.1.1 Grey cast iron, pearlitic/ferritic, 180 HB	90	0.205	0.235	0.265	0.295	0.325	0.350	0.375	0.425
K1.1.2 Grey cast iron, pearlitic/martensitic, 260 HB	75	0.175	0.200	0.225	0.250	0.275	0.295	0.320	0.365
K1.2.1 Cast iron with spheroidal graphite, ferritic, 160 HB	75	0.175	0.200	0.225	0.250	0.275	0.295	0.320	0.365
K1.2.2 Cast iron with spheroidal graphite, pearlitic, 250 HB	70	0.165	0.190	0.215	0.235	0.260	0.280	0.300	0.340
K1.3.1 Malleable cast iron, ferritic, 130 HB	70	0.165	0.190	0.215	0.235	0.260	0.280	0.300	0.340
K1.3.2 Malleable cast iron, pearlitic, 230 HB	60	0.145	0.165	0.185	0.205	0.225	0.245	0.265	0.300
K2.1.1 Vermicular graphite cast iron (GJV)	70	0.165	0.190	0.215	0.235	0.260	0.280	0.300	0.340
K2.2.1 Austenitic-ferritic spheroidal graphite cast iron (ADI)	55	0.125	0.140	0.160	0.175	0.195	0.210	0.225	0.255
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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Drill head BT 800, with tool holder 12xD

Machining group		f (mm/rev) with nom. Ø							
	v_c (m/min)	10	12	14	16	18	20	22	26
P1.1.1 Unalloyed steel, annealed, 0.15 % C, Rm 420 N/mm², 125 HB	115	0.195	0.225	0.255	0.280	0.310	0.335	0.360	0.405
P1.1.2 Unalloyed steel, heat-treated, 0.15 % C, Rm 420 N/mm², 125 HB	100	0.175	0.205	0.230	0.255	0.275	0.300	0.320	0.365
P1.1.3 Unalloyed steel, annealed, 0.45 % C, Rm 640 N/mm², 190 HB	100	0.175	0.205	0.230	0.255	0.275	0.300	0.320	0.365
P1.1.4 Unalloyed steel, heat-treated, 0.45 % C, Rm 640 N/mm², 190 HB	95	0.165	0.190	0.215	0.240	0.260	0.285	0.305	0.345
P1.1.5 Unalloyed steel, heat-treated, 0.45 % C, Rm 850 N/mm², 250 HB	95	0.165	0.190	0.215	0.240	0.260	0.285	0.305	0.345
P1.1.6 Unalloyed steel, annealed, 0.75 % C, Rm 915 N/mm², 270 HB	90	0.155	0.180	0.205	0.225	0.245	0.265	0.285	0.325
P1.1.7 Unalloyed steel, heat-treated, 0.75 % C, Rm 1020 N/mm², 300 HB	85	0.150	0.170	0.190	0.210	0.230	0.250	0.270	0.305
P2.1.1 Low-alloy steel, annealed, Rm 610 N/mm², 180 HB	95	0.195	0.225	0.255	0.280	0.310	0.335	0.360	0.405
P2.1.2 Low-alloy steel, heat-treated, Rm 930 N/mm², 275 HB	95	0.195	0.225	0.255	0.280	0.310	0.335	0.360	0.405
P2.1.3 Low-alloy steel, heat-treated, Rm 1020 N/mm², 300 HB	80	0.165	0.190	0.215	0.240	0.260	0.285	0.305	0.345
P2.1.4 Low-alloy steel, heat-treated, Rm 1190 N/mm², 350 HB	70	0.150	0.170	0.190	0.210	0.230	0.250	0.270	0.305
P3.1.1 High-alloy steel and tool steel, annealed, Rm 680 N/mm², 200 HB	55	0.155	0.180	0.205	0.225	0.245	0.265	0.285	0.325
P3.1.2 High-alloy steel and tool steel, hardened and tempered, Rm 1100 N/mm², 325 HB	45	0.135	0.155	0.175	0.190	0.210	0.225	0.245	0.275
M1.1.1 Stainless steel, ferritic/martensitic, with machining additives	45	0.125	0.145	0.160	0.180	0.195	0.210	0.230	0.260
M1.1.2 Stainless steel, ferritic/martensitic, annealed, Rm 680 N/mm², 200 HB	40	0.115	0.130	0.145	0.160	0.175	0.190	0.205	0.235
M1.1.3 Stainless steel, ferritic/martensitic, heat-treated, Rm 810 N/mm², 240 HB	40	0.105	0.120	0.140	0.150	0.165	0.180	0.195	0.220
M2.1.1 Stainless steel, austenitic, quenched, 180 HB	35	0.125	0.145	0.160	0.180	0.195	0.210	0.230	0.260
M2.2.1 Duplex steel, high-strength stainless steels	30	0.105	0.120	0.140	0.150	0.165	0.180	0.195	0.220
K1.1.1 Grey cast iron, pearlitic/ferritic, 180 HB	85	0.195	0.225	0.255	0.280	0.310	0.335	0.360	0.405
K1.1.2 Grey cast iron, pearlitic/martensitic, 260 HB	70	0.165	0.190	0.215	0.240	0.260	0.285	0.305	0.345
K1.2.1 Cast iron with spheroidal graphite, ferritic, 160 HB	70	0.165	0.190	0.215	0.240	0.260	0.285	0.305	0.345
K1.2.2 Cast iron with spheroidal graphite, pearlitic, 250 HB	65	0.155	0.180	0.205	0.225	0.245	0.265	0.285	0.325
K1.3.1 Malleable cast iron, ferritic, 130 HB	65	0.155	0.180	0.205	0.225	0.245	0.265	0.285	0.325
K1.3.2 Malleable cast iron, pearlitic, 230 HB	60	0.140	0.160	0.180	0.195	0.215	0.235	0.250	0.285
K2.1.1 Vermicular graphite cast iron (GJV)	65	0.155	0.180	0.205	0.225	0.245	0.265	0.285	0.325
K2.2.1 Austenitic-ferritic spheroidal graphite cast iron (ADI)	50	0.120	0.135	0.150	0.170	0.185	0.200	0.215	0.245
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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Indexable insert drills ISO P & K

Article no.	Factor V_c	Factor fz
28500 (2xD), 28501 (3xD)	± 0 %	± 0 %
28502 (4xD)	-10 %	-15 %
28503 (5xD)	-15 %	-20 %

Machining group	v_c (m/min)	f (mm/rev) with nom. Ø			
		14-23.5	24-29.5	30-42	43-50
P1.1.1 Unalloyed steel, annealed, 0.15 % C, Rm 420 N/mm², 125 HB	250	0.08	0.10	0.11	0.14
P1.1.2 Unalloyed steel, heat-treated, 0.15 % C, Rm 420 N/mm², 125 HB	250	0.08	0.10	0.11	0.14
P1.1.3 Unalloyed steel, annealed, 0.45 % C, Rm 640 N/mm², 190 HB	250	0.08	0.10	0.11	0.14
P1.1.4 Unalloyed steel, heat-treated, 0.45 % C, Rm 640 N/mm², 190 HB	250	0.08	0.10	0.11	0.14
P1.1.5 Unalloyed steel, heat-treated, 0.45 % C, Rm 850 N/mm², 250 HB	225	0.08	0.10	0.11	0.14
P1.1.6 Unalloyed steel, annealed, 0.75 % C, Rm 915 N/mm², 270 HB	225	0.08	0.10	0.11	0.14
P1.1.7 Unalloyed steel, heat-treated, 0.75 % C, Rm 1020 N/mm², 300 HB	200	0.08	0.10	0.11	0.14
P2.1.1 Low-alloy steel, annealed, Rm 610 N/mm², 180 HB	220	0.11	0.14	0.17	0.21
P2.1.2 Low-alloy steel, heat-treated, Rm 930 N/mm², 275 HB	220	0.11	0.14	0.17	0.21
P2.1.3 Low-alloy steel, heat-treated, Rm 1020 N/mm², 300 HB	200	0.11	0.14	0.17	0.21
P2.1.4 Low-alloy steel, heat-treated, Rm 1190 N/mm², 350 HB	200	0.11	0.14	0.17	0.21
P3.1.1 High-alloy steel and tool steel, annealed, Rm 680 N/mm², 200 HB	180	0.11	0.14	0.17	0.21
P3.1.2 High-alloy steel and tool steel, hardened and tempered, Rm 1100 N/mm², 325 HB	160	0.11	0.14	0.17	0.21
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	250	0.13	0.17	0.20	0.25
K1.1.2 Grey cast iron, pearlitic/martensitic, 260 HB	225	0.13	0.17	0.20	0.25
K1.2.1 Cast iron with spheroidal graphite, ferritic, 160 HB	250	0.13	0.17	0.20	0.25
K1.2.2 Cast iron with spheroidal graphite, pearlitic, 250 HB	225	0.13	0.17	0.20	0.25
K1.3.1 Malleable cast iron, ferritic, 130 HB	250	0.13	0.17	0.20	0.25
K1.3.2 Malleable cast iron, pearlitic, 230 HB	225	0.13	0.17	0.20	0.25
K2.1.1 Vermicular graphite cast iron (GJV)	200	0.11	0.14	0.17	0.21
K2.2.1 Austenitic-ferritic spheroidal graphite cast iron (ADI)	180	0.11	0.14	0.17	0.21
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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Indexable insert drills ISO M & S

Article no.	Factor V_c	Factor fz
28500 (2xD), 28501 (3xD)	± 0 %	± 0 %
28502 (4xD)	- 10 %	- 15 %
28503 (5xD)	- 15 %	- 20 %

Machining group	v_c (m/min)	f (mm/rev) with nom. Ø			
		14-23.5	24-29.5	30-42	43-50
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	220	0.10	0.13	0.15	0.19
M1.1.2 Stainless steel, ferritic/martensitic, annealed, Rm 680 N/mm², 200 HB	200	0.09	0.12	0.14	0.17
M1.1.3 Stainless steel, ferritic/martensitic, heat-treated, Rm 810 N/mm², 240 HB	200	0.09	0.12	0.14	0.17
M2.1.1 Stainless steel, austenitic, quenched, 180 HB	180	0.08	0.10	0.12	0.15
M2.2.1 Duplex steel, high-strength stainless steels	145	0.06	0.08	0.10	0.12
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					
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	90	0.07	0.09	0.11	0.13
S1.1.2 Heat-resistant alloys, Fe-based, hardened, 280 HB	90	0.07	0.09	0.11	0.13
S1.1.3 Heat-resistant alloys, Ni- or Co-based, annealed, 250 HB	90	0.07	0.09	0.11	0.13
S1.1.4 Heat-resistant alloys, Ni- or Co-based, hardened, 350 HB	80	0.06	0.08	0.09	0.12
S1.1.5 Heat-resistant alloys, Ni- or Co-based, cast, 320 HB	80	0.06	0.08	0.09	0.12
S2.1.1 Titanium alloys, pure titanium, Rm 400 N/mm²	60	0.06	0.08	0.09	0.11
S2.1.2 Titanium alloys, Alpha and Beta alloys, hardened, Rm 1050 N/mm²	50	0.05	0.06	0.07	0.09
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.

Single-fluted gun drills EB 100 M STEEL

Correction of length diameter ratio:

< 25xD	100 %	< 45xD	90 %	< 65xD 75 %
< 80xD	60 %	< 150xD	50 %	

Machining group	Y	f (mm/rev) with nom. Ø									
	v_c (m/min)	2	3	4	5	6	7	8	9	10	12
P1.1.1 Unalloyed steel, annealed, 0.15 % C, Rm 420 N/mm², 125 HB	95	0.025	0.050	0.060	0.070	0.085	0.095	0.105	0.115	0.125	0.145
P1.1.2 Unalloyed steel, heat-treated, 0.15 % C, Rm 420 N/mm², 125 HB	85	0.025	0.045	0.055	0.065	0.075	0.085	0.095	0.105	0.115	0.130
P1.1.3 Unalloyed steel, annealed, 0.45 % C, Rm 640 N/mm², 190 HB	85	0.025	0.045	0.055	0.065	0.075	0.085	0.095	0.105	0.115	0.130
P1.1.4 Unalloyed steel, heat-treated, 0.45 % C, Rm 640 N/mm², 190 HB	80	0.020	0.040	0.050	0.060	0.070	0.080	0.090	0.100	0.105	0.125
P1.1.5 Unalloyed steel, heat-treated, 0.45 % C, Rm 850 N/mm², 250 HB	80	0.020	0.040	0.050	0.060	0.070	0.080	0.090	0.100	0.105	0.125
P1.1.6 Unalloyed steel, annealed, 0.75 % C, Rm 915 N/mm², 270 HB	75	0.020	0.040	0.050	0.055	0.065	0.075	0.085	0.090	0.100	0.115
P1.1.7 Unalloyed steel, heat-treated, 0.75 % C, Rm 1020 N/mm², 300 HB	70	0.020	0.035	0.045	0.055	0.060	0.070	0.080	0.085	0.095	0.110
P2.1.1 Low-alloy steel, annealed, Rm 610 N/mm², 180 HB	80	0.025	0.040	0.055	0.065	0.075	0.085	0.090	0.100	0.110	0.125
P2.1.2 Low-alloy steel, heat-treated, Rm 930 N/mm², 275 HB	80	0.025	0.040	0.055	0.065	0.075	0.085	0.090	0.100	0.110	0.125
P2.1.3 Low-alloy steel, heat-treated, Rm 1020 N/mm², 300 HB	65	0.020	0.035	0.045	0.055	0.060	0.070	0.080	0.085	0.095	0.110
P2.1.4 Low-alloy steel, heat-treated, Rm 1190 N/mm², 350 HB	60	0.015	0.030	0.040	0.045	0.055	0.060	0.070	0.075	0.085	0.095
P3.1.1 High-alloy steel and tool steel, annealed, Rm 680 N/mm², 200 HB	65	0.020	0.035	0.045	0.055	0.065	0.070	0.080	0.085	0.095	0.110
P3.1.2 High-alloy steel and tool steel, hardened and tempered, Rm 1100 N/mm², 325 HB	55	0.015	0.030	0.040	0.045	0.055	0.060	0.070	0.075	0.080	0.095
M1.1.1 Stainless steel, ferritic/martensitic, with machining additives	55	0.011	0.020	0.025	0.030	0.035	0.040	0.045	0.050	0.055	0.065
M1.1.2 Stainless steel, ferritic/martensitic, annealed, Rm 680 N/mm², 200 HB	45	0.010	0.020	0.025	0.030	0.035	0.035	0.040	0.045	0.050	0.055
M1.1.3 Stainless steel, ferritic/martensitic, heat-treated, Rm 810 N/mm², 240 HB	45	0.010	0.020	0.020	0.025	0.030	0.035	0.040	0.045	0.045	0.055
M2.1.1 Stainless steel, austenitic, quenched, 180 HB	40	0.009	0.015	0.020	0.025	0.030	0.035	0.040	0.040	0.045	0.050
M2.2.1 Duplex steel, high-strength stainless steels	35	0.008	0.015	0.020	0.020	0.025	0.030	0.030	0.035	0.040	0.045
K1.1.1 Grey cast iron, pearlitic/ferritic, 180 HB	85	0.025	0.050	0.060	0.075	0.085	0.100	0.110	0.120	0.130	0.150
K1.1.2 Grey cast iron, pearlitic/martensitic, 260 HB	70	0.025	0.040	0.055	0.065	0.075	0.085	0.090	0.100	0.110	0.130
K1.2.1 Cast iron with spheroidal graphite, ferritic, 160 HB	70	0.025	0.040	0.055	0.065	0.075	0.085	0.090	0.100	0.110	0.130
K1.2.2 Cast iron with spheroidal graphite, pearlitic, 250 HB	65	0.020	0.040	0.050	0.060	0.070	0.080	0.085	0.095	0.105	0.120
K1.3.1 Malleable cast iron, ferritic, 130 HB	65	0.020	0.040	0.050	0.060	0.070	0.080	0.085	0.095	0.105	0.120
K1.3.2 Malleable cast iron, pearlitic, 230 HB	60	0.020	0.035	0.045	0.050	0.060	0.070	0.075	0.085	0.090	0.105
K2.1.1 Vermicular graphite cast iron (GJV)	70	0.020	0.035	0.045	0.050	0.060	0.070	0.075	0.085	0.090	0.105
K2.2.1 Austenitic-ferritic spheroidal graphite cast iron (ADI)	50	0.015	0.025	0.030	0.040	0.045	0.050	0.055	0.060	0.070	0.080
N1.1.1 Wrought aluminium alloys, non-hardened, 60 HB	105	0.025	0.050	0.060	0.075	0.085	0.100	0.110	0.120	0.130	0.150
N1.1.2 Wrought aluminium alloys, hardened, 100 HB	105	0.025	0.050	0.060	0.075	0.085	0.100	0.110	0.120	0.130	0.150
N2.1.1 Aluminium casting alloys, non-hardened, ≤ 12 % Si, 75 HB	170	0.075	0.135	0.170	0.200	0.235	0.265	0.295	0.320	0.350	0.405
N2.1.2 Aluminium casting alloys, hardened, ≤ 12 % Si, 90 HB	170	0.075	0.135	0.170	0.200	0.235	0.265	0.295	0.320	0.350	0.405
N2.1.3 Aluminium casting alloys, non-hardened, > 12 % Si, 130 HB	145	0.060	0.115	0.145	0.170	0.200	0.225	0.250	0.275	0.295	0.345
N3.1.1 Copper and copper alloys: Free-machining alloy, Pb > 1 %	85	0.030	0.055	0.070	0.085	0.100	0.115	0.125	0.140	0.150	0.175
N3.1.2 Copper and copper alloys: CuZn, CuSnZn	70	0.025	0.050	0.060	0.075	0.085	0.095	0.105	0.115	0.130	0.150
N3.1.3 Copper and copper alloys: CuSn, lead-free copper and copper electrolyte	65	0.025	0.045	0.060	0.070	0.080	0.090	0.100	0.110	0.120	0.140
N4.1.1 Non-metallic materials: Duroplastics, fibre-reinforced plastics	65	0.020	0.040	0.050	0.055	0.065	0.075	0.085	0.090	0.100	0.115
N4.1.2 Non-metallic materials: Hard rubber, wood, etc.	65	0.020	0.040	0.050	0.055	0.065	0.075	0.085	0.090	0.100	0.115
N4.1.3 Non-metallic materials: Graphite	65	0.020	0.040	0.050	0.055	0.065	0.075	0.085	0.090	0.100	0.115
S1.1.1 Heat-resistant alloys, Fe-based, annealed, 200 HB	40	0.010	0.020	0.025	0.030	0.035	0.040	0.040	0.045	0.050	0.060
S1.1.2 Heat-resistant alloys, Fe-based, hardened, 280 HB	35	0.009	0.015	0.020	0.025	0.030	0.030	0.035	0.040	0.045	0.050
S1.1.3 Heat-resistant alloys, Ni- or Co-based, annealed, 250 HB	25	0.008	0.015	0.020	0.020	0.025	0.030	0.030	0.035	0.040	0.045
S1.1.4 Heat-resistant alloys, Ni- or Co-based, hardened, 350 HB	25	0.007	0.015	0.015	0.020	0.025	0.025	0.030	0.030	0.035	0.040
S1.1.5 Heat-resistant alloys, Ni- or Co-based, cast, 320 HB	20	0.007	0.012	0.015	0.020	0.020	0.025	0.025	0.030	0.035	0.040
S2.1.1 Titanium alloys, pure titanium, Rm 400 N/mm²	30	0.008	0.015	0.020	0.025	0.025	0.030	0.035	0.035	0.040	0.045
S2.1.2 Titanium alloys, Alpha and Beta alloys, hardened, Rm 1050 N/mm²	30	0.007	0.015	0.015	0.020	0.025	0.025	0.030	0.035	0.035	0.040
H1.1.1 Hardened steel, hardened and tempered, < 55 HRC	30	0.008	0.015	0.020	0.025	0.025	0.030	0.035	0.035	0.040	0.045
H1.1.2 Hardened steel, hardened and tempered, < 60 HRC	20	0.007	0.012	0.015	0.020	0.020	0.025	0.025	0.030	0.030	0.035
H1.1.3 Hardened steel, hardened and tempered, > 60 HRC	20	0.006	0.011	0.015	0.015	0.020	0.025	0.025	0.030	0.030	0.035
H2.1.1 Chilled cast iron, 400 HB	20	0.007	0.015	0.015	0.020	0.025	0.025	0.030	0.030	0.035	0.040
H2.1.2 Chilled cast iron, hardened and tempered, < 55 HRC	15	0.005	0.009	0.012	0.015	0.015	0.020	0.020	0.025	0.025	0.030

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

Single-fluted gun drills EB 80 Cross

Machining group	A	f (mm/rev) with nom. Ø									
	v_c (m/min)	3	4	6	8	10	12	14	16	18	20
P1.1.1 Unalloyed steel, annealed, 0.15 % C, Rm 420 N/mm², 125 HB	85	0.015	0.020	0.030	0.040	0.045	0.050	0.060	0.065	0.070	0.080
P1.1.2 Unalloyed steel, heat-treated, 0.15 % C, Rm 420 N/mm², 125 HB	75	0.015	0.020	0.025	0.035	0.040	0.045	0.055	0.060	0.065	0.070
P1.1.3 Unalloyed steel, annealed, 0.45 % C, Rm 640 N/mm², 190 HB	75	0.015	0.020	0.025	0.035	0.040	0.045	0.055	0.060	0.065	0.070
P1.1.4 Unalloyed steel, heat-treated, 0.45 % C, Rm 640 N/mm², 190 HB	70	0.015	0.020	0.025	0.030	0.040	0.045	0.050	0.055	0.060	0.065
P1.1.5 Unalloyed steel, heat-treated, 0.45 % C, Rm 850 N/mm², 250 HB	70	0.015	0.020	0.025	0.030	0.040	0.045	0.050	0.055	0.060	0.065
P1.1.6 Unalloyed steel, annealed, 0.75 % C, Rm 915 N/mm², 270 HB	65	0.015	0.015	0.025	0.030	0.035	0.040	0.045	0.050	0.060	0.065
P1.1.7 Unalloyed steel, heat-treated, 0.75 % C, Rm 1020 N/mm², 300 HB	65	0.015	0.015	0.020	0.030	0.035	0.040	0.045	0.050	0.055	0.060
P2.1.1 Low-alloy steel, annealed, Rm 610 N/mm², 180 HB	75	0.015	0.020	0.025	0.035	0.040	0.045	0.050	0.060	0.065	0.070
P2.1.2 Low-alloy steel, heat-treated, Rm 930 N/mm², 275 HB	75	0.015	0.020	0.025	0.035	0.040	0.045	0.050	0.060	0.065	0.070
P2.1.3 Low-alloy steel, heat-treated, Rm 1020 N/mm², 300 HB	60	0.015	0.015	0.025	0.030	0.035	0.040	0.045	0.050	0.055	0.060
P2.1.4 Low-alloy steel, heat-treated, Rm 1190 N/mm², 350 HB	55	0.011	0.015	0.020	0.025	0.030	0.035	0.040	0.045	0.050	0.050
P3.1.1 High-alloy steel and tool steel, annealed, Rm 680 N/mm², 200 HB	65	0.015	0.020	0.025	0.035	0.040	0.045	0.050	0.060	0.065	0.070
P3.1.2 High-alloy steel and tool steel, hardened and tempered, Rm 1100 N/mm², 325 HB	55	0.015	0.015	0.025	0.030	0.035	0.040	0.045	0.050	0.055	0.060
M1.1.1 Stainless steel, ferritic/martensitic, with machining additives	55	0.011	0.015	0.020	0.025	0.030	0.035	0.040	0.045	0.050	0.050
M1.1.2 Stainless steel, ferritic/martensitic, annealed, Rm 680 N/mm², 200 HB	45	0.010	0.015	0.020	0.025	0.025	0.030	0.035	0.040	0.045	0.045
M1.1.3 Stainless steel, ferritic/martensitic, heat-treated, Rm 810 N/mm², 240 HB	45	0.010	0.012	0.015	0.020	0.025	0.030	0.035	0.035	0.040	0.045
M2.1.1 Stainless steel, austenitic, quenched, 180 HB	40	0.010	0.012	0.015	0.020	0.025	0.030	0.035	0.035	0.040	0.045
M2.2.1 Duplex steel, high-strength stainless steels	35	0.008	0.010	0.015	0.020	0.020	0.025	0.030	0.030	0.035	0.035
K1.1.1 Grey cast iron, pearlitic/ferritic, 180 HB	85	0.025	0.030	0.040	0.050	0.060	0.070	0.080	0.085	0.095	0.105
K1.1.2 Grey cast iron, pearlitic/martensitic, 260 HB	70	0.020	0.025	0.035	0.045	0.050	0.060	0.065	0.075	0.080	0.090
K1.2.1 Cast iron with spheroidal graphite, ferritic, 160 HB	70	0.020	0.025	0.035	0.045	0.050	0.060	0.065	0.075	0.080	0.090
K1.2.2 Cast iron with spheroidal graphite, pearlitic, 250 HB	65	0.020	0.025	0.030	0.040	0.050	0.055	0.065	0.070	0.075	0.085
K1.3.1 Malleable cast iron, ferritic, 130 HB	65	0.020	0.025	0.030	0.040	0.050	0.055	0.065	0.070	0.075	0.085
K1.3.2 Malleable cast iron, pearlitic, 230 HB	60	0.015	0.020	0.030	0.035	0.040	0.050	0.055	0.060	0.065	0.075
K2.1.1 Vermicular graphite cast iron (GJV)	70	0.020	0.025	0.035	0.040	0.050	0.060	0.065	0.075	0.080	0.085
K2.2.1 Austenitic-ferritic spheroidal graphite cast iron (ADI)	50	0.015	0.020	0.025	0.030	0.040	0.045	0.050	0.055	0.060	0.065
N1.1.1 Wrought aluminium alloys, non-hardened, 60 HB	85	0.025	0.035	0.045	0.060	0.070	0.080	0.090	0.100	0.110	0.120
N1.1.2 Wrought aluminium alloys, hardened, 100 HB	85	0.025	0.035	0.045	0.060	0.070	0.080	0.090	0.100	0.110	0.120
N2.1.1 Aluminium casting alloys, non-hardened, ≤ 12 % Si, 75 HB	125	0.075	0.095	0.135	0.165	0.200	0.230	0.260	0.290	0.320	0.350
N2.1.2 Aluminium casting alloys, hardened, ≤ 12 % Si, 90 HB	125	0.075	0.095	0.135	0.165	0.200	0.230	0.260	0.290	0.320	0.350
N2.1.3 Aluminium casting alloys, non-hardened, > 12 % Si, 130 HB	105	0.065	0.080	0.115	0.140	0.170	0.195	0.225	0.250	0.270	0.295
N3.1.1 Copper and copper alloys: Free-machining alloy, Pb > 1 %	75	0.030	0.040	0.055	0.065	0.080	0.095	0.105	0.115	0.130	0.140
N3.1.2 Copper and copper alloys: CuZn, CuSnZn	60	0.025	0.035	0.045	0.055	0.070	0.080	0.090	0.100	0.110	0.120
N3.1.3 Copper and copper alloys: CuSn, lead-free copper and copper electrolyte	60	0.025	0.030	0.045	0.055	0.065	0.075	0.085	0.095	0.100	0.110
N4.1.1 Non-metallic materials: Duroplastics, fibre-reinforced plastics	65	0.020	0.025	0.035	0.040	0.050	0.060	0.065	0.075	0.080	0.085
N4.1.2 Non-metallic materials: Hard rubber, wood, etc.	65	0.020	0.025	0.035	0.040	0.050	0.060	0.065	0.075	0.080	0.085
N4.1.3 Non-metallic materials: Graphite	65	0.020	0.025	0.035	0.040	0.050	0.060	0.065	0.075	0.080	0.085
S1.1.1 Heat-resistant alloys, Fe-based, annealed, 200 HB	40	0.008	0.010	0.015	0.015	0.020	0.025	0.025	0.030	0.030	0.035
S1.1.2 Heat-resistant alloys, Fe-based, hardened, 280 HB	35	0.006	0.008	0.011	0.015	0.015	0.020	0.020	0.025	0.025	0.030
S1.1.3 Heat-resistant alloys, Ni- or Co-based, annealed, 250 HB	25	0.006	0.007	0.010	0.015	0.015	0.015	0.020	0.020	0.025	0.025
S1.1.4 Heat-resistant alloys, Ni- or Co-based, hardened, 350 HB	25	0.005	0.007	0.009	0.012	0.015	0.015	0.020	0.020	0.020	0.025
S1.1.5 Heat-resistant alloys, Ni- or Co-based, cast, 320 HB	20	0.005	0.006	0.009	0.011	0.015	0.015	0.015	0.020	0.020	0.025
S2.1.1 Titanium alloys, pure titanium, Rm 400 N/mm²	30	0.006	0.007	0.010	0.015	0.015	0.015	0.020	0.020	0.025	0.025
S2.1.2 Titanium alloys, Alpha and Beta alloys, hardened, Rm 1050 N/mm²	30	0.005	0.006	0.009	0.011	0.015	0.015	0.020	0.020	0.020	0.025
H1.1.1 Hardened steel, hardened and tempered, < 55 HRC	30	0.006	0.007	0.010	0.015	0.015	0.015	0.020	0.020	0.025	0.025
H1.1.2 Hardened steel, hardened and tempered, < 60 HRC	20	0.005	0.006	0.008	0.010	0.012	0.015	0.015	0.015	0.020	0.020
H1.1.3 Hardened steel, hardened and tempered, > 60 HRC	20	0.004	0.005	0.007	0.009	0.011	0.015	0.015	0.015	0.020	0.020
H2.1.1 Chilled cast iron, 400 HB	20	0.006	0.007	0.010	0.015	0.015	0.015	0.020	0.020	0.025	0.025
H2.1.2 Chilled cast iron, hardened and tempered, < 55 HRC	15	0.004	0.005	0.007	0.009	0.011	0.012	0.015	0.015	0.015	0.020

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

Milling tools

Specialists as standard

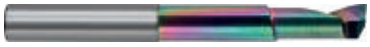
Customised solutions
for material & machine

GÜHRING

Page

P	M	K	N	S	H	O	Tool illustration		Z	Cutting edge profile	Length	Tool material	Surface	d1/mm	Article no.	Page
Ball nose end mills G-Mold 55 B short shank																
•	•	•	○	•				NEW	2	R ±0,01		VHM	X	0.500 - 3.000	6166	114
•	•	•	○	•				NEW	2	R ±0,01		VHM	X	0.500 - 3.000	6167	114
Ratio end mills RF 100 Sharp extra short short shank																
•	•		•	•				NEW	4	45°	XS	VHM	P	0.800 - 3.000	6163	115
Ratio end mills RF 100 Sharp short shank																
•	•		•	•				NEW	4	45°		VHM	P	1.000 - 3.000	6164	116
•	•		•	•				NEW	4	45°		VHM	P	1.000 - 3.000	6165	116
Ratio end mills RF 100 Sharp extra short																
•	•		•	•				NEW	4	R ±0,05	XS	VHM	P	0.800 - 16.000	6456	120
•	•		•	•				NEW	4	R ±0,05	XS	VHM	P	4.000 - 16.000	6457	120
Ratio end mills RF 100 Sharp																
•	•		•	•				NEW	4	R ±0,05		VHM	P	1.000 - 20.000	6458	122
•	•		•	•				NEW	4	R ±0,05		VHM	P	4.000 - 20.000	6459	122
•	•		•	•				NEW	4	R ±0,05		VHM	P	1.000 - 20.000	6460	124
•	•		•	•				NEW	4	R ±0,05		VHM	P	4.000 - 20.000	6461	124
Micro-precision milling cutters RF 100 AL																
			•			○			3	45°	2,5xD	VHM	Cb+	0.500 - 3.000	8069	128
			•			○			3	45°	5xD	VHM	Cb+	0.500 - 3.000	8070	129
			•			○			3	R ±0,01	2,5xD	VHM	Cb+	0.500 - 3.000	8065	130
			•			○			3	R ±0,01	5xD	VHM	Cb+	0.500 - 3.000	8066	131
Ratio end mills RF 100 AL																
			•			○		NEW	3	45°		VHM	Cb+	5.000 - 25.000	8234	132
			•			○		NEW	3	45°		VHM	Cb+	5.000 - 25.000	8235	132
			•			○		NEW	3	45°		VHM	Cb+	1.000 - 25.000	8232	133
			•			○		NEW	3	45°		VHM	Cb+	3.500 - 25.000	8233	133
			•					NEW	3	45°		VHM		1.000 - 25.000	8230	134
			•					NEW	3	45°		VHM		3.500 - 25.000	8231	134
			•			○		NEW	3	R ±0,05		VHM	Cb+	6.000 - 25.000	8248	135
			•			○		NEW	3	R ±0,05		VHM	Cb+	6.000 - 25.000	8249	135
			•			○		NEW	3	R ±0,05		VHM	Cb+	1.000 - 25.000	8246	136
			•			○		NEW	3	R ±0,05		VHM	Cb+	4.000 - 25.000	8247	136

P	M	K	N	S	H	O	Tool illustration		Z	Cutting edge profile	Length	Tool material	Surface	d1/mm	Article no.	Page
Ratio end mills RF 100 AL																
			•					NEW	3	R±0,05		VHM	○	1.000 - 25.000	8244	137
			•					NEW	3	R±0,05		VHM	○	4.000 - 25.000	8245	137
			•			○		NEW	3	45°		VHM	Cb+	1.000 - 25.000	8238	138
			•			○		NEW	3	45°		VHM	Cb+	3.500 - 25.000	8239	138
			•					NEW	3	45°		VHM	○	1.000 - 25.000	8236	139
			•					NEW	3	45°		VHM	○	3.500 - 25.000	8237	139
			•			○		NEW	3	R±0,05		VHM	Cb+	1.000 - 25.000	8252	140
			•			○		NEW	3	R±0,05		VHM	Cb+	4.000 - 25.000	8253	140
			•					NEW	3	R±0,05		VHM	○	1.000 - 25.000	8250	141
			•					NEW	3	R±0,05		VHM	○	4.000 - 25.000	8251	141
			•			○		NEW	3	45°	6xD	VHM	Cb+	1.000 - 20.000	8242	142
			•			○		NEW	3	45°	6xD	VHM	Cb+	3.500 - 20.000	8243	142
			•						3	45°	6xD	VHM	○	1.000 - 20.000	8240	143
			•						3	45°	6xD	VHM	○	3.500 - 20.000	8241	143
			•			○		NEW	3	R±0,05	6xD	VHM	Cb+	1.000 - 20.000	8256	144
			•			○		NEW	3	R±0,05	6xD	VHM	Cb+	4.000 - 20.000	8257	144
			•						3	R±0,05	6xD	VHM	○	1.000 - 20.000	8254	145
			•						3	R±0,05	6xD	VHM	○	4.000 - 20.000	8255	145
Ratio roughing end mills Alu RF 100 AL																
			•			○		NEW	3	45°		VHM	Cb+	6.000 - 20.000	6464	146
			•			○		NEW	3	45°		VHM	Cb+	6.000 - 20.000	6465	146
			•			○		NEW	3	45°		VHM	Cb+	6.000 - 20.000	6466	146
			•			○		NEW	3	45°		VHM	Cb+	6.000 - 20.000	6467	146
			•			○		NEW	3	45°	5xD	VHM	Cb+	10.000 - 25.000	6463	147
Ratio end mills RF 100 AL µF																
			•			○		NEW	4	45°	2,2xD	VHM	Cb+	1.000 - 20.000	8220	147
			•			○		NEW	4	45°	3,2xD	VHM	Cb+	1.000 - 20.000	8221	148
			•			○		NEW	4	45°	5,2xD	VHM	Cb+	1.000 - 20.000	8222	148
Ball nose end mills GA 200 A																
			•			○		NEW	2	R±0,02		VHM	○	3.000 - 16.000	6916	149
			•			•		NEW	2	R±0,02		VHM	Cb+	3.000 - 16.000	6917	149

P	M	K	N	S	H	O	Tool illustration		Z	Cutting edge profile	Length	Tool material	Surface	d1/mm	Article no.	Page
End mills (single-fluted)																
			●			●			1	90°		VHM	○	2.000 - 16.000	6793	150
			●			●			1	90°		VHM	Cb+	2.000 - 16.000	8138	150
			●			●			1	90°		VHM	○	3.000 - 16.000	6935	151
			●			●			1	90°		VHM	Cb+	3.000 - 16.000	8135	151
			●			●			1	30°		VHM	○	1.000 - 10.000	6936	152
			●			●			1	30°		VHM	Cb+	1.000 - 10.000	8136	152
			●			●			1	30°		VHM	○	1.000 - 10.000	6937	153
			●			●			1	30°		VHM	Cb+	1.000 - 10.000	8137	153
90° Chamfering milling cutters																
			●			○		NEW	4			VHM	○	4.000 - 12.000	6918	154
			●			●		NEW	4			VHM	Cb+	4.000 - 12.000	6919	154
End mills CR 200 for fibre-reinforced plastics																
						●		NEW	6-8	45°		VHM	○	4.000 - 12.700	6925	155
						●		NEW	6-8	45°		VHM	D	4.000 - 12.700	6930	155
Circular milling cutters																
●	●	○	○	○				NEW		45°		VHM	P	3.800 - 11.800	6949	156
●	●	○	○	○				NEW		R ±0,05		VHM	P	7.800 - 11.800	6950	156
●	●	○	○	○				NEW		R ±0,05		VHM	P	3.800 - 11.800	6951	157


RF
100 AL
NEW

Maximum performance in minimum space

New short shank tools for micro-machining centres

Gühring has developed a new standard range of short shank tools that are specially designed for machining on micro-machining centres.

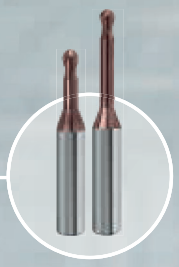
With seven different varieties, we cover all common machining operations in the field of micro-machining and offer our customers a new, efficient way to maximise their production capacity in a small space. Due to the new tools' reduced shank length, no special tools are required. In addition, the compact design facilitates machining with higher cutting parameters as well as delivering more precise and high-quality surface results. The short shank tools also increase process reliability and tool life compared to tools with a DIN shank.

- **Up to 15 mm saving in length**
- **Higher cutting parameters** possible

- X Designed for all common applications in micro-machining centres
- X Short shank & overhang lengths for higher performance
- X Easy cutting tool geometry for universal application

Tool with conventional shank length according to DIN
36 mm (for Ø 6.0 mm)

Short shank tool with adapted shank length
21 – 26 mm (for Ø 6.0 mm)



G-Mold 55 B
#6166, #6167

RF 100 Sharp
#6163, #6164, #6165

ExclusiveLine Micro-precision drill
#6161, #6162

Ball nose end mills G-Mold 55 B short shank

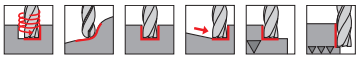
Article no. **6166**

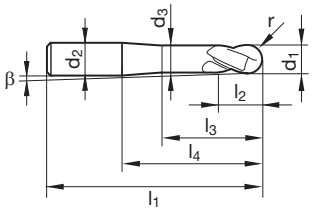
NEW | VHM | N | WN | 30° | 2 | HA | R ±0,01 | 8° | 55 HRC

neck clearance • centre cutting

cutting data see page 160

P	M	K	N	S	H
●	●	●	○	●	●





Article no. **6166**

d1 $^{-0,01}_{-0,03}$ mm	d2 h5 mm	d3 mm	l1 mm	l2 mm	l3 mm	l4 mm	r mm	β °	Z	Order no.
0.50	4.00	0.45	33	0.5	2.5	9.1	0.25	11.10	2	6166 0.500
0.80	4.00	0.75	33	0.8	3.2	9.3	0.40	10.20	2	6166 0.800
1.00	4.00	0.92	33	1.0	4.0	9.7	0.50	9.20	2	6166 1.000
1.50	4.00	1.40	33	1.5	6.0	10.9	0.75	7.00	2	6166 1.500
2.00	6.00	1.85	38	2.0	8.0	13.7	1.00	8.90	2	6166 2.000
3.00	6.00	2.85	38	3.0	12.0	16.3	1.50	5.70	2	6166 3.000

Ball nose end mills G-Mold 55 B short shank

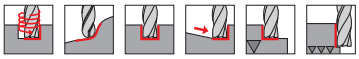
Article no. **6167**

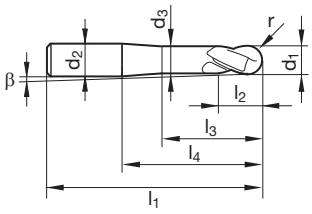
NEW | VHM | N | WN | 30° | 2 | HA | R ±0,01 | 8° | 55 HRC

neck clearance • centre cutting

cutting data see page 160

P	M	K	N	S	H
●	●	●	○	●	●





Article no. **6167**

d1 $^{-0,01}_{-0,03}$ mm	d2 h5 mm	d3 mm	l1 mm	l2 mm	l3 mm	l4 mm	r mm	β °	Z	Order no.
0.50	4.00	0.45	33	0.5	3.6	10.2	0.25	9.90	2	6167 0.500
0.80	4.00	0.75	33	0.8	5.0	11.1	0.40	8.50	2	6167 0.800
1.00	4.00	0.92	36	1.0	6.5	12.2	0.50	7.30	2	6167 1.000
1.50	4.00	1.40	38	1.5	10.0	14.9	0.75	5.00	2	6167 1.500
2.00	6.00	1.85	43	2.0	13.0	18.7	1.00	6.40	2	6167 2.000
3.00	6.00	2.85	48	3.0	20.0	24.3	1.50	3.70	2	6167 3.000

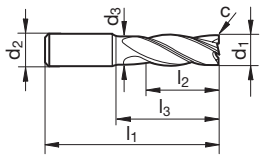
Ratio end mills RF 100 Sharp extra short short shank

Article no. **6163**

cutting data see page 158

P	M	K	N	S	H
●	●		●	●	

especially for soft, tough and high-alloyed materials • neck clearance • centre cutting • 40% higher milling performance thanks to short stable design • with special plunging face



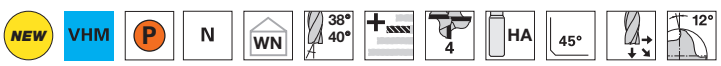
Article no.	6163

d1 e8 mm	d2 h6 mm	d3 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Order no.
0.80	4.00	0.75	30	0.8	1.7	0.00	4	6163 0.800
1.00	4.00	0.92	30	1.0	2.1	0.01	4	6163 1.000
1.20	4.00	1.12	30	1.2	2.5	0.01	4	6163 1.200
1.40	4.00	1.32	30	1.4	2.9	0.01	4	6163 1.400
1.50	4.00	1.40	30	1.5	3.2	0.01	4	6163 1.500
1.60	4.00	1.50	30	1.6	3.4	0.01	4	6163 1.600
1.80	4.00	1.70	30	1.8	3.8	0.01	4	6163 1.800
2.00	6.00	1.85	35	2.0	4.2	0.02	4	6163 2.000
2.50	6.00	2.35	35	2.5	5.3	0.02	4	6163 2.500
2.80	6.00	2.65	35	2.8	5.9	0.02	4	6163 2.800
3.00	6.00	2.85	35	3.0	6.3	0.03	4	6163 3.000

Ratio end mills RF 100 Sharp short shank

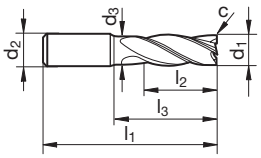
Article no. **6164**

cutting data see page 158



especially for soft, tough and high-alloyed materials • neck clearance • centre cutting

P	M	K	N	S	H
•	•		•	•	



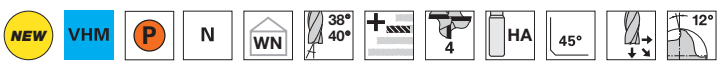
Article no. **6164**

d1 e8 mm	d2 h6 mm	d3 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Order no.
1.00	4.00	0.92	33	3.0	4.0	0.02	4	6164 1.000
1.50	4.00	1.40	33	4.5	6.0	0.03	4	6164 1.500
2.00	6.00	1.85	43	6.0	8.0	0.04	4	6164 2.000
2.50	6.00	2.35	43	7.5	10.0	0.05	4	6164 2.500
3.00	6.00	2.85	43	10.0	15.0	0.06	4	6164 3.000

Ratio end mills RF 100 Sharp short shank

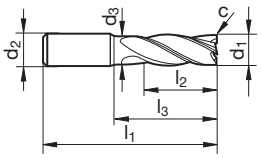
Article no. **6165**

cutting data see page 158



especially for soft, tough and high-alloyed materials • neck clearance • centre cutting

P	M	K	N	S	H
•	•		•	•	



Article no. **6165**

d1 e8 mm	d2 h6 mm	d3 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Order no.
1.00	4.00	0.92	36	3.0	5.5	0.02	4	6165 1.000
1.50	4.00	1.40	36	4.5	8.5	0.03	4	6165 1.500
2.00	6.00	1.85	44	6.0	11.5	0.04	4	6165 2.000
2.50	6.00	2.35	44	7.5	14.5	0.05	4	6165 2.500
3.00	6.00	2.85	48	10.0	20.0	0.06	4	6165 3.000

GÜHRING

Precision begins with the tool selection

Your digital guide

The navigator for your application

The Gühring Navigator guides you to the optimum solution in four steps:

1. select product group & application
2. enter dimensions
3. determine material & strength
4. find the best tool

webnavigator.guehring.de/en

RF 100 Sharp

Our sharpest milling cutter

Specialist for soft, tough and high-alloyed materials

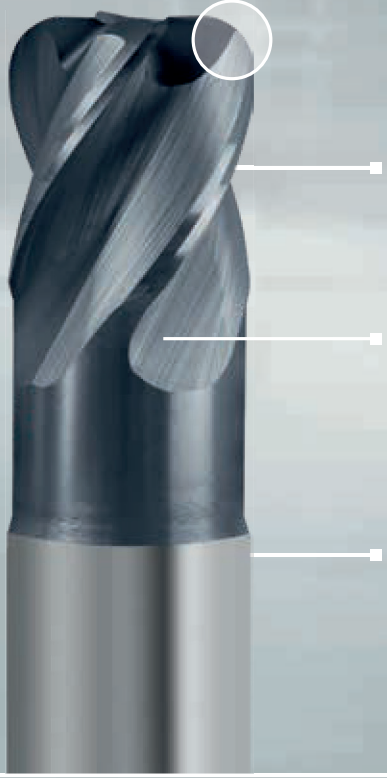
With our RF 100 Sharp solid carbide milling cutter, you no longer have to worry about chip removal when machining soft, tough and high-alloy materials.

Thanks to a rake angle of 12°, it is our sharpest milling cutter and ensures a soft, smooth cut on all soft-tough materials with a tensile strength of 300 – 900 N/mm^2. The combination of carbide developed in-house and an AlCrN coating enables high-performance machining not only under stable machining conditions. The RF 100 Sharp can also handle unstable machines and workpiece clamping effortlessly. Thanks to adapted micro and macro geometry, the tool can achieve long tool lives despite the high demands placed on it.

x **faster and more stable** machining

x **Tool life** increased by 50 %

- X Soft cutting in soft-tough & high-alloyed material
- X Full flexibility in milling operations slotting, roughing, ramping, helical, finishing
- X Powerful & smooth on all machines
- X Application-oriented dimensions for cost-effective machining



NEW!

With corner radius
for stability & resistance against breakage

Wear-resistant
AlCrN coating

Uneven pitch
reduces vibrations

Tough tool material
prevents tool breakage

Application example

Component:	Keyway according to DIN 6885, 60 x 16 x 4.3 mm (L x W x D), X5CrNi18-10 (1,4301)	
Customer target:	Reduced tool diversity & adherence to contour	
Difficulty:	Process with full-size milling cutters is very time-consuming	
Tool & milling strategy:	**Gühring** #6456 Ø 10 mm, ER 0.3 mm, 4-fluted cutter, circular milling	**Competition** Solid carbide milling cutter Ø 16 mm, 3-fluted cutter, full groove milling
Cutting data:	v_c 80 m/min f_z 0.06 mm/z a_p 4.3 mm **S** 2,547 rpm **F** 611 mm/min a_e 10 mm	v_c 60 m/min f_z 0.045 mm/z a_p 4.3 mm **S** 1,194 rpm **F** 161 mm/min a_e 16 mm
Tool life:	200 components	130 components

Ratio end mills RF 100 Sharp extra short

Article no. **6456**

NEW | VHM | P | NH | WN | 38° | XS | 4 | HA | R ±0,05 | | 12°

especially for soft, tough and high-alloyed materials • neck clearance • centre cutting • 40% higher milling performance thanks to short stable design • with special plunging face

cutting data see page 162

P	M	K	N	S	H
●	●		●	●	

Ratio end mills RF 100 Sharp extra short

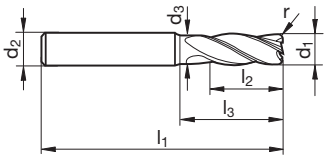
Article no. **6457**

NEW | VHM | P | NH | WN | 38° | XS | 4 | HB | R ±0,05 | | 12°

especially for soft, tough and high-alloyed materials • neck clearance • centre cutting • 40% higher milling performance thanks to short stable design • with special plunging face

cutting data see page 162

P	M	K	N	S	H
●	●		●	●	



								Article no.	6456	6457
d1 e8 mm	d2 h6 mm	d3 mm	l1 mm	l2 mm	l3 mm	r mm	Z	Order no.		
0.80	4.00	0.75	40	0.8	1.7	0.05	4		6456 0.800	
0.80	4.00	0.75	40	0.8	1.7	0.10	4		6456 0.801	
1.00	4.00	0.92	40	1.0	2.1	0.05	4		6456 1.000	
1.00	4.00	0.92	40	1.0	2.1	0.10	4		6456 1.001	
1.00	4.00	0.92	40	1.0	2.1	0.20	4		6456 1.002	
1.40	4.00	1.32	40	1.4	2.9	0.10	4		6456 1.401	
1.50	4.00	1.40	40	1.5	3.2	0.10	4		6456 1.501	
1.50	4.00	1.40	40	1.5	3.2	0.20	4		6456 1.502	
1.50	4.00	1.40	40	1.5	3.2	0.30	4		6456 1.503	
1.60	4.00	1.50	40	1.6	3.4	0.10	4		6456 1.601	
1.80	4.00	1.70	40	1.8	3.8	0.10	4		6456 1.801	
1.80	4.00	1.70	40	1.8	3.8	0.20	4		6456 1.802	
1.80	4.00	1.70	40	1.8	3.8	0.30	4		6456 1.803	
2.00	6.00	1.85	50	2.0	4.2	0.10	4		6456 2.001	
2.00	6.00	1.85	50	2.0	4.2	0.20	4		6456 2.002	
2.00	6.00	1.85	50	2.0	4.2	0.30	4		6456 2.003	
2.00	6.00	1.85	50	2.0	4.2	0.50	4		6456 2.005	
2.50	6.00	2.35	50	2.5	5.3	0.10	4		6456 2.501	
2.50	6.00	2.35	50	2.5	5.3	0.20	4		6456 2.502	
2.50	6.00	2.35	50	2.5	5.3	0.30	4		6456 2.503	
2.50	6.00	2.35	50	2.5	5.3	0.50	4		6456 2.505	
2.80	6.00	2.65	50	2.8	5.9	0.10	4		6456 2.801	
2.80	6.00	2.65	50	2.8	5.9	0.20	4		6456 2.802	
2.80	6.00	2.65	50	2.8	5.9	0.30	4		6456 2.803	
2.80	6.00	2.65	50	2.8	5.9	0.50	4		6456 2.805	
3.00	6.00	2.85	50	3.0	6.3	0.10	4		6456 3.001	
3.00	6.00	2.85	50	3.0	6.3	0.20	4		6456 3.002	
3.00	6.00	2.85	50	3.0	6.3	0.30	4		6456 3.003	
3.00	6.00	2.85	50	3.0	6.3	0.50	4		6456 3.005	
4.00	6.00	3.80	50	4.0	8.4	0.20	4		6456 4.002	6457 4.002
4.00	6.00	3.80	50	4.0	8.4	0.50	4		6456 4.005	6457 4.005
4.00	6.00	3.80	50	4.0	8.4	1.00	4		6456 4.010	6457 4.010
5.00	6.00	4.80	50	5.0	10.5	0.20	4		6456 5.002	6457 5.002
5.00	6.00	4.80	50	5.0	10.5	0.50	4		6456 5.005	6457 5.005
5.00	6.00	4.80	50	5.0	10.5	1.00	4		6456 5.010	6457 5.010
6.00	6.00	5.70	50	6.0	12.0	0.20	4		6456 6.002	6457 6.002
6.00	6.00	5.70	50	6.0	12.0	0.50	4		6456 6.005	6457 6.005
6.00	6.00	5.70	50	6.0	12.0	1.00	4		6456 6.010	6457 6.010
6.00	6.00	5.70	50	6.0	12.0	1.50	4		6456 6.015	6457 6.015
7.00	8.00	6.70	55	7.0	16.0	0.30	4		6456 7.003	6457 7.003
7.00	8.00	6.70	55	7.0	16.0	0.50	4		6456 7.005	6457 7.005
7.00	8.00	6.70	55	7.0	16.0	1.00	4		6456 7.010	6457 7.010
8.00	8.00	7.70	55	8.0	16.0	0.30	4		6456 8.003	6457 8.003
8.00	8.00	7.70	55	8.0	16.0	0.50	4		6456 8.005	6457 8.005
8.00	8.00	7.70	55	8.0	16.0	1.00	4		6456 8.010	6457 8.010
8.00	8.00	7.70	55	8.0	16.0	1.50	4		6456 8.015	6457 8.015
8.00	8.00	7.70	55	8.0	16.0	2.00	4		6456 8.020	6457 8.020
10.00	10.00	9.50	61	10.0	20.0	0.30	4		6456 10.003	6457 10.003
10.00	10.00	9.50	61	10.0	20.0	0.50	4		6456 10.005	6457 10.005
10.00	10.00	9.50	61	10.0	20.0	1.00	4		6456 10.010	6457 10.010
10.00	10.00	9.50	61	10.0	20.0	1.50	4		6456 10.015	6457 10.015
10.00	10.00	9.50	61	10.0	20.0	2.00	4		6456 10.020	6457 10.020
10.00	10.00	9.50	61	10.0	20.0	2.50	4		6456 10.025	6457 10.025
11.00	12.00	10.50	70	11.0	24.0	0.30	4		6456 11.003	6457 11.003

								Article no.	6456	6457
d1 e8 mm	d2 h6 mm	d3 mm	l1 mm	l2 mm	l3 mm	r mm	Z	Order no.		
11.00	12.00	10.50	70	11.0	24.0	0.50	4		6456 11.005	6457 11.005
11.00	12.00	10.50	70	11.0	24.0	1.00	4		6456 11.010	6457 11.010
12.00	12.00	11.50	70	12.0	24.0	0.30	4		6456 12.003	6457 12.003
12.00	12.00	11.50	70	12.0	24.0	0.50	4		6456 12.005	6457 12.005
12.00	12.00	11.50	70	12.0	24.0	1.00	4		6456 12.010	6457 12.010
12.00	12.00	11.50	70	12.0	24.0	1.50	4		6456 12.015	6457 12.015
12.00	12.00	11.50	70	12.0	24.0	2.00	4		6456 12.020	6457 12.020
12.00	12.00	11.50	70	12.0	24.0	2.50	4		6456 12.025	6457 12.025
16.00	16.00	15.50	82	16.0	32.0	0.50	4		6456 16.005	6457 16.005
16.00	16.00	15.50	82	16.0	32.0	1.00	4		6456 16.010	6457 16.010
16.00	16.00	15.50	82	16.0	32.0	1.50	4		6456 16.015	6457 16.015
16.00	16.00	15.50	82	16.0	32.0	2.00	4		6456 16.020	6457 16.020
16.00	16.00	15.50	82	16.0	32.0	2.50	4		6456 16.025	6457 16.025
16.00	16.00	15.50	82	16.0	32.0	3.00	4		6456 16.030	6457 16.030
16.00	16.00	15.50	82	16.0	32.0	4.00	4		6456 16.040	6457 16.040

Ratio end mills RF 100 Sharp

Article no. **6458**

NEW | VHM | P | NH | WN | 38° 40° | 4 | HA | R ±0,05 | 12°

especially for soft, tough and high-alloyed materials • longer cutting edge than DIN 6527 L • neck clearance • centre cutting • with special plunging face

cutting data see page 162

P	M	K	N	S	H
●	●		●	●	

Ratio end mills RF 100 Sharp

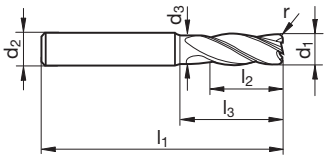
Article no. **6459**

NEW | VHM | P | NH | WN | 38° 40° | 4 | HB | R ±0,05 | 12°

especially for soft, tough and high-alloyed materials • longer cutting edge than DIN 6527 L • neck clearance • centre cutting • with special plunging face

cutting data see page 162

P	M	K	N	S	H
●	●		●	●	



Article no.		6458	6459
d1 e8 mm	d2 h6 mm	d3 mm	l1 mm	l2 mm	l3 mm	r mm	Z	Order no.	
1.00	4.00	0.92	40	3.0	4.0	0.05	4	6458 1.000	
1.00	4.00	0.92	40	3.0	4.0	0.10	4	6458 1.001	
1.00	4.00	0.92	40	3.0	4.0	0.20	4	6458 1.002	
1.50	4.00	1.40	40	4.5	6.0	0.10	4	6458 1.501	
1.50	4.00	1.40	40	4.5	6.0	0.20	4	6458 1.502	
1.50	4.00	1.40	40	4.5	6.0	0.30	4	6458 1.503	
2.00	6.00	1.85	50	6.0	8.0	0.10	4	6458 2.001	
2.00	6.00	1.85	50	6.0	8.0	0.20	4	6458 2.002	
2.00	6.00	1.85	50	6.0	8.0	0.30	4	6458 2.003	
2.00	6.00	1.85	50	6.0	8.0	0.50	4	6458 2.005	
2.50	6.00	2.35	50	7.5	10.0	0.10	4	6458 2.501	
2.50	6.00	2.35	50	7.5	10.0	0.20	4	6458 2.502	
2.50	6.00	2.35	50	7.5	10.0	0.30	4	6458 2.503	
2.50	6.00	2.35	50	7.5	10.0	0.50	4	6458 2.505	
3.00	6.00	2.85	57	10.0	15.0	0.10	4	6458 3.001	
3.00	6.00	2.85	57	10.0	15.0	0.20	4	6458 3.002	
3.00	6.00	2.85	57	10.0	15.0	0.30	4	6458 3.003	
3.00	6.00	2.85	57	10.0	15.0	0.50	4	6458 3.005	
4.00	6.00	3.80	57	14.0	18.0	0.20	4	6458 4.002	6459 4.002
4.00	6.00	3.80	57	14.0	18.0	0.50	4	6458 4.005	6459 4.005
4.00	6.00	3.80	57	14.0	18.0	1.00	4	6458 4.010	6459 4.010
5.00	6.00	4.80	57	15.0	18.0	0.20	4	6458 5.002	6459 5.002
5.00	6.00	4.80	57	15.0	18.0	0.50	4	6458 5.005	6459 5.005
5.00	6.00	4.80	57	15.0	18.0	1.00	4	6458 5.010	6459 5.010
6.00	6.00	5.70	57	16.0	20.0	0.20	4	6458 6.002	6459 6.002
6.00	6.00	5.70	57	16.0	20.0	0.50	4	6458 6.005	6459 6.005
6.00	6.00	5.70	57	16.0	20.0	1.00	4	6458 6.010	6459 6.010
6.00	6.00	5.70	57	16.0	20.0	1.50	4	6458 6.015	6459 6.015
8.00	8.00	7.70	63	21.0	26.0	0.30	4	6458 8.003	6459 8.003
8.00	8.00	7.70	63	21.0	26.0	0.50	4	6458 8.005	6459 8.005
8.00	8.00	7.70	63	21.0	26.0	1.00	4	6458 8.010	6459 8.010
8.00	8.00	7.70	63	21.0	26.0	1.50	4	6458 8.015	6459 8.015
8.00	8.00	7.70	63	21.0	26.0	2.00	4	6458 8.020	6459 8.020
10.00	10.00	9.50	72	25.0	31.0	0.30	4	6458 10.003	6459 10.003
10.00	10.00	9.50	72	25.0	31.0	0.50	4	6458 10.005	6459 10.005
10.00	10.00	9.50	72	25.0	31.0	1.00	4	6458 10.010	6459 10.010
10.00	10.00	9.50	72	25.0	31.0	1.50	4	6458 10.015	6459 10.015
10.00	10.00	9.50	72	25.0	31.0	2.00	4	6458 10.020	6459 10.020
10.00	10.00	9.50	72	25.0	31.0	2.50	4	6458 10.025	6459 10.025
12.00	12.00	11.50	83	28.0	37.0	0.30	4	6458 12.003	6459 12.003
12.00	12.00	11.50	83	28.0	37.0	0.50	4	6458 12.005	6459 12.005
12.00	12.00	11.50	83	28.0	37.0	1.00	4	6458 12.010	6459 12.010
12.00	12.00	11.50	83	28.0	37.0	1.50	4	6458 12.015	6459 12.015
12.00	12.00	11.50	83	28.0	37.0	2.00	4	6458 12.020	6459 12.020
12.00	12.00	11.50	83	28.0	37.0	2.50	4	6458 12.025	6459 12.025
16.00	16.00	15.50	92	36.0	43.0	0.50	4	6458 16.005	6459 16.005
16.00	16.00	15.50	92	36.0	43.0	1.00	4	6458 16.010	6459 16.010
16.00	16.00	15.50	92	36.0	43.0	1.50	4	6458 16.015	6459 16.015
16.00	16.00	15.50	92	36.0	43.0	2.00	4	6458 16.020	6459 16.020
16.00	16.00	15.50	92	36.0	43.0	2.50	4	6458 16.025	6459 16.025
16.00	16.00	15.50	92	36.0	43.0	3.00	4	6458 16.030	6459 16.030
16.00	16.00	15.50	92	36.0	43.0	4.00	4	6458 16.040	6459 16.040
20.00	20.00	19.50	104	41.0	53.0	0.50	4	6458 20.005	6459 20.005
20.00	20.00	19.50	104	41.0	53.0	1.00	4	6458 20.010	6459 20.010

Article no.								6458	6459
d1 e8 mm	d2 h6 mm	d3 mm	l1 mm	l2 mm	l3 mm	r mm	Z	Order no.	
20.00	20.00	19.50	104	41.0	53.0	1.50	4	6458 20.015	6459 20.015
20.00	20.00	19.50	104	41.0	53.0	2.00	4	6458 20.020	6459 20.020
20.00	20.00	19.50	104	41.0	53.0	2.50	4	6458 20.025	6459 20.025
20.00	20.00	19.50	104	41.0	53.0	3.00	4	6458 20.030	6459 20.030
20.00	20.00	19.50	104	41.0	53.0	4.00	4	6458 20.040	6459 20.040

Ratio end mills RF 100 Sharp

Article no. **6460**

NEW | VHM | P | NH | WN | 38° 40° | 4 | HA | R ±0,05 | 12°

especially for soft, tough and high-alloyed materials • medium length version • neck clearance • centre cutting • with special plunging face

cutting data see page 162

P	M	K	N	S	H
●	●		●	●	

Ratio end mills RF 100 Sharp

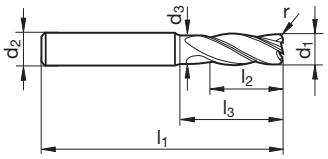
Article no. **6461**

NEW | VHM | P | NH | WN | 38° 40° | 4 | HB | R ±0,05 | 12°

especially for soft, tough and high-alloyed materials • medium length version • neck clearance • centre cutting • with special plunging face

cutting data see page 162

P	M	K	N	S	H
●	●		●	●	



Article no.								6460	6461
d1 e8 mm	d2 h6 mm	d3 mm	l1 mm	l2 mm	l3 mm	r mm	Z	Order no.	
1.00	4.00	0.92	40	3.0	5.5	0.05	4	6460 1.000	
1.00	4.00	0.92	40	3.0	5.5	0.10	4	6460 1.001	
1.00	4.00	0.92	40	3.0	5.5	0.20	4	6460 1.002	
1.50	4.00	1.40	40	4.5	8.5	0.10	4	6460 1.501	
1.50	4.00	1.40	40	4.5	8.5	0.20	4	6460 1.502	
1.50	4.00	1.40	40	4.5	8.5	0.30	4	6460 1.503	
2.00	6.00	1.85	57	6.0	11.5	0.10	4	6460 2.001	
2.00	6.00	1.85	57	6.0	11.5	0.20	4	6460 2.002	
2.00	6.00	1.85	57	6.0	11.5	0.30	4	6460 2.003	
2.00	6.00	1.85	57	6.0	11.5	0.50	4	6460 2.005	
2.50	6.00	2.35	57	7.5	14.5	0.10	4	6460 2.501	
2.50	6.00	2.35	57	7.5	14.5	0.20	4	6460 2.502	
2.50	6.00	2.35	57	7.5	14.5	0.30	4	6460 2.503	
2.50	6.00	2.35	57	7.5	14.5	0.50	4	6460 2.505	
3.00	6.00	2.85	65	10.0	20.0	0.10	4	6460 3.001	
3.00	6.00	2.85	65	10.0	20.0	0.20	4	6460 3.002	
3.00	6.00	2.85	65	10.0	20.0	0.30	4	6460 3.003	
3.00	6.00	2.85	65	10.0	20.0	0.50	4	6460 3.005	
4.00	6.00	3.80	65	14.0	27.0	0.20	4	6460 4.002	6461 4.002
4.00	6.00	3.80	65	14.0	27.0	0.50	4	6460 4.005	6461 4.005
4.00	6.00	3.80	65	14.0	27.0	1.00	4	6460 4.010	6461 4.010
5.00	6.00	4.80	65	15.0	25.0	0.20	4	6460 5.002	6461 5.002
5.00	6.00	4.80	65	15.0	25.0	0.50	4	6460 5.005	6461 5.005
5.00	6.00	4.80	65	15.0	25.0	1.00	4	6460 5.010	6461 5.010
6.00	6.00	5.70	75	16.0	38.0	0.20	4	6460 6.002	6461 6.002
6.00	6.00	5.70	75	16.0	38.0	0.50	4	6460 6.005	6461 6.005
6.00	6.00	5.70	75	16.0	38.0	1.00	4	6460 6.010	6461 6.010
6.00	6.00	5.70	75	16.0	38.0	1.50	4	6460 6.015	6461 6.015
8.00	8.00	7.70	80	21.0	43.0	0.30	4	6460 8.003	6461 8.003
8.00	8.00	7.70	80	21.0	43.0	0.50	4	6460 8.005	6461 8.005
8.00	8.00	7.70	80	21.0	43.0	1.00	4	6460 8.010	6461 8.010
8.00	8.00	7.70	80	21.0	43.0	1.50	4	6460 8.015	6461 8.015
8.00	8.00	7.70	80	21.0	43.0	2.00	4	6460 8.020	6461 8.020
10.00	10.00	9.50	93	25.0	52.0	0.30	4	6460 10.003	6461 10.003
10.00	10.00	9.50	93	25.0	52.0	0.50	4	6460 10.005	6461 10.005
10.00	10.00	9.50	93	25.0	52.0	1.00	4	6460 10.010	6461 10.010
10.00	10.00	9.50	93	25.0	52.0	1.50	4	6460 10.015	6461 10.015
10.00	10.00	9.50	93	25.0	52.0	2.00	4	6460 10.020	6461 10.020
10.00	10.00	9.50	93	25.0	52.0	2.50	4	6460 10.025	6461 10.025
12.00	12.00	11.50	100	28.0	54.0	0.30	4	6460 12.003	6461 12.003
12.00	12.00	11.50	100	28.0	54.0	0.50	4	6460 12.005	6461 12.005
12.00	12.00	11.50	100	28.0	54.0	1.00	4	6460 12.010	6461 12.010
12.00	12.00	11.50	100	28.0	54.0	1.50	4	6460 12.015	6461 12.015
12.00	12.00	11.50	100	28.0	54.0	2.00	4	6460 12.020	6461 12.020
12.00	12.00	11.50	100	28.0	54.0	2.50	4	6460 12.025	6461 12.025
16.00	16.00	15.50	123	36.0	74.0	0.50	4	6460 16.005	6461 16.005
16.00	16.00	15.50	123	36.0	74.0	1.00	4	6460 16.010	6461 16.010
16.00	16.00	15.50	123	36.0	74.0	1.50	4	6460 16.015	6461 16.015
16.00	16.00	15.50	123	36.0	74.0	2.00	4	6460 16.020	6461 16.020
16.00	16.00	15.50	123	36.0	74.0	2.50	4	6460 16.025	6461 16.025
16.00	16.00	15.50	123	36.0	74.0	3.00	4	6460 16.030	6461 16.030
16.00	16.00	15.50	123	36.0	74.0	4.00	4	6460 16.040	6461 16.040
20.00	20.00	19.50	126	41.0	75.0	0.50	4	6460 20.005	6461 20.005
20.00	20.00	19.50	126	41.0	75.0	1.00	4	6460 20.010	6461 20.010

								Article no.	6460	6461
d1 e8 mm	d2 h6 mm	d3 mm	l1 mm	l2 mm	l3 mm	r mm	Z	Order no.		
20.00	20.00	19.50	126	41.0	75.0	1.50	4		6460 20.015	6461 20.015
20.00	20.00	19.50	126	41.0	75.0	2.00	4		6460 20.020	6461 20.020
20.00	20.00	19.50	126	41.0	75.0	2.50	4		6460 20.025	6461 20.025
20.00	20.00	19.50	126	41.0	75.0	3.00	4		6460 20.030	6461 20.030
20.00	20.00	19.50	126	41.0	75.0	4.00	4		6460 20.040	6461 20.040

RF 100 AL

For guaranteed perfect surfaces

30 % higher machining performance in aluminium and plastic

The new RF 100 AL solid carbide milling cutter unleashes its strengths when machining aluminium, non-ferrous metals and plastics. The three-fluted cutter scores points with the highest cutting performance as well as perfect surfaces and dimensional accuracy.

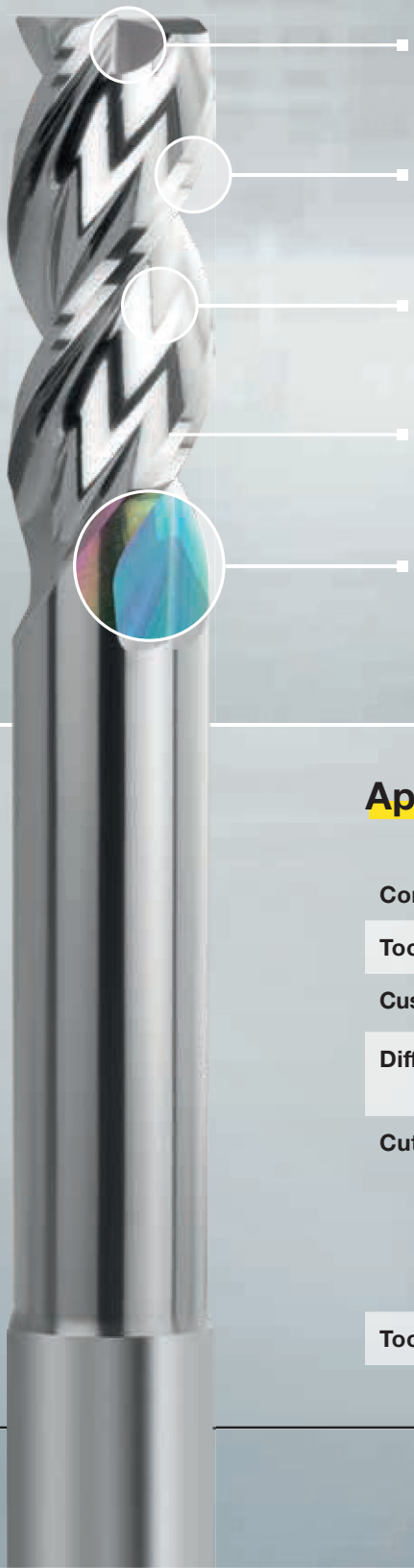
Thanks to its nano-polished cylindrical support land, the solid carbide milling cutter achieves the tightest tolerances and optimum running smoothness. Thanks to the large, polished flutes with a dynamic flute profile, you benefit from long tool lives and better chip removal.

The RF 100 AL with optional Carbo+ coating is ideal for dry and MQL machining. The extra-smooth coating prevents built-up edges and guarantees a long tool life.

x **Tool life** increased by 54 %

x **Machining time** reduced by 59 %

- X Perfect dimensional accuracy & the best surface qualities
- X Highest machining performance & perfect chip removal
- X Continuous range from 1 – 20 mm with corner chamfers
- X Wide range of corner radii from R 0.1 – 4 mm



Symmetrical drill face
for plunging

Nano-polished cylindrical support land
for optimum running smoothness & tightest tolerances

Dynamic flute profile
with polished surface & reinforced core

3 different production lengths
with neck clearance (short, medium, long)

Available with Carbo+ coating
for maximum wear resistance

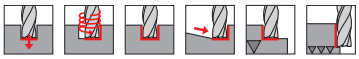
Application example

Component:	Integral component, AlCuMg1	
Tool:	#8240, Ø 12 mm	
Customer target:	Running time reduction	
Difficulty:	The component contains thin-walled, vibration-sensitive lands	
Cutting data:	**Gühring**	**Competition**
	v_c 546 m/min **n** 14,500 rpm v_f 5,220 mm/min a_e 2.5 mm	v_c 452 m/min **n** 12,000 rpm v_f 3,600 mm/min a_e 1.5 mm
Tool life:	485 m	315 m

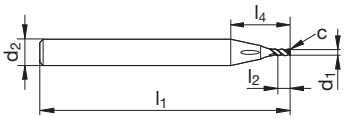
Micro-precision milling cutters RF 100 AL

Article no. **8069**

cutting data see page 164



for extreme cutting values and cutting performance • with internal cooling: GühroJet peripheral cooling with 6 or 4 exits • centre cutting



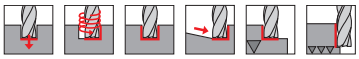
Article no. **8069**

d1 h8 mm	d2 h5 mm	l1 mm	l2 mm	l4 mm	c mm	Z	Order no.
0.500	4.00	38.0	1.250	10.000	0.010	3	8069 0.500
0.750	4.00	38.0	1.875	10.000	0.015	3	8069 0.750
0.790	4.00	38.1	1.975	10.100	0.016	3	8069 0.790
0.800	4.00	38.0	2.000	10.000	0.016	3	8069 0.800
1.000	4.00	38.0	2.500	10.000	0.020	3	8069 1.000
1.190	4.00	38.1	2.975	10.100	0.024	3	8069 1.190
1.200	4.00	38.0	3.000	10.000	0.024	3	8069 1.200
1.500	4.00	45.0	3.750	17.000	0.030	3	8069 1.500
1.590	4.00	44.4	3.975	16.500	0.032	3	8069 1.590
1.800	4.00	45.0	4.500	17.000	0.036	3	8069 1.800
1.980	6.00	50.8	4.950	14.800	0.040	3	8069 1.980
2.000	6.00	50.0	5.000	14.400	0.040	3	8069 2.000
2.200	6.00	50.0	5.500	14.800	0.044	3	8069 2.200
2.380	6.00	50.8	5.950	15.000	0.048	3	8069 2.380
2.500	6.00	50.0	6.250	15.100	0.050	3	8069 2.500
2.780	6.00	50.8	6.950	15.400	0.056	3	8069 2.780
2.800	6.00	50.0	7.000	15.400	0.056	3	8069 2.800
3.000	6.00	50.0	7.500	15.800	0.060	3	8069 3.000

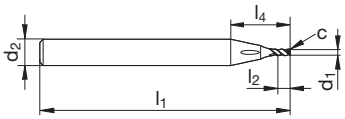
Micro-precision milling cutters RF 100 AL

Article no. **8070**

cutting data see page 165



for extreme cutting values and cutting performance • with internal cooling: GühroJet peripheral cooling with 6 or 4 exits • centre cutting



Article no. **8070**

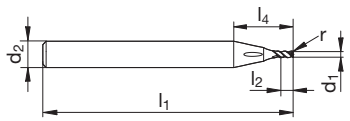
d1 h8 mm	d2 h5 mm	l1 mm	l2 mm	l4 mm	c mm	Z	Order no.
0.500	4.00	38.0	2.500	10.500	0.010	3	8070 0.500
0.750	4.00	38.0	3.750	11.100	0.015	3	8070 0.750
0.790	4.00	38.1	3.950	11.200	0.016	3	8070 0.790
0.800	4.00	38.0	4.000	11.200	0.016	3	8070 0.800
1.000	4.00	45.0	5.000	17.000	0.020	3	8070 1.000
1.190	4.00	50.8	5.950	22.800	0.024	3	8070 1.190
1.200	4.00	50.0	6.000	22.000	0.024	3	8070 1.200
1.500	4.00	50.0	7.500	22.000	0.030	3	8070 1.500
1.590	4.00	50.8	7.950	22.800	0.032	3	8070 1.590
1.800	4.00	50.0	9.000	22.000	0.036	3	8070 1.800
1.980	6.00	57.1	9.900	21.200	0.040	3	8070 1.980
2.000	6.00	57.0	10.000	21.000	0.040	3	8070 2.000
2.200	6.00	57.0	11.000	21.000	0.044	3	8070 2.200
2.380	6.00	57.1	11.900	21.200	0.048	3	8070 2.380
2.500	6.00	57.0	12.500	21.600	0.050	3	8070 2.500
2.780	6.00	57.1	13.900	22.700	0.056	3	8070 2.780
2.800	6.00	57.0	14.000	22.800	0.056	3	8070 2.800
3.000	6.00	57.0	15.000	23.600	0.060	3	8070 3.000

Micro-precision milling cutters RF 100 AL

Article no. **8065**

cutting data see page 164

for extreme cutting values and cutting performance • with internal cooling: GühroJet peripheral cooling with 6 or 4 exits • centre cutting



Article no. **8065**

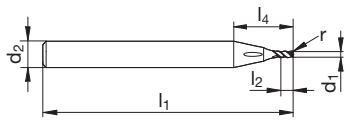
d1 h8 mm	d2 h5 mm	l1 mm	l2 mm	l4 mm	r mm	Z	Order no.
0.50	4.00	38	1.250	10.000	0.05	3	8065 0.500
0.50	4.00	38	1.250	10.000	0.10	3	8065 0.501
0.75	4.00	38	1.875	10.000	0.05	3	8065 0.750
0.75	4.00	38	1.875	10.000	0.10	3	8065 0.751
0.80	4.00	38	2.000	10.000	0.05	3	8065 0.800
0.80	4.00	38	2.000	10.000	0.10	3	8065 0.801
1.00	4.00	38	2.500	10.000	0.05	3	8065 1.000
1.00	4.00	38	2.500	10.000	0.10	3	8065 1.001
1.00	4.00	38	2.500	10.000	0.20	3	8065 1.002
1.20	4.00	38	3.000	10.000	0.10	3	8065 1.201
1.20	4.00	38	3.000	10.000	0.20	3	8065 1.202
1.50	4.00	45	3.750	17.000	0.10	3	8065 1.501
1.50	4.00	45	3.750	17.000	0.20	3	8065 1.502
1.50	4.00	45	3.750	17.000	0.30	3	8065 1.503
1.80	4.00	45	4.500	17.000	0.10	3	8065 1.801
1.80	4.00	45	4.500	17.000	0.20	3	8065 1.802
1.80	4.00	45	4.500	17.000	0.30	3	8065 1.803
2.00	6.00	50	5.000	14.400	0.10	3	8065 2.001
2.00	6.00	50	5.000	14.400	0.20	3	8065 2.002
2.00	6.00	50	5.000	14.400	0.30	3	8065 2.003
2.00	6.00	50	5.000	14.400	0.50	3	8065 2.005
2.50	6.00	50	6.250	15.100	0.20	3	8065 2.502
2.50	6.00	50	6.250	15.100	0.30	3	8065 2.503
2.50	6.00	50	6.250	15.100	0.50	3	8065 2.505
2.80	6.00	50	7.000	15.400	0.20	3	8065 2.802
2.80	6.00	50	7.000	15.400	0.30	3	8065 2.803
2.80	6.00	50	7.000	15.400	0.50	3	8065 2.805
3.00	6.00	50	7.500	15.800	0.20	3	8065 3.002
3.00	6.00	50	7.500	15.800	0.30	3	8065 3.003
3.00	6.00	50	7.500	15.800	0.50	3	8065 3.005

Micro-precision milling cutters RF 100 AL

Article no. **8066**

cutting data see page 165

for extreme cutting values and cutting performance • with internal cooling: GühroJet peripheral cooling with 6 or 4 exits • centre cutting



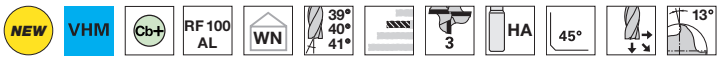
Article no. **8066**

d1 h8 mm	d2 h5 mm	l1 mm	l2 mm	l4 mm	r mm	Z	Order no.
0.50	4.00	38	2.500	10.500	0.05	3	8066 0.500
0.50	4.00	38	2.500	10.500	0.10	3	8066 0.501
0.75	4.00	38	3.750	11.100	0.05	3	8066 0.750
0.75	4.00	38	3.750	11.100	0.10	3	8066 0.751
0.80	4.00	38	4.000	11.200	0.05	3	8066 0.800
0.80	4.00	38	4.000	11.200	0.10	3	8066 0.801
1.00	4.00	45	5.000	17.000	0.05	3	8066 1.000
1.00	4.00	45	5.000	17.000	0.10	3	8066 1.001
1.00	4.00	45	5.000	17.000	0.20	3	8066 1.002
1.20	4.00	50	6.000	22.000	0.10	3	8066 1.201
1.20	4.00	50	6.000	22.000	0.20	3	8066 1.202
1.50	4.00	50	7.500	22.000	0.10	3	8066 1.501
1.50	4.00	50	7.500	22.000	0.20	3	8066 1.502
1.50	4.00	50	7.500	22.000	0.30	3	8066 1.503
1.80	4.00	50	9.000	22.000	0.10	3	8066 1.801
1.80	4.00	50	9.000	22.000	0.20	3	8066 1.802
1.80	4.00	50	9.000	22.000	0.30	3	8066 1.803
2.00	6.00	57	10.000	21.000	0.10	3	8066 2.001
2.00	6.00	57	10.000	21.000	0.20	3	8066 2.002
2.00	6.00	57	10.000	21.000	0.30	3	8066 2.003
2.00	6.00	57	10.000	21.000	0.50	3	8066 2.005
2.50	6.00	57	12.500	21.600	0.20	3	8066 2.502
2.50	6.00	57	12.500	21.600	0.30	3	8066 2.503
2.50	6.00	57	12.500	21.600	0.50	3	8066 2.505
2.80	6.00	57	14.000	22.800	0.20	3	8066 2.802
2.80	6.00	57	14.000	22.800	0.30	3	8066 2.803
2.80	6.00	57	14.000	22.800	0.50	3	8066 2.805
3.00	6.00	57	15.000	23.600	0.20	3	8066 3.002
3.00	6.00	57	15.000	23.600	0.30	3	8066 3.003
3.00	6.00	57	15.000	23.600	0.50	3	8066 3.005

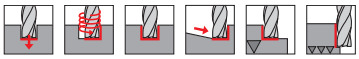
Ratio end mills RF 100 AL

Article no. **8234**

cutting data see page 166



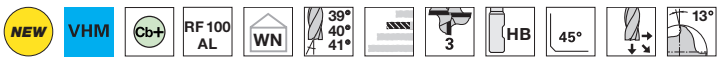
nano polished cutting edges • neck clearance • centre cutting • with internal cooling: radial and axial exits



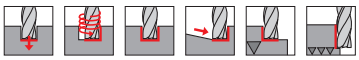
Ratio end mills RF 100 AL

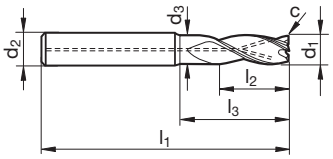
Article no. **8235**

cutting data see page 166



nano polished cutting edges • neck clearance • centre cutting • with internal cooling: radial and axial exits

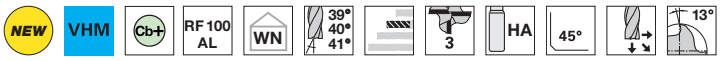




Article no.								8234	8235
d1 js7 mm	d2 h5 mm	d3 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Order no.	
5.00	6.00	4.80	57	13.0	18.0	0.05	3	8234 5.000	8235 5.000
6.00	6.00	5.70	57	13.0	20.0	0.06	3	8234 6.000	8235 6.000
8.00	8.00	7.70	63	19.0	26.0	0.08	3	8234 8.000	8235 8.000
10.00	10.00	9.50	72	22.0	30.0	0.10	3	8234 10.000	8235 10.000
12.00	12.00	11.50	83	26.0	36.0	0.12	3	8234 12.000	8235 12.000
16.00	16.00	15.50	92	32.0	42.0	0.16	3	8234 16.000	8235 16.000
20.00	20.00	19.50	104	38.0	52.0	0.20	3	8234 20.000	8235 20.000
25.00	25.00	24.00	121	45.0	63.0	0.25	3	8234 25.000	8235 25.000

Ratio end mills RF 100 AL

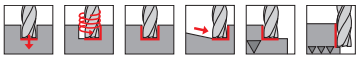
Article no. **8232**



nano polished cutting edges • neck clearance • centre cutting

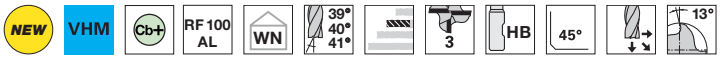
cutting data see page 166

P	M	K	N	S	H	O
			●			○



Ratio end mills RF 100 AL

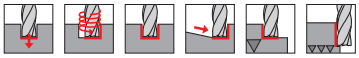
Article no. **8233**

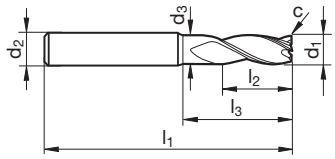


nano polished cutting edges • neck clearance • centre cutting

cutting data see page 166

P	M	K	N	S	H	O
			●			○



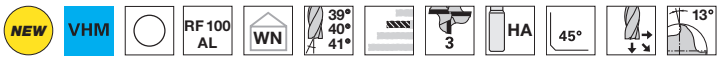


d1 js7 mm	d2 h5 mm	d3 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Article no. 8232	Article no. 8233
1.00	4.00	0.92	50	2.5	5.0	0.02	3	8232 1.000	
1.50	4.00	1.40	50	4.0	7.5	0.03	3	8232 1.500	
2.00	6.00	1.85	57	5.0	10.0	0.04	3	8232 2.000	
2.50	6.00	2.35	57	6.5	12.5	0.05	3	8232 2.500	
3.00	6.00	2.85	57	8.0	15.0	0.06	3	8232 3.000	
3.50	6.00	3.30	57	11.0	15.0	0.03	3	8232 3.500	8233 3.500
4.00	6.00	3.80	57	11.0	18.0	0.04	3	8232 4.000	8233 4.000
4.50	6.00	4.30	57	13.0	18.0	0.04	3	8232 4.500	8233 4.500
5.00	6.00	4.80	57	13.0	18.0	0.05	3	8232 5.000	8233 5.000
5.50	6.00	5.30	57	13.0	20.0	0.05	3	8232 5.500	8233 5.500
6.00	6.00	5.70	57	13.0	20.0	0.06	3	8232 6.000	8233 6.000
7.50	8.00	7.20	63	19.0	26.0	0.07	3	8232 7.500	8233 7.500
8.00	8.00	7.70	63	19.0	26.0	0.08	3	8232 8.000	8233 8.000
9.50	10.00	9.20	72	22.0	30.0	0.09	3	8232 9.500	8233 9.500
10.00	10.00	9.50	72	22.0	30.0	0.10	3	8232 10.000	8233 10.000
11.50	12.00	11.00	83	26.0	36.0	0.11	3	8232 11.500	8233 11.500
12.00	12.00	11.50	83	26.0	36.0	0.12	3	8232 12.000	8233 12.000
14.00	14.00	13.50	83	26.0	36.0	0.14	3	8232 14.000	8233 14.000
16.00	16.00	15.50	92	32.0	42.0	0.16	3	8232 16.000	8233 16.000
20.00	20.00	19.50	104	38.0	52.0	0.20	3	8232 20.000	8233 20.000
25.00	25.00	24.00	121	45.0	63.0	0.25	3	8232 25.000	8233 25.000

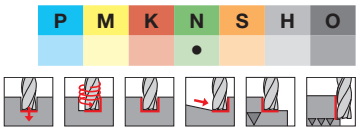
Ratio end mills RF 100 AL

Article no. **8230**

cutting data see page 166



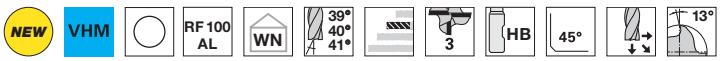
nano polished cutting edges • neck clearance • centre cutting



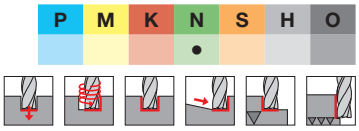
Ratio end mills RF 100 AL

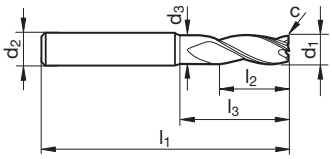
Article no. **8231**

cutting data see page 166



nano polished cutting edges • neck clearance • centre cutting

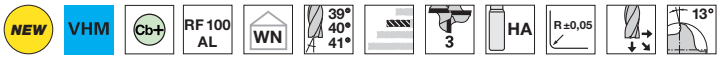




								Article no.	
d1 js7 mm	d2 h5 mm	d3 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Order no.	
1.00	4.00	0.92	50	2.5	5.0	0.02	3	8230 1.000	
1.50	4.00	1.40	50	4.0	7.5	0.03	3	8230 1.500	
2.00	6.00	1.85	57	5.0	10.0	0.04	3	8230 2.000	
2.50	6.00	2.35	57	6.5	12.5	0.05	3	8230 2.500	
3.00	6.00	2.85	57	8.0	15.0	0.06	3	8230 3.000	
3.50	6.00	3.30	57	11.0	15.0	0.03	3	8230 3.500	8231 3.500
4.00	6.00	3.80	57	11.0	18.0	0.04	3	8230 4.000	8231 4.000
4.50	6.00	4.30	57	13.0	18.0	0.04	3	8230 4.500	8231 4.500
5.00	6.00	4.80	57	13.0	18.0	0.05	3	8230 5.000	8231 5.000
5.50	6.00	5.30	57	13.0	20.0	0.05	3	8230 5.500	8231 5.500
6.00	6.00	5.70	57	13.0	20.0	0.06	3	8230 6.000	8231 6.000
7.50	8.00	7.20	63	19.0	26.0	0.07	3	8230 7.500	8231 7.500
8.00	8.00	7.70	63	19.0	26.0	0.08	3	8230 8.000	8231 8.000
9.50	10.00	9.20	72	22.0	30.0	0.09	3	8230 9.500	8231 9.500
10.00	10.00	9.50	72	22.0	30.0	0.10	3	8230 10.000	8231 10.000
11.50	12.00	11.00	83	26.0	36.0	0.11	3	8230 11.500	8231 11.500
12.00	12.00	11.50	83	26.0	36.0	0.12	3	8230 12.000	8231 12.000
14.00	14.00	13.50	83	26.0	36.0	0.14	3	8230 14.000	8231 14.000
16.00	16.00	15.50	92	32.0	42.0	0.16	3	8230 16.000	8231 16.000
20.00	20.00	19.50	104	38.0	52.0	0.20	3	8230 20.000	8231 20.000
25.00	25.00	24.00	121	45.0	63.0	0.25	3	8230 25.000	8231 25.000

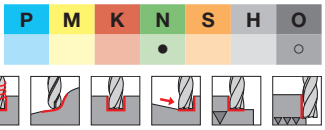
Ratio end mills RF 100 AL

Article no. **8248**



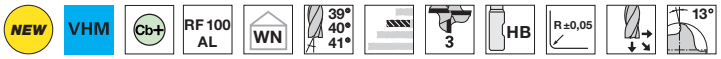
nano polished cutting edges • neck clearance • centre cutting • with internal cooling: radial and axial exits

cutting data see page 166



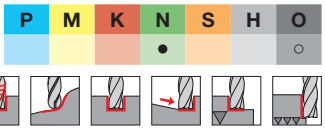
Ratio end mills RF 100 AL

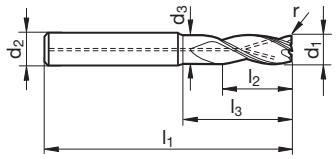
Article no. **8249**



nano polished cutting edges • neck clearance • centre cutting • with internal cooling: radial and axial exits

cutting data see page 166





Article no.								8248	8249
d1 js7 mm	d2 h5 mm	d3 mm	l1 mm	l2 mm	l3 mm	r mm	Z	Order no.	
6.00	6.00	5.70	57	13.0	20.0	0.20	3	8248 6.002	8249 6.002
6.00	6.00	5.70	57	13.0	20.0	0.50	3	8248 6.005	8249 6.005
6.00	6.00	5.70	57	13.0	20.0	0.80	3	8248 6.008	8249 6.008
6.00	6.00	5.70	57	13.0	20.0	1.00	3	8248 6.010	8249 6.010
8.00	8.00	7.70	63	19.0	26.0	0.20	3	8248 8.002	8249 8.002
8.00	8.00	7.70	63	19.0	26.0	0.50	3	8248 8.005	8249 8.005
8.00	8.00	7.70	63	19.0	26.0	0.80	3	8248 8.008	8249 8.008
8.00	8.00	7.70	63	19.0	26.0	1.00	3	8248 8.010	8249 8.010
8.00	8.00	7.70	63	19.0	26.0	2.00	3	8248 8.020	8249 8.020
10.00	10.00	9.50	72	22.0	30.0	0.30	3	8248 10.003	8249 10.003
10.00	10.00	9.50	72	22.0	30.0	0.50	3	8248 10.005	8249 10.005
10.00	10.00	9.50	72	22.0	30.0	0.80	3	8248 10.008	8249 10.008
10.00	10.00	9.50	72	22.0	30.0	1.00	3	8248 10.010	8249 10.010
10.00	10.00	9.50	72	22.0	30.0	1.50	3	8248 10.015	8249 10.015
12.00	12.00	11.50	83	26.0	36.0	0.30	3	8248 12.003	8249 12.003
12.00	12.00	11.50	83	26.0	36.0	0.50	3	8248 12.005	8249 12.005
12.00	12.00	11.50	83	26.0	36.0	0.80	3	8248 12.008	8249 12.008
12.00	12.00	11.50	83	26.0	36.0	1.00	3	8248 12.010	8249 12.010
12.00	12.00	11.50	83	26.0	36.0	1.50	3	8248 12.015	8249 12.015
12.00	12.00	11.50	83	26.0	36.0	2.00	3	8248 12.020	8249 12.020
12.00	12.00	11.50	83	26.0	36.0	2.50	3	8248 12.025	8249 12.025
12.00	12.00	11.50	83	26.0	36.0	3.00	3	8248 12.030	8249 12.030
12.00	12.00	11.50	83	26.0	36.0	4.00	3	8248 12.040	8249 12.040
16.00	16.00	15.50	92	32.0	42.0	0.50	3	8248 16.005	8249 16.005
16.00	16.00	15.50	92	32.0	42.0	1.00	3	8248 16.010	8249 16.010
16.00	16.00	15.50	92	32.0	42.0	2.00	3	8248 16.020	8249 16.020
16.00	16.00	15.50	92	32.0	42.0	2.50	3	8248 16.025	8249 16.025
16.00	16.00	15.50	92	32.0	42.0	3.00	3	8248 16.030	8249 16.030
16.00	16.00	15.50	92	32.0	42.0	4.00	3	8248 16.040	8249 16.040
20.00	20.00	19.50	104	38.0	52.0	0.50	3	8248 20.005	8249 20.005
20.00	20.00	19.50	104	38.0	52.0	1.00	3	8248 20.010	8249 20.010
20.00	20.00	19.50	104	38.0	52.0	2.00	3	8248 20.020	8249 20.020
20.00	20.00	19.50	104	38.0	52.0	2.50	3	8248 20.025	8249 20.025
20.00	20.00	19.50	104	38.0	52.0	3.00	3	8248 20.030	8249 20.030
20.00	20.00	19.50	104	38.0	52.0	4.00	3	8248 20.040	8249 20.040
25.00	25.00	24.00	121	45.0	63.0	2.00	3	8248 25.020	8249 25.020
25.00	25.00	24.00	121	45.0	63.0	3.00	3	8248 25.030	8249 25.030
25.00	25.00	24.00	121	45.0	63.0	4.00	3	8248 25.040	8249 25.040

Ratio end mills RF 100 AL

Article no. **8246**

cutting data see page 166

NEW | VHM | Cb+ | RF 100 AL | WN | 39° 40° 41° | 3 | HA | R ±0,05 | 13°

nano polished cutting edges • neck clearance • centre cutting

P	M	K	N	S	H	O
			●			○

Ratio end mills RF 100 AL

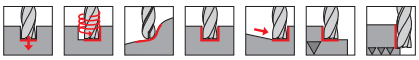
Article no. **8247**

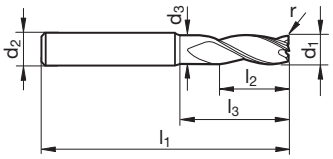
cutting data see page 166

NEW | VHM | Cb+ | RF 100 AL | WN | 39° 40° 41° | 3 | HB | R ±0,05 | 13°

nano polished cutting edges • neck clearance • centre cutting

P	M	K	N	S	H	O
			●			○





Article no.								8246	8247
d1 js7 mm	d2 h5 mm	d3 mm	l1 mm	l2 mm	l3 mm	r mm	Z	Order no.	
1.00	4.00	0.92	50	2.5	5.0	0.10	3	8246 1.001	
1.00	4.00	0.92	50	2.5	5.0	0.20	3	8246 1.002	
2.00	6.00	1.85	57	5.0	10.0	0.10	3	8246 2.001	
2.00	6.00	1.85	57	5.0	10.0	0.20	3	8246 2.002	
3.00	6.00	2.85	57	8.0	15.0	0.20	3	8246 3.002	
3.00	6.00	2.85	57	8.0	15.0	0.50	3	8246 3.005	
4.00	6.00	3.80	57	11.0	18.0	0.20	3	8246 4.002	8247 4.002
4.00	6.00	3.80	57	11.0	18.0	0.50	3	8246 4.005	8247 4.005
4.00	6.00	3.80	57	11.0	18.0	1.00	3	8246 4.010	8247 4.010
5.00	6.00	4.80	57	13.0	18.0	0.20	3	8246 5.002	8247 5.002
5.00	6.00	4.80	57	13.0	18.0	0.50	3	8246 5.005	8247 5.005
5.00	6.00	4.80	57	13.0	18.0	1.00	3	8246 5.010	8247 5.010
6.00	6.00	5.70	57	13.0	20.0	0.20	3	8246 6.002	8247 6.002
6.00	6.00	5.70	57	13.0	20.0	0.50	3	8246 6.005	8247 6.005
6.00	6.00	5.70	57	13.0	20.0	0.80	3	8246 6.008	8247 6.008
6.00	6.00	5.70	57	13.0	20.0	1.00	3	8246 6.010	8247 6.010
8.00	8.00	7.70	63	19.0	26.0	0.20	3	8246 8.002	8247 8.002
8.00	8.00	7.70	63	19.0	26.0	0.50	3	8246 8.005	8247 8.005
8.00	8.00	7.70	63	19.0	26.0	0.80	3	8246 8.008	8247 8.008
8.00	8.00	7.70	63	19.0	26.0	1.00	3	8246 8.010	8247 8.010
8.00	8.00	7.70	63	19.0	26.0	2.00	3	8246 8.020	8247 8.020
10.00	10.00	9.50	72	22.0	30.0	0.30	3	8246 10.003	8247 10.003
10.00	10.00	9.50	72	22.0	30.0	0.50	3	8246 10.005	8247 10.005
10.00	10.00	9.50	72	22.0	30.0	0.80	3	8246 10.008	8247 10.008
10.00	10.00	9.50	72	22.0	30.0	1.00	3	8246 10.010	8247 10.010
10.00	10.00	9.50	72	22.0	30.0	1.50	3	8246 10.015	8247 10.015
12.00	12.00	11.50	83	26.0	36.0	0.30	3	8246 12.003	8247 12.003
12.00	12.00	11.50	83	26.0	36.0	0.50	3	8246 12.005	8247 12.005
12.00	12.00	11.50	83	26.0	36.0	0.80	3	8246 12.008	8247 12.008
12.00	12.00	11.50	83	26.0	36.0	1.00	3	8246 12.010	8247 12.010
12.00	12.00	11.50	83	26.0	36.0	1.50	3	8246 12.015	8247 12.015
12.00	12.00	11.50	83	26.0	36.0	2.00	3	8246 12.020	8247 12.020
12.00	12.00	11.50	83	26.0	36.0	2.50	3	8246 12.025	8247 12.025
12.00	12.00	11.50	83	26.0	36.0	3.00	3	8246 12.030	8247 12.030
12.00	12.00	11.50	83	26.0	36.0	4.00	3	8246 12.040	8247 12.040
16.00	16.00	15.50	92	32.0	42.0	0.50	3	8246 16.005	8247 16.005
16.00	16.00	15.50	92	32.0	42.0	1.00	3	8246 16.010	8247 16.010
16.00	16.00	15.50	92	32.0	42.0	2.00	3	8246 16.020	8247 16.020
16.00	16.00	15.50	92	32.0	42.0	2.50	3	8246 16.025	8247 16.025
16.00	16.00	15.50	92	32.0	42.0	3.00	3	8246 16.030	8247 16.030
16.00	16.00	15.50	92	32.0	42.0	4.00	3	8246 16.040	8247 16.040
20.00	20.00	19.50	104	38.0	52.0	0.50	3	8246 20.005	8247 20.005
20.00	20.00	19.50	104	38.0	52.0	1.00	3	8246 20.010	8247 20.010
20.00	20.00	19.50	104	38.0	52.0	2.00	3	8246 20.020	8247 20.020
20.00	20.00	19.50	104	38.0	52.0	2.50	3	8246 20.025	8247 20.025
20.00	20.00	19.50	104	38.0	52.0	3.00	3	8246 20.030	8247 20.030
20.00	20.00	19.50	104	38.0	52.0	4.00	3	8246 20.040	8247 20.040
25.00	25.00	24.00	121	45.0	63.0	2.00	3	8246 25.020	8247 25.020
25.00	25.00	24.00	121	45.0	63.0	3.00	3	8246 25.030	8247 25.030
25.00	25.00	24.00	121	45.0	63.0	4.00	3	8246 25.040	8247 25.040

Ratio end mills RF 100 AL

Article no. **8244**

cutting data see page 166

NEW | VHM | RF 100 AL | WN | 39° 40° 41° | 3 | HA | R ±0,05 | 13°

nano polished cutting edges • neck clearance • centre cutting

P	M	K	N	S	H	O
			•			

Ratio end mills RF 100 AL

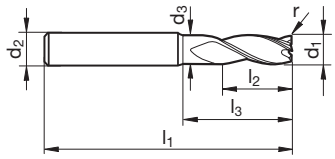
Article no. **8245**

cutting data see page 166

NEW | VHM | RF 100 AL | WN | 39° 40° 41° | 3 | HB | R ±0,05 | 13°

nano polished cutting edges • neck clearance • centre cutting

P	M	K	N	S	H	O
			•			



Article no.								8244	8245
d1 js7 mm	d2 h5 mm	d3 mm	l1 mm	l2 mm	l3 mm	r mm	Z	Order no.	
1.00	4.00	0.92	50	2.5	5.0	0.10	3	8244 1.001	
1.00	4.00	0.92	50	2.5	5.0	0.20	3	8244 1.002	
2.00	6.00	1.85	57	5.0	10.0	0.10	3	8244 2.001	
2.00	6.00	1.85	57	5.0	10.0	0.20	3	8244 2.002	
3.00	6.00	2.85	57	8.0	15.0	0.20	3	8244 3.002	
3.00	6.00	2.85	57	8.0	15.0	0.50	3	8244 3.005	
4.00	6.00	3.80	57	11.0	18.0	0.20	3	8244 4.002	8245 4.002
4.00	6.00	3.80	57	11.0	18.0	0.50	3	8244 4.005	8245 4.005
4.00	6.00	3.80	57	11.0	18.0	1.00	3	8244 4.010	8245 4.010
5.00	6.00	4.80	57	13.0	18.0	0.20	3	8244 5.002	8245 5.002
5.00	6.00	4.80	57	13.0	18.0	0.50	3	8244 5.005	8245 5.005
5.00	6.00	4.80	57	13.0	18.0	1.00	3	8244 5.010	8245 5.010
6.00	6.00	5.70	57	13.0	20.0	0.20	3	8244 6.002	8245 6.002
6.00	6.00	5.70	57	13.0	20.0	0.50	3	8244 6.005	8245 6.005
6.00	6.00	5.70	57	13.0	20.0	0.80	3	8244 6.008	8245 6.008
6.00	6.00	5.70	57	13.0	20.0	1.00	3	8244 6.010	8245 6.010
8.00	8.00	7.70	63	19.0	26.0	0.20	3	8244 8.002	8245 8.002
8.00	8.00	7.70	63	19.0	26.0	0.50	3	8244 8.005	8245 8.005
8.00	8.00	7.70	63	19.0	26.0	0.80	3	8244 8.008	8245 8.008
8.00	8.00	7.70	63	19.0	26.0	1.00	3	8244 8.010	8245 8.010
8.00	8.00	7.70	63	19.0	26.0	2.00	3	8244 8.020	8245 8.020
10.00	10.00	9.50	72	22.0	30.0	0.30	3	8244 10.003	8245 10.003
10.00	10.00	9.50	72	22.0	30.0	0.50	3	8244 10.005	8245 10.005
10.00	10.00	9.50	72	22.0	30.0	0.80	3	8244 10.008	8245 10.008
10.00	10.00	9.50	72	22.0	30.0	1.00	3	8244 10.010	8245 10.010
10.00	10.00	9.50	72	22.0	30.0	1.50	3	8244 10.015	8245 10.015
12.00	12.00	11.50	83	26.0	36.0	0.30	3	8244 12.003	8245 12.003
12.00	12.00	11.50	83	26.0	36.0	0.50	3	8244 12.005	8245 12.005
12.00	12.00	11.50	83	26.0	36.0	0.80	3	8244 12.008	8245 12.008
12.00	12.00	11.50	83	26.0	36.0	1.00	3	8244 12.010	8245 12.010
12.00	12.00	11.50	83	26.0	36.0	1.50	3	8244 12.015	8245 12.015
12.00	12.00	11.50	83	26.0	36.0	2.00	3	8244 12.020	8245 12.020
12.00	12.00	11.50	83	26.0	36.0	2.50	3	8244 12.025	8245 12.025
12.00	12.00	11.50	83	26.0	36.0	3.00	3	8244 12.030	8245 12.030
12.00	12.00	11.50	83	26.0	36.0	4.00	3	8244 12.040	8245 12.040
16.00	16.00	15.50	92	32.0	42.0	0.50	3	8244 16.005	8245 16.005
16.00	16.00	15.50	92	32.0	42.0	1.00	3	8244 16.010	8245 16.010
16.00	16.00	15.50	92	32.0	42.0	2.00	3	8244 16.020	8245 16.020
16.00	16.00	15.50	92	32.0	42.0	2.50	3	8244 16.025	8245 16.025
16.00	16.00	15.50	92	32.0	42.0	3.00	3	8244 16.030	8245 16.030
16.00	16.00	15.50	92	32.0	42.0	4.00	3	8244 16.040	8245 16.040
20.00	20.00	19.50	104	38.0	52.0	0.50	3	8244 20.005	8245 20.005
20.00	20.00	19.50	104	38.0	52.0	1.00	3	8244 20.010	8245 20.010
20.00	20.00	19.50	104	38.0	52.0	2.00	3	8244 20.020	8245 20.020
20.00	20.00	19.50	104	38.0	52.0	2.50	3	8244 20.025	8245 20.025
20.00	20.00	19.50	104	38.0	52.0	3.00	3	8244 20.030	8245 20.030
20.00	20.00	19.50	104	38.0	52.0	4.00	3	8244 20.040	8245 20.040
25.00	25.00	24.00	121	45.0	63.0	2.00	3	8244 25.020	8245 25.020
25.00	25.00	24.00	121	45.0	63.0	3.00	3	8244 25.030	8245 25.030
25.00	25.00	24.00	121	45.0	63.0	4.00	3	8244 25.040	8245 25.040

Ratio end mills RF 100 AL

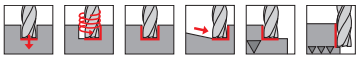
Article no. **8238**

NEW | VHM | Cb+ | RF 100 AL | WN | 39° 40° 41° | 3 | HA | 45° | 13°

nano polished cutting edges • neck clearance • centre cutting

cutting data see page 166

P	M	K	N	S	H	O
			●			○



Ratio end mills RF 100 AL

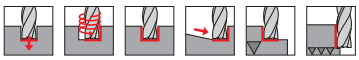
Article no. **8239**

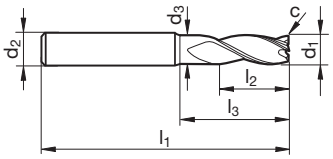
NEW | VHM | Cb+ | RF 100 AL | WN | 39° 40° 41° | 3 | HB | 45° | 13°

nano polished cutting edges • neck clearance • centre cutting

cutting data see page 166

P	M	K	N	S	H	O
			●			○





Article no.								8238	8239
d1 js7 mm	d2 h5 mm	d3 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Order no.	
1.00	4.00	0.92	50	2.5	7.0	0.02	3	8238 1.000	
1.50	4.00	1.40	50	4.0	10.5	0.03	3	8238 1.500	
2.00	6.00	1.85	57	5.0	14.0	0.04	3	8238 2.000	
2.50	6.00	2.35	57	6.5	17.5	0.05	3	8238 2.500	
3.00	6.00	2.85	65	8.0	21.0	0.06	3	8238 3.000	
3.50	6.00	3.30	65	11.0	26.0	0.03	3	8238 3.500	8239 3.500
4.00	6.00	3.80	65	11.0	26.0	0.04	3	8238 4.000	8239 4.000
4.50	6.00	4.30	65	13.0	26.0	0.04	3	8238 4.500	8239 4.500
5.00	6.00	4.80	65	13.0	26.0	0.05	3	8238 5.000	8239 5.000
5.50	6.00	5.30	65	13.0	28.0	0.05	3	8238 5.500	8239 5.500
6.00	6.00	5.70	65	13.0	28.0	0.06	3	8238 6.000	8239 6.000
7.50	8.00	7.20	75	19.0	38.0	0.07	3	8238 7.500	8239 7.500
8.00	8.00	7.70	75	19.0	38.0	0.08	3	8238 8.000	8239 8.000
9.50	10.00	9.20	80	22.0	38.0	0.09	3	8238 9.500	8239 9.500
10.00	10.00	9.50	80	22.0	38.0	0.10	3	8238 10.000	8239 10.000
11.50	12.00	11.00	93	26.0	46.0	0.11	3	8238 11.500	8239 11.500
12.00	12.00	11.50	93	26.0	46.0	0.12	3	8238 12.000	8239 12.000
14.00	14.00	13.50	100	26.0	54.0	0.14	3	8238 14.000	8239 14.000
16.00	16.00	15.50	108	32.0	58.0	0.16	3	8238 16.000	8239 16.000
20.00	20.00	19.50	126	38.0	74.0	0.20	3	8238 20.000	8239 20.000
25.00	25.00	24.00	150	45.0	92.0	0.25	3	8238 25.000	8239 25.000

Ratio end mills RF 100 AL

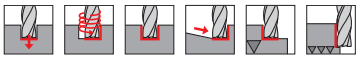
Article no. **8236**

NEW | VHM | RF 100 AL | WN | 39° 40° 41° | 3 | HA | 45° | 13°

nano polished cutting edges • neck clearance • centre cutting

cutting data see page 166

P	M	K	N	S	H	O
			•			



Ratio end mills RF 100 AL

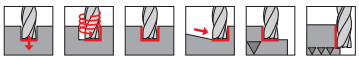
Article no. **8237**

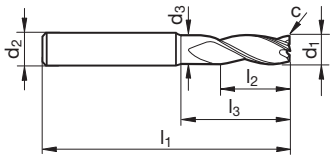
NEW | VHM | RF 100 AL | WN | 39° 40° 41° | 3 | HB | 45° | 13°

nano polished cutting edges • neck clearance • centre cutting

cutting data see page 166

P	M	K	N	S	H	O
			•			





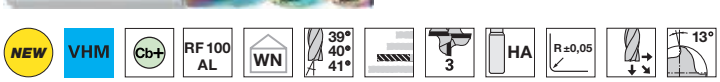
d1 js7 mm	d2 h5 mm	d3 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Article no. 8236	Article no. 8237
1.00	4.00	0.92	50	2.5	7.0	0.02	3	8236 1.000	
1.50	4.00	1.40	50	4.0	10.5	0.03	3	8236 1.500	
2.00	6.00	1.85	57	5.0	14.0	0.04	3	8236 2.000	
2.50	6.00	2.35	57	6.5	17.5	0.05	3	8236 2.500	
3.00	6.00	2.85	65	8.0	21.0	0.06	3	8236 3.000	
3.50	6.00	3.30	65	11.0	26.0	0.03	3	8236 3.500	8237 3.500
4.00	6.00	3.80	65	11.0	26.0	0.04	3	8236 4.000	8237 4.000
4.50	6.00	4.30	65	13.0	26.0	0.04	3	8236 4.500	8237 4.500
5.00	6.00	4.80	65	13.0	26.0	0.05	3	8236 5.000	8237 5.000
5.50	6.00	5.30	65	13.0	28.0	0.05	3	8236 5.500	8237 5.500
6.00	6.00	5.70	65	13.0	28.0	0.06	3	8236 6.000	8237 6.000
7.50	8.00	7.20	75	19.0	38.0	0.07	3	8236 7.500	8237 7.500
8.00	8.00	7.70	75	19.0	38.0	0.08	3	8236 8.000	8237 8.000
9.50	10.00	9.20	80	22.0	38.0	0.09	3	8236 9.500	8237 9.500
10.00	10.00	9.50	80	22.0	38.0	0.10	3	8236 10.000	8237 10.000
11.50	12.00	11.00	93	26.0	46.0	0.11	3	8236 11.500	8237 11.500
12.00	12.00	11.50	93	26.0	46.0	0.12	3	8236 12.000	8237 12.000
14.00	14.00	13.50	100	26.0	54.0	0.14	3	8236 14.000	8237 14.000
16.00	16.00	15.50	108	32.0	58.0	0.16	3	8236 16.000	8237 16.000
20.00	20.00	19.50	126	38.0	74.0	0.20	3	8236 20.000	8237 20.000
25.00	25.00	24.00	150	45.0	92.0	0.25	3	8236 25.000	8237 25.000

Ratio end mills RF 100 AL

Article no. **8252**

cutting data see page 166

P	M	K	N	S	H	O
			●			○



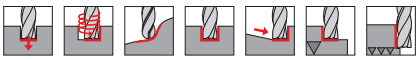
nano polished cutting edges • neck clearance • centre cutting

Ratio end mills RF 100 AL

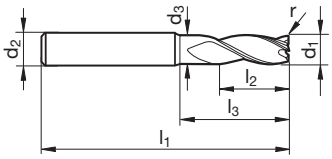
Article no. **8253**

cutting data see page 166

P	M	K	N	S	H	O
			●			○



nano polished cutting edges • neck clearance • centre cutting



Article no.								8252	8253
d1 js7 mm	d2 h5 mm	d3 mm	l1 mm	l2 mm	l3 mm	r mm	Z	Order no.	
1.00	4.00	0.92	50	2.5	7.0	0.10	3	8252 1.001	
1.00	4.00	0.92	50	2.5	7.0	0.20	3	8252 1.002	
2.00	6.00	1.85	57	5.0	14.0	0.10	3	8252 2.001	
2.00	6.00	1.85	57	5.0	14.0	0.20	3	8252 2.002	
3.00	6.00	2.85	65	8.0	21.0	0.20	3	8252 3.002	
3.00	6.00	2.85	65	8.0	21.0	0.50	3	8252 3.005	
4.00	6.00	3.80	65	11.0	26.0	0.20	3	8252 4.002	8253 4.002
4.00	6.00	3.80	65	11.0	26.0	0.50	3	8252 4.005	8253 4.005
4.00	6.00	3.80	65	11.0	26.0	1.00	3	8252 4.010	8253 4.010
5.00	6.00	4.80	65	13.0	26.0	0.20	3	8252 5.002	8253 5.002
5.00	6.00	4.80	65	13.0	26.0	0.50	3	8252 5.005	8253 5.005
5.00	6.00	4.80	65	13.0	26.0	1.00	3	8252 5.010	8253 5.010
6.00	6.00	5.70	65	13.0	28.0	0.20	3	8252 6.002	8253 6.002
6.00	6.00	5.70	65	13.0	28.0	0.50	3	8252 6.005	8253 6.005
6.00	6.00	5.70	65	13.0	28.0	0.80	3	8252 6.008	8253 6.008
6.00	6.00	5.70	65	13.0	28.0	1.00	3	8252 6.010	8253 6.010
8.00	8.00	7.70	75	19.0	38.0	0.20	3	8252 8.002	8253 8.002
8.00	8.00	7.70	75	19.0	38.0	0.50	3	8252 8.005	8253 8.005
8.00	8.00	7.70	75	19.0	38.0	0.80	3	8252 8.008	8253 8.008
8.00	8.00	7.70	75	19.0	38.0	1.00	3	8252 8.010	8253 8.010
8.00	8.00	7.70	75	19.0	38.0	2.00	3	8252 8.020	8253 8.020
10.00	10.00	9.50	80	22.0	38.0	0.30	3	8252 10.003	8253 10.003
10.00	10.00	9.50	80	22.0	38.0	0.50	3	8252 10.005	8253 10.005
10.00	10.00	9.50	80	22.0	38.0	0.80	3	8252 10.008	8253 10.008
10.00	10.00	9.50	80	22.0	38.0	1.00	3	8252 10.010	8253 10.010
10.00	10.00	9.50	80	22.0	38.0	1.50	3	8252 10.015	8253 10.015
12.00	12.00	11.50	93	26.0	46.0	0.30	3	8252 12.003	8253 12.003
12.00	12.00	11.50	93	26.0	46.0	0.50	3	8252 12.005	8253 12.005
12.00	12.00	11.50	93	26.0	46.0	0.80	3	8252 12.008	8253 12.008
12.00	12.00	11.50	93	26.0	46.0	1.00	3	8252 12.010	8253 12.010
12.00	12.00	11.50	93	26.0	46.0	1.50	3	8252 12.015	8253 12.015
12.00	12.00	11.50	93	26.0	46.0	2.00	3	8252 12.020	8253 12.020
12.00	12.00	11.50	93	26.0	46.0	3.00	3	8252 12.030	8253 12.030
16.00	16.00	15.50	108	32.0	58.0	0.50	3	8252 16.005	8253 16.005
16.00	16.00	15.50	108	32.0	58.0	1.00	3	8252 16.010	8253 16.010
16.00	16.00	15.50	108	32.0	58.0	1.50	3	8252 16.015	8253 16.015
16.00	16.00	15.50	108	32.0	58.0	2.00	3	8252 16.020	8253 16.020
16.00	16.00	15.50	108	32.0	58.0	2.50	3	8252 16.025	8253 16.025
16.00	16.00	15.50	108	32.0	58.0	3.00	3	8252 16.030	8253 16.030
16.00	16.00	15.50	108	32.0	58.0	4.00	3	8252 16.040	8253 16.040
20.00	20.00	19.50	126	38.0	74.0	0.50	3	8252 20.005	8253 20.005
20.00	20.00	19.50	126	38.0	74.0	1.00	3	8252 20.010	8253 20.010
20.00	20.00	19.50	126	38.0	74.0	1.50	3	8252 20.015	8253 20.015
20.00	20.00	19.50	126	38.0	74.0	2.00	3	8252 20.020	8253 20.020
20.00	20.00	19.50	126	38.0	74.0	2.50	3	8252 20.025	8253 20.025
20.00	20.00	19.50	126	38.0	74.0	3.00	3	8252 20.030	8253 20.030
20.00	20.00	19.50	126	38.0	74.0	4.00	3	8252 20.040	8253 20.040
25.00	25.00	24.00	150	45.0	92.0	2.00	3	8252 25.020	8253 25.020
25.00	25.00	24.00	150	45.0	92.0	3.00	3	8252 25.030	8253 25.030
25.00	25.00	24.00	150	45.0	92.0	4.00	3	8252 25.040	8253 25.040

Ratio end mills RF 100 AL

Article no. **8250**

NEW | VHM | RF 100 AL | WN | 39° 40° 41° | 3 | HA | R ±0,05 | 13°

nano polished cutting edges • neck clearance • centre cutting

cutting data see page 166

P	M	K	N	S	H	O
			•			

Ratio end mills RF 100 AL

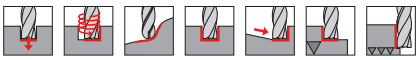
Article no. **8251**

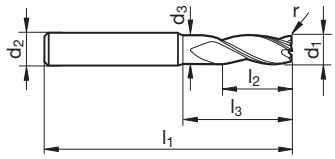
NEW | VHM | RF 100 AL | WN | 39° 40° 41° | 3 | HB | R ±0,05 | 13°

nano polished cutting edges • neck clearance • centre cutting

cutting data see page 166

P	M	K	N	S	H	O
			•			





Article no.								8250	8251
d1 js7 mm	d2 h5 mm	d3 mm	l1 mm	l2 mm	l3 mm	r mm	Z	Order no.	
1.00	4.00	0.92	50	2.5	7.0	0.10	3	8250 1.001	
1.00	4.00	0.92	50	2.5	7.0	0.20	3	8250 1.002	
2.00	6.00	1.85	57	5.0	14.0	0.10	3	8250 2.001	
2.00	6.00	1.85	57	5.0	14.0	0.20	3	8250 2.002	
3.00	6.00	2.85	65	8.0	21.0	0.20	3	8250 3.002	
3.00	6.00	2.85	65	8.0	21.0	0.50	3	8250 3.005	
4.00	6.00	3.80	65	11.0	26.0	0.20	3	8250 4.002	8251 4.002
4.00	6.00	3.80	65	11.0	26.0	0.50	3	8250 4.005	8251 4.005
4.00	6.00	3.80	65	11.0	26.0	1.00	3	8250 4.010	8251 4.010
5.00	6.00	4.80	65	13.0	26.0	0.20	3	8250 5.002	8251 5.002
5.00	6.00	4.80	65	13.0	26.0	0.50	3	8250 5.005	8251 5.005
5.00	6.00	4.80	65	13.0	26.0	1.00	3	8250 5.010	8251 5.010
6.00	6.00	5.70	65	13.0	28.0	0.20	3	8250 6.002	8251 6.002
6.00	6.00	5.70	65	13.0	28.0	0.50	3	8250 6.005	8251 6.005
6.00	6.00	5.70	65	13.0	28.0	0.80	3	8250 6.008	8251 6.008
6.00	6.00	5.70	65	13.0	28.0	1.00	3	8250 6.010	8251 6.010
8.00	8.00	7.70	75	19.0	38.0	0.20	3	8250 8.002	8251 8.002
8.00	8.00	7.70	75	19.0	38.0	0.50	3	8250 8.005	8251 8.005
8.00	8.00	7.70	75	19.0	38.0	0.80	3	8250 8.008	8251 8.008
8.00	8.00	7.70	75	19.0	38.0	1.00	3	8250 8.010	8251 8.010
8.00	8.00	7.70	75	19.0	38.0	2.00	3	8250 8.020	8251 8.020
10.00	10.00	9.50	80	22.0	38.0	0.30	3	8250 10.003	8251 10.003
10.00	10.00	9.50	80	22.0	38.0	0.50	3	8250 10.005	8251 10.005
10.00	10.00	9.50	80	22.0	38.0	0.80	3	8250 10.008	8251 10.008
10.00	10.00	9.50	80	22.0	38.0	1.00	3	8250 10.010	8251 10.010
10.00	10.00	9.50	80	22.0	38.0	1.50	3	8250 10.015	8251 10.015
12.00	12.00	11.50	93	26.0	46.0	0.30	3	8250 12.003	8251 12.003
12.00	12.00	11.50	93	26.0	46.0	0.50	3	8250 12.005	8251 12.005
12.00	12.00	11.50	93	26.0	46.0	0.80	3	8250 12.008	8251 12.008
12.00	12.00	11.50	93	26.0	46.0	1.00	3	8250 12.010	8251 12.010
12.00	12.00	11.50	93	26.0	46.0	1.50	3	8250 12.015	8251 12.015
12.00	12.00	11.50	93	26.0	46.0	2.00	3	8250 12.020	8251 12.020
12.00	12.00	11.50	93	26.0	46.0	3.00	3	8250 12.030	8251 12.030
16.00	16.00	15.50	108	32.0	58.0	0.50	3	8250 16.005	8251 16.005
16.00	16.00	15.50	108	32.0	58.0	1.00	3	8250 16.010	8251 16.010
16.00	16.00	15.50	108	32.0	58.0	1.50	3	8250 16.015	8251 16.015
16.00	16.00	15.50	108	32.0	58.0	2.00	3	8250 16.020	8251 16.020
16.00	16.00	15.50	108	32.0	58.0	2.50	3	8250 16.025	8251 16.025
16.00	16.00	15.50	108	32.0	58.0	3.00	3	8250 16.030	8251 16.030
16.00	16.00	15.50	108	32.0	58.0	4.00	3	8250 16.040	8251 16.040
20.00	20.00	19.50	126	38.0	74.0	0.50	3	8250 20.005	8251 20.005
20.00	20.00	19.50	126	38.0	74.0	1.00	3	8250 20.010	8251 20.010
20.00	20.00	19.50	126	38.0	74.0	1.50	3	8250 20.015	8251 20.015
20.00	20.00	19.50	126	38.0	74.0	2.00	3	8250 20.020	8251 20.020
20.00	20.00	19.50	126	38.0	74.0	2.50	3	8250 20.025	8251 20.025
20.00	20.00	19.50	126	38.0	74.0	3.00	3	8250 20.030	8251 20.030
20.00	20.00	19.50	126	38.0	74.0	4.00	3	8250 20.040	8251 20.040
25.00	25.00	24.00	150	45.0	92.0	2.00	3	8250 25.020	8251 25.020
25.00	25.00	24.00	150	45.0	92.0	3.00	3	8250 25.030	8251 25.030
25.00	25.00	24.00	150	45.0	92.0	4.00	3	8250 25.040	8251 25.040

Ratio end mills RF 100 AL

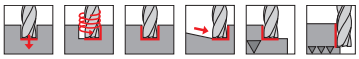
Article no. **8242**

NEW | VHM | Cb+ | RF 100 AL | WN | 39° 40° 41° | 6xD | 3 | HA | 45° | 13°

nano polished cutting edges • neck clearance • centre cutting

cutting data see page 166

P	M	K	N	S	H	O
			●			○



Ratio end mills RF 100 AL

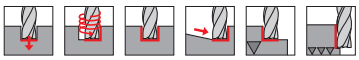
Article no. **8243**

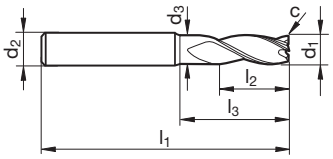
NEW | VHM | Cb+ | RF 100 AL | WN | 39° 40° 41° | 6xD | 3 | HB | 45° | 13°

nano polished cutting edges • neck clearance • centre cutting

cutting data see page 166

P	M	K	N	S	H	O
			●			○





Article no.								8242	8243
d1 js7 mm	d2 h5 mm	d3 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Order no.	
1.00	4.00	0.92	50	2.5	9.0	0.02	3	8242 1.000	
1.50	4.00	1.40	50	4.0	13.5	0.03	3	8242 1.500	
2.00	6.00	1.85	60	5.0	18.0	0.04	3	8242 2.000	
2.50	6.00	2.35	65	6.5	22.5	0.05	3	8242 2.500	
3.00	6.00	2.85	70	8.0	27.0	0.06	3	8242 3.000	
3.50	6.00	3.30	75	11.0	30.0	0.03	3	8242 3.500	8243 3.500
4.00	6.00	3.80	75	11.0	30.0	0.04	3	8242 4.000	8243 4.000
4.50	6.00	4.30	75	13.0	35.0	0.04	3	8242 4.500	8243 4.500
5.00	6.00	4.80	75	13.0	35.0	0.05	3	8242 5.000	8243 5.000
5.50	6.00	5.30	75	13.0	38.0	0.05	3	8242 5.500	8243 5.500
6.00	6.00	5.70	75	13.0	38.0	0.06	3	8242 6.000	8243 6.000
7.50	8.00	7.20	86	19.0	49.0	0.07	3	8242 7.500	8243 7.500
8.00	8.00	7.70	86	19.0	49.0	0.08	3	8242 8.000	8243 8.000
9.50	10.00	9.20	100	22.0	60.0	0.09	3	8242 9.500	8243 9.500
10.00	10.00	9.50	100	22.0	60.0	0.10	3	8242 10.000	8243 10.000
11.50	12.00	11.00	120	26.0	74.0	0.11	3	8242 11.500	8243 11.500
12.00	12.00	11.50	120	26.0	74.0	0.12	3	8242 12.000	8243 12.000
14.00	14.00	13.50	150	26.0	104.0	0.14	3	8242 14.000	8243 14.000
16.00	16.00	15.50	150	32.0	101.0	0.16	3	8242 16.000	8243 16.000
20.00	20.00	19.50	175	38.0	124.0	0.20	3	8242 20.000	8243 20.000

Ratio end mills RF 100 AL

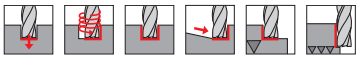
Article no. **8240**

VHM | RF 100 AL | WN | 39° 40° 41° | 6xD | 3 | HA | 45° | 13°

nano polished cutting edges • neck clearance • centre cutting

cutting data see page 166

P	M	K	N	S	H	O
			•			



Ratio end mills RF 100 AL

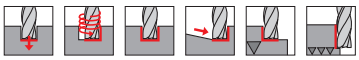
Article no. **8241**

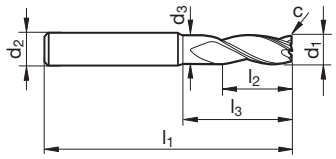
VHM | RF 100 AL | WN | 39° 40° 41° | 6xD | 3 | HB | 45° | 13°

nano polished cutting edges • neck clearance • centre cutting

cutting data see page 166

P	M	K	N	S	H	O
			•			





Article no.							8240	8241
d1 js7 mm	d2 h5 mm	d3 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Order no.	
1.00	4.00	0.92	50	2.5	9.0	0.02	3	8240 1.000	
1.50	4.00	1.40	50	4.0	13.5	0.03	3	8240 1.500	
2.00	6.00	1.85	60	5.0	18.0	0.04	3	8240 2.000	
2.50	6.00	2.35	65	6.5	22.5	0.05	3	8240 2.500	
3.00	6.00	2.85	70	8.0	27.0	0.06	3	8240 3.000	
3.50	6.00	3.30	75	11.0	30.0	0.03	3	8240 3.500	8241 3.500
4.00	6.00	3.80	75	11.0	30.0	0.04	3	8240 4.000	8241 4.000
4.50	6.00	4.30	75	13.0	35.0	0.04	3	8240 4.500	8241 4.500
5.00	6.00	4.80	75	13.0	35.0	0.05	3	8240 5.000	8241 5.000
5.50	6.00	5.30	75	13.0	38.0	0.05	3	8240 5.500	8241 5.500
6.00	6.00	5.70	75	13.0	38.0	0.06	3	8240 6.000	8241 6.000
7.50	8.00	7.20	86	19.0	49.0	0.07	3	8240 7.500	8241 7.500
8.00	8.00	7.70	86	19.0	49.0	0.08	3	8240 8.000	8241 8.000
9.50	10.00	9.20	100	22.0	60.0	0.09	3	8240 9.500	8241 9.500
10.00	10.00	9.50	100	22.0	60.0	0.10	3	8240 10.000	8241 10.000
11.50	12.00	11.00	120	26.0	74.0	0.11	3	8240 11.500	8241 11.500
12.00	12.00	11.50	120	26.0	74.0	0.12	3	8240 12.000	8241 12.000
14.00	14.00	13.50	150	26.0	104.0	0.14	3	8240 14.000	8241 14.000
16.00	16.00	15.50	150	32.0	101.0	0.16	3	8240 16.000	8241 16.000
20.00	20.00	19.50	175	38.0	124.0	0.20	3	8240 20.000	8241 20.000

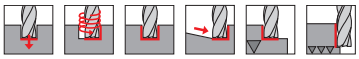
Ratio end mills RF 100 AL

Article no. **8256**

nano polished cutting edges • neck clearance • centre cutting

cutting data see page 166

P	M	K	N	S	H	O
			●			○



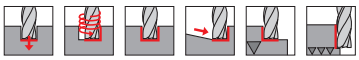
Ratio end mills RF 100 AL

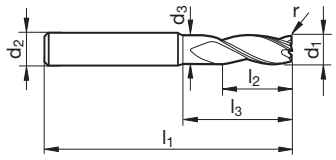
Article no. **8257**

nano polished cutting edges • neck clearance • centre cutting

cutting data see page 166

P	M	K	N	S	H	O
			●			○





Article no.								8256	8257
d1 js7 mm	d2 h5 mm	d3 mm	l1 mm	l2 mm	l3 mm	r mm	Z	Order no.	
1.00	4.00	0.92	50	2.5	9.0	0.10	3	8256 1.001	
1.00	4.00	0.92	50	2.5	9.0	0.20	3	8256 1.002	
2.00	6.00	1.85	60	5.0	18.0	0.10	3	8256 2.001	
2.00	6.00	1.85	60	5.0	18.0	0.20	3	8256 2.002	
3.00	6.00	2.85	70	8.0	27.0	0.20	3	8256 3.002	
3.00	6.00	2.85	70	8.0	27.0	0.50	3	8256 3.005	
4.00	6.00	3.80	75	11.0	30.0	0.20	3	8256 4.002	8257 4.002
4.00	6.00	3.80	75	11.0	30.0	0.50	3	8256 4.005	8257 4.005
4.00	6.00	3.80	75	11.0	30.0	1.00	3	8256 4.010	8257 4.010
5.00	6.00	4.80	75	13.0	35.0	0.20	3	8256 5.002	8257 5.002
5.00	6.00	4.80	75	13.0	35.0	0.50	3	8256 5.005	8257 5.005
5.00	6.00	4.80	75	13.0	35.0	1.00	3	8256 5.010	8257 5.010
6.00	6.00	5.70	75	13.0	38.0	0.20	3	8256 6.002	8257 6.002
6.00	6.00	5.70	75	13.0	38.0	0.50	3	8256 6.005	8257 6.005
6.00	6.00	5.70	75	13.0	38.0	0.80	3	8256 6.008	8257 6.008
6.00	6.00	5.70	75	13.0	38.0	1.00	3	8256 6.010	8257 6.010
8.00	8.00	7.70	86	19.0	49.0	0.20	3	8256 8.002	8257 8.002
8.00	8.00	7.70	86	19.0	49.0	0.50	3	8256 8.005	8257 8.005
8.00	8.00	7.70	86	19.0	49.0	0.80	3	8256 8.008	8257 8.008
8.00	8.00	7.70	86	19.0	49.0	1.00	3	8256 8.010	8257 8.010
8.00	8.00	7.70	86	19.0	49.0	2.00	3	8256 8.020	8257 8.020
10.00	10.00	9.50	100	22.0	60.0	0.30	3	8256 10.003	8257 10.003
10.00	10.00	9.50	100	22.0	60.0	0.50	3	8256 10.005	8257 10.005
10.00	10.00	9.50	100	22.0	60.0	0.80	3	8256 10.008	8257 10.008
10.00	10.00	9.50	100	22.0	60.0	1.00	3	8256 10.010	8257 10.010
10.00	10.00	9.50	100	22.0	60.0	1.50	3	8256 10.015	8257 10.015
12.00	12.00	11.50	120	26.0	74.0	0.30	3	8256 12.003	8257 12.003
12.00	12.00	11.50	120	26.0	74.0	0.50	3	8256 12.005	8257 12.005
12.00	12.00	11.50	120	26.0	74.0	0.80	3	8256 12.008	8257 12.008
12.00	12.00	11.50	120	26.0	74.0	1.00	3	8256 12.010	8257 12.010
12.00	12.00	11.50	120	26.0	74.0	1.50	3	8256 12.015	8257 12.015
12.00	12.00	11.50	120	26.0	74.0	2.00	3	8256 12.020	8257 12.020
12.00	12.00	11.50	120	26.0	74.0	3.00	3	8256 12.030	8257 12.030
16.00	16.00	15.50	150	32.0	101.0	0.50	3	8256 16.005	8257 16.005
16.00	16.00	15.50	150	32.0	101.0	1.00	3	8256 16.010	8257 16.010
16.00	16.00	15.50	150	32.0	101.0	1.50	3	8256 16.015	8257 16.015
16.00	16.00	15.50	150	32.0	101.0	2.00	3	8256 16.020	8257 16.020
16.00	16.00	15.50	150	32.0	101.0	2.50	3	8256 16.025	8257 16.025
16.00	16.00	15.50	150	32.0	101.0	3.00	3	8256 16.030	8257 16.030
16.00	16.00	15.50	150	32.0	101.0	4.00	3	8256 16.040	8257 16.040
20.00	20.00	19.50	175	38.0	124.0	0.50	3	8256 20.005	8257 20.005
20.00	20.00	19.50	175	38.0	124.0	1.00	3	8256 20.010	8257 20.010
20.00	20.00	19.50	175	38.0	124.0	1.50	3	8256 20.015	8257 20.015
20.00	20.00	19.50	175	38.0	124.0	2.00	3	8256 20.020	8257 20.020
20.00	20.00	19.50	175	38.0	124.0	2.50	3	8256 20.025	8257 20.025
20.00	20.00	19.50	175	38.0	124.0	3.00	3	8256 20.030	8257 20.030
20.00	20.00	19.50	175	38.0	124.0	4.00	3	8256 20.040	8257 20.040

Ratio end mills RF 100 AL

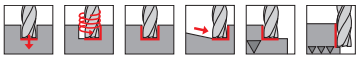
Article no. **8254**

VHM | RF 100 AL | WN | 39° 40° 41° | 6xD | 3 | HA | R±0,05 | 13°

nano polished cutting edges • neck clearance • centre cutting

cutting data see page 166

P	M	K	N	S	H	O
			•			



Ratio end mills RF 100 AL

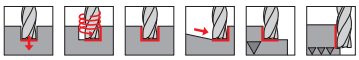
Article no. **8255**

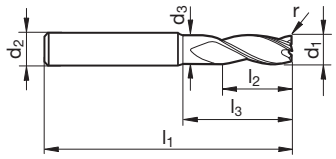
VHM | RF 100 AL | WN | 39° 40° 41° | 6xD | 3 | HB | R±0,05 | 13°

nano polished cutting edges • neck clearance • centre cutting

cutting data see page 166

P	M	K	N	S	H	O
			•			





Article no.								8254	8255
d1 js7 mm	d2 h5 mm	d3 mm	l1 mm	l2 mm	l3 mm	r mm x 45°	Z	Order no.	
1.00	4.00	0.92	50	2.5	9.0	0.10	3	8254 1.001	
1.00	4.00	0.92	50	2.5	9.0	0.20	3	8254 1.002	
2.00	6.00	1.85	60	5.0	18.0	0.10	3	8254 2.001	
2.00	6.00	1.85	60	5.0	18.0	0.20	3	8254 2.002	
3.00	6.00	2.85	70	8.0	27.0	0.20	3	8254 3.002	
3.00	6.00	2.85	70	8.0	27.0	0.50	3	8254 3.005	
4.00	6.00	3.80	75	11.0	30.0	0.20	3	8254 4.002	8255 4.002
4.00	6.00	3.80	75	11.0	30.0	0.50	3	8254 4.005	8255 4.005
4.00	6.00	3.80	75	11.0	30.0	1.00	3	8254 4.010	8255 4.010
5.00	6.00	4.80	75	13.0	35.0	0.20	3	8254 5.002	8255 5.002
5.00	6.00	4.80	75	13.0	35.0	0.50	3	8254 5.005	8255 5.005
5.00	6.00	4.80	75	13.0	35.0	1.00	3	8254 5.010	8255 5.010
6.00	6.00	5.70	75	13.0	38.0	0.20	3	8254 6.002	8255 6.002
6.00	6.00	5.70	75	13.0	38.0	0.50	3	8254 6.005	8255 6.005
6.00	6.00	5.70	75	13.0	38.0	0.80	3	8254 6.008	8255 6.008
6.00	6.00	5.70	75	13.0	38.0	1.00	3	8254 6.010	8255 6.010
8.00	8.00	7.70	86	19.0	49.0	0.20	3	8254 8.002	8255 8.002
8.00	8.00	7.70	86	19.0	49.0	0.50	3	8254 8.005	8255 8.005
8.00	8.00	7.70	86	19.0	49.0	0.80	3	8254 8.008	8255 8.008
8.00	8.00	7.70	86	19.0	49.0	1.00	3	8254 8.010	8255 8.010
8.00	8.00	7.70	86	19.0	49.0	2.00	3	8254 8.020	8255 8.020
10.00	10.00	9.50	100	22.0	60.0	0.30	3	8254 10.003	8255 10.003
10.00	10.00	9.50	100	22.0	60.0	0.50	3	8254 10.005	8255 10.005
10.00	10.00	9.50	100	22.0	60.0	0.80	3	8254 10.008	8255 10.008
10.00	10.00	9.50	100	22.0	60.0	1.00	3	8254 10.010	8255 10.010
10.00	10.00	9.50	100	22.0	60.0	1.50	3	8254 10.015	8255 10.015
12.00	12.00	11.50	120	26.0	74.0	0.30	3	8254 12.003	8255 12.003
12.00	12.00	11.50	120	26.0	74.0	0.50	3	8254 12.005	8255 12.005
12.00	12.00	11.50	120	26.0	74.0	0.80	3	8254 12.008	8255 12.008
12.00	12.00	11.50	120	26.0	74.0	1.00	3	8254 12.010	8255 12.010
12.00	12.00	11.50	120	26.0	74.0	1.50	3	8254 12.015	8255 12.015
12.00	12.00	11.50	120	26.0	74.0	2.00	3	8254 12.020	8255 12.020
12.00	12.00	11.50	120	26.0	74.0	3.00	3	8254 12.030	8255 12.030
16.00	16.00	15.50	150	32.0	101.0	0.50	3	8254 16.005	8255 16.005
16.00	16.00	15.50	150	32.0	101.0	1.00	3	8254 16.010	8255 16.010
16.00	16.00	15.50	150	32.0	101.0	1.50	3	8254 16.015	8255 16.015
16.00	16.00	15.50	150	32.0	101.0	2.00	3	8254 16.020	8255 16.020
16.00	16.00	15.50	150	32.0	101.0	2.50	3	8254 16.025	8255 16.025
16.00	16.00	15.50	150	32.0	101.0	3.00	3	8254 16.030	8255 16.030
16.00	16.00	15.50	150	32.0	101.0	4.00	3	8254 16.040	8255 16.040
20.00	20.00	19.50	175	38.0	124.0	0.50	3	8254 20.005	8255 20.005
20.00	20.00	19.50	175	38.0	124.0	1.00	3	8254 20.010	8255 20.010
20.00	20.00	19.50	175	38.0	124.0	1.50	3	8254 20.015	8255 20.015
20.00	20.00	19.50	175	38.0	124.0	2.00	3	8254 20.020	8255 20.020
20.00	20.00	19.50	175	38.0	124.0	2.50	3	8254 20.025	8255 20.025
20.00	20.00	19.50	175	38.0	124.0	3.00	3	8254 20.030	8255 20.030
20.00	20.00	19.50	175	38.0	124.0	4.00	3	8254 20.040	8255 20.040

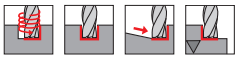
Ratio roughing end mills Alu RF 100 AL — Article no. 6464

NEW | VHM | Cb+ | W | WN | 30° 29° 31° | 3 | HA | 45° | 12°

neck clearance • centre cutting • with internal cooling: radial and axial exits

cutting data see page 167

P	M	K	N	S	H	O
			●			○



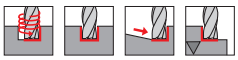
Ratio roughing end mills Alu RF 100 AL — Article no. 6465

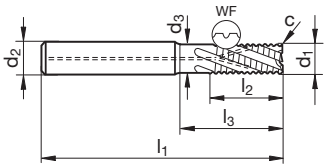
NEW | VHM | Cb+ | W | WN | 30° 29° 31° | 3 | HB | 45° | 12°

neck clearance • centre cutting • with internal cooling: radial and axial exits

cutting data see page 167

P	M	K	N	S	H	O
			●			○





Article no.		6464	6465
d1 js9 mm	d2 h5 mm	d3 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Order no.	
6.00	6.00	5.70	57	13.0	20.0	0.06	3	6464 6.000	6465 6.000
8.00	8.00	7.70	63	19.0	26.0	0.08	3	6464 8.000	6465 8.000
10.00	10.00	9.50	72	22.0	30.0	0.10	3	6464 10.000	6465 10.000
12.00	12.00	11.50	83	26.0	36.0	0.12	3	6464 12.000	6465 12.000
16.00	16.00	15.50	92	32.0	42.0	0.16	3	6464 16.000	6465 16.000
20.00	20.00	19.50	104	38.0	52.0	0.20	3	6464 20.000	6465 20.000

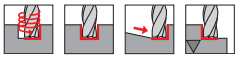
Ratio roughing end mills Alu RF 100 AL — Article no. 6466

NEW | VHM | Cb+ | W | WN | 30° 29° 31° | 3 | HA | 45° | 12°

neck clearance • centre cutting • with internal cooling: radial and axial exits

cutting data see page 167

P	M	K	N	S	H	O
			●			○



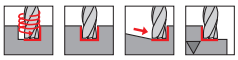
Ratio roughing end mills Alu RF 100 AL — Article no. 6467

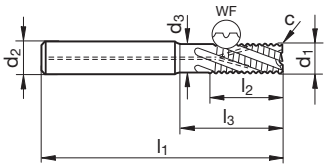
NEW | VHM | Cb+ | W | WN | 30° 29° 31° | 3 | HB | 45° | 12°

neck clearance • centre cutting • with internal cooling: radial and axial exits

cutting data see page 167

P	M	K	N	S	H	O
			●			○





Article no.		6466	6467
d1 js9 mm	d2 h5 mm	d3 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Order no.	
6.00	6.00	5.70	65	13.0	28.0	0.06	3	6466 6.000	6467 6.000
8.00	8.00	7.70	75	19.0	38.0	0.08	3	6466 8.000	6467 8.000
10.00	10.00	9.50	80	22.0	38.0	0.10	3	6466 10.000	6467 10.000
12.00	12.00	11.50	93	26.0	46.0	0.12	3	6466 12.000	6467 12.000
16.00	16.00	15.50	108	32.0	58.0	0.16	3	6466 16.000	6467 16.000
20.00	20.00	19.50	126	38.0	74.0	0.20	3	6466 20.000	6467 20.000

Ratio roughing end mills Alu RF 100 AL

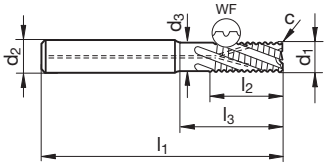
Article no. **6463**

cutting data see page 167

NEW | VHM | Cb+ | W | WN | 30° 29° 31° | 5xD | 3 | HA | 45° | 12°

P	M	K	N	S	H	O
			●			○

neck clearance • centre cutting • with internal cooling: radial and axial exits



Article no.								6463
d1 js9 mm	d2 h5 mm	d3 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Order no.
10.00	10.00	9.50	100	22.0	58.0	0.10	3	6463 10.000
12.00	12.00	11.50	108	26.0	61.0	0.12	3	6463 12.000
16.00	16.00	15.50	132	32.0	82.0	0.16	3	6463 16.000
20.00	20.00	19.50	154	38.0	102.0	0.20	3	6463 20.000
25.00	25.00	24.00	185	45.0	127.0	0.25	3	6463 25.000

Ratio end mills RF 100 AL µF

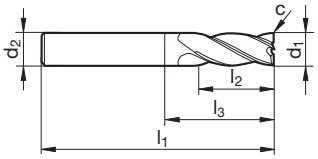
Article no. **8220**

cutting data see page 168

NEW | VHM | Cb+ | W | WN | 40° | 2,2xD | 4 | HA | 45° | 10°

P	M	K	N	S	H	O
			●			○

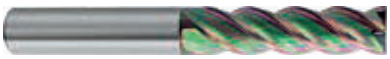
nano polished cutting edges • centre cutting • cylindrical support land and unequal cutting edge pitch for optimal running smoothness • narrow tolerance without taper for maximum component accuracy



Article no.							8220
d1 js7 mm	d2 h5 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Order no.
1.00	4.00	38	2.5	2.7	0.020	4	8220 1.000
1.50	4.00	45	3.8	4.0	0.030	4	8220 1.500
2.00	6.00	50	5.0	5.6	0.040	4	8220 2.000
2.50	6.00	50	6.3	7.3	0.050	4	8220 2.500
3.00	6.00	50	7.5	9.1	0.060	4	8220 3.000
4.00	6.00	54	11.0	14.0	0.080	4	8220 4.000
5.00	6.00	57	14.0	18.0	0.100	4	8220 5.000
6.00	6.00	57	16.0	21.0	0.120	4	8220 6.000
8.00	8.00	63	21.0	27.0	0.160	4	8220 8.000
10.00	10.00	72	25.0	32.0	0.200	4	8220 10.000
12.00	12.00	83	30.0	38.0	0.240	4	8220 12.000
14.00	14.00	83	31.0	38.0	0.280	4	8220 14.000
16.00	16.00	92	36.0	44.0	0.320	4	8220 16.000
20.00	20.00	104	44.0	54.0	0.400	4	8220 20.000

Ratio end mills RF 100 AL µF

Article no. **8221**

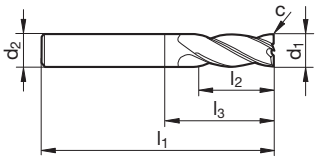


cutting data see page 168

P	M	K	N	S	H	O
			●			○

NEW | VHM | Cb+ | W | WN | 40° | 3,2xD | 4 | HA | 45° | 10°

nano polished cutting edges • centre cutting • cylindrical support land and unequal cutting edge pitch for optimal running smoothness • narrow tolerance without taper for maximum component accuracy



Article no. **8221**

d1 js7 mm	d2 h5 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Order no.
1.00	4.00	38	4.0	4.2	0.020	4	8221 1.000
1.50	4.00	45	6.0	6.3	0.030	4	8221 1.500
2.00	6.00	57	8.0	8.6	0.040	4	8221 2.000
2.50	6.00	57	10.0	11.0	0.050	4	8221 2.500
3.00	6.00	57	12.0	13.6	0.060	4	8221 3.000
4.00	6.00	57	15.0	18.0	0.080	4	8221 4.000
5.00	6.00	65	17.0	21.0	0.100	4	8221 5.000
6.00	6.00	65	21.0	29.0	0.120	4	8221 6.000
8.00	8.00	75	28.0	39.0	0.160	4	8221 8.000
10.00	10.00	80	33.0	40.0	0.200	4	8221 10.000
12.00	12.00	93	41.0	48.0	0.240	4	8221 12.000
14.00	14.00	100	46.0	55.0	0.280	4	8221 14.000
16.00	16.00	108	52.0	60.0	0.320	4	8221 16.000
20.00	20.00	126	65.0	76.0	0.400	4	8221 20.000

Ratio end mills RF 100 AL µF

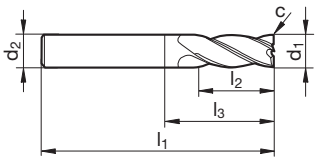
Article no. **8222**

cutting data see page 168

P	M	K	N	S	H	O
			●			○

NEW | VHM | Cb+ | W | WN | 40° | 5,2xD | 4 | HA | 45° | 10°

nano polished cutting edges • centre cutting • cylindrical support land and unequal cutting edge pitch for optimal running smoothness • narrow tolerance without taper for maximum component accuracy



Article no. **8222**

d1 js7 mm	d2 h5 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Order no.
1.00	4.00	45	6.0	6.2	0.020	4	8222 1.000
1.50	4.00	50	9.0	9.3	0.030	4	8222 1.500
2.00	6.00	57	12.0	12.6	0.040	4	8222 2.000
2.50	6.00	65	15.0	16.0	0.050	4	8222 2.500
3.00	6.00	65	18.0	19.6	0.060	4	8222 3.000
4.00	6.00	65	22.0	25.0	0.080	4	8222 4.000
5.00	6.00	69	28.0	32.0	0.100	4	8222 5.000
6.00	6.00	75	33.0	39.0	0.120	4	8222 6.000
8.00	8.00	86	44.0	50.0	0.160	4	8222 8.000
10.00	10.00	100	55.0	60.0	0.200	4	8222 10.000
12.00	12.00	120	65.0	75.0	0.240	4	8222 12.000
14.00	14.00	150	85.0	105.0	0.280	4	8222 14.000
16.00	16.00	150	85.0	102.0	0.320	4	8222 16.000
20.00	20.00	175	105.0	125.0	0.400	4	8222 20.000

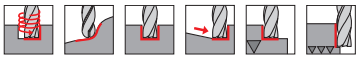
Ball nose end mills GA 200 A

Article no. **6916**

neck clearance • centre cutting

cutting data see page 169

P	M	K	N	S	H	O
			●			○



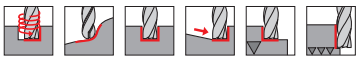
Ball nose end mills GA 200 A

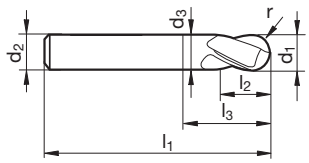
Article no. **6917**

neck clearance • centre cutting

cutting data see page 169

P	M	K	N	S	H	O
			●			○





	Article no.	6916	6917
d1 h10 mm	d2 h6 mm	d3 mm	l1 mm	l2 mm	l3 mm	r mm	Z	Order no.	
3.00	6.00	2.80	57	4.0	15.0	1.50	2	6916 3.000	6917 3.000
4.00	6.00	3.80	57	5.0	18.0	2.00	2	6916 4.000	6917 4.000
5.00	6.00	4.80	57	6.0	18.0	2.50	2	6916 5.000	6917 5.000
6.00	6.00	5.70	57	7.0	20.0	3.00	2	6916 6.000	6917 6.000
8.00	8.00	7.70	63	9.0	26.0	4.00	2	6916 8.000	6917 8.000
10.00	10.00	9.50	72	11.0	30.0	5.00	2	6916 10.000	6917 10.000
12.00	12.00	11.50	83	12.0	36.0	6.00	2	6916 12.000	6917 12.000
16.00	16.00	15.50	92	16.0	42.0	8.00	2	6916 16.000	6917 16.000

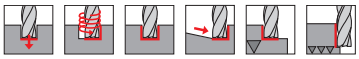
End mills (single-fluted)

Article no. **6793**

centre cutting • polished flutes

cutting data see page 170

P	M	K	N	S	H	O
			•			•



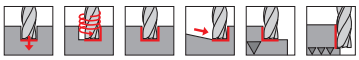
End mills (single-fluted)

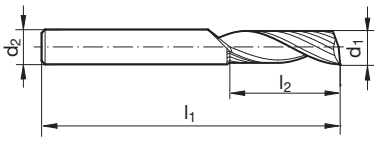
Article no. **8138**

centre cutting • polished flutes

cutting data see page 170

P	M	K	N	S	H	O
			•			•





Article no.		6793	8138
d1 h10 mm	d2 h6 mm	l1 mm	l2 mm	Z	Order no.	
2.00	2.00	38	10.0	1	6793 2.000	8138 2.000
3.00	3.00	39	12.0	1	6793 3.000	8138 3.000
4.00	4.00	40	15.0	1	6793 4.000	8138 4.000
5.00	5.00	50	16.0	1	6793 5.000	8138 5.000
6.00	6.00	57	20.0	1	6793 6.000	8138 6.000
8.00	8.00	63	22.0	1	6793 8.000	8138 8.000
10.00	10.00	73	25.0	1	6793 10.000	8138 10.000
12.00	12.00	83	30.0	1	6793 12.000	8138 12.000
16.00	16.00	92	35.0	1	6793 16.000	8138 16.000

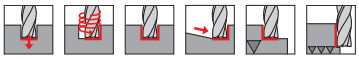
End mills (single-fluted)

Article no. **6935**

centre cutting • polished flutes

cutting data see page 170

P	M	K	N	S	H	O
			•			•



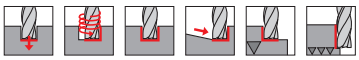
End mills (single-fluted)

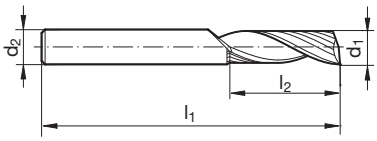
Article no. **8135**

centre cutting • polished flutes

cutting data see page 170

P	M	K	N	S	H	O
			•			•





Article no.	6935	8135

d1 h10 mm	d2 h6 mm	l1 mm	l2 mm	Z	Order no.	
3.00	3.00	55	18.0	1	6935 3.000	8135 3.000
4.00	4.00	60	22.0	1	6935 4.000	8135 4.000
5.00	5.00	60	24.0	1	6935 5.000	8135 5.000
6.00	6.00	80	30.0	1	6935 6.000	8135 6.000
8.00	8.00	80	32.0	1	6935 8.000	8135 8.000
10.00	10.00	100	45.0	1	6935 10.000	8135 10.000
12.00	12.00	110	52.0	1	6935 12.000	8135 12.000
16.00	16.00	120	55.0	1	6935 16.000	8135 16.000

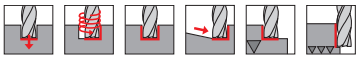
End mills (single-fluted)

Article no. **6936**

centre cutting • polished flutes

cutting data see page 170

P	M	K	N	S	H	O
			•			•



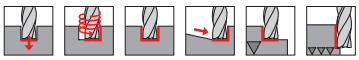
End mills (single-fluted)

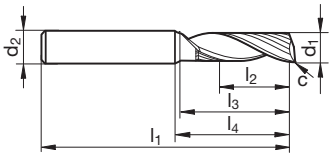
Article no. **8136**

centre cutting • polished flutes

cutting data see page 170

P	M	K	N	S	H	O
			•			•





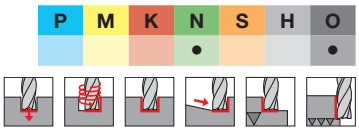
d1 h10 mm	d2 h6 mm	l1 mm	l2 mm	l3 mm	l4 mm	c mm x 45°	Z	Article no. 6936 Order no.	Article no. 8136 Order no.
1.00	6.00	50	5.0	7.2	14.000	0.025	1	6936 1.000	8136 1.000
1.50	6.00	50	7.0	9.7	15.060	0.030	1	6936 1.500	8136 1.500
2.00	6.00	57	10.0	13.7	19.000	0.035	1	6936 2.000	8136 2.000
3.00	6.00	57	12.0	15.7	19.000	0.050	1	6936 3.000	8136 3.000
4.00	6.00	57	14.0	18.0	21.000	0.065	1	6936 4.000	8136 4.000
5.00	6.00	57	16.0	17.5	21.000	0.080	1	6936 5.000	8136 5.000
6.00	6.00	57	20.0	21.0	21.000	0.100	1	6936 6.000	8136 6.000
8.00	8.00	63	22.0	27.0	27.000	0.100	1	6936 8.000	8136 8.000
10.00	10.00	73	25.0	33.0	33.000	0.130	1	6936 10.000	8136 10.000

End mills (single-fluted)

Article no. **6937**

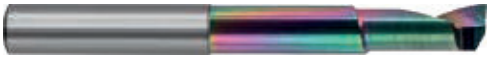
neck clearance • centre cutting • polished flutes

cutting data see page 170



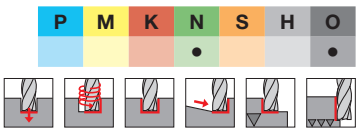
End mills (single-fluted)

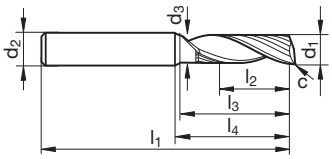
Article no. **8137**



neck clearance • centre cutting • polished flutes

cutting data see page 170

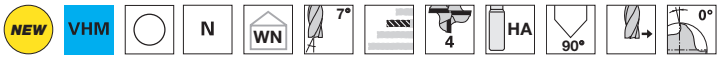




d1 h10 mm	d2 h6 mm	d3 mm	l1 mm	l2 mm	l3 mm	l4 mm	c mm	Z	Article no. 6937 Order no.	Article no. 8137 Order no.
1.00	6.00	0.92	50	2.5	7.0	17.140	0.025	1	6937 1.000	8137 1.000
1.50	6.00	1.40	57	4.0	11.0	20.240	0.030	1	6937 1.500	8137 1.500
2.00	6.00	1.85	57	6.0	14.0	22.400	0.035	1	6937 2.000	8137 2.000
3.00	6.00	2.85	65	8.0	22.0	27.280	0.050	1	6937 3.000	8137 3.000
4.00	6.00	3.80	65	11.0	28.0	31.370	0.065	1	6937 4.000	8137 4.000
5.00	6.00	4.80	80	13.0	35.0	37.000	0.080	1	6937 5.000	8137 5.000
6.00	6.00	5.70	80	13.0	41.0	42.000	0.100	1	6937 6.000	8137 6.000
8.00	8.00	7.70	80	19.0	41.0	42.000	0.100	1	6937 8.000	8137 8.000
10.00	10.00	9.50	100	22.0	59.0	60.000	0.130	1	6937 10.000	8137 10.000

90° Chamfering milling cutters

Article no. **6918**

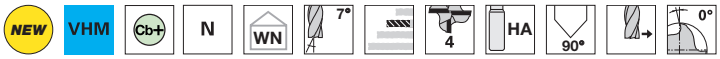


cutting data see page 171

P	M	K	N	S	H	O
			●			○

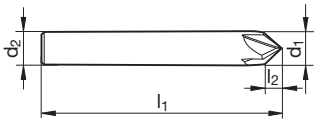
90° Chamfering milling cutters

Article no. **6919**



cutting data see page 171

P	M	K	N	S	H	O
			●			○



Article no.		6918	6919
d1 js9 mm	d2 h6 mm	l1 mm	l2 mm	Z	Order no.	
4.00	4.00	50.0	2.0	4	6918 4.000	6919 4.000
6.00	6.00	57.0	3.0	4	6918 6.000	6919 6.000
8.00	8.00	63.0	4.0	4	6918 8.000	6919 8.000
10.00	10.00	72.0	5.0	4	6918 10.000	6919 10.000
12.00	12.00	83.0	6.0	4	6918 12.000	6919 12.000

End mills CR 200 for fibre-reinforced plastics

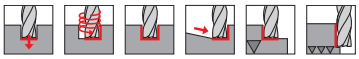
Article no. **6925**

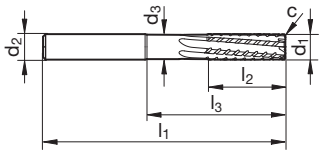
cutting data see page 172

NEW | VHM | CR 200 | WN | 5° | 6-8 | HA | 45° | 10°

for fibre-reinforced plastics (FRP) • with face milling geometry • neck clearance • centre cutting

P	M	K	N	S	H	O
						•





Article no. **6925**

d1 e10 mm	d2 h6 mm	d3 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Order no.
4.00	6.00	3.80	66	17.0	25.0	0.20	6	6925 4.000
4.76	6.35	4.56	63	17.0	24.3	0.20	6	6925 4.762
6.00	6.00	5.70	70	17.0	32.7	0.20	6	6925 6.000
6.35	6.35	6.05	70	17.0	33.7	0.20	6	6925 6.350
8.00	8.00	7.70	75	25.0	37.7	0.20	8	6925 8.000
9.52	9.52	9.22	76	30.0	38.8	0.20	8	6925 9.525
10.00	10.00	9.50	85	30.0	43.5	0.20	8	6925 10.000
12.00	12.00	11.50	93	32.0	46.3	0.20	8	6925 12.000
12.70	12.70	12.20	88	32.0	42.0	0.20	8	6925 12.700

End mills CR 200 for fibre-reinforced plastics

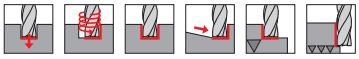
Article no. **6930**

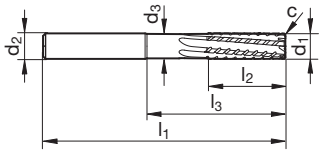
cutting data see page 172

NEW | VHM | D | CR 200 | WN | 5° | 6-8 | HA | 45° | 10°

for fibre-reinforced plastics (FRP) • with face milling geometry • neck clearance • centre cutting

P	M	K	N	S	H	O
						•





Article no. **6930**

d1 e10 mm	d2 h6 mm	d3 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Order no.
4.00	6.00	3.80	66	17.0	25.0	0.20	6	6930 4.000
4.76	6.35	4.56	63	17.0	24.3	0.20	6	6930 4.762
6.00	6.00	5.70	70	17.0	32.7	0.20	6	6930 6.000
6.35	6.35	6.05	70	17.0	33.7	0.20	6	6930 6.350
8.00	8.00	7.70	75	25.0	37.7	0.20	8	6930 8.000
9.52	9.52	9.22	76	30.0	38.8	0.20	8	6930 9.525
10.00	10.00	9.50	85	30.0	43.5	0.20	8	6930 10.000
12.00	12.00	11.50	93	32.0	46.3	0.20	8	6930 12.000
12.70	12.70	12.20	88	32.0	42.0	0.20	8	6930 12.700

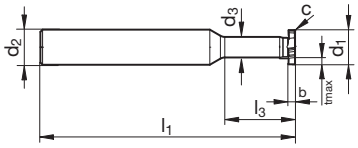
Circular milling cutters, corner chamfer

Article no. **6949**

cutting data see page 174

P	M	K	N	S	H
●	●	○	○	○	

for circular groove and contour milling • high running smoothness due to positive rake and helix angle with unequal pitch • neck clearance • without centre cutting



Article no. **6949**

d1 h10 mm	d2 h6 mm	d3 mm	l1 mm	l3 mm	b mm	tmax. mm	c mm	Z	Order no.
3.80	6.00	2.280	54.0	9.000	0.500	0.560	0.050	3	6949 3.801
3.80	6.00	2.280	54.0	9.000	1.000	0.560	0.050	3	6949 3.802
5.80	6.00	3.480	54.0	12.000	1.000	0.960	0.050	3	6949 5.801
5.80	6.00	3.480	54.0	12.000	1.500	0.960	0.050	3	6949 5.802
7.80	8.00	4.680	58.0	16.000	1.000	1.360	0.050	4	6949 7.801
7.80	8.00	4.680	58.0	16.000	1.500	1.360	0.050	4	6949 7.802
9.80	10.00	5.880	66.0	20.000	1.000	1.760	0.050	4	6949 9.801
9.80	10.00	5.880	66.0	20.000	1.500	1.760	0.050	4	6949 9.802
11.80	12.00	7.080	83.0	24.000	1.500	2.160	0.050	6	6949 11.801
11.80	12.00	7.080	83.0	24.000	2.000	2.160	0.050	6	6949 11.802
11.80	12.00	7.080	83.0	24.000	2.500	2.160	0.050	6	6949 11.803
11.80	12.00	7.080	83.0	24.000	3.000	2.160	0.050	6	6949 11.804

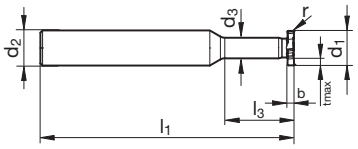
Circular milling cutters, corner radius

Article no. **6950**

cutting data see page 174

P	M	K	N	S	H
●	●	○	○	○	

for circular groove and contour milling • high running smoothness due to positive rake and helix angle with unequal pitch • neck clearance • without centre cutting



Article no. **6950**

d1 h10 mm	d2 h6 mm	d3 mm	l1 mm	l3 mm	b mm	tmax. mm	r mm	Z	Order no.
7.80	8.00	4.680	58.0	16.000	1.500	1.360	0.150	4	6950 7.801
7.80	8.00	4.680	58.0	16.000	2.000	1.360	0.150	4	6950 7.802
9.80	10.00	5.880	66.0	20.000	1.500	1.760	0.150	4	6950 9.801
9.80	10.00	5.880	66.0	20.000	2.000	1.760	0.150	4	6950 9.802
9.80	10.00	5.880	66.0	20.000	2.500	1.760	0.150	4	6950 9.803
9.80	10.00	5.880	66.0	20.000	3.000	1.760	0.150	4	6950 9.804
11.80	12.00	7.080	83.0	24.000	1.500	2.160	0.150	6	6950 11.801
11.80	12.00	7.080	83.0	24.000	2.000	2.160	0.150	6	6950 11.802
11.80	12.00	7.080	83.0	24.000	2.500	2.160	0.150	6	6950 11.803
11.80	12.00	7.080	83.0	24.000	3.000	2.160	0.150	6	6950 11.804
11.80	12.00	7.080	83.0	24.000	4.000	2.160	0.150	6	6950 11.805

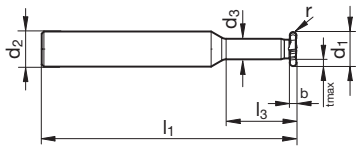
Circular milling cutters, full radius

Article no. **6951**

cutting data see page 174

P	M	K	N	S	H
●	●	○	○	○	

for circular groove and contour milling • high running smoothness due to positive rake and helix angle with unequal pitch • neck clearance • without centre cutting



Article no. **6951**

d1 h10 mm	d2 h6 mm	d3 mm	l1 mm	l3 mm	b mm	tmax. mm	r mm	Z	Order no.
3.80	6.00	2.280	54.0	9.000	1.000	0.560	0.500	3	6951 3.801
5.80	6.00	3.480	54.0	12.000	1.000	0.960	0.500	3	6951 5.801
5.80	6.00	3.480	54.0	12.000	1.500	0.960	0.750	3	6951 5.802
7.80	8.00	4.680	58.0	16.000	1.000	1.360	0.500	4	6951 7.801
7.80	8.00	4.680	58.0	16.000	1.500	1.360	0.750	4	6951 7.802
7.80	8.00	4.680	58.0	16.000	2.000	1.360	1.000	4	6951 7.803
9.80	10.00	5.880	66.0	20.000	1.000	1.760	0.500	4	6951 9.801
9.80	10.00	5.880	66.0	20.000	1.500	1.760	0.750	4	6951 9.802
9.80	10.00	5.880	66.0	20.000	2.000	1.760	1.000	4	6951 9.803
9.80	10.00	5.880	66.0	20.000	2.500	1.760	1.250	4	6951 9.804
9.80	10.00	5.880	66.0	20.000	3.000	1.760	1.500	4	6951 9.805
11.80	12.00	7.080	83.0	24.000	2.000	2.160	1.000	4	6951 11.801
11.80	12.00	7.080	83.0	24.000	3.000	2.160	1.500	4	6951 11.802

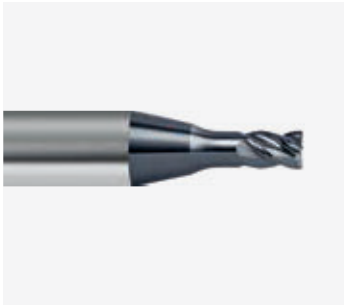
RF 100 Sharp short shank

Milling conditions:

HPC	stable machining conditions high drive power
M7C	unstable machining conditions low drive power
	long tools

Correction factors:

	a_p roughing > 1,5 x D	v_c -25 %	f_z -25 %
XS	extra short tools		f_z +40 %
	medium length tools	v_c -40 %	f_z -40 %



Machining group	Application	v_c (m/min)	a_e max.	f_z (mm/z) with nom. Ø					
				0.8	1	1.5	2	2.5	3
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	Slotting	180	1xD	0.0040	0.0050	0.0080	0.0110	0.0130	0.0160
	Roughing	205	0.75xD	0.0060	0.0070	0.0100	0.0140	0.0170	0.0210
	Finishing	360	0.02xD	0.0050	0.0070	0.0100	0.0130	0.0170	0.0200
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	Slotting	160	1xD	0.0040	0.0050	0.0070	0.0100	0.0120	0.0150
	Roughing	185	0.75xD	0.0050	0.0060	0.0090	0.0130	0.0160	0.0190
	Finishing	320	0.02xD	0.0050	0.0060	0.0090	0.0120	0.0150	0.0180
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	Slotting	135	1xD	0.0040	0.0040	0.0070	0.0090	0.0110	0.0130
	Roughing	155	0.75xD	0.0050	0.0060	0.0090	0.0120	0.0140	0.0170
	Finishing	270	0.02xD	0.0040	0.0060	0.0080	0.0110	0.0140	0.0170
M1.1.1 Stainless steel, ferritic/martensitic, with machining additives **M1.1.2** Stainless steel, ferritic/martensitic, annealed, Rm 680 N/mm², 200 HB	Slotting	120	1xD	0.0040	0.0040	0.0070	0.0090	0.0110	0.0130
	Roughing	140	0.75xD	0.0050	0.0060	0.0090	0.0120	0.0140	0.0170
	Finishing	240	0.02xD	0.0040	0.0060	0.0080	0.0110	0.0140	0.0170
M1.1.3 Stainless steel, ferritic/martensitic, heat-treated, Rm 810 N/mm², 240 HB	Slotting	90	1xD	0.0030	0.0040	0.0060	0.0080	0.0100	0.0120
	Roughing	100	0.75xD	0.0040	0.0050	0.0080	0.0100	0.0130	0.0160
	Finishing	175	0.02xD	0.0040	0.0050	0.0070	0.0100	0.0120	0.0150
M2.1.1 Stainless steel, austenitic, quenched, 180 HB	Slotting	80	1xD	0.0030	0.0040	0.0060	0.0080	0.0100	0.0120
	Roughing	100	0.6xD	0.0040	0.0050	0.0080	0.0110	0.0140	0.0160
	Finishing	160	0.01xD	0.0040	0.0050	0.0070	0.0090	0.0110	0.0140
M2.2.1 Duplex steel, high-strength stainless steels	Slotting	60	1xD	0.0030	0.0030	0.0050	0.0070	0.0090	0.0100
	Roughing	75	0.6xD	0.0040	0.0050	0.0070	0.0090	0.0120	0.0140
	Finishing	120	0.01xD	0.0030	0.0040	0.0060	0.0080	0.0100	0.0120
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 **N1.1.2** Wrought aluminium alloys, hardened, 100 HB	Slotting	500	1xD	0.0060	0.0070	0.0110	0.0140	0.0180	0.0210
	Roughing	575	0.75xD	0.0070	0.0090	0.0140	0.0180	0.0230	0.0280
	Finishing	1000	0.02xD	0.0070	0.0090	0.0130	0.0180	0.0220	0.0260
N2.1.1 Aluminium casting alloys, non-hardened, ≤ 12 % Si, 75 HB **N2.1.2** Aluminium casting alloys, hardened, ≤ 12 % Si, 90 HB	Slotting	230	1xD	0.0040	0.0050	0.0080	0.0110	0.0130	0.0160
	Roughing	265	0.75xD	0.0060	0.0070	0.0100	0.0140	0.0170	0.0210
	Finishing	460	0.02xD	0.0050	0.0070	0.0100	0.0130	0.0170	0.0200
N2.1.3 Aluminium casting alloys, non-hardened, > 12 % Si, 130 HB	Slotting	180	1xD	0.0040	0.0050	0.0080	0.0110	0.0130	0.0160
	Roughing	180	0.75xD	0.0050	0.0060	0.0090	0.0120	0.0150	0.0180
	Finishing	365	0.02xD	0.0050	0.0070	0.0100	0.0130	0.0170	0.0200

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

Machining group	Application	v_c (m/min)	a_e max.	f_z (mm/z) with nom. Ø					
				0.8	1	1.5	2	2.5	3
N3.1.1 Copper and copper alloys: Free-machining alloy, Pb > 1 % **N3.1.2** Copper and copper alloys: CuZn, CuSnZn	Slotting	250	1xD	0.0040	0.0050	0.0080	0.0110	0.0130	0.0160
	Roughing	290	0.75xD	0.0060	0.0070	0.0100	0.0140	0.0170	0.0210
	Finishing	500	0.02xD	0.0050	0.0070	0.0100	0.0130	0.0170	0.0200
N3.1.3 Copper and copper alloys: CuSn, lead-free copper and copper electrolyte	Slotting	195	1xD	0.0040	0.0050	0.0070	0.0100	0.0120	0.0150
	Roughing	225	0.75xD	0.0050	0.0060	0.0100	0.0130	0.0160	0.0190
	Finishing	390	0.02xD	0.0050	0.0060	0.0090	0.0120	0.0150	0.0180
N4.1.1 Non-metallic materials: Duroplastics, fibre-reinforced plastics	Slotting	150	1xD	0.0040	0.0060	0.0080	0.0110	0.0140	0.0170
	Roughing	175	0.75xD	0.0060	0.0070	0.0110	0.0140	0.0180	0.0220
	Finishing	300	0.02xD	0.0060	0.0070	0.0100	0.0140	0.0170	0.0210
N4.1.2 Non-metallic materials: Hard rubber, wood, etc.	Slotting	200	1xD	0.0040	0.0050	0.0070	0.0100	0.0120	0.0150
	Roughing	230	0.75xD	0.0050	0.0060	0.0100	0.0130	0.0160	0.0190
	Finishing	400	0.02xD	0.0050	0.0060	0.0090	0.0120	0.0150	0.0190
N4.1.3 Non-metallic materials: Graphite	Slotting	240	1xD	0.0060	0.0070	0.0110	0.0140	0.0180	0.0210
	Roughing	275	0.75xD	0.0070	0.0090	0.0140	0.0180	0.0230	0.0280
	Finishing	480	0.02xD	0.0070	0.0090	0.0130	0.0180	0.0220	0.0260
S1.1.1 Heat-resistant alloys, Fe-based, annealed, 200 HB	Slotting	30	1xD	0.0030	0.0040	0.0050	0.0070	0.0090	0.0110
	Roughing	40	0.6xD	0.0040	0.0050	0.0070	0.0100	0.0120	0.0140
	Finishing	60	0.01xD	0.0030	0.0040	0.0060	0.0080	0.0100	0.0120
S1.1.2 Heat-resistant alloys, Fe-based, hardened, 280 HB	Slotting	25	1xD	0.0030	0.0040	0.0050	0.0070	0.0090	0.0110
	Roughing	30	0.6xD	0.0040	0.0050	0.0070	0.0100	0.0120	0.0140
	Finishing	50	0.01xD	0.0030	0.0040	0.0060	0.0080	0.0100	0.0120
S1.1.3 Heat-resistant alloys, Ni- or Co-based, annealed, 250 HB	Slotting	15	1xD	0.0020	0.0030	0.0040	0.0060	0.0070	0.0090
	Roughing	20	0.6xD	0.0030	0.0040	0.0060	0.0080	0.0100	0.0120
	Finishing	35	0.01xD	0.0030	0.0030	0.0050	0.0060	0.0080	0.0100
S1.1.4 Heat-resistant alloys, Ni- or Co-based, hardened, 350 HB	Slotting	15	1xD	0.0020	0.0030	0.0040	0.0050	0.0070	0.0080
	Roughing	15	0.6xD	0.0030	0.0040	0.0060	0.0070	0.0090	0.0110
	Finishing	25	0.01xD	0.0020	0.0030	0.0050	0.0060	0.0080	0.0090
S1.1.5 Heat-resistant alloys, Ni- or Co-based, cast, 320 HB	Slotting	15	1xD	0.0020	0.0030	0.0040	0.0060	0.0070	0.0090
	Roughing	20	0.6xD	0.0030	0.0040	0.0060	0.0080	0.0100	0.0120
	Finishing	30	0.01xD	0.0030	0.0030	0.0050	0.0060	0.0080	0.0100
S2.1.1 Titanium alloys, pure titanium, Rm 400 N/mm²	Slotting	70	1xD	0.0040	0.0040	0.0070	0.0090	0.0110	0.0130
	Roughing	90	0.6xD	0.0050	0.0060	0.0090	0.0120	0.0150	0.0180
	Finishing	140	0.02xD	0.0040	0.0060	0.0080	0.0110	0.0140	0.0170
S2.1.2 Titanium alloys, Alpha and Beta alloys, hardened, Rm 1050 N/mm²	Slotting	60	1xD	0.0030	0.0040	0.0060	0.0080	0.0100	0.0120
	Roughing	75	0.6xD	0.0040	0.0050	0.0080	0.0110	0.0130	0.0160
	Finishing	120	0.02xD	0.0040	0.0050	0.0070	0.0100	0.0120	0.0150
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 navigator.guehring.de/en.

G-Mold 55 B milling cutters short shank

Milling conditions:

HSC stable machining conditions
low cutting depths, high cutting values

short tools

long tools

Correction factors:

XS	extra short tools		f_z +40 %
	medium length tools	v_c -25 %	f_z -25 %
	extralong tools	v_c -50 %	f_z -50 %
	uncoated tools	v_c -60 %	f_z -25 %

Machining group	Application Copy milling	v_c (m/min)	a_p max.	a_e max.	f_z (mm/z) with nom. Ø 0.5	0.8	1	1.5	2	3
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	Roughing	315	0.1xD	0.3xD	0.010	0.016	0.019	0.029	0.039	0.058
	(Pre-)Finishing	305	0.05xD	0.1xD	0.012	0.019	0.024	0.036	0.048	0.072
	Fine finishing	315	0.01xD	0.02xD	0.010	0.017	0.021	0.031	0.042	0.063
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	Roughing	285	0.1xD	0.3xD	0.010	0.016	0.019	0.029	0.039	0.058
	(Pre-)Finishing	275	0.05xD	0.1xD	0.012	0.019	0.024	0.036	0.048	0.072
	Fine finishing	285	0.01xD	0.02xD	0.010	0.017	0.021	0.031	0.042	0.063
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	Roughing	255	0.1xD	0.3xD	0.008	0.012	0.016	0.023	0.031	0.047
	(Pre-)Finishing	245	0.05xD	0.1xD	0.010	0.015	0.019	0.029	0.038	0.058
	Fine finishing	255	0.01xD	0.02xD	0.008	0.013	0.017	0.025	0.034	0.050
M1.1.1 Stainless steel, ferritic/martensitic, with machining additives **M1.1.2** Stainless steel, ferritic/martensitic, annealed, Rm 680 N/mm², 200 HB	Roughing	200	0.1xD	0.3xD	0.009	0.014	0.018	0.026	0.035	0.053
	(Pre-)Finishing	195	0.05xD	0.1xD	0.011	0.017	0.022	0.032	0.043	0.065
	Fine finishing	200	0.01xD	0.02xD	0.009	0.015	0.019	0.028	0.038	0.057
M1.1.3 Stainless steel, ferritic/martensitic, heat-treated, Rm 810 N/mm², 240 HB	Roughing	150	0.1xD	0.3xD	0.008	0.013	0.016	0.024	0.032	0.048
	(Pre-)Finishing	145	0.05xD	0.1xD	0.010	0.016	0.020	0.029	0.039	0.059
	Fine finishing	150	0.01xD	0.02xD	0.009	0.014	0.017	0.026	0.034	0.051
M2.1.1 Stainless steel, austenitic, quenched, 180 HB	Roughing	150	0.06xD	0.2xD	0.010	0.015	0.019	0.029	0.038	0.058
	(Pre-)Finishing	135	0.02xD	0.05xD	0.010	0.015	0.019	0.029	0.038	0.058
	Fine finishing	135	0.01xD	0.02xD	0.008	0.013	0.017	0.025	0.034	0.050
M2.2.1 Duplex steel, high-strength stainless steels	Roughing	115	0.06xD	0.2xD	0.008	0.013	0.017	0.025	0.034	0.050
	(Pre-)Finishing	100	0.02xD	0.05xD	0.008	0.013	0.017	0.025	0.034	0.050
	Fine finishing	100	0.01xD	0.02xD	0.007	0.012	0.015	0.022	0.029	0.044
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	Roughing	285	0.1xD	0.3xD	0.010	0.016	0.019	0.029	0.039	0.058
	(Pre-)Finishing	275	0.05xD	0.1xD	0.012	0.019	0.024	0.036	0.048	0.072
	Fine finishing	285	0.01xD	0.02xD	0.010	0.017	0.021	0.031	0.042	0.063
K1.3.1 Malleable cast iron, ferritic, 130 HB **K1.3.2** Malleable cast iron, pearlitic, 230 HB	Roughing	235	0.1xD	0.3xD	0.009	0.014	0.017	0.026	0.035	0.052
	(Pre-)Finishing	230	0.05xD	0.1xD	0.011	0.017	0.021	0.032	0.043	0.064
	Fine finishing	235	0.01xD	0.02xD	0.009	0.015	0.019	0.028	0.037	0.056
K2.1.1 Vermicular graphite cast iron (GJV) **K2.2.1** Austenitic-ferritic spheroidal graphite cast iron (ADI)	Roughing	185	0.1xD	0.3xD	0.008	0.012	0.015	0.023	0.030	0.046
	(Pre-)Finishing	180	0.05xD	0.1xD	0.009	0.015	0.019	0.028	0.037	0.056
	Fine finishing	185	0.01xD	0.02xD	0.008	0.013	0.016	0.025	0.033	0.049
N1.1.1 Wrought aluminium alloys, non-hardened, 60 HB **N1.1.2** Wrought aluminium alloys, hardened, 100 HB	Roughing	1135	0.3xD	0.1xD	0.019	0.030	0.038	0.057	0.076	0.114
	(Pre-)Finishing	895	0.1xD	0.05xD	0.013	0.021	0.026	0.040	0.053	0.079
	Fine finishing	895	0.02xD	0.01xD	0.007	0.011	0.013	0.020	0.026	0.040
N2.1.1 Aluminium casting alloys, non-hardened, ≤ 12 % Si, 75 HB **N2.1.2** Aluminium casting alloys, hardened, ≤ 12 % Si, 90 HB	Roughing	565	0.3xD	0.1xD	0.017	0.028	0.034	0.052	0.069	0.103
	(Pre-)Finishing	450	0.1xD	0.05xD	0.012	0.019	0.024	0.036	0.048	0.072
	Fine finishing	450	0.02xD	0.01xD	0.006	0.010	0.012	0.018	0.024	0.036
N2.1.3 Aluminium casting alloys, non-hardened, > 12 % Si, 130 HB	Roughing	450	0.3xD	0.1xD	0.017	0.028	0.034	0.052	0.069	0.103
	(Pre-)Finishing	355	0.1xD	0.05xD	0.012	0.019	0.024	0.036	0.048	0.072
	Fine finishing	355	0.02xD	0.01xD	0.006	0.010	0.012	0.018	0.024	0.036

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

Machining group	Application Copy milling	v_c (m/min)	a_p max.	a_e max.	f_z (mm/z) with nom. Ø					
					0.5	0.8	1	1.5	2	3
N3.1.1 Copper and copper alloys: Free-machining alloy, Pb > 1 % **N3.1.2** Copper and copper alloys: CuZn, CuSnZn	Roughing	455	0.3xD	0.1xD	0.017	0.028	0.034	0.052	0.069	0.103
	(Pre-)Finishing	360	0.1xD	0.05xD	0.012	0.019	0.024	0.036	0.048	0.072
	Fine finishing	360	0.02xD	0.01xD	0.006	0.010	0.012	0.018	0.024	0.036
N3.1.3 Copper and copper alloys: CuSn, lead-free copper and copper electrolyte	Roughing	355	0.3xD	0.1xD	0.016	0.025	0.032	0.048	0.063	0.095
	(Pre-)Finishing	280	0.1xD	0.05xD	0.011	0.018	0.022	0.033	0.044	0.066
	Fine finishing	280	0.02xD	0.01xD	0.006	0.009	0.011	0.017	0.022	0.033
N4.1.1 Non-metallic materials: Duroplastics, fibre-reinforced plastics	Roughing	375	0.3xD	0.1xD	0.018	0.029	0.037	0.055	0.074	0.110
	(Pre-)Finishing	295	0.1xD	0.05xD	0.013	0.020	0.026	0.038	0.051	0.077
	Fine finishing	295	0.02xD	0.01xD	0.006	0.010	0.013	0.019	0.026	0.038
N4.1.2 Non-metallic materials: Hard rubber, wood, etc.	Roughing	500	0.3xD	0.1xD	0.016	0.026	0.033	0.049	0.066	0.099
	(Pre-)Finishing	395	0.1xD	0.05xD	0.011	0.018	0.023	0.034	0.046	0.069
	Fine finishing	395	0.02xD	0.01xD	0.006	0.009	0.011	0.017	0.023	0.034
N4.1.3 Non-metallic materials: Graphite	Roughing	600	0.3xD	0.1xD	0.023	0.038	0.047	0.070	0.094	0.141
	(Pre-)Finishing	475	0.1xD	0.05xD	0.016	0.026	0.033	0.049	0.065	0.098
	Fine finishing	475	0.02xD	0.01xD	0.008	0.013	0.016	0.025	0.033	0.049
S1.1.1 Heat-resistant alloys, Fe-based, annealed, 200 HB	Roughing	85	0.2xD	0.06xD	0.015	0.024	0.030	0.045	0.060	0.091
	(Pre-)Finishing	65	0.05xD	0.02xD	0.008	0.014	0.017	0.025	0.034	0.051
	Fine finishing	65	0.02xD	0.01xD	0.005	0.008	0.010	0.015	0.019	0.029
S1.1.2 Heat-resistant alloys, Fe-based, hardened, 280 HB	Roughing	75	0.2xD	0.06xD	0.015	0.024	0.030	0.045	0.060	0.091
	(Pre-)Finishing	55	0.05xD	0.02xD	0.008	0.014	0.017	0.025	0.034	0.051
	Fine finishing	55	0.02xD	0.01xD	0.005	0.008	0.010	0.015	0.019	0.029
S1.1.3 Heat-resistant alloys, Ni- or Co-based, annealed, 250 HB	Roughing	50	0.2xD	0.06xD	0.012	0.020	0.025	0.037	0.049	0.074
	(Pre-)Finishing	35	0.05xD	0.02xD	0.007	0.011	0.014	0.021	0.027	0.041
	Fine finishing	35	0.02xD	0.01xD	0.004	0.006	0.008	0.012	0.016	0.024
S1.1.4 Heat-resistant alloys, Ni- or Co-based, hardened, 350 HB	Roughing	35	0.2xD	0.06xD	0.012	0.019	0.023	0.035	0.047	0.070
	(Pre-)Finishing	25	0.05xD	0.02xD	0.007	0.010	0.013	0.020	0.026	0.039
	Fine finishing	25	0.02xD	0.01xD	0.004	0.006	0.007	0.011	0.015	0.022
S1.1.5 Heat-resistant alloys, Ni- or Co-based, cast, 320 HB	Roughing	45	0.2xD	0.06xD	0.012	0.020	0.025	0.037	0.049	0.074
	(Pre-)Finishing	35	0.05xD	0.02xD	0.007	0.011	0.014	0.021	0.027	0.041
	Fine finishing	35	0.02xD	0.01xD	0.004	0.006	0.008	0.012	0.016	0.024
S2.1.1 Titanium alloys, pure titanium, Rm 400 N/mm²	Roughing	120	0.2xD	0.06xD	0.016	0.026	0.033	0.049	0.066	0.099
	(Pre-)Finishing	90	0.05xD	0.02xD	0.009	0.015	0.018	0.028	0.037	0.055
	Fine finishing	90	0.02xD	0.01xD	0.005	0.008	0.011	0.016	0.021	0.032
S2.1.2 Titanium alloys, Alpha and Beta alloys, hardened, Rm 1050 N/mm²	Roughing	100	0.2xD	0.06xD	0.015	0.024	0.030	0.044	0.059	0.089
	(Pre-)Finishing	75	0.05xD	0.02xD	0.008	0.013	0.017	0.025	0.033	0.050
	Fine finishing	75	0.02xD	0.01xD	0.005	0.008	0.009	0.014	0.019	0.028
H1.1.1 Hardened steel, hardened and tempered, < 55 HRC	Roughing	275	0.2xD	0.06xD	0.016	0.025	0.032	0.048	0.063	0.095
	(Pre-)Finishing	205	0.05xD	0.02xD	0.009	0.014	0.018	0.027	0.036	0.053
	Fine finishing	205	0.02xD	0.01xD	0.005	0.008	0.010	0.015	0.020	0.030
H1.1.2 Hardened steel, hardened and tempered, < 60 HRC	Roughing	205	0.2xD	0.06xD	0.013	0.022	0.027	0.040	0.054	0.081
	(Pre-)Finishing	155	0.05xD	0.02xD	0.008	0.012	0.015	0.023	0.030	0.045
	Fine finishing	155	0.02xD	0.01xD	0.004	0.007	0.009	0.013	0.017	0.026
H1.1.3 Hardened steel, hardened and tempered, > 60 HRC	Roughing	165	0.2xD	0.06xD	0.012	0.019	0.024	0.036	0.048	0.071
	(Pre-)Finishing	125	0.05xD	0.02xD	0.007	0.011	0.013	0.020	0.027	0.040
	Fine finishing	125	0.02xD	0.01xD	0.004	0.006	0.008	0.011	0.015	0.023
H2.1.1 Chilled cast iron, 400 HB	Roughing	330	0.3xD	0.1xD	0.015	0.024	0.031	0.046	0.061	0.092
	(Pre-)Finishing	260	0.1xD	0.05xD	0.011	0.017	0.021	0.032	0.043	0.064
	Fine finishing	260	0.02xD	0.01xD	0.005	0.009	0.011	0.016	0.021	0.032
H2.1.2 Chilled cast iron, hardened and tempered, < 55 HRC	Roughing	250	0.2xD	0.06xD	0.015	0.024	0.030	0.044	0.059	0.089
	(Pre-)Finishing	185	0.05xD	0.02xD	0.008	0.013	0.017	0.025	0.033	0.050
	Fine finishing	185	0.02xD	0.01xD	0.005	0.008	0.009	0.014	0.019	0.028

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

RF 100 Sharp

Milling conditions:

HPC	stable machining conditions high drive power
MTC	unstable machining conditions low drive power
	long tools
	long (DIN)+ tools

Correction factors:

	a_p roughing > 1.5xD	v_c -25 %	f_z -25 %
XS	extra short tools	v_c -40 %	f_z -40 %
	medium length tools		f_z +40 %

Cutting data

Machining group	Application	v_c (m/min)	a_e max.	f_z (mm) with nom. Ø								
				1	3	4	6	8	10	12	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	Slotting	180	1xD	0.005	0.016	0.020	0.030	0.040	0.060	0.070	0.095	0.120
	Roughing	205	0.75xD	0.007	0.021	0.030	0.040	0.055	0.070	0.085	0.110	0.140
	Finishing	360	0.02xD	0.007	0.020	0.025	0.040	0.055	0.065	0.080	0.105	0.130
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	Slotting	160	1xD	0.005	0.015	0.020	0.030	0.040	0.055	0.065	0.090	0.110
	Roughing	185	0.75xD	0.006	0.019	0.025	0.040	0.050	0.065	0.075	0.100	0.125
	Finishing	320	0.02xD	0.006	0.018	0.025	0.035	0.050	0.060	0.075	0.095	0.120
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	Slotting	135	1xD	0.004	0.013	0.020	0.025	0.035	0.050	0.060	0.080	0.100
	Roughing	155	0.75xD	0.006	0.017	0.025	0.035	0.045	0.060	0.070	0.090	0.115
	Finishing	270	0.02xD	0.006	0.017	0.020	0.035	0.045	0.055	0.065	0.090	0.110
M1.1.1 Stainless steel, ferritic/martensitic, with machining additives **M1.1.2** Stainless steel, ferritic/martensitic, annealed, Rm 680 N/mm², 200 HB	Slotting	120	1xD	0.004	0.013	0.020	0.025	0.035	0.050	0.060	0.080	0.100
	Roughing	140	0.75xD	0.006	0.017	0.025	0.035	0.045	0.060	0.070	0.090	0.115
	Finishing	240	0.02xD	0.006	0.017	0.020	0.035	0.045	0.055	0.065	0.090	0.110
M1.1.3 Stainless steel, ferritic/martensitic, heat-treated, Rm 810 N/mm², 240 HB	Slotting	90	1xD	0.004	0.012	0.015	0.025	0.030	0.045	0.055	0.070	0.090
	Roughing	100	0.75xD	0.005	0.016	0.020	0.030	0.040	0.050	0.060	0.085	0.105
	Finishing	175	0.02xD	0.005	0.015	0.020	0.030	0.040	0.050	0.060	0.080	0.100
M2.1.1 Stainless steel, austenitic, quenched, 180 HB	Slotting	80	1xD	0.004	0.012	0.015	0.025	0.030	0.045	0.055	0.070	0.090
	Roughing	100	0.6xD	0.005	0.016	0.020	0.030	0.045	0.055	0.065	0.085	0.110
	Finishing	160	0.01xD	0.005	0.014	0.020	0.025	0.035	0.045	0.055	0.070	0.090
M2.2.1 Duplex steel, high-strength stainless steels	Slotting	60	1xD	0.003	0.010	0.015	0.020	0.030	0.040	0.045	0.065	0.080
	Roughing	75	0.6xD	0.005	0.014	0.020	0.030	0.040	0.045	0.055	0.075	0.095
	Finishing	120	0.01xD	0.004	0.012	0.015	0.025	0.030	0.040	0.045	0.065	0.080
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 **N1.1.2** Wrought aluminium alloys, hardened, 100 HB	Slotting	500	1xD	0.007	0.021	0.030	0.040	0.055	0.080	0.095	0.130	0.160
	Roughing	575	0.75xD	0.009	0.028	0.035	0.055	0.075	0.090	0.110	0.145	0.185
	Finishing	1000	0.02xD	0.009	0.026	0.035	0.055	0.070	0.090	0.105	0.140	0.175
N2.1.1 Aluminium casting alloys, non-hardened, ≤ 12 % Si, 75 HB **N2.1.2** Aluminium casting alloys, hardened, ≤ 12 % Si, 90 HB	Slotting	230	1xD	0.005	0.016	0.020	0.030	0.040	0.060	0.070	0.095	0.120
	Roughing	265	0.75xD	0.007	0.021	0.030	0.040	0.055	0.070	0.085	0.110	0.140
	Finishing	460	0.02xD	0.007	0.020	0.025	0.040	0.055	0.065	0.080	0.105	0.130
N2.1.3 Aluminium casting alloys, non-hardened, > 12 % Si, 130 HB	Slotting	180	1xD	0.005	0.016	0.020	0.030	0.040	0.060	0.070	0.095	0.120
	Roughing	180	0.75xD	0.006	0.018	0.025	0.035	0.050	0.060	0.070	0.095	0.120
	Finishing	365	0.02xD	0.007	0.020	0.025	0.040	0.055	0.065	0.080	0.105	0.130

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

Machining group	Application	v_c (m/min)	a_e max.	f_z (mm) with nom. Ø								
				1	3	4	6	8	10	12	16	20
N3.1.1 Copper and copper alloys: Free-machining alloy, Pb > 1 % **N3.1.2** Copper and copper alloys: CuZn, CuSnZn	Slotting	250	1xD	0.005	0.016	0.020	0.030	0.040	0.060	0.070	0.095	0.120
	Roughing	290	0.75xD	0.007	0.021	0.030	0.040	0.055	0.070	0.085	0.110	0.140
	Finishing	500	0.02xD	0.007	0.020	0.025	0.040	0.055	0.065	0.080	0.105	0.130
N3.1.3 Copper and copper alloys: CuSn, lead-free copper and copper electrolyte	Slotting	195	1xD	0.005	0.015	0.020	0.030	0.040	0.055	0.065	0.090	0.110
	Roughing	225	0.75xD	0.006	0.019	0.025	0.040	0.050	0.065	0.075	0.100	0.125
	Finishing	390	0.02xD	0.006	0.018	0.025	0.035	0.050	0.060	0.075	0.095	0.120
N4.1.1 Non-metallic materials: Duroplastics, fibre-reinforced plastics	Slotting	150	1xD	0.006	0.017	0.020	0.035	0.045	0.065	0.075	0.100	0.125
	Roughing	175	0.75xD	0.007	0.022	0.030	0.045	0.060	0.070	0.085	0.115	0.145
	Finishing	300	0.02xD	0.007	0.021	0.030	0.040	0.055	0.070	0.085	0.110	0.140
N4.1.2 Non-metallic materials: Hard rubber, wood, etc.	Slotting	200	1xD	0.005	0.015	0.020	0.030	0.040	0.055	0.065	0.090	0.110
	Roughing	230	0.75xD	0.006	0.019	0.025	0.040	0.050	0.065	0.075	0.105	0.130
	Finishing	400	0.02xD	0.006	0.019	0.025	0.035	0.050	0.060	0.075	0.100	0.125
N4.1.3 Non-metallic materials: Graphite	Slotting	240	1xD	0.007	0.021	0.030	0.040	0.055	0.080	0.095	0.130	0.160
	Roughing	275	0.75xD	0.009	0.028	0.035	0.055	0.075	0.090	0.110	0.145	0.185
	Finishing	480	0.02xD	0.009	0.026	0.035	0.055	0.070	0.090	0.105	0.140	0.175
S1.1.1 Heat-resistant alloys, Fe-based, annealed, 200 HB	Slotting	30	1xD	0.004	0.011	0.015	0.020	0.030	0.040	0.050	0.065	0.080
	Roughing	40	0.6xD	0.005	0.014	0.020	0.030	0.040	0.050	0.060	0.075	0.095
	Finishing	60	0.01xD	0.004	0.012	0.015	0.025	0.030	0.040	0.050	0.065	0.080
S1.1.2 Heat-resistant alloys, Fe-based, hardened, 280 HB	Slotting	25	1xD	0.004	0.011	0.015	0.020	0.030	0.040	0.050	0.065	0.080
	Roughing	30	0.6xD	0.005	0.014	0.020	0.030	0.040	0.050	0.060	0.075	0.095
	Finishing	50	0.01xD	0.004	0.012	0.015	0.025	0.030	0.040	0.050	0.065	0.080
S1.1.3 Heat-resistant alloys, Ni- or Co-based, annealed, 250 HB	Slotting	15	1xD	0.003	0.009	0.010	0.015	0.025	0.030	0.040	0.050	0.065
	Roughing	20	0.6xD	0.004	0.012	0.015	0.025	0.030	0.040	0.045	0.060	0.080
	Finishing	35	0.01xD	0.003	0.010	0.015	0.020	0.025	0.030	0.040	0.050	0.065
S1.1.4 Heat-resistant alloys, Ni- or Co-based, hardened, 350 HB	Slotting	15	1xD	0.003	0.008	0.010	0.015	0.020	0.030	0.035	0.050	0.060
	Roughing	15	0.6xD	0.004	0.011	0.015	0.020	0.030	0.035	0.045	0.060	0.075
	Finishing	25	0.01xD	0.003	0.009	0.010	0.020	0.025	0.030	0.035	0.050	0.060
S1.1.5 Heat-resistant alloys, Ni- or Co-based, cast, 320 HB	Slotting	15	1xD	0.003	0.009	0.010	0.015	0.025	0.030	0.040	0.050	0.065
	Roughing	20	0.6xD	0.004	0.012	0.015	0.025	0.030	0.040	0.045	0.060	0.080
	Finishing	30	0.01xD	0.003	0.010	0.015	0.020	0.025	0.030	0.040	0.050	0.065
S2.1.1 Titanium alloys, pure titanium, Rm 400 N/mm²	Slotting	70	1xD	0.004	0.013	0.020	0.025	0.035	0.050	0.060	0.080	0.100
	Roughing	90	0.6xD	0.006	0.018	0.025	0.035	0.050	0.060	0.070	0.095	0.120
	Finishing	140	0.02xD	0.006	0.017	0.020	0.035	0.045	0.055	0.065	0.090	0.110
S2.1.2 Titanium alloys, Alpha and Beta alloys, hardened, Rm 1050 N/mm²	Slotting	60	1xD	0.004	0.012	0.015	0.025	0.030	0.045	0.055	0.070	0.090
	Roughing	75	0.6xD	0.005	0.016	0.020	0.030	0.045	0.055	0.065	0.085	0.110
	Finishing	120	0.02xD	0.005	0.015	0.020	0.030	0.040	0.050	0.060	0.080	0.100
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.

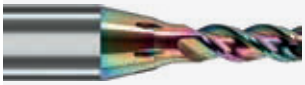
Micro-precision milling cutters RF 100 AL, 2.5xD

Milling conditions:

HPC stable machining conditions
high drive power

HSC stable machining conditions
low cutting depths, high cutting values

2,5xD tools 2.5xD



Machining group	Application	v_c (m/min)			a_p max.	a_e max.	f_z (mm) with nom. Ø						
		Ø0.5 - 1.0	Ø1.01 - 2.0	Ø2.01 - 3.175			0.5	0.8	1.0	1.5	2.0	2.5	3.0
N1.1.1 Wrought aluminium alloys, non-hardened, 60 HB **N1.1.2** Wrought aluminium alloys, hardened, 100 HB	Plunging	80	145	180	1xD	1xD	0.004	0.004	0.006	0.008	0.011	0.014	0.017
	Slotting	135	240	300	1xD	1xD	0.007	0.011	0.014	0.033	0.044	0.055	0.066
	Roughing	130	240	295	2xD	0.33xD	0.012	0.020	0.025	0.041	0.055	0.069	0.083
	Finishing	135	190	245	2.5xD	0.03xD	0.005	0.009	0.011	0.016	0.021	0.027	0.032
N2.1.1 Aluminium casting alloys, non-hardened, ≤ 12 % Si, 75 HB **N2.1.2** Aluminium casting alloys, hardened, ≤ 12 % Si, 90 HB	Plunging	65	120	150	1xD	1xD	0.004	0.004	0.004	0.006	0.008	0.009	0.011
	Slotting	115	200	250	1xD	1xD	0.005	0.008	0.010	0.023	0.030	0.038	0.045
	Roughing	110	200	245	2xD	0.33xD	0.008	0.014	0.017	0.028	0.038	0.047	0.056
	Finishing	115	160	200	2.5xD	0.03xD	0.004	0.006	0.007	0.011	0.015	0.018	0.022
N2.1.3 Aluminium casting alloys, non-hardened, > 12 % Si, 130 HB	Plunging	50	95	120	1xD	1xD	0.004	0.004	0.004	0.006	0.008	0.009	0.011
	Slotting	90	160	200	1xD	1xD	0.005	0.008	0.010	0.023	0.030	0.038	0.045
	Roughing	85	160	195	2xD	0.33xD	0.008	0.014	0.017	0.028	0.038	0.047	0.056
	Finishing	90	125	160	2.5xD	0.03xD	0.004	0.006	0.007	0.011	0.015	0.018	0.022
N3.1.1 Copper and copper alloys: Free-machining alloy, Pb > 1 % **N3.1.2** Copper and copper alloys: CuZn, CuSnZn	Plunging	75	135	170	1xD	1xD	0.004	0.004	0.004	0.004	0.005	0.006	0.008
	Slotting	125	225	280	1xD	1xD	0.004	0.005	0.007	0.015	0.020	0.025	0.030
	Roughing	120	225	275	2xD	0.33xD	0.006	0.009	0.011	0.019	0.025	0.031	0.038
	Finishing	125	175	225	2.5xD	0.03xD	0.004	0.004	0.005	0.007	0.010	0.012	0.015
N3.1.3 Copper and copper alloys: CuSn, lead-free copper and copper electrolyte	Plunging	60	105	130	1xD	1xD	0.004	0.004	0.004	0.004	0.005	0.006	0.007
	Slotting	100	175	220	1xD	1xD	0.004	0.005	0.006	0.014	0.018	0.023	0.028
	Roughing	95	175	215	2xD	0.33xD	0.005	0.008	0.010	0.017	0.023	0.029	0.035
	Finishing	100	140	180	2.5xD	0.03xD	0.004	0.004	0.004	0.007	0.009	0.011	0.013
01.1.1 Thermoplastics	Plunging	55	100	120	1xD	1xD	0.004	0.004	0.005	0.008	0.010	0.013	0.015
	Slotting	90	160	200	1xD	1xD	0.007	0.010	0.013	0.030	0.040	0.050	0.060
	Roughing	85	160	200	2xD	0.33xD	0.011	0.018	0.023	0.038	0.050	0.063	0.075
	Finishing	90	125	160	2.5xD	0.03xD	0.005	0.008	0.010	0.015	0.019	0.024	0.029
01.1.3 Duroplastics	Plunging	35	70	85	1xD	1xD	0.004	0.004	0.005	0.008	0.010	0.013	0.015
	Slotting	65	110	140	1xD	1xD	0.007	0.010	0.013	0.030	0.040	0.050	0.060
	Roughing	60	110	140	2xD	0.33xD	0.011	0.018	0.023	0.038	0.050	0.063	0.075
	Finishing	65	90	115	2.5xD	0.03xD	0.005	0.008	0.010	0.015	0.019	0.024	0.029
01.1.5 Acrylic glass / Plexiglass / PMMA	Plunging	40	80	95	1xD	1xD	0.004	0.004	0.005	0.008	0.010	0.013	0.015
	Slotting	70	130	160	1xD	1xD	0.007	0.010	0.013	0.030	0.040	0.050	0.060
	Roughing	70	130	160	2xD	0.33xD	0.011	0.018	0.023	0.038	0.050	0.063	0.075
	Finishing	70	100	130	2.5xD	0.03xD	0.005	0.008	0.010	0.015	0.019	0.024	0.029

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

Micro-precision milling cutters RF 100 AL, 5xD

Milling conditions:

HPC stable machining conditions
high drive power

HSC stable machining conditions
low cutting depths, high cutting values

5xD tools 5xD

Machining group	Application	v_c (m/min)			a_p max.	a_e max.	f_z (mm) with nom. Ø						
		Ø0.5 - 1.0	Ø1.01 - 2.0	Ø2.01 - 3.175			0.5	0.8	1.0	1.5	2.0	2.5	3.0
N1.1.1 Wrought aluminium alloys, non-hardened, 60 HB **N1.1.2** Wrought aluminium alloys, hardened, 100 HB	Plunging	55	100	120	0.25xD	1xD	0.004	0.004	0.004	0.007	0.009	0.011	0.013
	Slotting	90	160	200	0.33xD	1xD	0.004	0.006	0.007	0.017	0.022	0.028	0.033
	Roughing	105	195	240	5xD	0.05xD	0.009	0.014	0.018	0.030	0.040	0.049	0.059
	Finishing	95	135	175	5xD	0.02xD	0.004	0.006	0.007	0.011	0.014	0.018	0.021
N2.1.1 Aluminium casting alloys, non-hardened, ≤ 12 % Si, 75 HB **N2.1.2** Aluminium casting alloys, hardened, ≤ 12 % Si, 90 HB	Plunging	35	60	75	0.25xD	1xD	0.004	0.004	0.004	0.005	0.006	0.008	0.009
	Slotting	55	100	125	0.33xD	1xD	0.004	0.004	0.005	0.011	0.015	0.019	0.023
	Roughing	65	125	150	5xD	0.05xD	0.006	0.010	0.012	0.020	0.027	0.034	0.041
	Finishing	60	85	110	5xD	0.02xD	0.004	0.004	0.005	0.007	0.010	0.012	0.014
N2.1.3 Aluminium casting alloys, non-hardened, > 12 % Si, 130 HB	Plunging	25	50	60	0.25xD	1xD	0.004	0.004	0.004	0.005	0.006	0.008	0.009
	Slotting	45	80	100	0.33xD	1xD	0.004	0.004	0.005	0.011	0.015	0.019	0.023
	Roughing	50	95	120	5xD	0.05xD	0.006	0.010	0.012	0.020	0.027	0.034	0.041
	Finishing	45	65	85	5xD	0.02xD	0.004	0.004	0.005	0.007	0.010	0.012	0.014
N3.1.1 Copper and copper alloys: Free-machining alloy, Pb > 1 % **N3.1.2** Copper and copper alloys: CuZn, CuSnZn	Plunging	35	70	85	0.25xD	1xD	0.004	0.004	0.004	0.004	0.004	0.005	0.006
	Slotting	65	110	140	0.33xD	1xD	0.004	0.004	0.004	0.008	0.010	0.013	0.015
	Roughing	75	140	170	5xD	0.05xD	0.004	0.006	0.008	0.014	0.018	0.023	0.027
	Finishing	65	95	120	5xD	0.02xD	0.004	0.004	0.004	0.005	0.006	0.008	0.010
N3.1.3 Copper and copper alloys: CuSn, lead-free copper and copper electrolyte	Plunging	30	55	65	0.25xD	1xD	0.004	0.004	0.004	0.004	0.004	0.005	0.006
	Slotting	50	90	110	0.33xD	1xD	0.004	0.004	0.004	0.007	0.009	0.012	0.014
	Roughing	60	110	135	5xD	0.05xD	0.004	0.006	0.007	0.012	0.017	0.021	0.025
	Finishing	55	75	95	5xD	0.02xD	0.004	0.004	0.004	0.004	0.006	0.007	0.009
01.1.1 Thermoplastics	Plunging	25	50	60	0.25xD	1xD	0.004	0.004	0.004	0.006	0.008	0.010	0.012
	Slotting	45	80	100	0.33xD	1xD	0.004	0.005	0.007	0.015	0.020	0.025	0.030
	Roughing	55	100	120	5xD	0.05xD	0.008	0.013	0.016	0.027	0.036	0.045	0.054
	Finishing	50	65	85	5xD	0.02xD	0.004	0.005	0.006	0.010	0.013	0.016	0.019
01.1.3 Duroplastics	Plunging	20	35	40	0.25xD	1xD	0.004	0.004	0.004	0.006	0.008	0.010	0.012
	Slotting	30	55	70	0.33xD	1xD	0.004	0.005	0.007	0.015	0.020	0.025	0.030
	Roughing	35	70	85	5xD	0.05xD	0.008	0.013	0.016	0.027	0.036	0.045	0.054
	Finishing	35	45	60	5xD	0.02xD	0.004	0.005	0.006	0.010	0.013	0.016	0.019
01.1.5 Acrylic glass / Plexiglass / PMMA	Plunging	20	40	50	0.25xD	1xD	0.004	0.004	0.004	0.006	0.008	0.010	0.012
	Slotting	35	65	80	0.33xD	1xD	0.004	0.005	0.007	0.015	0.020	0.025	0.030
	Roughing	40	80	95	5xD	0.05xD	0.008	0.013	0.016	0.027	0.036	0.045	0.054
	Finishing	40	55	70	5xD	0.02xD	0.004	0.005	0.006	0.010	0.013	0.016	0.019

Ratio end mills RF 100 AL (smooth cutting) for stable conditions

Milling conditions:

HPC	stable machining conditions high drive power
	short tools
	long tools

Correction factors:

	a_p roughing > 1.5xD	v_c -25 %	f_z -25 %
	medium length tools	v_c -40 %	f_z -40 %
	extra length tools	v_c -60 %	f_z -55 %

Machining group	Application	v_c (m/min)	a_p max.	a_e max.	f_z (mm) with nom. Ø										
					1	2	3	4	6	8	10	12	16	20	25
N1.1.1 Wrought aluminium alloys. non-hardened. 60 HB **N1.1.2** Wrought aluminium alloys. hardened. 100 HB	Slotting	500	1xD	1xD	0.0070	0.0141	0.021	0.030	0.040	0.055	0.080	0.095	0.130	0.160	0.200
	Roughing	575	1xD	0.75xD	0.0092	0.0184	0.028	0.035	0.055	0.075	0.090	0.110	0.145	0.185	0.230
	Finishing	1000	1xD	0.02xD	0.0088	0.0176	0.026	0.035	0.055	0.070	0.090	0.105	0.140	0.175	0.220
N2.1.1 Aluminium casting alloys. non-hardened. ≤ 12 % Si. 75 HB **N2.1.2** Aluminium casting alloys. hardened. ≤ 12 % Si. 90 HB	Slotting	230	1xD	1xD	0.0053	0.0106	0.016	0.020	0.030	0.040	0.060	0.070	0.095	0.120	0.150
	Roughing	265	1xD	0.75xD	0.0069	0.0138	0.021	0.030	0.040	0.055	0.070	0.085	0.110	0.140	0.175
	Finishing	460	1xD	0.02xD	0.0066	0.0132	0.020	0.025	0.040	0.055	0.065	0.080	0.105	0.130	0.165
N2.1.3 Aluminium casting alloys. non-hardened. > 12 % Si. 130 HB	Slotting	180	1xD	1xD	0.0053	0.0106	0.016	0.020	0.030	0.040	0.060	0.070	0.095	0.120	0.150
	Roughing	180	1xD	0.75xD	0.0060	0.0120	0.018	0.025	0.035	0.050	0.060	0.070	0.095	0.120	0.150
	Finishing	365	1xD	0.02xD	0.0066	0.0132	0.020	0.025	0.040	0.055	0.065	0.080	0.105	0.130	0.165
N3.1.1 Copper and copper alloys: Free-machining alloy. Pb > 1 % **N3.1.2** Copper and copper alloys: CuZn. CuSnZn	Slotting	250	1xD	1xD	0.0053	0.0106	0.016	0.020	0.030	0.040	0.060	0.070	0.095	0.120	0.150
	Roughing	290	1xD	0.75xD	0.0069	0.0138	0.021	0.030	0.040	0.055	0.070	0.085	0.110	0.140	0.175
	Finishing	500	1xD	0.02xD	0.0066	0.0132	0.020	0.025	0.040	0.055	0.065	0.080	0.105	0.130	0.165
N3.1.3 Copper and copper alloys: CuSn. lead-free copper and copper electrolyte	Slotting	195	1xD	1xD	0.0049	0.0097	0.015	0.020	0.030	0.040	0.055	0.065	0.090	0.110	0.140
	Roughing	225	1xD	0.75xD	0.0064	0.0127	0.019	0.025	0.040	0.050	0.065	0.075	0.100	0.125	0.160
	Finishing	390	1xD	0.02xD	0.0061	0.0122	0.018	0.025	0.035	0.050	0.060	0.075	0.095	0.120	0.150
01.1.1 Thermoplastics	Slotting	150	1xD	1xD	0.0055	0.0110	0.017	0.020	0.035	0.045	0.065	0.075	0.100	0.125	0.155
	Roughing	225	1xD	0.33xD	0.0081	0.0163	0.024	0.035	0.050	0.065	0.080	0.100	0.130	0.165	0.205
	Finishing	300	1xD	0.01xD	0.0063	0.0125	0.019	0.025	0.040	0.050	0.065	0.075	0.100	0.125	0.155
01.1.3 Duroplastics	Slotting	105	1xD	1xD	0.0055	0.0110	0.017	0.020	0.035	0.045	0.065	0.075	0.100	0.125	0.155
	Roughing	160	1xD	0.33xD	0.0081	0.0163	0.024	0.035	0.050	0.065	0.080	0.100	0.130	0.165	0.205
	Finishing	210	1xD	0.01xD	0.0063	0.0125	0.019	0.025	0.040	0.050	0.065	0.075	0.100	0.125	0.155
01.1.5 Acrylic glass / Plexiglass / PMMA	Slotting	120	1xD	1xD	0.0055	0.0110	0.017	0.020	0.035	0.045	0.065	0.075	0.100	0.125	0.155
	Roughing	180	1xD	0.33xD	0.0081	0.0163	0.024	0.035	0.050	0.065	0.080	0.100	0.130	0.165	0.205
	Finishing	240	1xD	0.01xD	0.0063	0.0125	0.019	0.025	0.040	0.050	0.065	0.075	0.100	0.125	0.155

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

Ratio roughing end mills RF 100 AL for unstable conditions

Milling conditions:

MTC	stable machining conditions high drive power
	long tools

Correction factors:

	a_p roughing > 1.5xD	v_c -25 %	f_z -25 %
	medium length tools	v_c -40 %	f_z -40 %
	extra length tools	v_c -60 %	f_z -55 %

Machining group	Application	v_c (m/min)	a_p max.	a_e max.	f_z (mm) with nom. Ø						
					6	8	10	12	16	20	25
N1.1.1 Wrought aluminium alloys, non-hardened, 60 HB **N1.1.2** Wrought aluminium alloys, hardened, 100 HB	Slotting	375	1xD	1xD	0.0200	0.0250	0.0350	0.0450	0.0600	0.0750	0.0950
	Roughing	430	1xD	0.75xD	0.0250	0.0350	0.0450	0.0500	0.0700	0.0850	0.1050
N2.1.1 Aluminium casting alloys, non-hardened, ≤ 12 % Si, 75 HB **N2.1.2** Aluminium casting alloys, hardened, ≤ 12 % Si, 90 HB	Slotting	200	1xD	1xD	0.0200	0.0250	0.0350	0.0400	0.0550	0.0700	0.0900
	Roughing	230	1xD	0.75xD	0.0250	0.0300	0.0400	0.0500	0.0650	0.0800	0.1000
N2.1.3 Aluminium casting alloys, non-hardened, > 12 % Si, 130 HB	Slotting	160	1xD	1xD	0.0200	0.0250	0.0350	0.0400	0.0550	0.0700	0.0900
	Roughing	160	1xD	0.75xD	0.0200	0.0300	0.0350	0.0400	0.0550	0.0700	0.0900
N3.1.1 Copper and copper alloys: Free-machining alloy, Pb > 1 % **N3.1.2** Copper and copper alloys: CuZn, CuSnZn	Slotting	220	1xD	1xD	0.0200	0.0250	0.0350	0.0400	0.0550	0.0700	0.0900
	Roughing	255	1xD	0.75xD	0.0250	0.0300	0.0400	0.0500	0.0650	0.0800	0.1000
N3.1.3 Copper and copper alloys: CuSn, lead-free copper and copper electrolyte	Slotting	170	1xD	1xD	0.0150	0.0250	0.0300	0.0400	0.0500	0.0650	0.0800
	Roughing	200	1xD	0.75xD	0.0200	0.0300	0.0350	0.0450	0.0600	0.0750	0.0950
01.1.1 Thermoplastics	Slotting	110	1xD	1xD	0.0150	0.0250	0.0350	0.0400	0.0550	0.0650	0.0850
	Roughing	170	1xD	0.33xD	0.0250	0.0350	0.0450	0.0500	0.0700	0.0850	0.1050
01.1.3 Duroplaste	Slotting	80	1xD	1xD	0.0150	0.0250	0.0350	0.0400	0.0550	0.0650	0.0850
	Roughing	120	1xD	0.33xD	0.0250	0.0350	0.0450	0.0500	0.0700	0.0850	0.1050
01.1.5 Acrylglas / Plexiglas / PMMA	Slotting	90	1xD	1xD	0.0150	0.0250	0.0350	0.0400	0.0550	0.0650	0.0850
	Roughing	135	1xD	0.33xD	0.0250	0.0350	0.0450	0.0500	0.0700	0.0850	0.1050

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

Finishing end mills RF 100 AL µF

Milling conditions:

HPC stable machining conditions high drive power

short tools

long tools

medium length tools

Correction factors:

extralong tools v_c -60 % f_z -55 %

Machining group	Application	v_c (m/min)	a_p max.	a_e max.	f_z (mm/z) with nom. Ø									
					1	2	3	4	6	8	10	12	16	20
N1.1.1 Wrought aluminium alloys, non-hardened, 60 HB **N1.1.2** Wrought aluminium alloys, hardened, 100 HB	Roughing	575	1xD	0.15xD	0.009	0.018	0.028	0.035	0.055	0.075	0.090	0.110	0.145	0.185
	Finishing	1000	1xD	0.02xD	0.009	0.018	0.026	0.035	0.055	0.070	0.090	0.105	0.140	0.175
N2.1.1 Aluminium casting alloys, non-hardened, ≤ 12 % Si, 75 HB **N2.1.2** Aluminium casting alloys, hardened, ≤ 12 % Si, 90 HB	Roughing	265	1xD	0.15xD	0.007	0.014	0.021	0.030	0.040	0.055	0.070	0.085	0.110	0.140
	Finishing	460	1xD	0.02xD	0.007	0.013	0.020	0.025	0.040	0.055	0.065	0.080	0.105	0.130
N2.1.3 Aluminium casting alloys, non-hardened, > 12 % Si, 130 HB	Roughing	180	1xD	0.1xD	0.006	0.012	0.018	0.025	0.035	0.050	0.060	0.070	0.095	0.120
	Finishing	365	1xD	0.02xD	0.007	0.013	0.020	0.025	0.040	0.055	0.065	0.080	0.105	0.130
N3.1.1 Copper and copper alloys: Free-machining alloy, Pb > 1 % **N3.1.2** Copper and copper alloys: CuZn, CuSnZn	Roughing	290	1xD	0.1xD	0.007	0.014	0.021	0.030	0.040	0.055	0.070	0.085	0.110	0.140
	Finishing	500	1xD	0.02xD	0.007	0.013	0.020	0.025	0.040	0.055	0.065	0.080	0.105	0.130
N3.1.3 Copper and copper alloys: CuSn, lead-free copper and copper electrolyte	Roughing	225	1xD	0.1xD	0.006	0.013	0.019	0.025	0.040	0.050	0.065	0.075	0.100	0.125
	Finishing	390	1xD	0.02xD	0.006	0.012	0.018	0.025	0.035	0.050	0.060	0.075	0.095	0.120
01.1.1 Thermoplastics	Roughing	225	1xD	0.2xD	0.008	0.016	0.024	0.035	0.050	0.065	0.080	0.100	0.130	0.165
	Finishing	300	1xD	0.02xD	0.006	0.013	0.019	0.025	0.040	0.050	0.065	0.075	0.100	0.125
01.1.3 Duroplastics **01.3.2** Duroplastics Aramid / Synthetic-fibre-reinforced **01.3.3** Duroplastics natural-fibre-reinforced	Roughing	160	1xD	0.2xD	0.008	0.016	0.024	0.035	0.050	0.065	0.080	0.100	0.130	0.165
	Finishing	210	1xD	0.02xD	0.006	0.013	0.019	0.025	0.040	0.050	0.065	0.075	0.100	0.125
01.4.1 Acrylic glass / Plexiglass / PMMA	Roughing	180	1xD	0.2xD	0.008	0.016	0.024	0.035	0.050	0.065	0.080	0.100	0.130	0.165
	Finishing	240	1xD	0.02xD	0.006	0.013	0.019	0.025	0.040	0.050	0.065	0.075	0.100	0.125

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

Ball nose end mills GA 200 A

Milling conditions:

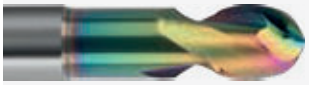
HSC stable machining conditions
high drive power

short tools

long tools

Correction factors:

medium length tools	v_c -25 %	f_z -25 %
extra length tools	v_c -50 %	f_z -50 %



Machining group	Application	v_c (m/min)	a_p max.	a_e max.	f_z (mm) with nom. Ø						
					3	4	6	8	10	12	16
N1.1.1 Wrought aluminium alloys, non-hardened, 60 HB **N1.1.2** Wrought aluminium alloys, hardened, 100 HB	Slotting	895	0.3xD	0.1xD	0.064	0.085	0.130	0.170	0.215	0.255	0.345
	Roughing	865	0.1xD	0.05xD	0.079	0.105	0.160	0.210	0.265	0.315	0.420
	Finishing	895	0.02xD	0.01xD	0.069	0.090	0.140	0.185	0.230	0.275	0.370
N2.1.1 Aluminium casting alloys, non-hardened, ≤ 12 % Si, 75 HB **N2.1.2** Aluminium casting alloys, hardened, ≤ 12 % Si, 90 HB	Slotting	450	0.3xD	0.1xD	0.058	0.080	0.115	0.155	0.195	0.235	0.310
	Roughing	435	0.1xD	0.05xD	0.072	0.095	0.145	0.190	0.240	0.290	0.385
	Finishing	450	0.02xD	0.01xD	0.063	0.085	0.125	0.170	0.210	0.250	0.335
N2.1.3 Aluminium casting alloys, non-hardened, > 12 % Si, 130 HB	Slotting	355	0.3xD	0.1xD	0.058	0.080	0.115	0.155	0.195	0.235	0.310
	Roughing	340	0.1xD	0.05xD	0.072	0.095	0.145	0.190	0.240	0.290	0.385
	Finishing	355	0.02xD	0.01xD	0.063	0.085	0.125	0.170	0.210	0.250	0.335
N3.1.1 Copper and copper alloys: Free-machining alloy, Pb > 1 % **N3.1.2** Copper and copper alloys: CuZn, CuSnZn	Slotting	360	0.3xD	0.1xD	0.058	0.080	0.115	0.155	0.195	0.235	0.310
	Roughing	345	0.1xD	0.05xD	0.072	0.095	0.145	0.190	0.240	0.290	0.385
	Finishing	360	0.02xD	0.01xD	0.063	0.085	0.125	0.170	0.210	0.250	0.335
N3.1.3 Copper and copper alloys: CuSn, lead-free copper and copper electrolyte	Slotting	280	0.3xD	0.1xD	0.054	0.070	0.110	0.145	0.180	0.215	0.285
	Roughing	270	0.1xD	0.05xD	0.066	0.090	0.130	0.175	0.220	0.265	0.355
	Finishing	280	0.02xD	0.01xD	0.058	0.075	0.115	0.155	0.195	0.230	0.310
01.1.1 Thermoplastics	Slotting	295	0.3xD	0.1xD	0.062	0.085	0.125	0.165	0.210	0.250	0.330
	Roughing	285	0.1xD	0.05xD	0.077	0.100	0.155	0.205	0.255	0.305	0.410
	Finishing	295	0.02xD	0.01xD	0.067	0.090	0.135	0.180	0.225	0.270	0.360
01.1.3 Duroplastics	Slotting	210	0.3xD	0.1xD	0.062	0.085	0.125	0.165	0.210	0.250	0.330
	Roughing	200	0.1xD	0.05xD	0.077	0.100	0.155	0.205	0.255	0.305	0.410
	Finishing	210	0.02xD	0.01xD	0.067	0.090	0.135	0.180	0.225	0.270	0.360
01.1.5 Acrylic glass / Plexiglass / PMMA	Slotting	235	0.3xD	0.1xD	0.062	0.085	0.125	0.165	0.210	0.250	0.330
	Roughing	230	0.1xD	0.05xD	0.077	0.100	0.155	0.205	0.255	0.305	0.410
	Finishing	235	0.02xD	0.01xD	0.067	0.090	0.135	0.180	0.225	0.270	0.360

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

Solid carbide single-fluted cutters AL

Milling conditions:

MTC unstable machining conditions
low drive power

HSC stable machining conditions
low cutting depths, high cutting values

short tools

long tools

Correction factors:

a_p roughing > 1.5 x D	v_c -25 %	f_z -25 %
medium length tools	v_c -40 %	f_z -40 %
extra length tools	v_c -60 %	f_z -55 %

Machining group	Application	v_c (m/min)	a_p max.	a_e max.	f_z (mm) with nom. Ø								
					1	2	3	4	6	8	10	12	16
N1.1.1 Wrought aluminium alloys, non-hardened, 60 HB **N1.1.2** Wrought aluminium alloys, hardened, 100 HB	Slotting	500	1xD	1xD	0.0070	0.0141	0.021	0.030	0.040	0.055	0.080	0.095	0.130
	Roughing	575	1xD	0.75xD	0.0092	0.0184	0.028	0.035	0.055	0.075	0.090	0.110	0.145
	Finishing	1000	1xD	0.02xD	0.0088	0.0176	0.026	0.035	0.055	0.070	0.090	0.105	0.140
N2.1.1 Aluminium casting alloys, non-hardened, ≤ 12 % Si, 75 HB **N2.1.2** Aluminium casting alloys, hardened, ≤ 12 % Si, 90 HB	Slotting	230	1xD	1xD	0.0053	0.0106	0.016	0.020	0.030	0.040	0.060	0.070	0.095
	Roughing	265	1xD	0.75xD	0.0069	0.0138	0.021	0.030	0.040	0.055	0.070	0.085	0.110
	Finishing	460	1xD	0.02xD	0.0066	0.0132	0.020	0.025	0.040	0.055	0.065	0.080	0.105
N2.1.3 Aluminium casting alloys, non-hardened, > 12 % Si, 130 HB	Slotting	180	1xD	1xD	0.0053	0.0106	0.016	0.020	0.030	0.040	0.060	0.070	0.095
	Roughing	180	1xD	0.75xD	0.0060	0.0120	0.018	0.025	0.035	0.050	0.060	0.070	0.095
	Finishing	365	1xD	0.02xD	0.0066	0.0132	0.020	0.025	0.040	0.055	0.065	0.080	0.105
N3.1.1 Copper and copper alloys: Free-machining alloy, Pb > 1 % **N3.1.2** Copper and copper alloys: CuZn, CuSnZn	Slotting	250	1xD	1xD	0.0053	0.0106	0.016	0.020	0.030	0.040	0.060	0.070	0.095
	Roughing	290	1xD	0.75xD	0.0069	0.0138	0.021	0.030	0.040	0.055	0.070	0.085	0.110
	Finishing	500	1xD	0.02xD	0.0066	0.0132	0.020	0.025	0.040	0.055	0.065	0.080	0.105
N3.1.3 Copper and copper alloys: CuSn, lead-free copper and copper electrolyte	Slotting	195	1xD	1xD	0.0049	0.0097	0.015	0.020	0.030	0.040	0.055	0.065	0.090
	Roughing	225	1xD	0.75xD	0.0064	0.0127	0.019	0.025	0.040	0.050	0.065	0.075	0.100
	Finishing	390	1xD	0.02xD	0.0061	0.0122	0.018	0.025	0.035	0.050	0.060	0.075	0.095
01.1.1 Thermoplastics	Slotting	150	1xD	1xD	0.0055	0.0110	0.017	0.020	0.035	0.045	0.065	0.075	0.100
	Roughing	225	1xD	0.33xD	0.0081	0.0163	0.024	0.035	0.050	0.065	0.080	0.100	0.130
	Finishing	300	1xD	0.01xD	0.0063	0.0125	0.019	0.025	0.040	0.050	0.065	0.075	0.100
01.1.3 Duroplastics	Slotting	105	1xD	1xD	0.0055	0.0110	0.017	0.020	0.035	0.045	0.065	0.075	0.100
	Roughing	160	1xD	0.33xD	0.0081	0.0163	0.024	0.035	0.050	0.065	0.080	0.100	0.130
	Finishing	210	1xD	0.01xD	0.0063	0.0125	0.019	0.025	0.040	0.050	0.065	0.075	0.100
01.1.5 Acrylic glass / Plexiglass / PMMA	Slotting	120	1xD	1xD	0.0055	0.0110	0.017	0.020	0.035	0.045	0.065	0.075	0.100
	Roughing	180	1xD	0.33xD	0.0081	0.0163	0.024	0.035	0.050	0.065	0.080	0.100	0.130
	Finishing	240	1xD	0.01xD	0.0063	0.0125	0.019	0.025	0.040	0.050	0.065	0.075	0.100

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

Chamfering milling cutters AL

Milling conditions:

HPC stable machining conditions high drive power

short tools

long tools

Korrekturfaktoren:

extra length tools v_c -60 % f_z -55 %

Machining group	Application	v_c (m/min)	a_p max.	a_e max.	f_z (mm) with nom. Ø				
					4	6	8	10	12
N1.1.1 Wrought aluminium alloys, non-hardened, 60 HB **N1.1.2** Wrought aluminium alloys, hardened, 100 HB	Chamfering	345	0.25xD	0.25xD	0.0300	0.0450	0.0600	0.0750	0.0900
	Deburring	600	0.05xD	0.05xD	0.0300	0.0450	0.0550	0.0700	0.0850
N2.1.1 Aluminium casting alloys, non-hardened, ≤ 12 % Si, 75 HB **N2.1.2** Aluminium casting alloys, hardened, ≤ 12 % Si, 90 HB	Chamfering	185	0.25xD	0.25xD	0.0250	0.0400	0.0500	0.0650	0.0750
	Deburring	320	0.05xD	0.05xD	0.0250	0.0350	0.0500	0.0600	0.0750
N2.1.3 Aluminium casting alloys, non-hardened, > 12 % Si, 130 HB	Chamfering	125	0.25xD	0.25xD	0.0200	0.0350	0.0450	0.0550	0.0650
	Deburring	255	0.05xD	0.05xD	0.0250	0.0350	0.0500	0.0600	0.0750
N3.1.1 Copper and copper alloys: Free-machining alloy, Pb > 1 % **N3.1.2** Copper and copper alloys: CuZn, CuSnZn	Chamfering	230	0.25xD	0.25xD	0.0200	0.0300	0.0400	0.0550	0.0650
	Deburring	400	0.05xD	0.05xD	0.0200	0.0300	0.0400	0.0500	0.0600
N3.1.3 Copper and copper alloys: CuSn, lead-free copper and copper electrolyte	Chamfering	180	0.25xD	0.25xD	0.0200	0.0300	0.0400	0.0500	0.0600
	Deburring	315	0.05xD	0.05xD	0.0200	0.0300	0.0350	0.0450	0.0550
01.1.1 Thermoplaste	Chamfering	105	0.25xD	0.25xD	0.0200	0.0300	0.0350	0.0450	0.0550
	Deburring	300	0.05xD	0.05xD	0.0250	0.0400	0.0500	0.0650	0.0750
01.1.3 Duroplaste	Chamfering	225	0.25xD	0.25xD	0.0350	0.0500	0.0650	0.0800	0.1000
	Deburring	210	0.05xD	0.05xD	0.0250	0.0400	0.0500	0.0650	0.0750
01.1.5 Acrylglas / Plexiglas / PMMA	Chamfering	160	0.25xD	0.25xD	0.0350	0.0500	0.0650	0.0800	0.1000
	Deburring	240	0.05xD	0.05xD	0.0250	0.0400	0.0500	0.0650	0.0750

CR 200 milling cutters for fibre-reinforced plastics

Milling conditions:

HPC stable machining conditions high drive power

short tools

long tools

Correction factors:

a_p roughing > 1.5 x D v_c -25 % f_z -25 %

medium length tools v_c -40 % f_z -40 %

Machining group	Application	v_c (m/min)	a_p max.	a_e max.	f_z (mm/z) with nom. Ø								
					3	4	5	6	8	10	12	16	20
01.2.1 Carbon-fi bre-reinforced thermoplastics	Slotting	450	0.5xD	1xD	0.0050	0.0056	0.0062	0.0068	0.0079	0.0091	0.0103	0.0126	0.0150
	Roughing	450	1xD	0.5xD	0.0050	0.0056	0.0062	0.0068	0.0079	0.0091	0.0103	0.0126	0.0150
	Finishing	450	1.5xD	0.1xD	0.0050	0.0056	0.0062	0.0068	0.0079	0.0091	0.0103	0.0126	0.0150
01.1.3 Duroplastics	Slotting	150	1xD	1xD	0.0250	0.0268	0.0285	0.0303	0.0338	0.0374	0.0409	0.0479	0.0550
	Roughing	200	1.5xD	0.8xD	0.0350	0.0368	0.0385	0.0403	0.0438	0.0474	0.0509	0.0579	0.0650
	Finishing	250	2xD	0.2xD	0.0250	0.0268	0.0285	0.0303	0.0338	0.0374	0.0409	0.0479	0.0550
01.3.2 Duroplastics Aramid / Synthetic-fi bre-reinforced	Slotting	100	1xD	1xD	0.0150	0.0168	0.0185	0.0203	0.0238	0.0274	0.0309	0.0379	0.0450
	Roughing	150	1.5xD	0.8xD	0.0150	0.0168	0.0185	0.0203	0.0238	0.0274	0.0309	0.0379	0.0450
	Finishing	150	2xD	0.2xD	0.0150	0.0168	0.0185	0.0203	0.0238	0.0274	0.0309	0.0379	0.0450
01.3.3 Natural-fi bre-reinforced duroplastics	Slotting	150	1xD	1xD	0.0250	0.0268	0.0285	0.0303	0.0338	0.0374	0.0409	0.0479	0.0550
	Roughing	200	1.5xD	0.8xD	0.0350	0.0368	0.0385	0.0403	0.0438	0.0474	0.0509	0.0579	0.0650
	Finishing	250	2xD	0.2xD	0.0250	0.0268	0.0285	0.0303	0.0338	0.0374	0.0409	0.0479	0.0550

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


NEW

Circular milling cutters

Milling conditions:

HPC stable machining conditions
high drive power

M7C unstable machining conditions
low drive power

long tools

Machining group	Application	v_c (m/min)	a_p max.	a_e max.	f_z (mm) with nom. Ø				
					3.8	5.8	7.8	9.8	11.8
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	Circular slotting	140	b	tmax	0.0150	0.0200	0.0300	0.0400	0.0500
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	Circular slotting	120	b	tmax	0.0150	0.0200	0.0300	0.0400	0.0500
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	Circular slotting	110	b	tmax	0.0150	0.0200	0.0250	0.0350	0.0450
M1.1.1 Stainless steel, ferritic/martensitic, with machining additives **M1.1.2** Stainless steel, ferritic/martensitic, annealed, Rm 680 N/mm², 200 HB	Circular slotting	130	b	tmax	0.0150	0.0200	0.0250	0.0350	0.0450
M1.1.3 Stainless steel, ferritic/martensitic, heat-treated, Rm 810 N/mm², 240 HB	Circular slotting	95	b	tmax	0.0100	0.0150	0.0250	0.0350	0.0400
M2.1.1 Stainless steel, austenitic, quenched, 180 HB	Circular slotting	95	b	tmax	0.0100	0.0150	0.0250	0.0350	0.0400
M2.2.1 Duplex steel, high-strength stainless steels	Circular slotting	70	b	tmax	0.0100	0.0150	0.0200	0.0300	0.0350
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	Circular slotting	120	b	tmax	0.0150	0.0200	0.0300	0.0400	0.0500
K1.3.1 Malleable cast iron, ferritic, 130 HB **K1.3.2** Malleable cast iron, pearlitic, 230 HB	Circular slotting	100	b	tmax	0.0100	0.0200	0.0250	0.0350	0.0400
K2.1.1 Vermicular graphite cast iron (GJV) **K2.2.1** Austenitic-ferritic spheroidal graphite cast iron (ADI)	Circular slotting	85	b	tmax	0.0100	0.0150	0.0250	0.0350	0.0400
N1.1.1 Wrought aluminium alloys, non-hardened, 60 HB **N1.1.2** Wrought aluminium alloys, hardened, 100 HB	Circular slotting	350	b	tmax	0.0250	0.0350	0.0450	0.0650	0.0800
N2.1.1 Aluminium casting alloys, non-hardened, ≤ 12 % Si, 75 HB **N2.1.2** Aluminium casting alloys, hardened, ≤ 12 % Si, 90 HB	Circular slotting	250	b	tmax	0.0200	0.0300	0.0400	0.0550	0.0700
N2.1.3 Aluminium casting alloys, non-hardened, > 12 % Si, 130 HB	Circular slotting	200	b	tmax	0.0200	0.0300	0.0400	0.0550	0.0700

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

Machining group	Application	v_c (m/min)	a_p max.	a_e max.	f_z (mm) with nom. Ø				
					3.8	5.8	7.8	9.8	11.8
N3.1.1 Copper and copper alloys: Free-machining alloy, Pb > 1 % **N3.1.2** Copper and copper alloys: CuZn, CuSnZn	Circular slotting	185	b	tmax	0.0150	0.0250	0.0300	0.0450	0.0550
N3.1.3 Copper and copper alloys: CuSn, lead-free copper and copper electrolyte	Circular slotting	145	b	tmax	0.0150	0.0200	0.0300	0.0400	0.0500
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	Circular slotting	30	b	tmax	0.0100	0.0150	0.0200	0.0300	0.0350
S1.1.2 Heat-resistant alloys, Fe-based, hardened, 280 HB	Circular slotting	25	b	tmax	0.0100	0.0150	0.0200	0.0300	0.0350
S1.1.3 Heat-resistant alloys, Ni- or Co-based, annealed, 250 HB	Circular slotting	15	b	tmax	0.0100	0.0150	0.0200	0.0250	0.0300
S1.1.4 Heat-resistant alloys, Ni- or Co-based, hardened, 350 HB	Circular slotting	15	b	tmax	0.0100	0.0100	0.0150	0.0250	0.0300
S1.1.5 Heat-resistant alloys, Ni- or Co-based, cast, 320 HB	Circular slotting	15	b	tmax	0.0100	0.0150	0.0200	0.0250	0.0300
S2.1.1 Titanium alloys, pure titanium, Rm 400 N/mm²	Circular slotting	50	b	tmax	0.0100	0.0200	0.0250	0.0350	0.0400
S2.1.2 Titanium alloys, Alpha and Beta alloys, hardened, Rm 1050 N/mm²	Circular slotting	45	b	tmax	0.0100	0.0150	0.0200	0.0300	0.0400
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.

Threading tools

Perfectly shaped

With these new solutions, technology meets material & industry experience

GÜHRING

Page

P	M	K	N	S	H	Tool illustration		Standard	Hole type	Form	Tool material	Tolerance	d1/mm	Article no.	Page
Taps with coolant ducts for ISO metric threads															
•		•					NEW	DIN 376		C	HSS-E-PM	6HX	M16 - M48	8313	182
•		•					NEW	~DIN 376		C	HSS-E-PM	6HX	M16 - M48	8314	183
Fluteless taps with coolant ducts for ISO metric threads															
•							NEW	~DIN 371/376		C	HSS-E-PM	6HX	M3 - M24	8325	186
•							NEW	~DIN 371/376		C	HSS-E-PM	6HX	M5 - M24	8327	186
Fluteless taps with coolant ducts for ISO metric fine threads															
•							NEW	~DIN 374		C	HSS-E-PM	6HX	M8 x 1 - M24 x 1,5	8326	187
•							NEW	~DIN 374		C	HSS-E-PM	6HX	M8 x 1 - M24 x 1,5	8328	187
Thread milling cutters without chamfer for ISO metric threads															
•	•	•	•	•	○		NEW	WN			VHM		M3 - M20 x 1,5	4870	190


NEW

Strong performance in steel, reliable process stability

The industry specialist for demanding threads

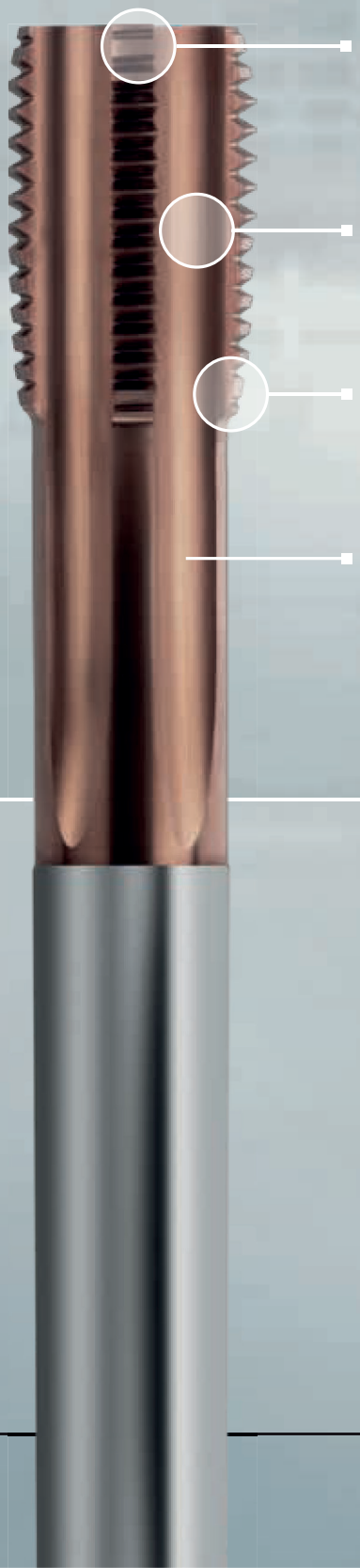
Large components, special thread solutions and narrow tolerances - these challenges are part of everyday life in the energy industry and place the highest demands on machining.

Threading tools, which are usually used in the final working step, must be reliable and absolutely process-reliable. With the Energy high-performance tap, Gühring has developed an industry specialist that shows its strengths in typical materials such as high-strength steels or cast materials: short chips and optimum chip removal ensure process-reliable threads, which also score points with maximum cost-effectiveness thanks to long tool lives.

x **Tool life** increased by 20 %

x Significantly improved **surface quality**

- X Short chips & safe chip removal
- X Perfect thread quality
- X Outstanding tool lives



Process-reliable chip removal
thanks to central internal cooling

New flute profile for short chips
and perfect thread surfaces

Stepped threaded part
reduces friction & improves chip flow

HiPIMs coating
for high wear resistance

Application example

Component:	Large gear ring 42CrMo4, thread depth 70 mm, blind hole	
Tool:	#8314, tap M36	
Customer target:	Increased tool life & high thread surface quality	
Difficulty:	Long chips are difficult to transport, jam & damage tool & component surfaces	
Cutting data:	**Gühring** v_c 11 m/min **f** 4.0 mm/rev	**Competition** v_c 11 m/min **f** 4.0 mm/rev
Tool life:	17 meters	11 meters

Taps with coolant ducts for ISO metric threads

Article no. **8313**

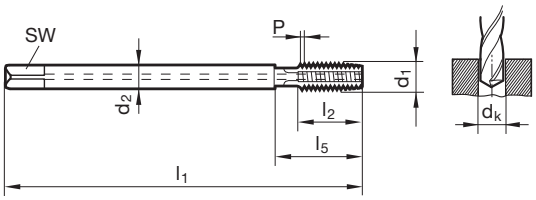
NEW | HSS-E-PM | P | EPL | 6HX | R | Cyl | C

for short chips and optimal thread surface

cutting data see page 191

P	M	K	N	S	H
●		●			

P ≤ 1200 N/mm²



Standard **DIN 376**

Article no. **8313**

d1	P mm	d2 mm	SW mm	dk mm	l1 mm	l2 mm	l5 mm	Order no.
M16	2.000	12.00	9.00	14.00	110.00	26.00	54.00	8313 16.000
M20	2.500	16.00	12.00	17.50	140.00	32.00	62.00	8313 20.000
M24	3.000	18.00	14.50	21.00	160.00	36.00	73.00	8313 24.000
M27	3.000	20.00	16.00	24.00	160.00	36.00	73.00	8313 27.000
M30	3.500	22.00	18.00	26.50	180.00	40.00	85.00	8313 30.000
M33	3.500	25.00	20.00	29.50	180.00	40.00	91.00	8313 33.000
M36	4.000	28.00	22.00	32.00	200.00	50.00	102.00	8313 36.000
M39	4.000	32.00	24.00	35.00	200.00	50.00	107.00	8313 39.000
M42	4.500	32.00	24.00	37.50	200.00	56.00	112.00	8313 42.000
M48	5.000	36.00	29.00	43.00	250.00	65.00	127.00	8313 48.000

Taps with coolant ducts for ISO metric threads

Article no. **8314**

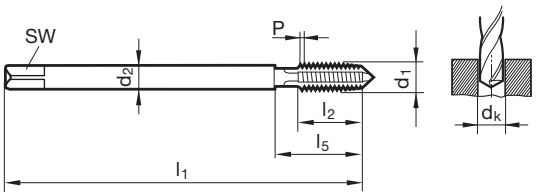
NEW | HSS-E-PM | P | EPL | 6HX | R | Cyl | C

for short chips and optimal thread surface • long design

cutting data see page 191

P	M	K	N	S	H
•		•			

P ≤ 1200 N/mm²



Standard **~DIN 376**

Article no. **8314**

d1	P mm	d2 mm	SW mm	dk mm	l1 mm	l2 mm	l5 mm	Order no.
M16	2.000	12.00	9.00	14.00	160.00	26.00	100.00	8314 16.000
M20	2.500	16.00	12.00	17.50	180.00	32.00	120.00	8314 20.000
M24	3.000	18.00	14.50	21.00	200.00	36.00	120.00	8314 24.000
M27	3.000	20.00	16.00	24.00	225.00	36.00	145.00	8314 27.000
M30	3.500	22.00	18.00	26.50	250.00	40.00	160.00	8314 30.000
M33	3.500	25.00	20.00	29.50	275.00	40.00	170.00	8314 33.000
M36	4.000	28.00	22.00	32.00	300.00	50.00	180.00	8314 36.000
M39	4.000	32.00	24.00	35.00	325.00	50.00	210.00	8314 39.000
M42	4.500	32.00	24.00	37.50	350.00	56.00	235.00	8314 42.000
M48	5.000	36.00	29.00	43.00	400.00	65.00	275.00	8314 48.000

The specialist for forming steel materials

High performance in steel materials

The new XF fluteless tap is the high-performance fluteless tap for all steel materials in ISO group P.

The tool is characterised by its newly developed polygon geometry. The combination of an increased number of polygons, an extremely smooth thread surface and the HiPIMS AlCrN coating – which is characterised by extremely high temperature resistance – helps to achieve outstanding tool life in steel materials.

x **Tool life** increased by 60 %

x **Processing time** reduced by 25 %

- X Outstanding tool lives
- X Shorter machining times
- X Coating & polygon geometry adapted to the challenge

Increased number of polygons

Optimised polygon shape
to reduce the contact area

Extremely smooth thread surface

HiPIMS AlCrN coating

Application example

Component:	Axle journal, 1.7225 (42CrMo4)	
Tool:	#8325, Ø 8.00 mm	
Customer target:	Increased tool life	
Difficulty:	Material deformation rate	
Cutting data:	**Gühring** v_c 20 m/min	**Competition** v_c 15 m/min
Tool life:	3,840 threads	2,400 threads

Fluteless taps with coolant ducts for ISO metric threads

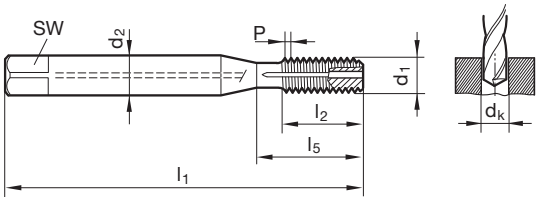
Article no. **8325**

cutting data see page 192

P	M	K	N	S	H
●					

NEW | HSS-E-PM | P | XF | 6HX | R | Cyl | C

with internal cooling ≥ M5 • maximum performance • optimised polygon shape • for steel materials



Standard **~DIN 371/~DIN 376**

Article no. **8325**

d1	P mm	d2 mm	SW mm	dk mm	l1 mm	l2 mm	l5 mm		Order no.
M3	0.500	3.50	2.70	2.80	56.00	6.00	18.00	~DIN 371	8325 3.000
M4	0.700	4.50	3.40	3.70	63.00	7.50	21.00	~DIN 371	8325 4.000
M5	0.800	6.00	4.90	4.65	70.00	8.50	25.00	~DIN 371	8325 5.000
M6	1.000	6.00	4.90	5.55	80.00	11.00	30.00	~DIN 371	8325 6.000
M8	1.250	8.00	6.20	7.40	90.00	14.00	35.00	~DIN 371	8325 8.000
M10	1.500	10.00	8.00	9.30	100.00	16.00	39.00	~DIN 371	8325 10.000
M12	1.750	9.00	7.00	11.20	110.00	18.50	49.00	~DIN 376	8325 12.000
M14	2.000	11.00	9.00	13.10	110.00	20.00	53.00	~DIN 376	8325 14.000
M16	2.000	12.00	9.00	15.10	110.00	20.00	54.00	~DIN 376	8325 16.000
M20	2.500	16.00	12.00	18.90	140.00	25.00	62.00	~DIN 376	8325 20.000
M24	3.000	18.00	14.50	22.70	160.00	30.00	73.00	~DIN 376	8325 24.000

Fluteless taps with coolant ducts for ISO metric threads

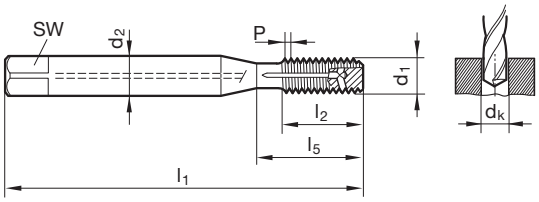
Article no. **8327**

cutting data see page 192

P	M	K	N	S	H
●					

NEW | HSS-E-PM | P | XF | 6HX | R | Cyl | C

maximum performance • optimised polygon shape • for steel materials



Standard **~DIN 371/~DIN 376**

Article no. **8327**

d1	P mm	d2 mm	SW mm	dk mm	l1 mm	l2 mm	l5 mm		Order no.
M5	0.800	6.00	4.90	4.65	70.00	8.50	25.00	~DIN 371	8327 5.000
M6	1.000	6.00	4.90	5.55	80.00	11.00	30.00	~DIN 371	8327 6.000
M8	1.250	8.00	6.20	7.40	90.00	14.00	35.00	~DIN 371	8327 8.000
M10	1.500	10.00	8.00	9.30	100.00	16.00	39.00	~DIN 371	8327 10.000
M12	1.750	9.00	7.00	11.20	110.00	18.50	49.00	~DIN 376	8327 12.000
M14	2.000	11.00	9.00	13.10	110.00	20.00	53.00	~DIN 376	8327 14.000
M16	2.000	12.00	9.00	15.10	110.00	20.00	54.00	~DIN 376	8327 16.000
M20	2.500	16.00	12.00	18.90	140.00	25.00	62.00	~DIN 376	8327 20.000
M24	3.000	18.00	14.50	22.70	160.00	30.00	73.00	~DIN 376	8327 24.000

Fluteless taps with coolant ducts for ISO metric fine threads

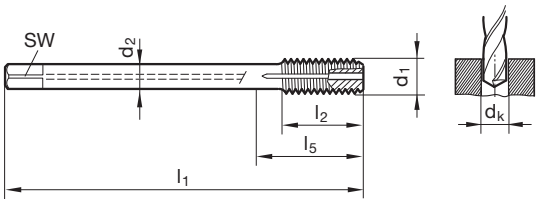
Article no. **8326**

NEW | HSS-E-PM | P | XF | 6HX | R | Cyl | C

maximum performance • optimised polygon shape • for steel materials

cutting data see page 192

P	M	K	N	S	H
•					



Standard ~DIN 374

Article no. **8326**

d1	P mm	d2 mm	SW mm	dk mm	l1 mm	l2 mm	l5 mm	Order no.
M8 x 1	1.000	6.00	4.90	7.55	90.00	11.00	35.00	8326 8.005
M10 x 1	1.000	7.00	5.50	9.55	90.00	11.00	35.00	8326 10.005
M12 x 1,25	1.250	9.00	7.00	11.40	100.00	15.00	40.00	8326 12.006
M12 x 1,5	1.500	9.00	7.00	11.30	100.00	15.00	40.00	8326 12.007
M14 x 1,25	1.250	11.00	9.00	13.40	100.00	15.00	40.00	8326 14.006
M14 x 1,5	1.500	11.00	9.00	13.30	100.00	15.00	40.00	8326 14.007
M16 x 1,5	1.500	12.00	9.00	15.30	100.00	15.00	44.00	8326 16.007
M20 x 1,5	1.500	16.00	12.00	19.30	125.00	16.00	44.00	8326 20.007
M22 x 1,5	1.500	18.00	14.50	21.30	125.00	16.00	44.00	8326 22.007
M24 x 1,5	1.500	18.00	14.50	23.30	140.00	16.00	48.00	8326 24.007

Fluteless taps with coolant ducts for ISO metric fine threads

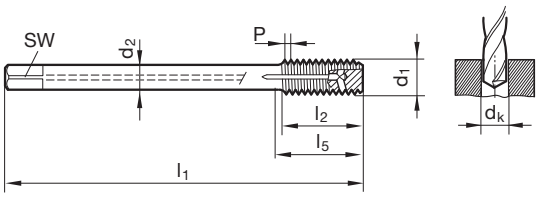
Article no. **8328**

NEW | HSS-E-PM | P | XF | 6HX | R | Cyl | C

maximum performance • optimised polygon shape • for steel materials

cutting data see page 192

P	M	K	N	S	H
•					



Standard ~DIN 374

Article no. **8328**

d1	P mm	d2 mm	SW mm	dk mm	l1 mm	l2 mm	l5 mm	Order no.
M8 x 1	1.000	6.00	4.90	7.55	90.00	11.00	35.00	8328 8.005
M10 x 1	1.000	7.00	5.50	9.55	90.00	11.00	35.00	8328 10.005
M12 x 1,25	1.250	9.00	7.00	11.40	100.00	15.00	40.00	8328 12.006
M12 x 1,5	1.500	9.00	7.00	11.30	100.00	15.00	40.00	8328 12.007
M14 x 1,25	1.250	11.00	9.00	13.40	100.00	15.00	40.00	8328 14.006
M14 x 1,5	1.500	11.00	9.00	13.30	100.00	15.00	40.00	8328 14.007
M16 x 1,5	1.500	12.00	9.00	15.30	100.00	15.00	44.00	8328 16.007
M20 x 1,5	1.500	16.00	12.00	19.30	125.00	16.00	44.00	8328 20.007
M22 x 1,5	1.500	18.00	14.50	21.30	125.00	16.00	44.00	8328 22.007
M24 x 1,5	1.500	18.00	14.50	23.30	140.00	16.00	48.00	8328 24.007

SC-Line thread milling cutter
SC-TM-Z SP

Thread milling at the limits

Economical & process-reliable thread milling up to 2.5xD thread depth

The high-performance full-profile thread milling cutter produces the complete thread in two passes.

Thanks to its new flute geometry, vibrations are successfully suppressed, which enables higher cutting parameters to be achieved. Users benefit from significantly shorter machining times and high thread quality. Thanks to its outstanding wear resistance, the thread milling cutter can produce true-to-gauge for longer. Tool radius compensation is only required much later on.

x 55 % reduction in **machining time** per thread

x **Tool life** increased by 17 %

- X Excellent running smoothness and surface quality thanks to patent-pending flute geometry
- X New milling strategy & short machining time reduce cost per thread
- X High process reliability with maximum tool life up to 2.5xD thread depth
- X Reduced radial load

New flute geometry with uneven division
and uneven helix angle suppresses vibrations

Irregular tooth rows reduce radial forces
and improve dimensional accuracy and process reliability

Optimum combination of **carbide, Sirius coating**
and tool geometry ensures maximum wear resistance

Application example

Component:	Bearing block St-52, 1,0570, thread depth 20 mm	
Tool:	#4870, M10x(1.5) 2.5xD with internal cooling	
Customer target:	Machining times reduced at thread depth of max. 2.5xD	
Difficulty:	Increased cost-effectiveness compared to competitors' tools	
Cutting data:	**Gühring** v_c 120 m/min f_z 0.075 mm/z **Counter rotation** 2/3-1/3	**Competition** v_c 110 m/min f_z 0.055 mm/z **Counter rotation** 2/3-1/3
Tool life:	820 parts	700 parts

Thread milling cutters without chamfer for ISO metric threads

Article no. **4870**

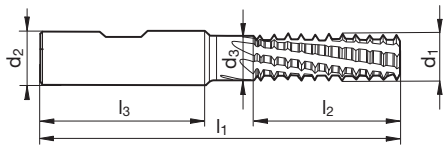
NEW | VHM | S | SC-TM-Z SP | R | ~HB | 2,5xD | 55 HRC

maximum performance • unequal flute spacing • unequal helix

cutting data see page 193

P	M	K	N	S	H
●	●	●	●	●	○

H = 55 HRC



D	P mm	d1 mm	d2 mm	d3 mm	dk mm	l1 mm	l3 mm	l2 mm	Z	Standard Article no. Company std. 4870 Order no.
M3	0.500	2.30	6.00	2.30	2.50	54.00	36.00	7.50	4	4870 3.000
M4	0.700	3.10	6.00	3.10	3.30	58.00	36.00	10.50	4	4870 4.000
M5	0.800	4.00	6.00	4.00	4.20	58.00	36.00	12.80	4	4870 5.000
M6	1.000	4.80	6.00	4.80	5.00	58.00	36.00	16.00	4	4870 6.000
M8	1.250	6.30	8.00	6.30	6.80	68.00	36.00	21.25	4	4870 8.000
M8 x 1	1.000	6.30	8.00	6.30	7.00	68.00	36.00	21.00	4	4870 8.005
M10	1.500	8.00	10.00	8.00	8.50	74.00	40.00	25.50	4	4870 10.000
M10 x 1	1.000	8.00	10.00	8.00	9.00	74.00	40.00	25.00	4	4870 10.005
M10 x 1,25	1.250	8.00	10.00	8.00	8.80	74.00	40.00	26.25	4	4870 10.006
M12	1.750	9.95	12.00	9.95	10.20	90.00	45.00	33.25	4	4870 12.000
M12 x 1	1.000	9.95	12.00	9.95	11.00	90.00	45.00	31.00	4	4870 12.005
M12 x 1,5	1.500	9.95	12.00	9.95	10.50	90.00	45.00	31.50	4	4870 12.007
M14	2.000	11.20	12.00	11.20	12.00	100.00	45.00	38.00	6	4870 14.000
M14 x 1,5	1.500	11.20	12.00	11.20	12.50	100.00	45.00	37.50	6	4870 14.007
M16	2.000	13.10	16.00	13.10	14.00	105.00	48.00	42.00	6	4870 16.000
M16 x 1,5	1.500	13.10	16.00	13.10	14.50	105.00	48.00	40.50	6	4870 16.007
M20	2.500	14.95	16.00	14.95	17.50	120.00	48.00	52.50	6	4870 20.000
M20 x 1,5	1.500	14.95	16.00	14.95	18.50	120.00	48.00	49.50	6	4870 20.007

Taps Energy

Machining group	Through-, blind holes
	HSS-E-PM
	P
	v_c (m/min)
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	18
P2.1.3 Low-alloy steel, heat-treated, Rm 1020 N/mm², 300 HB	15
P2.1.4 Low-alloy steel, heat-treated, Rm 1190 N/mm², 350 HB	12
P3.1.1 High-alloy steel and tool steel, annealed, Rm 680 N/mm², 200 HB	10
P3.1.2 High-alloy steel and tool steel, hardened and tempered, Rm 1100 N/mm², 325 HB	10
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	28
K1.1.2 Grey cast iron, pearlitic/martensitic, 260 HB	28
K1.2.1 Cast iron with spheroidal graphite, ferritic, 160 HB	28
K1.2.2 Cast iron with spheroidal graphite, pearlitic, 250 HB	28
K1.3.1 Malleable cast iron, ferritic, 130 HB	28
K1.3.2 Malleable cast iron, pearlitic, 230 HB	28
K2.1.1 Vermicular graphite cast iron (GJV)	14
K2.2.1 Austenitic-ferritic spheroidal graphite cast iron (ADI)	14
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	

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

Fluteless taps XF, ISO P M/MF

Machining group	HSS-E-PM
	P
	v_c (m/min)
P1.1.1 Unalloyed steel, annealed, 0.15 % C, Rm 420 N/mm², 125 HB	31
P1.1.2 Unalloyed steel, heat-treated, 0.15 % C, Rm 420 N/mm², 125 HB	31
P1.1.3 Unalloyed steel, annealed, 0.45 % C, Rm 640 N/mm², 190 HB	31
P1.1.4 Unalloyed steel, heat-treated, 0.45 % C, Rm 640 N/mm², 190 HB	31
P1.1.5 Unalloyed steel, heat-treated, 0.45 % C, Rm 850 N/mm², 250 HB	31
P1.1.6 Unalloyed steel, annealed, 0.75 % C, Rm 915 N/mm², 270 HB	31
P1.1.7 Unalloyed steel, heat-treated, 0.75 % C, Rm 1020 N/mm², 300 HB	31
P2.1.1 Low-alloy steel, annealed, Rm 610 N/mm², 180 HB	25
P2.1.2 Low-alloy steel, heat-treated, Rm 930 N/mm², 275 HB	25
P2.1.3 Low-alloy steel, heat-treated, Rm 1020 N/mm², 300 HB	25
P2.1.4 Low-alloy steel, heat-treated, Rm 1190 N/mm², 350 HB	25
P3.1.1 High-alloy steel and tool steel, annealed, Rm 680 N/mm², 200 HB	19
P3.1.2 High-alloy steel and tool steel, hardened and tempered, Rm 1100 N/mm², 325 HB	19
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	
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	

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

SC-Line Thread milling cutters, SC-TM-Z SP

Machining group		fz (mm/z) with milling part-Ø (d1)									
	S										
	v_c (m/min)	3	4	5	6	8	10	12	14	16	20
P1.1.1 Unalloyed steel, annealed, 0.15 % C, Rm 420 N/mm², 125 HB	120	0.045	0.055	0.060	0.065	0.080	0.090	0.100	0.110	0.120	0.135
P1.1.2 Unalloyed steel, heat-treated, 0.15 % C, Rm 420 N/mm², 125 HB	120	0.045	0.055	0.060	0.065	0.080	0.090	0.100	0.110	0.120	0.135
P1.1.3 Unalloyed steel, annealed, 0.45 % C, Rm 640 N/mm², 190 HB	120	0.045	0.055	0.060	0.065	0.080	0.090	0.100	0.110	0.120	0.135
P1.1.4 Unalloyed steel, heat-treated, 0.45 % C, Rm 640 N/mm², 190 HB	120	0.045	0.055	0.060	0.065	0.080	0.090	0.100	0.110	0.120	0.135
P1.1.5 Unalloyed steel, heat-treated, 0.45 % C, Rm 850 N/mm², 250 HB	120	0.045	0.055	0.060	0.065	0.080	0.090	0.100	0.110	0.120	0.135
P1.1.6 Unalloyed steel, annealed, 0.75 % C, Rm 915 N/mm², 270 HB	120	0.045	0.055	0.060	0.065	0.080	0.090	0.100	0.110	0.120	0.135
P1.1.7 Unalloyed steel, heat-treated, 0.75 % C, Rm 1020 N/mm², 300 HB	120	0.045	0.055	0.060	0.065	0.080	0.090	0.100	0.110	0.120	0.135
P2.1.1 Low-alloy steel, annealed, Rm 610 N/mm², 180 HB	110	0.045	0.055	0.060	0.065	0.080	0.090	0.100	0.110	0.120	0.135
P2.1.2 Low-alloy steel, heat-treated, Rm 930 N/mm², 275 HB	110	0.045	0.055	0.060	0.065	0.080	0.090	0.100	0.110	0.120	0.135
P2.1.3 Low-alloy steel, heat-treated, Rm 1020 N/mm², 300 HB	110	0.045	0.055	0.060	0.065	0.080	0.090	0.100	0.110	0.120	0.135
P2.1.4 Low-alloy steel, heat-treated, Rm 1190 N/mm², 350 HB	110	0.045	0.055	0.060	0.065	0.080	0.090	0.100	0.110	0.120	0.135
P3.1.1 High-alloy steel and tool steel, annealed, Rm 680 N/mm², 200 HB	90	0.035	0.040	0.045	0.050	0.060	0.070	0.080	0.085	0.095	0.105
P3.1.2 High-alloy steel and tool steel, hardened and tempered, Rm 1100 N/mm², 325 HB	90	0.035	0.040	0.045	0.050	0.060	0.070	0.080	0.085	0.095	0.105
M1.1.1 Stainless steel, ferritic/martensitic, with machining additives	80	0.035	0.040	0.045	0.050	0.060	0.070	0.080	0.085	0.095	0.105
M1.1.2 Stainless steel, ferritic/martensitic, annealed, Rm 680 N/mm², 200 HB	80	0.035	0.040	0.045	0.050	0.060	0.070	0.080	0.085	0.095	0.105
M1.1.3 Stainless steel, ferritic/martensitic, heat-treated, Rm 810 N/mm², 240 HB	80	0.035	0.040	0.045	0.050	0.060	0.070	0.080	0.085	0.095	0.105
M2.1.1 Stainless steel, austenitic, quenched, 180 HB	55	0.025	0.030	0.035	0.035	0.045	0.050	0.055	0.060	0.065	0.075
M2.2.1 Duplex steel, high-strength stainless steels	50	0.025	0.030	0.035	0.035	0.045	0.050	0.055	0.060	0.065	0.075
K1.1.1 Grey cast iron, pearlitic/ferritic, 180 HB	110	0.045	0.055	0.060	0.065	0.080	0.090	0.100	0.110	0.120	0.135
K1.1.2 Grey cast iron, pearlitic/martensitic, 260 HB	110	0.045	0.055	0.060	0.065	0.080	0.090	0.100	0.110	0.120	0.135
K1.2.1 Cast iron with spheroidal graphite, ferritic, 160 HB	90	0.045	0.055	0.060	0.065	0.080	0.090	0.100	0.110	0.120	0.135
K1.2.2 Cast iron with spheroidal graphite, pearlitic, 250 HB	90	0.045	0.055	0.060	0.065	0.080	0.090	0.100	0.110	0.120	0.135
K1.3.1 Malleable cast iron, ferritic, 130 HB	90	0.045	0.055	0.060	0.065	0.080	0.090	0.100	0.110	0.120	0.135
K1.3.2 Malleable cast iron, pearlitic, 230 HB	90	0.045	0.055	0.060	0.065	0.080	0.090	0.100	0.110	0.120	0.135
K2.1.1 Vermicular graphite cast iron (GJV)	100	0.035	0.040	0.045	0.050	0.060	0.070	0.080	0.085	0.095	0.105
K2.2.1 Austenitic-ferritic spheroidal graphite cast iron (ADI)	100	0.035	0.040	0.045	0.050	0.060	0.070	0.080	0.085	0.095	0.105
N1.1.1 Wrought aluminium alloys, non-hardened, 60 HB	180	0.055	0.065	0.075	0.080	0.095	0.110	0.120	0.135	0.145	0.165
N1.1.2 Wrought aluminium alloys, hardened, 100 HB	180	0.055	0.065	0.075	0.080	0.095	0.110	0.120	0.135	0.145	0.165
N2.1.1 Aluminium casting alloys, non-hardened, ≤ 12 % Si, 75 HB	160	0.050	0.060	0.065	0.075	0.090	0.100	0.110	0.120	0.130	0.150
N2.1.2 Aluminium casting alloys, hardened, ≤ 12 % Si, 90 HB	160	0.050	0.060	0.065	0.075	0.090	0.100	0.110	0.120	0.130	0.150
N2.1.3 Aluminium casting alloys, non-hardened, > 12 % Si, 130 HB	160	0.050	0.060	0.065	0.075	0.090	0.100	0.110	0.120	0.130	0.150
N3.1.1 Copper and copper alloys: Free-machining alloy, Pb > 1 %	140	0.045	0.055	0.060	0.065	0.080	0.090	0.100	0.110	0.120	0.135
N3.1.2 Copper and copper alloys: CuZn, CuSnZn	140	0.045	0.055	0.060	0.065	0.080	0.090	0.100	0.110	0.120	0.135
N3.1.3 Copper and copper alloys: CuSn, lead-free copper and copper electrolyte	110	0.040	0.045	0.050	0.055	0.065	0.075	0.085	0.095	0.100	0.115
N4.1.1 Non-metallic materials: Duroplastics, fibre-reinforced plastics	200	0.040	0.045	0.055	0.060	0.070	0.080	0.090	0.100	0.105	0.120
N4.1.2 Non-metallic materials: Hard rubber, wood, etc.	200	0.040	0.045	0.055	0.060	0.070	0.080	0.090	0.100	0.105	0.120
N4.1.3 Non-metallic materials: Graphite	200	0.040	0.045	0.055	0.060	0.070	0.080	0.090	0.100	0.105	0.120
S1.1.1 Heat-resistant alloys, Fe-based, annealed, 200 HB	60	0.025	0.030	0.035	0.035	0.045	0.050	0.055	0.060	0.065	0.075
S1.1.2 Heat-resistant alloys, Fe-based, hardened, 280 HB	60	0.025	0.030	0.035	0.035	0.045	0.050	0.055	0.060	0.065	0.075
S1.1.3 Heat-resistant alloys, Ni- or Co-based, annealed, 250 HB	60	0.025	0.030	0.035	0.035	0.045	0.050	0.055	0.060	0.065	0.075
S1.1.4 Heat-resistant alloys, Ni- or Co-based, hardened, 350 HB	60	0.025	0.030	0.035	0.035	0.045	0.050	0.055	0.060	0.065	0.075
S1.1.5 Heat-resistant alloys, Ni- or Co-based, cast, 320 HB	60	0.025	0.030	0.035	0.035	0.045	0.050	0.055	0.060	0.065	0.075
S2.1.1 Titanium alloys, pure titanium, Rm 400 N/mm²	45	0.025	0.030	0.035	0.035	0.045	0.050	0.055	0.060	0.065	0.075
S2.1.2 Titanium alloys, Alpha and Beta alloys, hardened, Rm 1050 N/mm²	45	0.025	0.030	0.035	0.035	0.045	0.050	0.055	0.060	0.065	0.075
H1.1.1 Hardened steel, hardened and tempered, < 55 HRC	40	0.025	0.030	0.035	0.035	0.045	0.050	0.055	0.060	0.065	0.075
H1.1.2 Hardened steel, hardened and tempered, < 60 HRC	40	0.025	0.030	0.035	0.035	0.045	0.050	0.055	0.060	0.065	0.075
H1.1.3 Hardened steel, hardened and tempered, > 60 HRC	40	0.025	0.030	0.035	0.035	0.045	0.050	0.055	0.060	0.065	0.075
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 navigator.guehring.de/en.

Reaming & deburring tools

Drilling at the highest level

Process-precise technologies
for reaming & deburring

GÜHRING

Page


NEW
HR
500

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															
●	○	○	○	●	●		+Ø	+0,005 +0		HR 500 S	HA	VHM	a	1.950 - 20.050	1675	200
●	○	○	○	●	●		+Ø	+0,005 +0		HR 500 D	HA	VHM	a	1.950 - 20.050	1676	200
90° Front/back deburrers															
●	●	●	○	●	●		+Ø	js9		EW 100 VR	HA	VHM	a	2.000 - 16.000	495	208

HR 500

The perfect fit for any diameter range

New market standard for fixed sizes results in more than double the tool life

The high-performance reamers from the HR 500 family are characterised by maximum performance and precision.

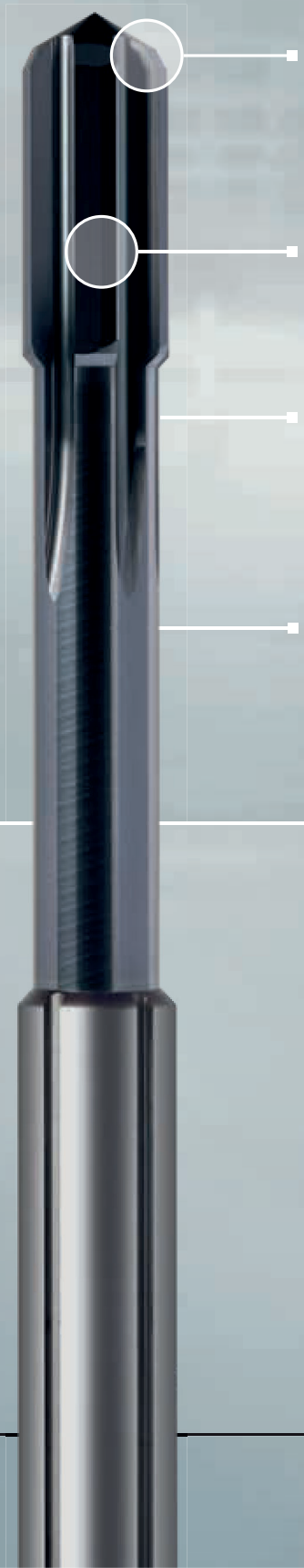
While standard fixed-size series cover a range around the main dimension of ± 0.03 mm in increments of one hundredth, Gühring is expanding its fixed-size series to a range of ± 0.05 mm. In addition, the diameter range from Ø 1.95 to 12.05 is available in 5µ increments and, NEW, in the range from Ø 12.95 to 20.05 in 10µ increments.

Thanks to the finer and wider scaling, numerous fits can also be precisely served outside the H7 class.

x **Tool life** doubled

x **Machining time** reduced by a factor of 5

- X precise reaming without compromises or expensive custom-made products
- X 100 % more wear buffer and longer tool lives thanks to finer increments
- X programme covers numerous tolerances even outside the H7 range
- X universally applicable in a wide range of materials



extremely unequal cutting edge pitch
for a smooth cut & excellent surface finishes

nanoA coating prevents built-up edges
and ensures maximum process reliability

Intermediate dimensions each side of the main dimension
in the range of Ø 1.95 – 12.05 in 5µ steps and
a range of ± 0.05 mm

NEW!

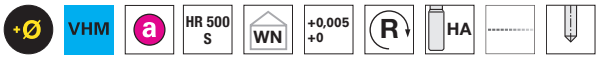
Intermediate dimensions each side of the main dimension
in the range of Ø 12.95 – 20.05 in 10µ steps and
a range of ± 0.05 mm

Application example

Component:	Ø12 F9 fit in a 42CrMo4 gear	
Customer target:	Increased tool life	
Difficulty:	Premature wear, insufficient dimensional accuracy	
Tool & Cutting data:	**Gühring** Ø 14.05 v_c 180 m/min **n** 4,095 rpm v_f 8,395 mm/min	**Competition** Ø 14.03 v_c 90 m/min **n** 2,045 rpm v_f 1,635 mm/min
Tool life:	110 m	55 m

High-performance reamers, fixed-size series

Article no. **1675**



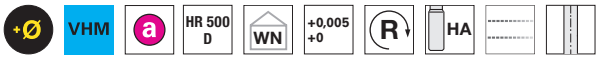
cutting data see page 205

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

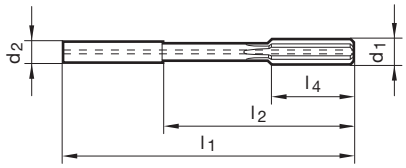
Article no. **1676**



cutting data see page 205

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 Order no.	Article no. 1676 Order no.
	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

	d1 mm	d2 h6 mm	l1 mm	l2 mm	l4 mm	Z	Article no. 1675	Article no. 1676
							Order no.	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
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	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
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	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
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	6.030	6.00	76.0	40.0	12.0	4	1675 6.030	1676 6.030
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	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
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	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
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	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

	d1 mm	d2 h6 mm	l1 mm	l2 mm	l4 mm	Z	Article no. 1675 Order no.	1676 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

	d1 mm	d2 h6 mm	l1 mm	l2 mm	l4 mm	Z	Article no. 1675 Order no.	1676 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
NEW	12.950	14.00	130.0	85.0	22.0	6	1675 12.950	1676 12.950
NEW	12.960	14.00	130.0	85.0	22.0	6	1675 12.960	1676 12.960
NEW	12.970	14.00	130.0	85.0	22.0	6	1675 12.970	1676 12.970
NEW	12.980	14.00	130.0	85.0	22.0	6	1675 12.980	1676 12.980
NEW	12.990	14.00	130.0	85.0	22.0	6	1675 12.990	1676 12.990
NEW	13.000	14.00	130.0	85.0	22.0	6	1675 13.000	1676 13.000
NEW	13.010	14.00	130.0	85.0	22.0	6	1675 13.010	1676 13.010
NEW	13.020	14.00	130.0	85.0	22.0	6	1675 13.020	1676 13.020
NEW	13.030	14.00	130.0	85.0	22.0	6	1675 13.030	1676 13.030
NEW	13.040	14.00	130.0	85.0	22.0	6	1675 13.040	1676 13.040
NEW	13.050	14.00	130.0	85.0	22.0	6	1675 13.050	1676 13.050
NEW	13.950	14.00	130.0	85.0	22.0	6	1675 13.950	1676 13.950
NEW	13.960	14.00	130.0	85.0	22.0	6	1675 13.960	1676 13.960
NEW	13.970	14.00	130.0	85.0	22.0	6	1675 13.970	1676 13.970
NEW	13.980	14.00	130.0	85.0	22.0	6	1675 13.980	1676 13.980
NEW	13.990	14.00	130.0	85.0	22.0	6	1675 13.990	1676 13.990
NEW	14.000	14.00	130.0	85.0	22.0	6	1675 14.000	1676 14.000
NEW	14.010	14.00	130.0	85.0	22.0	6	1675 14.010	1676 14.010
NEW	14.020	14.00	130.0	85.0	22.0	6	1675 14.020	1676 14.020
NEW	14.030	14.00	130.0	85.0	22.0	6	1675 14.030	1676 14.030
NEW	14.040	14.00	130.0	85.0	22.0	6	1675 14.040	1676 14.040
NEW	14.050	14.00	130.0	85.0	22.0	6	1675 14.050	1676 14.050
NEW	14.950	16.00	150.0	102.0	22.0	6	1675 14.950	1676 14.950
NEW	14.960	16.00	150.0	102.0	22.0	6	1675 14.960	1676 14.960
NEW	14.970	16.00	150.0	102.0	22.0	6	1675 14.970	1676 14.970
NEW	14.980	16.00	150.0	102.0	22.0	6	1675 14.980	1676 14.980
NEW	14.990	16.00	150.0	102.0	22.0	6	1675 14.990	1676 14.990
NEW	15.000	16.00	150.0	102.0	22.0	6	1675 15.000	1676 15.000
NEW	15.010	16.00	150.0	102.0	22.0	6	1675 15.010	1676 15.010
NEW	15.020	16.00	150.0	102.0	22.0	6	1675 15.020	1676 15.020
NEW	15.030	16.00	150.0	102.0	22.0	6	1675 15.030	1676 15.030
NEW	15.040	16.00	150.0	102.0	22.0	6	1675 15.040	1676 15.040
NEW	15.050	16.00	150.0	102.0	22.0	6	1675 15.050	1676 15.050
NEW	15.950	16.00	150.0	102.0	22.0	6	1675 15.950	1676 15.950
NEW	15.960	16.00	150.0	102.0	22.0	6	1675 15.960	1676 15.960
NEW	15.970	16.00	150.0	102.0	22.0	6	1675 15.970	1676 15.970
NEW	15.980	16.00	150.0	102.0	22.0	6	1675 15.980	1676 15.980
NEW	15.990	16.00	150.0	102.0	22.0	6	1675 15.990	1676 15.990
NEW	16.000	16.00	150.0	102.0	22.0	6	1675 16.000	1676 16.000
NEW	16.010	16.00	150.0	102.0	22.0	6	1675 16.010	1676 16.010
NEW	16.020	16.00	150.0	102.0	22.0	6	1675 16.020	1676 16.020
NEW	16.030	16.00	150.0	102.0	22.0	6	1675 16.030	1676 16.030
NEW	16.040	16.00	150.0	102.0	22.0	6	1675 16.040	1676 16.040
NEW	16.050	16.00	150.0	102.0	22.0	6	1675 16.050	1676 16.050
NEW	17.950	18.00	150.0	102.0	25.0	6	1675 17.950	1676 17.950
NEW	17.960	18.00	150.0	102.0	25.0	6	1675 17.960	1676 17.960
NEW	17.970	18.00	150.0	102.0	25.0	6	1675 17.970	1676 17.970
NEW	17.980	18.00	150.0	102.0	25.0	6	1675 17.980	1676 17.980
NEW	17.990	18.00	150.0	102.0	25.0	6	1675 17.990	1676 17.990
NEW	18.000	18.00	150.0	102.0	25.0	6	1675 18.000	1676 18.000
NEW	18.010	18.00	150.0	102.0	25.0	6	1675 18.010	1676 18.010
NEW	18.020	18.00	150.0	102.0	25.0	6	1675 18.020	1676 18.020
NEW	18.030	18.00	150.0	102.0	25.0	6	1675 18.030	1676 18.030
NEW	18.040	18.00	150.0	102.0	25.0	6	1675 18.040	1676 18.040
NEW	18.050	18.00	150.0	102.0	25.0	6	1675 18.050	1676 18.050
NEW	18.950	20.00	150.0	100.0	25.0	6	1675 18.950	1676 18.950
NEW	18.960	20.00	150.0	100.0	25.0	6	1675 18.960	1676 18.960
NEW	18.970	20.00	150.0	100.0	25.0	6	1675 18.970	1676 18.970
NEW	18.980	20.00	150.0	100.0	25.0	6	1675 18.980	1676 18.980
NEW	18.990	20.00	150.0	100.0	25.0	6	1675 18.990	1676 18.990
NEW	19.000	20.00	150.0	100.0	25.0	6	1675 19.000	1676 19.000
NEW	19.010	20.00	150.0	100.0	25.0	6	1675 19.010	1676 19.010
NEW	19.020	20.00	150.0	100.0	25.0	6	1675 19.020	1676 19.020
NEW	19.030	20.00	150.0	100.0	25.0	6	1675 19.030	1676 19.030
NEW	19.040	20.00	150.0	100.0	25.0	6	1675 19.040	1676 19.040
NEW	19.050	20.00	150.0	100.0	25.0	6	1675 19.050	1676 19.050
NEW	19.950	20.00	150.0	100.0	25.0	6	1675 19.950	1676 19.950
NEW	19.960	20.00	150.0	100.0	25.0	6	1675 19.960	1676 19.960
NEW	19.970	20.00	150.0	100.0	25.0	6	1675 19.970	1676 19.970
NEW	19.980	20.00	150.0	100.0	25.0	6	1675 19.980	1676 19.980
NEW	19.990	20.00	150.0	100.0	25.0	6	1675 19.990	1676 19.990
NEW	20.000	20.00	150.0	100.0	25.0	6	1675 20.000	1676 20.000
NEW	20.010	20.00	150.0	100.0	25.0	6	1675 20.010	1676 20.010
NEW	20.020	20.00	150.0	100.0	25.0	6	1675 20.020	1676 20.020
NEW	20.030	20.00	150.0	100.0	25.0	6	1675 20.030	1676 20.030

							Article no.	1675	1676
	d1 mm	d2 h6 mm	l1 mm	l2 mm	l4 mm	Z		Order no.	
NEW	20.040	20.00	150.0	100.0	25.0	6		1675 20.040	1676 20.040
NEW	20.050	20.00	150.0	100.0	25.0	6		1675 20.050	1676 20.050

Fixed-size / H7 / 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

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

EW 100 VR

For clean entrances and exits – burr-free in both directions

Front/back deburrer with 90° chamfer angle

The EW 100 VR solid carbide deburring milling cutter is a high-precision tool for automated deburring and chamfering.

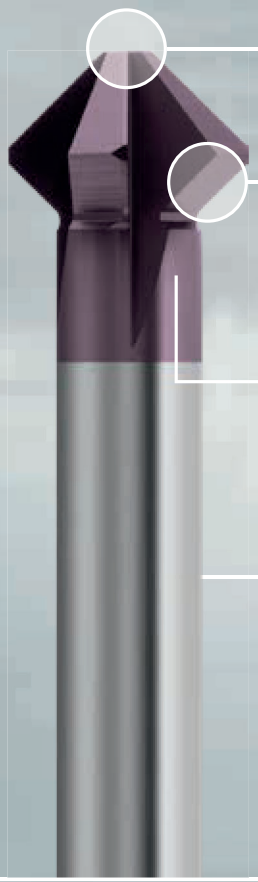
Using its special geometry, the milling head creates low-burr edge breaks at hole entrances and exits.

The powerful carbide, TiAlN coating and universal cutting geometry make the tool ideal for demanding production environments and a wide range of materials.

x complete **2 tasks** burr-free with just 1 tool

x machine **in 2 directions** without any compromise

- X Reduced set-up times due to combination of front and back deburring
- X High wear resistance & tool life thanks to tailored substrate & coating
- X Contour chamfering option for deburring freeform shapes



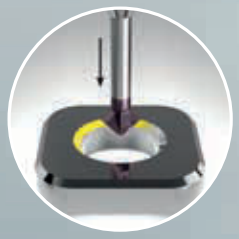
4 straight-fluted cuttting edges

Rear cutting edge can be used
up to neck diameter

Wear-resistant
TiAlN-nanoA coating

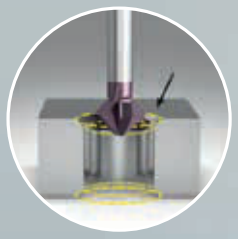
Available in the diameter range
Ø 2-16 mm in all full and 0.8 dimensions

1 tool, 5 applications

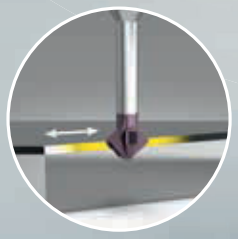


Circular countersinking

Circular deburring



Helical milling



Edge breakage

Contour chamfering

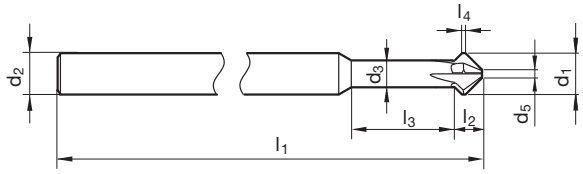
90° Front/back deburrers

Article no. **495**

cutting data see page 209

P	M	K	N	S	H
●	●	●	○	●	●

neck clearance < Ø 8.0 mm • without centre cutting



Article no. **495**

	d1 mm	d2 h6 mm	d3 mm	d5 mm	l1 mm	l2 mm	l3 mm	l4 mm	Z	Order no.
NEW	2.00	4.00	1.50	0.40	75.0	1.5	9.2	0.5	4	495 2.000
NEW	2.80	4.00	2.10	0.56	75.0	1.9	9.4	0.5	4	495 2.800
	3.00	4.00	2.25	0.60	75.0	2.0	9.4	0.5	4	495 3.000
NEW	3.80	4.00	2.85	0.76	75.0	2.5	12.5	0.5	4	495 3.800
	4.00	4.00	3.00	0.80	75.0	2.6	12.5	0.5	4	495 4.000
NEW	4.80	5.00	3.60	0.96	75.0	3.0	14.7	0.5	4	495 4.800
	5.00	5.00	3.75	1.00	75.0	3.1	14.7	0.5	4	495 5.000
NEW	5.80	6.00	4.35	1.16	100.0	3.5	15.0	0.5	4	495 5.800
	6.00	6.00	4.50	1.20	100.0	3.6	15.0	0.5	4	495 6.000
NEW	6.80	6.00	5.10	1.36	100.0	4.0	15.1	0.5	4	495 6.800
NEW	7.00	6.00	5.25	1.40	100.0	4.1	15.2	0.5	4	495 7.000
NEW	7.80	6.00	5.85	1.56	100.0	4.6	15.3	0.5	4	495 7.800
	8.00	6.00		1.60	100.0	7.7		0.5	4	495 8.000
NEW	8.80	6.00		1.76	100.0	8.4		0.5	4	495 8.800
NEW	9.00	6.00		1.80	100.0	8.6		0.5	4	495 9.000
NEW	9.80	6.00		1.96	100.0	9.3		0.5	4	495 9.800
	10.00	6.00		2.00	100.0	9.5		0.5	4	495 10.000
NEW	10.80	6.00		2.16	100.0	10.2		0.5	4	495 10.800
NEW	11.00	6.00		2.20	100.0	10.4		0.5	4	495 11.000
NEW	11.80	6.00		2.36	100.0	11.1		0.5	4	495 11.800
	12.00	6.00		2.40	100.0	11.3		0.5	4	495 12.000
NEW	12.80	8.00		2.56	100.0	12.0		0.5	4	495 12.800
NEW	13.00	8.00		2.60	100.0	12.2		0.5	4	495 13.000
NEW	13.80	8.00		2.76	100.0	12.9		0.5	4	495 13.800
NEW	14.00	8.00		2.80	100.0	13.1		0.5	4	495 14.000
NEW	14.80	8.00		2.96	100.0	13.8		0.5	4	495 14.800
NEW	15.00	8.00		3.00	100.0	14.0		0.5	4	495 15.000
NEW	15.80	8.00		3.16	100.0	14.7		0.5	4	495 15.800
NEW	16.00	8.00		3.20	100.0	14.9		0.5	4	495 16.000

90° Front/back deburrers

ISO	Hardness	X	f (mm/rev) with nom. Ø						
		v_c (m/min)	3	6	8	10	12	16	20
P	≤ 850 N/mm2	180	0.08	0.12	0.20	0.20	0.25	0.25	0.25
	≥ 850 N/mm2	150	0.06	0.10	0.15	0.15	0.20	0.20	0.20
M	≤ 750 N/mm2	100	0.06	0.10	0.15	0.15	0.20	0.20	0.20
	≥ 750 N/mm2	80	0.05	0.08	0.12	0.12	0.15	0.15	0.15
K	≤ 350 HB	120	0.08	0.12	0.20	0.20	0.25	0.25	0.25
N*	≤ 3 % Si	200	0.10	0.15	0.25	0.25	0.30	0.30	0.30
	> 3 % Si	150	0.08	0.12	0.20	0.20	0.25	0.25	0.25
S	≤ 850 N/mm2	60	0.05	0.08	0.12	0.12	0.15	0.15	0.15
	≤ 1400 N/mm2	40	0.04	0.06	0.10	0.10	0.12	0.12	0.12
H	< 55 HRC	100	0.06	0.10	0.15	0.15	0.20	0.20	0.20
	≤ 63 HRC	40	0.04	0.05	0.06	0.06	0.08	0.08	0.08

* We recommend our Carbo-coating for the machining of aluminium.

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

Clamping systems GM 300

Clamping increases with Gühring

Modern tool holders
for flawless machining results

GÜHRING

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GÜHROSync

Exciting combination of two systems

Clamping chuck for perfect machine tapping and fluteless tapping

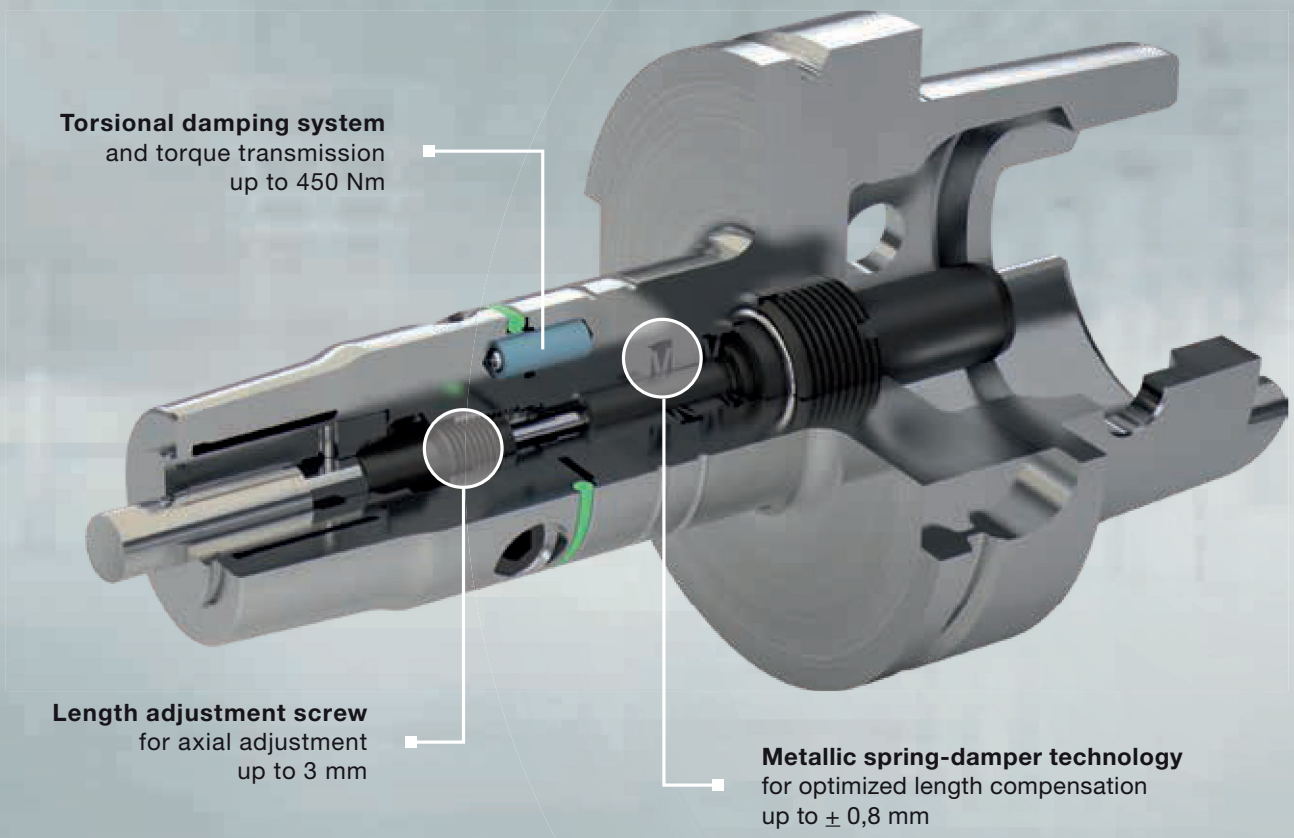
Thread pitches are affected by tool tolerances and temperature fluctuations. In addition, synchronisation errors in CNC machines increase with increasing machining speed and age-related wear.

The Gührosync tapping chucks combine the advantages of hydraulic and synchro tapping chucks. They dampen impulse-like torsional loads during cutting, reduce vibrations in the axial and radial direction and minimise axial forces. This ensures high concentricity and vibration damping. This not only results in higher cutting parameters and more precise thread tolerances, the lower tool load also reduces wear by up to 75%.

x **Reduced radial and axial forces**

x Significantly **higher cutting parameters** possible

- X High concentricity thanks to hydraulic clamping
- X Encapsulated functional compartment allows for internal cooling up to 80 bar
- X Quick and precise tool length presetting



Application example

Component:	Rocker truck semi-trailer, ADI EN-GJS-1050-6 1,050 N/mm²	
Tool:	#4601 32,100 (threading tool #4648, M30)	
Customer target:	Increased tool life	
Difficulty:	Uneven cutting edge wear due to Weldon clamping	
Cutting data:	**Gühring** v_c 7 m/min **f** 260 mm/min **Thread depth** 85 mm	**Competition** v_c 7 m/min **f** 260 mm/min **Thread depth** 85 mm
Tool life:	100 min	40 min

HSK-A hydraulic synchro tapping chucks for internal cooling

Article no. **4601**

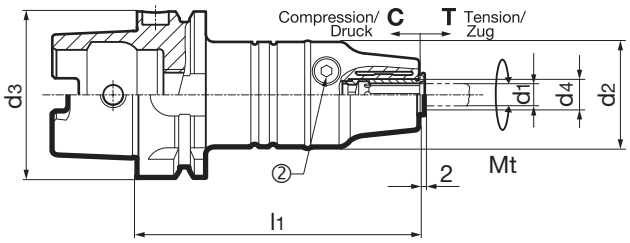
HSK-A

Product information:

- HSK-A according to ISO 12164-1 / DIN 69893-1
- balancing quality: G 6.3 / 15,000 rpm
- coolant pressure up to max. 80 bar
- compensates synchronisation errors
- convenient hydraulic clamping using reduction bushes with active drive
- adjusting screw enables 3 mm axial length readjustment

Suitable accessories separately available:

- length adjusting screws art. no. 4364
- adjustment key, art. no. 4912, type B for adjusting screws
- replacement clamping screw (2) art. no. 4241
- hexagonal key (2), art. no. 4912
- reduction bushes art. no. 4605 or 4606
- coolant supply set art. no. 4949



Article no. **4601**

	d3	for threads	d1 mm	d2 mm	d4 mm	l1 mm	Mt max. Nm	C/T mm	②	②	kg	Order no.
NEW	HSK-A 32	M0,5-M4	2,5-5,0	34.0	12	100.0	10	0,3	4241 8.000	4912 4.600	0.6	4601 12.032
NEW	HSK-A 40	M0,5-M4	2,5-5,0	34.0	12	100.0	10	0,3	4241 8.000	4912 4.600	0.7	4601 12.040
NEW	HSK-A 63	M0,5-M4	2,5-5,0	34.0	12	106.5	10	0,3	4241 8,000	4912 4,600	1.5	4601 12.163
	HSK-A 63	M4-M12		40.0	12	106.5	26	0,5	4241 8.000	4912 4.600	1.2	4601 12.063
	HSK-A 63	M8-M20	6.0-16.0	40.0	20	120.5	150	0,5	4241 10.003	4912 5.000	1.3	4601 20.063
NEW	HSK-A 63	M14-M30	10,5-23,0	63.0	32	158.0	450	0,8	4241 12,000	4912 6,000	3.3	4601 32.063
	HSK-A 100	M4-M12		40.0	12	113.0	26	0,5	4241 8.000	4912 4.600	2.6	4601 12.100
	HSK-A 100	M8-M20	6.0-16.0	40.0	20	127.0	150	0,5	4241 10.003	4912 5.000	2.9	4601 20.100
NEW	HSK-A 100	M14-M30	10,5-23,0	63.0	32	164.0	450	0,8	4241 12,000	4912 6,000	6.2	4601 32.100

ISO taper hydraulic synchro tapping chucks for internal cooling

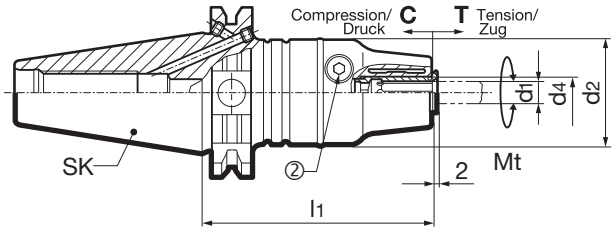
Article no. **4576**

Product information:

- SK30 according to DIN ISO 7388-1
- SK40 according to DIN ISO 7388-1 form AD/AF
- balancing quality: G 6.3 / 15,000 rpm
- coolant pressure up to max. 80 bar
- compensates synchronisation errors
- convenient hydraulic clamping using reduction bushes with active drive
- adjusting screw enables 3 mm axial length readjustment

Suitable accessories separately available:

- length adjusting screws art. no. 4364
- adjustment key, art. no. 4912, type B for adjusting screws
- replacement clamping screw (2) art. no. 4241
- hexagonal key (2), art. no. 4912
- reduction bushes art. no. 4605 or 4606
- pull studs art. no. 4925, 4926



Article no. **4576**

	SK	for threads	d1 mm	d2 mm	d4 mm	l1 mm	Mt max. Nm	C/T mm	②	②	kg	Order no.
NEW	SK 30	M0,5-M4	2,5-5,0	34.0	12	80.0	10	0,3	4241 8,000	4912 4,600	0.7	4576 12.130
	SK 30	M4-M12		40.0	12	81.0	26	0,5	4241 8.000	4912 4.600	0.8	4576 12.030
	SK 30	M8-M20	6.0-16.0	40.0	20	95.0	150	0,5	4241 10.003	4912 5.000	0.9	4576 20.030
NEW	SK 40	M0,5-M4	2,5-5,0	34.0	12	80.0	10	0,3	4241 8,000	4912 4,600	1.2	4576 12.140
	SK 40	M4-M12		40.0	12	85.0	26	0,5	4241 8.000	4912 4.600	1.3	4576 12.040
	SK 40	M8-M20	6.0-16.0	40.0	20	99.0	150	0,5	4241 10.003	4912 5.000	1.5	4576 20.040
NEW	SK 50	M14-M30	10,5-23,0	63.0	32	125.0	450	0,8	4241 12,000	4912 6,000	4.7	4576 32.050

MAS/BT hydraulic synchro tapping chucks for internal cooling

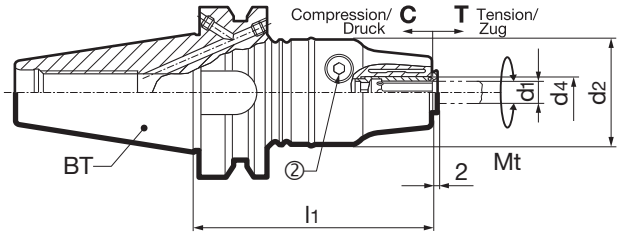
Article no. **4577**

Product information:

- BT 30 according to DIN ISO 7388-2 form JD without coolant supply via the collar
- BT 40 / BT 50 according to DIN ISO 7388-2 form JD/JF
- balancing quality: G 6.3 / 15,000 rpm
- coolant pressure up to max. 80 bar
- compensates synchronisation errors
- convenient hydraulic clamping using reduction bushes with active drive
- adjusting screw enables 3 mm axial length readjustment

Suitable accessories separately available:

- length adjusting screws art. no. 4364
- adjustment key, art. no. 4912, type B for adjusting screws
- replacement clamping screw (2) art. no. 4241
- hexagonal key (2), art. no. 4912
- reduction bushes art. no. 4605 or 4606
- BT pull studs art. no. 4927, 4928



	BT	for threads	d1 mm	d2 mm	d4 mm	l1 mm	Mt max. Nm	C/T mm	②	②	kg	Order no.
NEW	BT 30	M0,5-M4	2,5-5,0	34.0	12	80.0	10	0,3	4241 8,000	4912 4,600	0.7	4577 12.130
	BT 30	M4-M12		40.0	12	81.0	26	0,5	4241 8.000	4912 4.600	0.9	4577 12.030
	BT 30	M8-M20	6.0-16.0	40.0	20	95.0	150	0,5	4241 10.003	4912 5.000	0.9	4577 20.030
NEW	BT 40	M0,5-M4	2,5-5,0	34.0	12	80.0	10	0,3	4241 8,000	4912 4,600	1.2	4577 12.140
	BT 40	M4-M12		40.0	12	85.0	26	0,5	4241 8.000	4912 4.600	1.3	4577 12.040
	BT 40	M8-M20	6.0-16.0	40.0	20	99.0	150	0,5	4241 10.003	4912 5.000	1.4	4577 20.040
NEW	BT 50	M14-M30	10,5-23,0	63.0	32	125.0	450	0,8	4241 12,000	4912 6,000	4.7	4577 32.050

Article no. **4577**

Straight shank hydraulic synchro tapping chucks for internal cooling

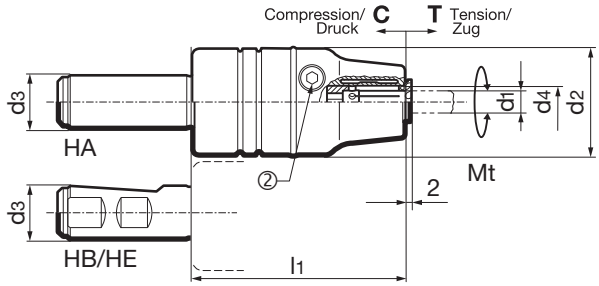
Article no. **4525**

Product information:

- HA straight shank similar to DIN 6535
  HB straight shank also with HE clamping surface, similar to DIN 1835
- balancing quality: G 6.3 / 15,000 rpm
- coolant pressure up to max. 80 bar
- compensates synchronisation errors
- convenient hydraulic clamping using reduction bushes with active drive
- adjusting screw enables 3 mm axial length readjustment

Suitable accessories separately available:

- length adjusting screws art. no. 4364
- adjustment key, art. no. 4912, type B for adjusting screws
- replacement clamping screw (2) art. no. 4241
- hexagonal key (2), art. no. 4912
- reduction bushes art. no. 4605 or 4606



Article no. **4525**

	d3 h6 mm	Shank	for threads	d1 mm	d2 mm	d4 mm	l1 mm	Mt max. Nm	C/T	②	②	kg	Order no.
NEW	12	HA	M0,5-M4	2,5-5,0	34	12	80	10	0,3	4241 8,001	4912 4,600	0.6	4525 12.012
	20	HA	M4-M12		40	12	80	26	0,5	4241 8.000	4912 4.600	0.8	4525 12.020
	20	HA	M8-M20	6.0-16.0	40	20	94	150	0,5	4241 10.003	4912 5.000	0.8	4525 20.020
	25	HB	M4-M12		40	12	80	26	0,5	4241 8.000	4912 4.600	0.7	4525 12.025
	25	HB	M8-M20	6.0-16.0	40	20	94	150	0,8	4241 10.003	4912 5.000	1.0	4525 20.025
NEW	25	HB	M14-M30	10,5-23,0	63	32	135	450	0,8	4241 12,000	4912 6,000	4.4	4525 32.025
NEW	32	HA	M14-M30	10,5-23,0	63	32	135	450	0,8	4241 12,000	4912 6,000	4.5	4525 32.032
NEW	32	HB	M14-M30	10,5-23,0	63	32	135	450	0,8	4241 12,000	4912 6,000	4.5	4525 32.132

CAT hydraulic chucks for internal cooling

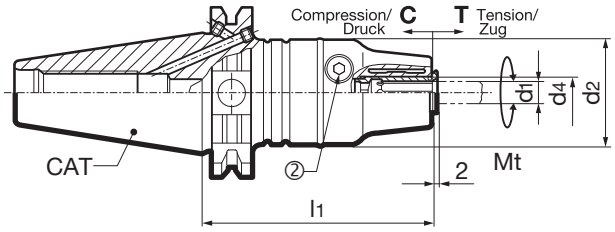
Article no. **4526**

Product information:

- CAT according to ASME B5.50-2009 / DIN ISO 7388-1 form UD/UF
- balancing quality: G 6.3 / 15,000 rpm
- coolant pressure up to max. 80 bar
- compensates synchronisation errors
- convenient hydraulic clamping using reduction bushes with active drive
- adjusting screw enables 3 mm axial length readjustment

Suitable accessories separately available:

- length adjusting screws art. no. 4364
- adjustment key, art. no. 4912, type B for adjusting screws
- replacement clamping screw (2) art. no. 4241
- hexagonal key (2), art. no. 4912
- reduction bushes art. no. 4605 or 4606
- CAT pull studs on request



Article no. **4526**

	CAT	for threads	d1 mm	d2 mm	d4 mm	l1 mm	Mt max. Nm	C/T mm	②	②	kg	Order no.
NEW	CAT 40	M0,5-M4	2,5-5,0	34.0	12	80.0	10	0,3	4241 8,000	4912 4,600	0.7	4526 12.140
	CAT 40	M4-M12		40.0	12	85.0	26	0,5	4241 8,000	4912 4,600	1.2	4526 12.040
	CAT 40	M8-M20	6.0-16.0	40.0	20	99.0	150	0,5	4241 10,003	4912 5,000	3.0	4526 20.040
	CAT 50	M4-M12		40.0	12	85.0	26	0,5	4241 8,000	4912 4,600	1.0	4526 12.050
	CAT 50	M8-M20	6.0-16.0	40.0	20	99.0	150	0,5	4241 8,000	4912 4,600	3.2	4526 20.050
NEW	CAT 50	M14-M30	10,5-23,0	63.0	32	125.0	450	0,8	4241 12,000	4912 6,000	4.7	4526 32.050

Reduction bushes, sealed, for hydraulic synchro tapping chucks

Article no. **4605**

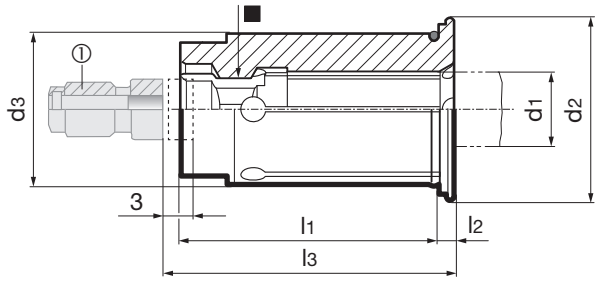
+Ø Cyl

Product information:

- for clamping taps with square shank in hydraulic synchro tapping chucks
- clamping Ø for tool shank tolerance h6-h9
- front face closed, therefore coolant leakproof for taps with IC
- positive drive of reduction bush in hydraulic synchro tapping chucks
- position ajdusting screw on the shank of the tap
- adjusting screw enables 3 mm axial length readjustment

Suitable accessories separately available:

- length adjusting screw (1), art. no. 4364
- adjustment key, art. no. 4912, type B for adjusting screws
- MQL axial adjusting screw, art. no. 4305



Article no. **4605**

	d3 mm	d1 mm	■ mm	Standard	d2 mm	l1 mm	l2 mm	l3 mm	①	for threads	Order no.
NEW	12	2.5	2.1	DIN	16.5	29.0	2.0	18.0	4364 2,812	M1-M1,8 / M3,5	4605 2.501
	12	2.8	2.1	DIN	16.5	29.0	2.0	18.0		M2/M2,2/M2,5/M4	4605 2.812
	12	3.5	2.7	DIN	16.5	29.0	2.0	20.0		M3/M4/M5	4605 3.512
	12	4.0	3.2	JIS	16.5	29.0	2.0	24.0		M3/M3,5	4605 4.012
	12	4.5	3.4	DIN	16.5	29.0	2.0	26.0	4364 5.020	M4/M6	4605 4.512
	12	4.9	3.8	ANSI	16.5	29.0	2.0	26.0	4364 5.020	10-24 / 10-32	4605 4.912
	12	5.0	4.0	JIS	16.5	29.0	2.0	26.0	4364 5.020	M4/M4,5/M5	4605 5.012
	12	5.5	4.5	JIS	16.5	29.0	2.0	26.0	4364 5.020	M5	4605 5.512
	12	6.0	4.9	DIN	16.5	29.0	2.0	26.0	4364 6.020	M4,5/M5/M6/M7/M8	4605 6.012
	12	6.2	5.0	JIS	16.5	29.0	2.0	26.0	4364 6.020	M7/M8	4605 6.212
	12	6.4	4.8	ANSI	16.5	29.0	2.0	26.0	4364 6.020	1/4-20 / 1/4-28	4605 6.412
	12	7.0	5.5	DIN/JIS	16.5	29.0	2.0	26.0	4364 7.020	M7/M9/M10	4605 7.012
	12	7.9	5.9	ANSI	16.5	29.0	2.0	26.0	4364 8.020	1/16-27 / 1/8-27	4605 7.912
	12	8.0	6.2	DIN	16.5	29.0	2.0	31.0	4364 8.020	M8/M11	4605 8.012
	12	8.2	6.1	ANSI	16.5	29.0	2.0	31.0	4364 8.020	7/16-14 / 7/16-20	4605 8.212
	12	8.5	6.5	JIS	16.5	29.0	2.0	31.0	4364 8.020	M12	4605 8.512
	12	9.0	7.0	DIN	16.5	29.0	2.0	32.0	4364 9.020	M9/M12	4605 9.012
	12	9.3	6.9	ANSI	16.5	29.0	2.0	32.0	4364 9.020	1/2-13 / 1/2-20	4605 9.312
	12	9.6	7.2	ANSI	16.5	29.0	2.0	33.0	4364 9.020	3/8-16 / 3/8-24	4605 9.612
	12	10.0	8.0	DIN	16.5	29.0	2.0	36.0	4364 10.020	M10	4605 10.012
	12	5.5	4.1	ANSI	16.5	29.0	2.0	26.0	4364 5.020	12-24 / 12-28	4605 15.512
	12	6.0	4.5	JIS	16.5	29.0	2.0	26.0	4364 6.020	M6	4605 16.012
	12	8.0	6.5	JIS	16.5	29.0	2.0	31.0	4364 8.020	M11	4605 18.012
	12	8.0	6.0	ANSI	16.5	29.0	2.0	31.0	4364 8.020	5/16-18 / 5/16-24	4605 28.012
	20	6.0	4.9	DIN	24.1	34.0	2.0	26.0	4364 6.032	M4,5/M5/M6/M7/M8	4605 6.020
	20	6.2	5.0	JIS	24.1	34.0	2.0	26.0	4364 6.032	M7/M8	4605 6.220
	20	6.4	4.8	ANSI	24.1	34.0	2.0	26.0	4364 6.032	1/4-20 / 1/4-28	4605 6.420
	20	7.0	5.5	DIN/JIS	24.1	34.0	2.0	26.0	4364 7.032	M7/M9/M10	4605 7.020
	20	7.9	5.9	ANSI	24.1	34.0	2.0	34.0	4364 8.032	1/16-27 / 1/8-27	4605 7.920
	20	8.0	6.2	DIN	24.1	34.0	2.0	31.0	4364 8.032	M8/M11	4605 8.020
	20	8.2	6.1	ANSI	24.1	34.0	2.0	31.0	4364 8.032	7/16-14 / 7/16-20	4605 8.220
	20	8.5	6.5	JIS	24.1	34.0	2.0	31.0	4364 8.032	M12	4605 8.520
	20	9.0	7.0	DIN	24.1	34.0	2.0	32.0	4364 9.032	M9/M12	4605 9.020
	20	9.3	6.9	ANSI	24.1	34.0	2.0	32.0	4364 9.032	1/2-13 / 1/2-20	4605 9.320
	20	9.6	7.2	ANSI	24.1	34.0	2.0	33.0	4364 9.032	3/8-16 / 3/8-24	4605 9.620
	20	10.0	8.0	DIN	24.1	34.0	2.0	36.0	4364 10.032	M10	4605 10.020
	20	10.5	8.0	JIS	24.1	34.0	2.0	36.0	4364 10.032	M14	4605 10.520
	20	10.8	8.1	ANSI	24.1	34.0	2.0	35.0	4364 10.032	9/16-12 / 9/16-18	4605 10.820
	20	11.0	9.0	DIN	24.1	34.0	2.0	37.0	4364 11.032	M14	4605 11.020
	20	12.0	9.0	DIN	24.1	34.0	2.0	37.0	4364 11.032	M16	4605 12.020
	20	12.1	9.1	ANSI	24.1	34.0	2.0	36.0	4364 11.032	5/8-11 / 5/8-18	4605 12.120
	20	12.5	10.0	JIS	24.1	34.0	2.0	38.0	4364 11.032	M16	4605 12.520
	20	13.0	10.0	JIS	24.1	34.0	2.0	38.0	4364 11.032	M17	4605 13.020
	20	14.0	11.0	DIN/JIS	24.1	34.0	2.0	39.0	4364 14.032	M18	4605 14.020
	20	14.2	10.6	ANSI	24.1	34.0	2.0	38.0	4364 14.032	1/4-18	4605 14.220
	20	14.9	11.2	ANSI	24.1	34.0	2.0	39.0	4364 14.032	3/4-10 / 3/4-16	4605 14.920
	20	15.0	12.0	JIS	24.1	34.0	2.0	40.0	4364 16.032	M20	4605 15.020
	20	16.0	12.0	DIN	24.1	34.0	2.0	41.0	4364 16.032	M20	4605 16.020

										Article no.	4605
	d3 mm	d1 mm	■ mm	Standard	d2 mm	l1 mm	l2 mm	l3 mm	①	for threads	Order no.
	20	17.4	13.0	DIN	26.5	34.0	2.0	39.0	4364 16,040	M3	4605 17.420
	20	17.7	13.4	ANSI	26.5	34.0	2.0	39.0	4364 16,040	= 7/8	4605 17.720
	20	8.0	6.5	JIS	24.1	34.0	2.0	31.0	4364 8.032	M11	4605 18.020
	20	6.0	4.5	JIS	24.1	34.0	2.0	26.0	4364 6.032	M6	4605 26.020
	20	8.0	6.0	ANSI	24.1	34.0	2.0	31.0	4364 8.032	5/16-18 / 5/16-24	4605 28.020
NEW	32	10.5	8.0	JIS	35.5	47.0	2.0	41.0	4364 10.032	M14	4605 10.532
NEW	32	10.8	8.1	ANSI	35.5	47.0	2.0	41.0	4364 10,040	9/16-12 / 9/16-18	4605 10.832
NEW	32	11.0	9.0	DIN	35.5	47.0	2.0	42.0	4364 11.032	M14	4605 11.032
NEW	32	12.0	9.0	DIN	35.5	47.0	2.0	42.0	4364 11.032	M16	4605 12.032
NEW	32	12.1	9.1	ANSI	35.5	47.0	2.0	42.0	4364 11.032	5/8-11 / 5/8-18	4605 12.132
NEW	32	12.5	10.0	ANSI	35.5	47.0	2.0	42.0	4364 11.032	5/8-11 / 5/8-18	4605 12.532
NEW	32	13.0	10.0	JIS	35.5	47.0	2.0	42.0	4364 11,040	M16	4605 13.032
NEW	32	14.0	11.0	DIN	35.5	47.0	2.0	44.0	4364 14.032	M18	4605 14.032
NEW	32	14.9	11.2	DIN	35.5	47.0	2.0	44.0	4364 14,040	M18	4605 14.932
NEW	32	15.0	12.0	ANSI	35.5	47.0	2.0	44.0	4364 16,040	3/4-10 / 3/4-16	4605 15.032
NEW	32	16.0	12.0	JIS	35.5	47.0	2.0	45.0	4364 16,040	M20	4605 16.032
NEW	32	16.5	12.4	DIN	35.5	47.0	2.0	45.0	4364 16,040	M20	4605 16.532
NEW	32	17.0	13.0	ANSI	35.5	47.0	2.0	45.0	4364 16,040	= 13/16	4605 17.032
NEW	32	17.7	13.2	ANSI	35.5	47.0	2.0	46.0	4364 16,040	= 7/8	4605 17.732
NEW	32	18.0	14.5	DIN	35.5	47.0	2.0	47.0	4364 18,040	13/16	4605 18.032
NEW	32	19.0	15.0	DIN	35.5	47.0	2.0	47.0	4364 18,040	M22	4605 19.032
NEW	32	19.3	14.4	ANSI	35.5	47.0	2.0	47.0	4364 18,040	M24	4605 19.332
NEW	32	20.0	15.0	JIS	35.5	47.0	2.0	52.0	4364 20,040	M27	4605 20.032
NEW	32	20.0	16.0	DIN	35.5	47.0	2.0	47.0	4364 20,040	M27	4605 20.132
NEW	32	20.3	15.2	DIN	35.5	47.0	2.0	52.0	4364 18,040	M27	4605 20.332
NEW	32	21.0	17.0	ANSI	35.5	47.0	2.0	52.0	4364 20,040	1	4605 21.032
NEW	32	22.0	18.0	DIN	35.5	47.0	2.0	54.0	4364 22,040	M30	4605 22.032
NEW	32	22.7	17.0	DIN	35.5	47.0	2.0	54.0	4364 20,040	M30	4605 22.732
NEW	32	23.0	17.0	ANSI	35.5	47.0	2.0	54.0	4364 20,040	= 11/16	4605 23.032

Reduction bushes GÜHROJET for hydraulic synchro tapping chucks

Article no. **4606**

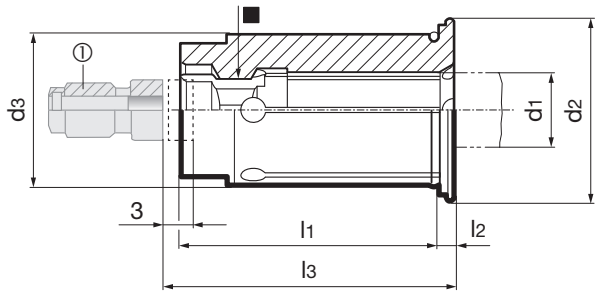
+Ø Cyl

Product information:

- for clamping taps with square shank in hydraulic synchro tapping chucks
- clamping Ø for tool shank tolerance h6-h9
- with coolant slots for peripheral cooling
- positive drive of reduction bush in hydraulic synchro tapping chucks
- position ajdusting screw on the shank of the tap
- adjusting screw enables 3 mm axial length readjustment

Suitable accessories separately available:

- length adjusting screw (1), art. no. 4364
- adjustment key, art. no. 4912, type B for adjusting screws
- MQL axial adjusting screw, art. no. 4305



Article no. **4606**

	d3 mm	d1 mm	■ mm	Standard	d2 mm	l1 mm	l2 mm	l3 mm	①	for threads	Order no.
NEW	12	2.5	2.1	DIN	16.5	29.0	2.0	18.0	4364 2,812	M1-M1,8 / M3,5	4606 2.501
	12	2.8	2.1	DIN	16.5	29.0	2.0			M2/M2,2/M2,5/M4	4606 2.812
	12	3.5	2.7	DIN	16.5	29.0	2.0			M3/M4/M5	4606 3.512
	12	3.5	2.7	ANSI	16.5	29.0	2.0			6-32 / 6-40	4606 3.612
	12	4.0	3.2	JIS	16.5	29.0	2.0			M3/M3,5	4606 4.012
	12	4.2	3.3	ANSI	16.5	29.0	2.0			8-32 / 8-36	4606 4.312
	12	4.5	3.4	DIN	16.5	29.0	2.0	26.0	4364 5.020	M4/M6	4606 4.512
	12	4.9	3.8	ANSI	16.5	29.0	2.0	26.0	4364 5.020	10-24 / 10-32	4606 4.912
	12	5.0	4.0	JIS	16.5	29.0	2.0	26.0	4364 5.020	M4/M4,5/M5	4606 5.012
	12	5.5	4.5	JIS	16.5	29.0	2.0	26.0	4364 5.020	M5	4606 5.512
	12	6.0	4.9	DIN	16.5	29.0	2.0	26.0	4364 6.020	M4,5/M5/M6/M7/M8	4606 6.012
	12	6.2	5.0	JIS	16.5	29.0	2.0	26.0	4364 6.020	M7/M8	4606 6.212
	12	6.4	4.8	ANSI	16.5	29.0	2.0	26.0	4364 6.020	1/4-20 / 1/4-28	4606 6.412
	12	7.0	5.5	DIN/JIS	16.5	29.0	2.0	26.0	4364 7.020	M7/M9/M10	4606 7.012
	12	7.9	5.9	ANSI	16.5	29.0	2.0	31.0	4364 8.020	1/16-27 / 1/8-27	4606 7.912
	12	8.0	6.2	DIN	16.5	29.0	2.0	31.0	4364 8.020	M8/M11	4606 8.012
	12	8.2	6.1	ANSI	16.5	29.0	2.0	31.0	4364 8.020	7/16-14 / 7/16-20	4606 8.212
	12	8.5	6.5	JIS	16.5	29.0	2.0	31.0	4364 8.020	M12	4606 8.512
	12	9.0	7.0	DIN	16.5	29.0	2.0	32.0	4364 9.020	M9/M12	4606 9.012
	12	9.3	6.9	ANSI	16.5	29.0	2.0	32.0	4364 9.020	1/2-13 / 1/2-20	4606 9.312
	12	9.6	7.2	ANSI	16.5	29.0	2.0	33.0	4364 9.020	3/8-16 / 3/8-24	4606 9.612
	12	10.0	8.0	DIN	16.5	29.0	2.0	36.0	4364 10.020	M10	4606 10.012
	12	5.5	4.1	ANSI	16.5	29.0	2.0	26.0	4364 5.020	12-24 / 12-28	4606 15.512
	12	6.0	4.5	JIS	16.5	29.0	2.0	26.0	4364 6.020	M6	4606 16.012
	12	8.0	6.5	JIS	16.5	29.0	2.0	31.0	4364 8.020	M11	4606 18.012
	12	8.0	6.0	ANSI	16.5	29.0	2.0	31.0	4364 8.020	5/16-18 / 5/16-24	4606 28.012
	20	6.0	4.9	DIN	24.1	34.0	2.0	26.0	4364 6.032	M4,5/M5/M6/M7/M8	4606 6.020
	20	6.2	5.0	JIS	24.1	34.0	2.0	26.0	4364 6.032	M7/M8	4606 6.220
	20	6.4	4.8	ANSI	24.1	34.0	2.0	26.0	4364 6.032	1/4-20 / 1/4-28	4606 6.420
	20	7.0	5.5	DIN/JIS	24.1	34.0	2.0	26.0	4364 7.032	M7/M9/M10	4606 7.020
	20	7.9	5.9	ANSI	24.1	34.0	2.0	31.0	4364 8.032	1/16-27 / 1/8-27	4606 7.920
	20	8.0	6.2	DIN	24.1	34.0	2.0	31.0	4364 8.032	M8/M11	4606 8.020
	20	8.2	6.1	ANSI	24.1	34.0	2.0	31.0	4364 8.032	7/16-14 / 7/16-20	4606 8.220
	20	8.5	6.5	JIS	24.1	34.0	2.0	31.0	4364 8.032	M12	4606 8.520
	20	9.0	7.0	DIN	24.1	34.0	2.0	32.0	4364 9.032	M9/M12	4606 9.020
	20	9.3	6.9	ANSI	24.1	34.0	2.0	32.0	4364 9.032	1/2-13 / 1/2-20	4606 9.320
	20	9.6	7.2	ANSI	24.1	34.0	2.0	33.0	4364 9.032	3/8-16 / 3/8-24	4606 9.620
	20	10.0	8.0	DIN	24.1	34.0	2.0	36.0	4364 10.032	M10	4606 10.020
	20	10.5	8.0	JIS	24.1	34.0	2.0	36.0	4364 10.032	M14	4606 10.520
	20	10.8	8.1	ANSI	24.1	34.0	2.0	35.0	4364 10.032	9/16-12 / 9/16-18	4606 10.820
	20	11.0	9.0	DIN	24.1	34.0	2.0	37.0	4364 11.032	M14	4606 11.020
	20	12.0	9.0	DIN	24.1	34.0	2.0	37.0	4364 11.032	M16	4606 12.020
	20	12.1	9.1	ANSI	24.1	34.0	2.0	36.0	4364 11.032	5/8-11 / 5/8-18	4606 12.120
	20	12.5	10.0	JIS	24.1	34.0	2.0	38.0	4364 11.032	M16	4606 12.520
	20	13.0	10.0	JIS	24.1	34.0	2.0	38.0	4364 11.032	M17	4606 13.020
	20	14.0	11.0	DIN/JIS	24.1	34.0	2.0	39.0	4364 14.032	M18	4606 14.020
	20	14.2	10.6	ANSI	24.1	34.0	2.0	38.0	4364 14.032	1/4-18	4606 14.220
	20	14.9	11.2	ANSI	24.1	34.0	2.0	39.0	4364 14.032	3/4-10 / 3/4-16	4606 14.920

Article no. **4606**

	d3 mm	d1 mm	■ mm	Standard	d2 mm	l1 mm	l2 mm	l3 mm	①	for threads	Order no.
	20	15.0	12.0	JIS	24.1	34.0	2.0	40.0	4364 16.032	M20	4606 15.020
	20	16.0	12.0	DIN	24.1	34.0	2.0	41.0	4364 16.032	M20	4606 16.020
	20	8.0	6.5	JIS	24.1	34.0	2.0	31.0	4364 8.032	M11	4606 18.020
	20	6.0	4.5	JIS	24.1	34.0	2.0	26.0	4364 6.032	M6	4606 26.020
	20	8.0	6.0	ANSI	24.1	34.0	2.0	31.0	4364 8.032	5/16-18 / 5/16-24	4606 28.020
NEW	32	10.5	8.0	JIS	35.5	47.0	2.0	41.0	4364 10.032	M14	4606 10.532
NEW	32	10.8	8.1	ANSI	35.5	47.0	2.0	41.0	4364 10,040	9/16-12 / 9/16-18	4606 10.832
NEW	32	11.0	9.0	DIN	35.5	47.0	2.0	42.0	4364 11.032	M14	4606 11.032
NEW	32	12.0	9.0	DIN	35.5	47.0	2.0	42.0	4364 11.032	M16	4606 12.032
NEW	32	12.1	9.1	ANSI	35.5	47.0	2.0	42.0	4364 11.032	5/8-11 / 5/8-18	4606 12.132
NEW	32	12.5	10.0	JIS	35.5	47.0	2.0	42.0	4364 11.032	M16	4606 12.532
NEW	32	13.0	10.0	JIS	35.5	47.0	2.0	42.0	4364 11,040	M17	4606 13.032
NEW	32	14.0	11.0	DIN	35.5	47.0	2.0	44.0	4364 14.032	M18	4606 14.032
NEW	32	14.9	11.2	ANSI	35.5	47.0	2.0	44.0	4364 14,040	3/4-10 / 3/4-16	4606 14.932
NEW	32	15.0	12.0	JIS	35.5	47.0	2.0	44.0	4364 16,040	M20	4606 15.032
NEW	32	16.0	12.0	DIN	35.5	47.0	2.0	45.0	4364 16,040	M20	4606 16.032
NEW	32	16.5	12.4	ANSI	35.5	47.0	2.0	45.0	4364 16,040		4606 16.532
NEW	32	17.0	13.0	JIS	35.5	47.0	2.0	45.0	4364 16,040	M22	4606 17.032
NEW	32	17.7	13.2	ANSI	35.5	47.0	2.0	46.0	4364 16,040		4606 17.732
NEW	32	18.0	14.5	JIS	35.5	47.0	2.0	47.0	4364 18,040	13/16	4606 18.032
NEW	32	19.0	15.0	JIS	35.5	47.0	2.0	47.0	4364 18,040	M24	4606 19.032
NEW	32	19.3	14.4	JIS	35.5	47.0	2.0	47.0	4364 18,040	7/8	4606 19.332
NEW	32	20.0	15.0	JIS	35.5	47.0	2.0	52.0	4364 20,040	M27	4606 20.032
NEW	32	20.0	16.0	JIS	35.5	47.0	2.0	47.0	4364 20,040	M27	4606 20.132
NEW	32	20.3	15.2	JIS	35.5	47.0	2.0	52.0	4364 18,040	1	4606 20.332
NEW	32	21.0	17.0	JIS	35.5	47.0	2.0	52.0	4364 20,040	M28	4606 21.032
NEW	32	22.0	18.0	JIS	35.5	47.0	2.0	54.0	4364 22,040	M30	4606 22.032
NEW	32	22.7	17.0	JIS	35.5	47.0	2.0	54.0	4364 20,040	1 1/16	4606 22.732
NEW	32	23.0	17.0	JIS	35.5	47.0	2.0	54.0	4364 20,040	M30	4606 23.032

Length adjusting screws for hydraulic synchro tapping chucks

Article no. **4364**

Product information:

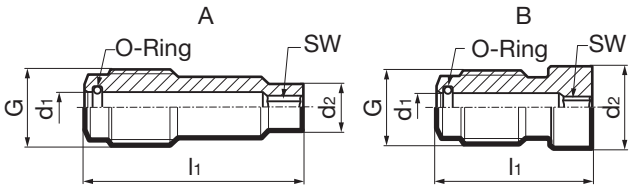
- for hydro synchro tapping chucks art. nos. 4601, 4525, 4526, 4576 and 4577
- for synchro tapping chucks art. no. 4326 and 4327
- for conventional internal cooling
- with plane stop for standard shank ends
- position ajdusting screw on the shank of the tap
- adjusting screw enables 3 mm axial length readjustment

Scope of delivery:

- with O-ring for secure seal

Suitable accessories separately available:

- adjustment key, art. no. 4912, type B for adjusting screws



Article no. **4364**

	Size	G	for shank Ø x ■ mm	d1 mm	d2 mm	l1 mm	SW mm	O-ring mm	Type	Order no.
NEW	ER11	M7x1	2,5x2,1 & 2,8x2	3.1	2.0	25.1	2.0	3x0,75	A	4364 2.812
NEW	ER11	M7x1	3,5x2,7	3.1	2.6	23.1	1.5	3x0,75	A	4364 3.512
NEW	ER11	M7x1	4x3,2	3.1	3.1	19.1	2.0	3x0,75	A	4364 4.012
NEW	ER11	M7x1	4,5x3,4	3.1	3.3	19.1	2.0	3x0,75	A	4364 4.512
NEW	ER11	M7x1	5x4	3.1	3.9	18.1	2.0	3x0,75	A	4364 5.012
	ER20	M8 x 1	<6	3.6	3.3	23.7	2.0	3,5X1	A	4364 5.020
	ER20	M8 x 1	6x4,9	3.6	4.8	23.7	2.5	3,5X1	A	4364 6.020
	ER20	M8 x 1	7x5,5	3.6	5.4	23.7	2.5	3,5X1	A	4364 7.020
	ER20	M8 x 1	8x6,2	3.6	5.8	18.7	2.5	3,5X1	A	4364 8.020
	ER20	M8 x 1	9x7	3.6	6.9	17.7	2.5	3,5X1	A	4364 9.020
	ER20	M8 x 1	10x8	3.6	7.8	13.7	2.5	3,5X1	B	4364 10.020
	ER20	M8 x 1	11x9	3.6	8.8	14.8	2.5	3,5X1	B	4364 11.020
	ER32	M10X1	6x4,9	4.1	3.3	33.0	2.0	4X1	A	4364 5.032
	ER32	M10X1	6x4,9	4.1	4.8	34.0	3.0	4X1	A	4364 6.032
	ER32	M10X1	7x5,5	4.1	5.4	33.8	3.0	4X1	A	4364 7.032
	ER32	M10X1	8x6,2	4.1	6.1	28.8	3.0	4X1	A	4364 8.032
	ER32	M10X1	9x7	4.1	6.9	28.2	3.0	4X1	A	4364 9.032
	ER32	M10X1	10x8	4.1	7.8	23.8	3.0	4X1	A	4364 10.032
	ER32	M10X1	11x9 & 12x9	4.1	8.8	22.9	3.0	4X1	A	4364 11.032
	ER32	M10X1	14x11	4.1	10.8	20.6	3.0	4X1	B	4364 14.032
	ER32	M10X1	16x12	4.1	11.8	19.6	3.0	4X1	B	4364 16.032
	ER32	M10X1	18x14,5 & 20x16	4.1	14.3	18.0	3.0	4X1	B	4364 18.032
NEW	ER40	M12x1	10x8	5.6	7.8	36.1	4.0	5,5x1,5	A	4364 10.040
NEW	ER40	M12x1	11x9 & 12x9	5.6	8.8	35.1	4.0	5,5x1,5	A	4364 11.040
NEW	ER40	M12x1	14x11	5.6	10.7	33.1	4.0	5,5x1,5	A	4364 14.040
NEW	ER40	M12x1	16x12	5.6	11.8	31.1	4.0	5,5x1,5	B	4364 16.040
NEW	ER40	M12x1	18x14,5	5.6	14.3	29.1	4.0	5,5x1,5	B	4364 18.040
NEW	ER40	M12x1	20x16	5.6	15.8	24.1	4.0	5,5x1,5	B	4364 20.040
NEW	ER40	M12x1	22x18	5.6	17.8	22.1	4.0	5,5x1,5	B	4364 22.040

Grooving tools

Grooving tools with system

The new combination for maximum performance in the smallest of spaces

GÜHRING

Page

P	M	K	N	S	H	Tool illustration	Type	Cutting direction	Tool material	Surface	Article no.	Page
Indexable inserts for radial grooving and copying												
●	●		○	○			NEW GE208	R	VHM	a	26800	232
●	●		○	○			NEW GE208	L	VHM	a	26802	232
Indexable inserts for radial grooving and longitudinal turning												
●	●		○	○			NEW GP208	R	VHM	a	26808	232
●	●		○	○			NEW GP208	L	VHM	a	26810	232
Indexable inserts for back turning												
●	●		○	○			NEW GR208	R	VHM	a	26812	233
●	●		○	○			NEW GR208	L	VHM	a	26814	233
Indexable inserts for parting off												
●	●		○	○			NEW GZ208	R	VHM	a	26816	234
●	●		○	○			NEW GZ208	L	VHM	a	26818	234
●	●		○	○			NEW GZ208	R	VHM	a	26820	234
●	●		○	○			NEW GZ208	L	VHM	a	26822	234
●	●		○	○			NEW GZ208	R	VHM	a	26824	235
●	●		○	○			NEW GZ208	L	VHM	a	26826	235

Tool illustration		Type	Design	Article no.	Page
Square shank holder straight, external machining, without IC					
	NEW	GH208	R	26700	236
	NEW	GH208	L	26701	236
Square shank holders straight, external machining, with IC					
	NEW	GH208	R	26702	237
	NEW	GH208	L	26703	237
Accessories					
	NEW			25914	238
	NEW			25911	238

Grooving in confined spaces

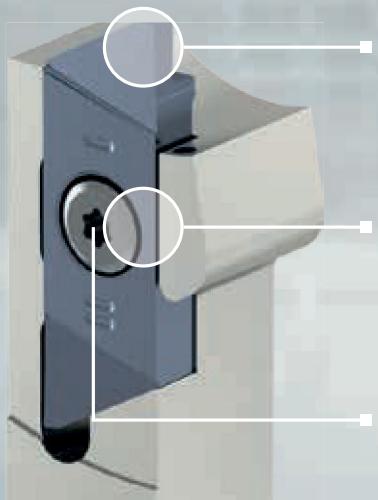
Our new grooving solution for sliding head lathes

The new System 208 was specially developed for machining complex micro-turned parts in confined spaces.

As the new main system for long-turning technology, System 208 contains new and proven geometries that offer you a wide range of machining options.
The double-ended grooving system impresses with a high-precision interface with a change accuracy of +/- 0.015 mm – the basis for high process reliability.
The insert facilitates depths of up to 8 mm and allows for versatile applications, from parting off to longitudinal turning. With this approach, the tool life can be increased by up to 30% compared to leading competitors in the ISO groups P and M. A newly developed clamping screw with double-sided Torx-Plus makes it easier to change the insert directly in the machine.

- **Tool life** increased by more than 28 %
- Significantly increased **process reliability**

- Outstanding tool lives in ISO groups P and M
- High-precision interface enables a change accuracy of +/- 0.015
- Cutting edge geometry adapted to conditions on sliding headstock lathes
- High grooving depth of up to 8 mm and various geometries for universal application



Adapted cutting edge geometry

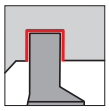
High-precision interface

Clamping screw
with double-sided Torx-Plus

Application example

Component:	Bar with Ø 16 mm, X5CrNi18-10 (1.4301)	
Tool:	System 208, indexable insert: #26824 9.050 mm, pitch width 2.00 mm, holder: #26702 8.070 mm	
Customer target:	Tool lives that exceed other market leaders	
Difficulty:	Lack of process reliability with small bar diameter	
Cutting data:	**Gühring** v_c 60 m/min **f** 0.03 mm/rev a_p 8 mm	**Competition** v_c 60 m/min **f** 0.03 mm/rev a_p 8 mm
Tool life:	1,000 parting cuts	780 parting cuts

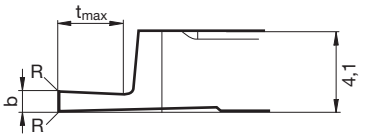
Indexable inserts for radial grooving and copying



grooving depth up to 4 mm

right handed inserts in right, left handed inserts in left tool holders

• geometry .AC ground



P	M	K	N	S	H
●	●		○	○	

NEW VHM GE208 a cutting data see page 239

Right-hand design as shown. Left-hand design is mirror image.

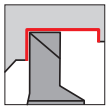
Article no. **26800** a R

b ±0,02 mm	R mm	tmax. mm	s mm	Size	Code no.	Description
1.00		3.00	4.10	04	9.020	GE208.100.300.000.04.AC.R
1.50		3.00	4.10	04	9.030	GE208.150.300.000.04.AC.R
2.00		4.00	4.10	04	9.040	GE208.200.400.000.04.AC.R
2.00	0.05	4.00	4.10	04	9.050	GE208.200.400.005.04.AC.R
2.50		4.00	4.10	04	9.060	GE208.250.400.000.04.AC.R
2.50	0.05	4.00	4.10	04	9.070	GE208.250.400.005.04.AC.R
3.00		4.00	4.10	04	9.080	GE208.300.400.000.04.AC.R
3.00	0.05	4.00	4.10	04	9.090	GE208.300.400.005.04.AC.R

On the left-hand design, the designation changes to .L

Article no. **26802** a L

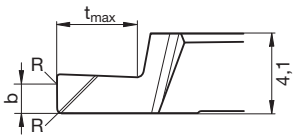
Indexable inserts for radial grooving and longitudinal turning



grooving depth up to 4 mm

right handed inserts in right, left handed inserts in left tool holders

• geometry .AB ground



P	M	K	N	S	H
●	●		○	○	

NEW VHM GP208 a cutting data see page 239

Right-hand design as shown. Left-hand design is mirror image.

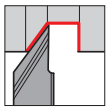
Article no. **26808** a R

b ±0,02 mm	R mm	tmax. mm	s mm	Size	Code no.	Description
1.50	0.05	2.50	4.10	04	9.020	GP208.150.250.005.04.AB.R
2.00	0.05	4.00	4.10	04	9.030	GP208.200.400.005.04.AB.R
2.00	0.10	4.00	4.10	04	9.040	GP208.200.400.010.04.AB.R

On the left-hand design, the designation changes to .L

Article no. **26810** a L

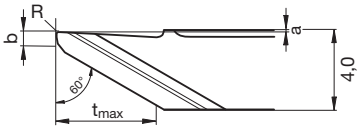
Indexable inserts for back turning



grooving depth up to 5 mm

right handed inserts in right, left handed inserts in left tool holders

• geometry .AE ground



P	M	K	N	S	H
●	●		○	○	

NEW VHM GR208 a cutting data see page 239

Right-hand design as shown. Left-hand design is mirror image.

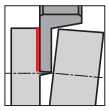
Article no. **26812** a R

b ±0,02 mm	R mm	tmax. mm	s mm	Angle °	Code no.	Description
	0.05	5.00	4.000	60.00	9.020	GR208.000.500.005.04.AE.R
	0.10	5.00	4.000	60.00	9.030	GR208.000.500.010.04.AE.R
0.80	0.05	5.00	4.000	60.00	9.040	GR208.080.500.000.04.AE.R
0.80	0.05	5.00	4.000	60.00	9.050	GR208.080.500.005.04.AE.R
0.80	0.15	5.00	4.000	60.00	9.060	GR208.080.500.015.04.AE.R

On the left-hand design, the designation changes to .L

Article no. **26814** a L

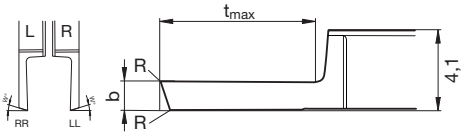
Indexable inserts for parting off



grooving depth up to 8 mm

right handed inserts in right, left handed inserts in left tool holders

• geometry .AC ground



P	M	K	N	S	H
●	●		○	○	

NEW VHM GZ208 a cutting data see page 240

Right-hand design as shown. Left-hand design is mirror image.

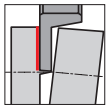
Article no. **26816** a R

b ±0,02 mm	R mm	tmax. mm	s mm	Size	Code no.	Description
1.00		4.00	4.10	04	9.020	GZ208.100.400.000.04.AC.RR
1.20		4.00	4.10	04	9.030	GZ208.120.400.000.04.AC.RR
1.50	0.05	6.00	4.10	04	9.040	GZ208.150.600.005.04.AC.RR
2.00	0.05	8.00	4.10	04	9.050	GZ208.200.800.005.04.AC.RR

On the left-hand design, the designation changes to .LL

Article no. **26818** a L

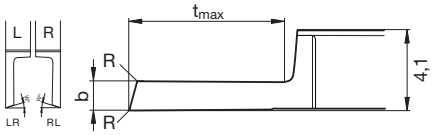
Indexable inserts for parting off



grooving depth up to 8 mm

right handed inserts in right, left handed inserts in left tool holders

• geometry .AC ground



P	M	K	N	S	H
●	●		○	○	

NEW VHM GZ208 a cutting data see page 240

Right-hand design as shown. Left-hand design is mirror image.

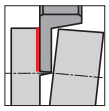
Article no. **26820** a R

b ±0,02 mm	R mm	tmax. mm	s mm	Size	Code no.	Description
1.00		4.00	4.10	04	9.020	GZ208.100.400.000.04.AC.RL
1.20		4.00	4.10	04	9.030	GZ208.120.400.000.04.AC.RL
1.50	0.05	6.00	4.10	04	9.040	GZ208.150.600.005.04.AC.RL
2.00	0.05	8.00	4.10	04	9.050	GZ208.200.800.005.04.AC.RL
2.00	0.05	8.00	4.10	04	9.060	GZ208.200.800.005.04.AC.RL

On the left-hand design, the designation changes to .LR

Article no. **26822** a L

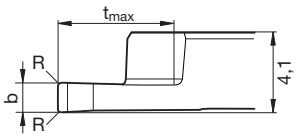
Indexable inserts for parting off



grooving depth up to 8 mm

right handed inserts in right, left handed inserts in left tool holders

• geometry .BF ground



P	M	K	N	S	H
●	●		○	○	

NEW VHM GZ208 a cutting data see page 241

Right-hand design as shown. Left-hand design is mirror image.

Article no. **26824** a R

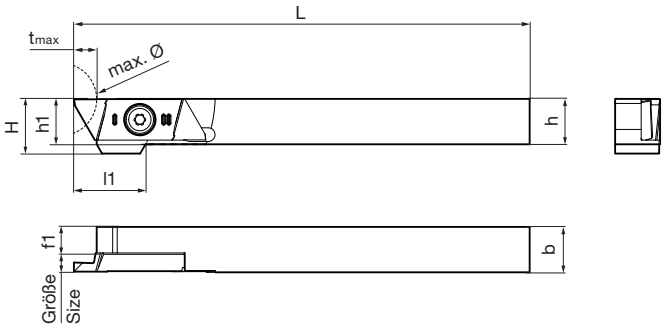
b ±0,02 mm	R mm	tmax. mm	s mm	Size	Code no.	Description
1.00		4.00	4.10	04	9.020	GZ208.100.400.000.04.BF.RN
1.20		4.00	4.10	04	9.030	GZ208.120.400.000.04.BF.RN
1.50	0.05	6.00	4.10	04	9.040	GZ208.150.600.005.04.BF.RN
2.00	0.05	8.00	4.10	04	9.050	GZ208.200.800.005.04.BF.RN

On the left-hand design, the designation changes to .LN

Article no. **26826** a L

Square shank holder straight, external machining, without IC

grooving depth up to 8 mm
without internal coolant supply



NEW GH208

Right-hand design as shown. Left-hand design is mirror image. Article no. **26700**

h mm	b mm	L mm	h1 mm	f1 mm	Dmax. mm	Size	Code no.	Description
10.00	10.00	95.00	9.80	5.750	18.0	04	8.030	GH208.1010.100.00.04.R
12.00	12.00	120.00	11.80	7.750	22.0	04	8.040	GH208.1212.125.00.04.R
12.70	12.70	122.00	12.50	8.450	22.0	04	8.050	GH208.0500.500.00.04.R
15.87	15.87	122.00	15.67	11.620	34.0	04	8.060	GH208.0625.500.00.04.R
16.00	16.00	120.00	15.80	11.750	34.0	04	8.070	GH208.1616.125.00.04.R

On the left-hand design, the designation changes to .L Article no. **26701**

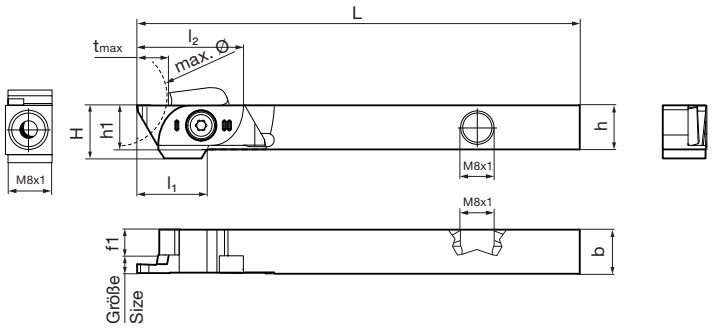
Spare parts

Article no. 25914	Clamping screw	Tightening torque Nm	Description
Code 4.501	M4.5x9 IP9	2.2	GH208.1010....
Code 4.502	M4.5x11 IP9	2.2	GH208.1212....; GH208.0500....
Code 4.503	M4.5x15 IP9	2.2	GH208.0625....; GH208.1616....

Article no. 25911	Torx Plus wrench
Code 9.000	T9IP

Square shank holders straight, external machining, with IC

grooving depth up to 8 mm
with internal coolant supply



NEW GH208

Right-hand design as shown. Left-hand design is mirror image. Article no. **26702**

h mm	b mm	L mm	h1 mm	f1 mm	Dmax. mm	Size	Code no.	Description
10.00	10.00	95.00	9.80	5.750	18.0	04	8.030	GH208.1010.100.00.04.R.IK
12.00	12.00	120.00	11.80	7.750	22.0	04	8.040	GH208.1212.125.00.04.R.IK
12.70	12.70	122.00	12.50	8.450	22.0	04	8.050	GH208.0500.500.00.04.R.IK
15.87	15.87	122.00	15.67	11.620	34.0	04	8.060	GH208.0625.500.00.04.R.IK
16.00	16.00	120.00	15.80	11.750	34.0	04	8.070	GH208.1616.125.00.04.R.IK

On the left-hand design, the designation changes to .L Article no. **26703**

Spare parts

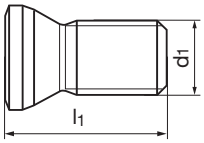
Article no. 25914	Clamping screw	Tightening torque Nm	Description
Code 4.501	M4.5x9 IP9	2.2	GH208.1010....
Code 4.502	M4.5x11 IP9	2.2	GH208.1212....; GH208.0500....
Code 4.503	M4.5x15 IP9	2.2	GH208.0625....; GH208.1616....

Article no. 25911	Torx Plus wrench
Code 9.000	T9IP

Clamping screws

NEW WN

for system 208



Article no. **25914**

Size	d1	l1 mm	Code no.
9IP	M 4.5 x 9 x 9IP	9.000	4.501
9IP	M 4.5 x 11 x 9IP	11.000	4.502
9IP	M 4.5 x 15 x 9IP	15.000	4.503

Torx-Plus screwdriver

NEW WN

Key with flag handle

Article no. **25911**

Size	l1 mm	Code no.
9IP	73.400	9.000

Radial grooving contour turning System 208

Machining group	v_c (m/min)	f (mm/U) by width			
		< 1	< 2	< 3	≥ 3
P1.1.1 Unalloyed steel, annealed, 0.15 % C, Rm 420 N/mm², 125 HB	100	0.040	0.060	0.085	0.100
P1.1.2 Unalloyed steel, heat-treated, 0.15 % C, Rm 420 N/mm², 125 HB	100	0.040	0.060	0.085	0.100
P1.1.3 Unalloyed steel, annealed, 0.45 % C, Rm 640 N/mm², 190 HB	100	0.040	0.060	0.085	0.100
P1.1.4 Unalloyed steel, heat-treated, 0.45 % C, Rm 640 N/mm², 190 HB	100	0.040	0.060	0.085	0.100
P1.1.5 Unalloyed steel, heat-treated, 0.45 % C, Rm 850 N/mm², 250 HB	100	0.040	0.060	0.085	0.100
P1.1.6 Unalloyed steel, annealed, 0.75 % C, Rm 915 N/mm², 270 HB	100	0.040	0.060	0.085	0.100
P1.1.7 Unalloyed steel, heat-treated, 0.75 % C, Rm 1020 N/mm², 300 HB	100	0.040	0.060	0.085	0.100
P2.1.1 Low-alloy steel, annealed, Rm 610 N/mm², 180 HB	100	0.040	0.060	0.085	0.100
P2.1.2 Low-alloy steel, heat-treated, Rm 930 N/mm², 275 HB	100	0.040	0.060	0.085	0.100
P2.1.3 Low-alloy steel, heat-treated, Rm 1020 N/mm², 300 HB	100	0.040	0.060	0.085	0.100
P2.1.4 Low-alloy steel, heat-treated, Rm 1190 N/mm², 350 HB	100	0.040	0.060	0.085	0.100
P3.1.1 High-alloy steel and tool steel, annealed, Rm 680 N/mm², 200 HB	100	0.040	0.060	0.085	0.100
P3.1.2 High-alloy steel and tool steel, hardened and tempered, Rm 1100 N/mm², 325 HB	100	0.040	0.060	0.085	0.100
M1.1.1 Stainless steel, ferritic/martensitic, with machining additives	80	0.035	0.045	0.065	0.080
M1.1.2 Stainless steel, ferritic/martensitic, annealed, Rm 680 N/mm², 200 HB	80	0.035	0.045	0.065	0.080
M1.1.3 Stainless steel, ferritic/martensitic, heat-treated, Rm 810 N/mm², 240 HB	80	0.035	0.045	0.065	0.080
M2.1.1 Stainless steel, austenitic, quenched, 180 HB	80	0.035	0.045	0.065	0.080
M2.2.1 Duplex steel, high-strength stainless steels	80	0.035	0.045	0.065	0.080
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	200	0.040	0.060	0.085	0.100
N1.1.2 Wrought aluminium alloys, hardened, 100 HB	200	0.040	0.060	0.085	0.100
N2.1.1 Aluminium casting alloys, non-hardened, ≤ 12 % Si, 75 HB	200	0.040	0.060	0.085	0.100
N2.1.2 Aluminium casting alloys, hardened, ≤ 12 % Si, 90 HB	200	0.040	0.060	0.085	0.100
N2.1.3 Aluminium casting alloys, non-hardened, > 12 % Si, 130 HB	200	0.040	0.060	0.085	0.100
N3.1.1 Copper and copper alloys: Free-machining alloy, Pb > 1 %	200	0.040	0.060	0.085	0.100
N3.1.2 Copper and copper alloys: CuZn, CuSnZn	200	0.040	0.060	0.085	0.100
N3.1.3 Copper and copper alloys: CuSn, lead-free copper and copper electrolyte	200	0.040	0.060	0.085	0.100
N4.1.1 Non-metallic materials: Duroplastics, fibre-reinforced plastics	200	0.040	0.060	0.085	0.100
N4.1.2 Non-metallic materials: Hard rubber, wood, etc.	200	0.040	0.060	0.085	0.100
N4.1.3 Non-metallic materials: Graphite	200	0.040	0.060	0.085	0.100
S1.1.1 Heat-resistant alloys, Fe-based, annealed, 200 HB	60	0.015	0.025	0.035	0.040
S1.1.2 Heat-resistant alloys, Fe-based, hardened, 280 HB	60	0.015	0.025	0.035	0.040
S1.1.3 Heat-resistant alloys, Ni- or Co-based, annealed, 250 HB	60	0.015	0.025	0.035	0.040
S1.1.4 Heat-resistant alloys, Ni- or Co-based, hardened, 350 HB	60	0.015	0.025	0.035	0.040
S1.1.5 Heat-resistant alloys, Ni- or Co-based, cast, 320 HB	60	0.015	0.025	0.035	0.040
S2.1.1 Titanium alloys, pure titanium, Rm 400 N/mm²	60	0.015	0.025	0.035	0.040
S2.1.2 Titanium alloys, Alpha and Beta alloys, hardened, Rm 1050 N/mm²	60	0.015	0.025	0.035	0.040
H1.1.1 Hardened steel, hardened and tempered, < 55 HRC	60	0.015	0.025	0.035	0.040
H1.1.2 Hardened steel, hardened and tempered, < 60 HRC	60	0.015	0.025	0.035	0.040
H1.1.3 Hardened steel, hardened and tempered, > 60 HRC	60	0.015	0.025	0.035	0.040
H2.1.1 Chilled cast iron, 400 HB	60	0.015	0.025	0.035	0.040
H2.1.2 Chilled cast iron, hardened and tempered, < 55 HRC	60	0.015	0.025	0.035	0.040

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Parting-off right / left System 208

Machining group	v_c (m/min) by width		f (mm/U) by width			
	< 2	≤ 4	< 1	< 2	< 3	≥ 3
P1.1.1 Unalloyed steel, annealed, 0.15 % C, Rm 420 N/mm², 125 HB	85	100	0.040	0.060	0.085	0.100
P1.1.2 Unalloyed steel, heat-treated, 0.15 % C, Rm 420 N/mm², 125 HB	85	100	0.040	0.060	0.085	0.100
P1.1.3 Unalloyed steel, annealed, 0.45 % C, Rm 640 N/mm², 190 HB	85	100	0.040	0.060	0.085	0.100
P1.1.4 Unalloyed steel, heat-treated, 0.45 % C, Rm 640 N/mm², 190 HB	85	100	0.040	0.060	0.085	0.100
P1.1.5 Unalloyed steel, heat-treated, 0.45 % C, Rm 850 N/mm², 250 HB	85	100	0.040	0.060	0.085	0.100
P1.1.6 Unalloyed steel, annealed, 0.75 % C, Rm 915 N/mm², 270 HB	85	100	0.040	0.060	0.085	0.100
P1.1.7 Unalloyed steel, heat-treated, 0.75 % C, Rm 1020 N/mm², 300 HB	85	100	0.040	0.060	0.085	0.100
P2.1.1 Low-alloy steel, annealed, Rm 610 N/mm², 180 HB	85	100	0.040	0.060	0.085	0.100
P2.1.2 Low-alloy steel, heat-treated, Rm 930 N/mm², 275 HB	85	100	0.040	0.060	0.085	0.100
P2.1.3 Low-alloy steel, heat-treated, Rm 1020 N/mm², 300 HB	85	100	0.040	0.060	0.085	0.100
P2.1.4 Low-alloy steel, heat-treated, Rm 1190 N/mm², 350 HB	85	100	0.040	0.060	0.085	0.100
P3.1.1 High-alloy steel and tool steel, annealed, Rm 680 N/mm², 200 HB	85	100	0.040	0.060	0.085	0.100
P3.1.2 High-alloy steel and tool steel, hardened and tempered, Rm 1100 N/mm², 325 HB	85	100	0.040	0.060	0.085	0.100
M1.1.1 Stainless steel, ferritic/martensitic, with machining additives	65	80	0.025	0.035	0.050	0.060
M1.1.2 Stainless steel, ferritic/martensitic, annealed, Rm 680 N/mm², 200 HB	65	80	0.025	0.035	0.050	0.060
M1.1.3 Stainless steel, ferritic/martensitic, heat-treated, Rm 810 N/mm², 240 HB	65	80	0.025	0.035	0.050	0.060
M2.1.1 Stainless steel, austenitic, quenched, 180 HB	65	80	0.025	0.035	0.050	0.060
M2.2.1 Duplex steel, high-strength stainless steels	65	80	0.025	0.035	0.050	0.060
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	165	200	0.040	0.060	0.085	0.100
N1.1.2 Wrought aluminium alloys, hardened, 100 HB	165	200	0.040	0.060	0.085	0.100
N2.1.1 Aluminium casting alloys, non-hardened, ≤ 12 % Si, 75 HB	165	200	0.040	0.060	0.085	0.100
N2.1.2 Aluminium casting alloys, hardened, ≤ 12 % Si, 90 HB	165	200	0.040	0.060	0.085	0.100
N2.1.3 Aluminium casting alloys, non-hardened, > 12 % Si, 130 HB	165	200	0.040	0.060	0.085	0.100
N3.1.1 Copper and copper alloys: Free-machining alloy, Pb > 1 %	165	200	0.040	0.060	0.085	0.100
N3.1.2 Copper and copper alloys: CuZn, CuSnZn	165	200	0.040	0.060	0.085	0.100
N3.1.3 Copper and copper alloys: CuSn, lead-free copper and copper electrolyte	165	200	0.040	0.060	0.085	0.100
N4.1.1 Non-metallic materials: Duroplastics, fibre-reinforced plastics	165	200	0.040	0.060	0.085	0.100
N4.1.2 Non-metallic materials: Hard rubber, wood, etc.	165	200	0.040	0.060	0.085	0.100
N4.1.3 Non-metallic materials: Graphite	165	200	0.040	0.060	0.085	0.100
S1.1.1 Heat-resistant alloys, Fe-based, annealed, 200 HB	50	60	0.015	0.025	0.035	0.040
S1.1.2 Heat-resistant alloys, Fe-based, hardened, 280 HB	50	60	0.015	0.025	0.035	0.040
S1.1.3 Heat-resistant alloys, Ni- or Co-based, annealed, 250 HB	50	60	0.015	0.025	0.035	0.040
S1.1.4 Heat-resistant alloys, Ni- or Co-based, hardened, 350 HB	50	60	0.015	0.025	0.035	0.040
S1.1.5 Heat-resistant alloys, Ni- or Co-based, cast, 320 HB	50	60	0.015	0.025	0.035	0.040
S2.1.1 Titanium alloys, pure titanium, Rm 400 N/mm²	50	60	0.015	0.025	0.035	0.040
S2.1.2 Titanium alloys, Alpha and Beta alloys, hardened, Rm 1050 N/mm²	50	60	0.015	0.025	0.035	0.040
H1.1.1 Hardened steel, hardened and tempered, < 55 HRC	50	60	0.015	0.025	0.035	0.040
H1.1.2 Hardened steel, hardened and tempered, < 60 HRC	50	60	0.015	0.025	0.035	0.040
H1.1.3 Hardened steel, hardened and tempered, > 60 HRC	50	60	0.015	0.025	0.035	0.040
H2.1.1 Chilled cast iron, 400 HB	50	60	0.015	0.025	0.035	0.040
H2.1.2 Chilled cast iron, hardened and tempered, < 55 HRC	50	60	0.015	0.025	0.035	0.040

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Parting-off neutral System 208

Machining group	v_c (m/min) by width		f (mm/U) by width			
	< 2	≤ 4	< 1	< 2	< 3	≥ 3
P1.1.1 Unalloyed steel, annealed, 0.15 % C, Rm 420 N/mm², 125 HB	85	100	0.040	0.060	0.085	0.100
P1.1.2 Unalloyed steel, heat-treated, 0.15 % C, Rm 420 N/mm², 125 HB	85	100	0.040	0.060	0.085	0.100
P1.1.3 Unalloyed steel, annealed, 0.45 % C, Rm 640 N/mm², 190 HB	85	100	0.040	0.060	0.085	0.100
P1.1.4 Unalloyed steel, heat-treated, 0.45 % C, Rm 640 N/mm², 190 HB	85	100	0.040	0.060	0.085	0.100
P1.1.5 Unalloyed steel, heat-treated, 0.45 % C, Rm 850 N/mm², 250 HB	85	100	0.040	0.060	0.085	0.100
P1.1.6 Unalloyed steel, annealed, 0.75 % C, Rm 915 N/mm², 270 HB	85	100	0.040	0.060	0.085	0.100
P1.1.7 Unalloyed steel, heat-treated, 0.75 % C, Rm 1020 N/mm², 300 HB	85	100	0.040	0.060	0.085	0.100
P2.1.1 Low-alloy steel, annealed, Rm 610 N/mm², 180 HB	85	100	0.040	0.060	0.085	0.100
P2.1.2 Low-alloy steel, heat-treated, Rm 930 N/mm², 275 HB	85	100	0.040	0.060	0.085	0.100
P2.1.3 Low-alloy steel, heat-treated, Rm 1020 N/mm², 300 HB	85	100	0.040	0.060	0.085	0.100
P2.1.4 Low-alloy steel, heat-treated, Rm 1190 N/mm², 350 HB	85	100	0.040	0.060	0.085	0.100
P3.1.1 High-alloy steel and tool steel, annealed, Rm 680 N/mm², 200 HB	85	100	0.040	0.060	0.085	0.100
P3.1.2 High-alloy steel and tool steel, hardened and tempered, Rm 1100 N/mm², 325 HB	85	100	0.040	0.060	0.085	0.100
M1.1.1 Stainless steel, ferritic/martensitic, with machining additives	65	80	0.025	0.035	0.050	0.060
M1.1.2 Stainless steel, ferritic/martensitic, annealed, Rm 680 N/mm², 200 HB	65	80	0.025	0.035	0.050	0.060
M1.1.3 Stainless steel, ferritic/martensitic, heat-treated, Rm 810 N/mm², 240 HB	65	80	0.025	0.035	0.050	0.060
M2.1.1 Stainless steel, austenitic, quenched, 180 HB	65	80	0.025	0.035	0.050	0.060
M2.2.1 Duplex steel, high-strength stainless steels	65	80	0.025	0.035	0.050	0.060
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	165	200	0.040	0.060	0.085	0.100
N1.1.2 Wrought aluminium alloys, hardened, 100 HB	165	200	0.040	0.060	0.085	0.100
N2.1.1 Aluminium casting alloys, non-hardened, ≤ 12 % Si, 75 HB	165	200	0.040	0.060	0.085	0.100
N2.1.2 Aluminium casting alloys, hardened, ≤ 12 % Si, 90 HB	165	200	0.040	0.060	0.085	0.100
N2.1.3 Aluminium casting alloys, non-hardened, > 12 % Si, 130 HB	165	200	0.040	0.060	0.085	0.100
N3.1.1 Copper and copper alloys: Free-machining alloy, Pb > 1 %	165	200	0.040	0.060	0.085	0.100
N3.1.2 Copper and copper alloys: CuZn, CuSnZn	165	200	0.040	0.060	0.085	0.100
N3.1.3 Copper and copper alloys: CuSn, lead-free copper and copper electrolyte	165	200	0.040	0.060	0.085	0.100
N4.1.1 Non-metallic materials: Duroplastics, fibre-reinforced plastics	165	200	0.040	0.060	0.085	0.100
N4.1.2 Non-metallic materials: Hard rubber, wood, etc.	165	200	0.040	0.060	0.085	0.100
N4.1.3 Non-metallic materials: Graphite	165	200	0.040	0.060	0.085	0.100
S1.1.1 Heat-resistant alloys, Fe-based, annealed, 200 HB	50	60	0.015	0.025	0.035	0.040
S1.1.2 Heat-resistant alloys, Fe-based, hardened, 280 HB	50	60	0.015	0.025	0.035	0.040
S1.1.3 Heat-resistant alloys, Ni- or Co-based, annealed, 250 HB	50	60	0.015	0.025	0.035	0.040
S1.1.4 Heat-resistant alloys, Ni- or Co-based, hardened, 350 HB	50	60	0.015	0.025	0.035	0.040
S1.1.5 Heat-resistant alloys, Ni- or Co-based, cast, 320 HB	50	60	0.015	0.025	0.035	0.040
S2.1.1 Titanium alloys, pure titanium, Rm 400 N/mm²	50	60	0.015	0.025	0.035	0.040
S2.1.2 Titanium alloys, Alpha and Beta alloys, hardened, Rm 1050 N/mm²	50	60	0.015	0.025	0.035	0.040
H1.1.1 Hardened steel, hardened and tempered, < 55 HRC	50	60	0.015	0.025	0.035	0.040
H1.1.2 Hardened steel, hardened and tempered, < 60 HRC	50	60	0.015	0.025	0.035	0.040
H1.1.3 Hardened steel, hardened and tempered, > 60 HRC	50	60	0.015	0.025	0.035	0.040
H2.1.1 Chilled cast iron, 400 HB	50	60	0.015	0.025	0.035	0.040
H2.1.2 Chilled cast iron, hardened and tempered, < 55 HRC	50	60	0.015	0.025	0.035	0.040

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Article no. index

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Article no.	Page	Cutting values	Description	Tool material	Type
495	208	209	90° Front/back deburrers	Solid carbide	EW 100 VR
1675	200	205	High-performance reamers, fixed-size series	Solid carbide	HR 500 S
1676	200	205	High-performance reamers, fixed-size series	Solid carbide	HR 500 D
4364	225		Adjusting screws “faces” for synchro tapping chucks with int. coolant		A/B
4525	219		Straight shank hydraulic synchro tapping chucks for internal cooling		
4526	220		CAT hydraulic chucks for internal cooling		
4576	217		ISO taper hydraulic synchro tapping chucks for internal cooling		
4577	218		MAS/BT hydraulic synchro tapping chucks for internal cooling		
4601	216		HSK-A hydraulic synchro tapping chucks for internal cooling		
4605	221		Reduction bushes, sealed, for hydraulic synchro tapping chucks		
4606	223		Reduction bushes GÜHROJET for hydraulic synchro tapping chucks		
4870	190	193	Thread milling cutters without chamfer for ISO metric threads	Solid carbide	SC-TM-Z SP
6091	72	104	Single-fluted gun drills EB 100 M STEEL	Solid carbide	EB 100 M STEEL
6092	73	104	Single-fluted gun drills EB 100 M STEEL	Solid carbide	EB 100 M STEEL
6093	74	104	Single-fluted gun drills EB 100 M STEEL	Solid carbide	EB 100 M STEEL
6094	75	104	Single-fluted gun drills EB 100 M STEEL	Solid carbide	EB 100 M STEEL
6095	76	104	Single-fluted gun drills EB 100 M STEEL	Solid carbide	EB 100 M STEEL
6161	18	89	ExclusiveLine micro-precision drills without coolant ducts short shank	Solid carbide	N
6162	19	90	ExclusiveLine micro-precision drills without coolant ducts short shank	Solid carbide	N
6163	115	158	Ratio end mills RF 100 Sharp extra short short shank	Solid carbide	N
6164	116	158	Ratio end mills RF 100 Sharp short shank	Solid carbide	N
6165	116	158	Ratio end mills RF 100 Sharp short shank	Solid carbide	N
6166	114	160	Ball nose end mills G-Mold 55 B short shank	Solid carbide	N
6167	114	160	Ball nose end mills G-Mold 55 B short shank	Solid carbide	N
6407	36	97	Step ratio drill with coolant ducts	Solid carbide	RT 100 U
6456	120	162	Ratio end mills RF 100 Sharp extra short	Solid carbide	NH
6457	120	162	Ratio end mills RF 100 Sharp extra short	Solid carbide	NH
6458	122	162	Ratio end mills RF 100 Sharp	Solid carbide	NH
6459	122	162	Ratio end mills RF 100 Sharp	Solid carbide	NH
6460	124	162	Ratio end mills RF 100 Sharp	Solid carbide	NH
6461	124	162	Ratio end mills RF 100 Sharp	Solid carbide	NH
6463	147	167	Ratio roughing end mills Alu RF 100 AL	Solid carbide	W
6464	146	167	Ratio roughing end mills Alu RF 100 AL	Solid carbide	W
6465	146	167	Ratio roughing end mills Alu RF 100 AL	Solid carbide	W
6466	146	167	Ratio roughing end mills Alu RF 100 AL	Solid carbide	W
6467	146	167	Ratio roughing end mills Alu RF 100 AL	Solid carbide	W
6494	16	88	ExclusiveLine micro-precision drills XL with coolant ducts	Solid carbide	N
6497	17	91	Micro-precision drills with coolant ducts	Solid carbide	RT 100 U
6591	28	94	Ratio drills with coolant ducts, 3-fluted	Solid carbide	FT 200 U
6592	29	95	Ratio drills with coolant ducts, 3-fluted	Solid carbide	FT 200 U
6793	150	170	End mills (single-fluted)	Solid carbide	AL
6916	149	169	Ball nose end mills GA 200 A	Solid carbide	W
6917	149	169	Ball nose end mills GA 200 A	Solid carbide	W
6918	154	171	90° Chamfering milling cutters	Solid carbide	N
6919	154	171	90° Chamfering milling cutters	Solid carbide	N
6925	155	172	End mills CR 200 for fibre-reinforced plastics	Solid carbide	CR 200
6930	155	172	End mills CR 200 for fibre-reinforced plastics	Solid carbide	CR 200
6935	151	170	End mills (single-fluted)	Solid carbide	AL
6936	152	170	End mills (single-fluted)	Solid carbide	AL
6937	153	170	End mills (single-fluted)	Solid carbide	AL
6949	156	174	Circular milling cutters, corner chamfer	Solid carbide	
6950	156	174	Circular milling cutters, corner radius	Solid carbide	
6951	157	174	Circular milling cutters, full radius	Solid carbide	
8065	130	164	Micro-precision milling cutters RF 100 AL	Solid carbide	RF 100 AL
8066	131	165	Micro-precision milling cutters RF 100 AL	Solid carbide	RF 100 AL
8069	128	164	Micro-precision milling cutters RF 100 AL	Solid carbide	RF 100 AL
8070	129	165	Micro-precision milling cutters RF 100 AL	Solid carbide	RF 100 AL
8135	151	170	End mills (single-fluted)	Solid carbide	AL
8136	152	170	End mills (single-fluted)	Solid carbide	AL
8137	153	170	End mills (single-fluted)	Solid carbide	AL
8138	150	170	End mills (single-fluted)	Solid carbide	AL
8150	40		Drill head holder BT 800		BT 800
8151	42		Drill head holder BT 800		BT 800
8152	44		Drill head holder BT 800		BT 800
8153	46		Drill head holder BT 800		BT 800
8154	48		Drill head holder BT 800		BT 800
8162	50	98	Drill head BT 800 for piloting	Solid carbide	BT 800
8163	52	99	Drill head BT 800	Solid carbide	BT 800
8170	54		Mounting key BT 800		
8220	147	168	Ratio end mills RF 100 AL µF	Solid carbide	W
8221	148	168	Ratio end mills RF 100 AL µF	Solid carbide	W
8222	148	168	Ratio end mills RF 100 AL µF	Solid carbide	W

Article no.	Page	Cutting values	Description	Tool material	Type
8230	134	166	Ratio end mills RF 100 AL	Solid carbide	RF 100 AL
8231	134	166	Ratio end mills RF 100 AL	Solid carbide	RF 100 AL
8232	133	166	Ratio end mills RF 100 AL	Solid carbide	RF 100 AL
8233	133	166	Ratio end mills RF 100 AL	Solid carbide	RF 100 AL
8234	132	166	Ratio end mills RF 100 AL	Solid carbide	RF 100 AL
8235	132	166	Ratio end mills RF 100 AL	Solid carbide	RF 100 AL
8236	139	166	Ratio end mills RF 100 AL	Solid carbide	RF 100 AL
8237	139	166	Ratio end mills RF 100 AL	Solid carbide	RF 100 AL
8238	138	166	Ratio end mills RF 100 AL	Solid carbide	RF 100 AL
8239	138	166	Ratio end mills RF 100 AL	Solid carbide	RF 100 AL
8240	143	166	Ratio end mills RF 100 AL	Solid carbide	RF 100 AL
8241	143	166	Ratio end mills RF 100 AL	Solid carbide	RF 100 AL
8242	142	166	Ratio end mills RF 100 AL	Solid carbide	RF 100 AL
8243	142	166	Ratio end mills RF 100 AL	Solid carbide	RF 100 AL
8244	137	166	Ratio end mills RF 100 AL	Solid carbide	RF 100 AL
8245	137	166	Ratio end mills RF 100 AL	Solid carbide	RF 100 AL
8246	136	166	Ratio end mills RF 100 AL	Solid carbide	RF 100 AL
8247	136	166	Ratio end mills RF 100 AL	Solid carbide	RF 100 AL
8248	135	166	Ratio end mills RF 100 AL	Solid carbide	RF 100 AL
8249	135	166	Ratio end mills RF 100 AL	Solid carbide	RF 100 AL
8250	141	166	Ratio end mills RF 100 AL	Solid carbide	RF 100 AL
8251	141	166	Ratio end mills RF 100 AL	Solid carbide	RF 100 AL
8252	140	166	Ratio end mills RF 100 AL	Solid carbide	RF 100 AL
8253	140	166	Ratio end mills RF 100 AL	Solid carbide	RF 100 AL
8254	145	166	Ratio end mills RF 100 AL	Solid carbide	RF 100 AL
8255	145	166	Ratio end mills RF 100 AL	Solid carbide	RF 100 AL
8256	144	166	Ratio end mills RF 100 AL	Solid carbide	RF 100 AL
8257	144	166	Ratio end mills RF 100 AL	Solid carbide	RF 100 AL
8313	182	191	Taps with coolant ducts for ISO metric threads	HSS-E-PM	EPL
8314	183	191	Taps with coolant ducts for ISO metric threads	HSS-E-PM	EPL
8325	186	192	Fluteless taps with coolant ducts for ISO metric threads	HSS-E-PM	XF
8326	187	192	Fluteless taps with coolant ducts for ISO metric fine threads	HSS-E-PM	XF
8327	186	192	Fluteless taps with coolant ducts for ISO metric threads	HSS-E-PM	XF
8328	187	192	Fluteless taps with coolant ducts for ISO metric fine threads	HSS-E-PM	XF
8518	32	96	Ratio drills with coolant ducts	Solid carbide	INOX PRO
8525	22	92	Micro-precision drills without coolant ducts	Solid carbide	RT 100 AL
8526	23	92	Micro-precision drills with coolant ducts	Solid carbide	RT 100 AL
8527	24	93	Micro-precision drills with coolant ducts	Solid carbide	RT 100 AL
8528	25	93	Micro-precision drills with coolant ducts	Solid carbide	RT 100 AL
9190	80	105	EB 80 CROSS single-fluted gun drills	Carbide	EB 80 CROSS
9191	80	105	EB 80 CROSS single-fluted gun drills	Carbide	EB 80 CROSS
9192	81	105	EB 80 CROSS single-fluted gun drills	Carbide	EB 80 CROSS
9193	82	105	EB 80 CROSS single-fluted gun drills	Carbide	EB 80 CROSS
9194	83	105	EB 80 CROSS single-fluted gun drills	Carbide	EB 80 CROSS
9195	84	105	EB 80 CROSS single-fluted gun drills	Carbide	EB 80 CROSS
9196	85	105	EB 80 CROSS single-fluted gun drills	Carbide	EB 80 CROSS
9197	86	105	EB 80 CROSS single-fluted gun drills	Carbide	EB 80 CROSS
9198	87	105	EB 80 CROSS single-fluted gun drills	Carbide	EB 80 CROSS
25911	238		Torx-Plus screwdriver		
25914	238		Clamping screws		
26700	236		Square shank holder straight, external machining, without IC		GH208
26701	236		Square shank holder straight, external machining, without IC		GH208
26702	237		Square shank holders straight, external machining, with IC		GH208
26703	237		Square shank holders straight, external machining, with IC		GH208
26800	232	239	Indexable inserts for radial grooving and copying	Solid carbide	GE208
26802	232	239	Indexable inserts for radial grooving and copying	Solid carbide	GE208
26808	232	239	Indexable inserts for radial grooving and longitudinal turning	Solid carbide	GP208
26810	232	239	Indexable inserts for radial grooving and longitudinal turning	Solid carbide	GP208
26812	233	239	Indexable inserts for back turning	Solid carbide	GR208
26814	233	239	Indexable inserts for back turning	Solid carbide	GR208
26816	234	240	Indexable inserts for parting off	Solid carbide	GZ208
26818	234	240	Indexable inserts for parting off	Solid carbide	GZ208
26820	234	240	Indexable inserts for parting off	Solid carbide	GZ208
26822	234	240	Indexable inserts for parting off	Solid carbide	GZ208
26824	235	241	Indexable inserts for parting off	Solid carbide	GZ208
26826	235	241	Indexable inserts for parting off	Solid carbide	GZ208
28500	58		Indexable insert drills with internal cooling		GMD
28501	60		Indexable insert drills with internal cooling		GMD
28502	62		Indexable insert drills with internal cooling		GMD
28503	64		Indexable insert drills with internal cooling		GMD
28504	66	102	Indexable inserts SOLX, single-sided, peripheral	Solid carbide	SOLX
28505	66	103	Indexable inserts SOLX, single-sided, peripheral	Solid carbide	SOLX

Article no.	Page	Cutting values	Description	Tool material	Type
28508	67	102	Indexable inserts XOLX, single-sided, central	Solid carbide	XOLX
28509	67	103	Indexable inserts XOLX, single-sided, central	Solid carbide	XOLX
28900	68		Clamping screws		

Appendix

Reference work for practical use

Material examples cutting data tables,
abbreviations & symbols

GÜHRING

Mat. no.	DIN	EN	AISI/ASTM/SAE	AFNOR
P1.1.1 **P1.1.2**	Unalloyed steel, annealed, 0.15 % C, Rm 420 N/mm², 125 HB Unalloyed steel, heat-treated, 0.15 % C, Rm 420 N/mm², 125 HB			
1.0037	St 37-2	S235JR	-	E24-2
1.0038	St 37-3	S275J2G3	A570.36	E28-3
1.0045	S 355 JR	S 1207	-	E36-2
1.0050	St 50-2	E 295	A570 Gr. 50	A50-2
1.0060	St 60-2	-	A572 Gr. 65	A60-2
1.0114	S 235 J0	S 235 J0	-	E24-3
1.0143	S 275 J0	S 275 J0	-	E28-3
1.0144	St 44-3 N	S 275 J2 G3	A573 Gr. 81	E28-3
1.0149	Ro St 44-2	S 275 J0 H	-	-
1.0301	C10	C10	1010	34C10, XC10
1.0330	St 12	Fe P01	-	DC 01/Fe P01
1.0338	St4	Fe P04	A620(1008)	Fe 14
1.0401	C15	-	1015	C18RR, XC18
1.0402	C22	1 C 22	1020	C20
1.0443	GS-45		A2765-35	E23-45M
1.0539	S355NH			TSE355-4
1.0545	S355N			E355R
1.0546	S355NL			E355FP
1.0547	S355J0H			TSE355-3
1.0549	S355NLH			
1.0553	St52-3U		A14880-40	320-560M
1.0562	St E 355		A633 Gr. C	FeE355KGN
1.0570	St 52-3	S355JR	1	E36-3
1.0715	9SMn28		1213	S250
1.0718	9SMnPb28		12L13	S250Pb
1.0721	10S20		1108	10S20
1.0722	10SPb20		11L08	10PbF2
1.0736	9SMn36		1215	S300
1.0737	9SMnPb36		12L14	S300Pb
1.0972	S315MC			E315D
1.0976	S355MC			E355D
1.0982	S460MC			
1.0984	S500MC			E490D
1.0986	S500MC			E560D
1.1121	Ck10		1010	XC10
1.1141	Ck15	32C	1015	XC15
1.1151	C22E		1020	2C22
1.8900	StE380		A572-60	
P1.1.3 **P1.1.4**	Unalloyed steel, annealed, 0.45 % C, Rm 640 N/mm², 190 HB Unalloyed steel, heat-treated, 0.45 % C, Rm 640 N/mm², 190 HB			
1.0501	C35		1035	1C35
1.0503	C45		1045	XC42H1TS
1.0511	C40		1040	1C40
1.0540	C50			
1.0551	GS-52		A2770-36	280-480M
1.0553	St52-3U		A14880-40	320-560M
1.0577	S 355 J 2 G 4		A738	A52FP
1.0726	35S20	8M	1140	35MF6
1.0727	45S20		1146	45MF4
1.1157	40Mn4	15	1039	40M5
1.1158	C25E		1025	XC25
1.1166	34Mn5		1536	
1.1167	36Mn5		1335	40M5
1.1170	28Mn6	14A	1330	20M5
1.1178	C30E			XC32
1.1180	C35R		1035	3C35
1.1181	C35E		1035	XC38
1.1191	Ck45		1045	XC45
1.1206	C50E		1050	2C50
1.1213	Cf53		1050	XC48HTS

Mat. no.	DIN	EN	AISI/ASTM/SAE	AFNOR
P1.1.5	Unalloyed steel, heat-treated, 0.45 % C, Rm 850 N/mm², 250 HB			
1.0501	C35		1035	1C35
1.0503	C45		1045	XC42H1TS
1.0614	C76D		1074	XC75
1.0616	C86D		1086	XC80
1.0618	C92D		1095	XC90
1.0726	35S20	8M	1140	35MF6
1.1157	40Mn4	15	1039	40M5
1.1165	30Mn5		1036	35M5
1.1167	36Mn5		1335	40M5
1.1186	C40E		1040	2C40
1.1191	Ck45		1045	2C45
1.1201	C45R		1049	3C45
1.1213	Cf53		1050	XC48HTS
1.7242	18CrMo4			
1.7337	16CrMo4-4		A387 Gr.12	
1.7362	12CrMo195			Z10CD5-05
P1.1.6	Unalloyed steel, annealed, 0.75 % C, Rm 915 N/mm², 270 HB			
1.0603	C67		107	XC65
1.0605	C75		1075	
1.1203	Ck55		1055	2C55
1.1209	C55R		1055	3C55
1.1221	Ck60	43D	1060	2C60
1.1231	C67E		1070	XC68
1.1248	C75E		1074	XC75
1.1269	C85E		1086	XC90
1.1274	Ck 101	C 100S	1095	XC100
1.1545	C 105 W1	C 105U	W1	Y1 105
1.1663	C125W		W112	Y2120
P1.1.7	Unalloyed steel, heat-treated, 0.75 % C, Rm 1020 N/mm², 300 HB			
1.0070	St 70-2		1055	A70-2
1.0535	C55		1055	1C55
1.0601	C60	43D	1060	1C60
1.1203	Ck55		1055	2C55
1.1221	Ck60	43D	1060	2C60
1.1274	Ck 101	C 100S	1095	XC100
1.1545	C 105 W1	C 105U	W1	Y1 105
1.1663	C125W		W112	Y2120
1.5120	38MnSi4			
1.5710	36NiCr6	111A	3135	35NC6
1.7701	51CrMoV4			
P2.1.1	Low-alloy steel, annealed, Rm 610 N/mm², 180 HB			
1.0904	55Si7	45	9255	55S7
1.0961	60SiCr7		9262	60SC6
1.2067	102CR6	100CR6	L3	Y100C6
1.2108	90CrSi5		L1	
1.2210	115CrV3		L2	100C3
1.2241	51CrV4			
1.2330	35CrMo4		4135	34CD4
1.2419	105WCr6			105WC13
1.2510	100MnCrW4		O1	90 MWCV 5
1.2542	45WCrV7		S1	
1.2550	60WCrV7		S1	55WC20
1.2713	55NiCrMoV6		L6	55NCDV7
1.2721	50NiCr13		L6	55NCV6
1.2842	90MnCrV8		O2	90MV8
1.3501	100Cr2		E50100	
1.3505	100Cr6	31	52100	100C6
1.5024	46Si7			45S7
1.5025	51Si7	50Si7	9259H	51S7
1.5027	60Si7	60Si7	9260	60S7
1.5028	65Si7		9260H	
1.5415	15Mo3		A204Gr.A	15D3

The multiple naming of materials results from the different heat treatment states.

Mat. no.	DIN	EN	AISI/ASTM/SAE	AFNOR
P2.1.1	Low-alloy steel, annealed, Rm 610 N/mm², 180 HB			
1.5419	20Mo4		4419	
1.5423	16Mo5		4520	
1.5622	14Ni6		A350-LF5	16N6
1.5732	14NilCr10		3415	14NC11
1.5752	14NiCr14	36A	3310	12NC15
1.6511	36CrNiMo4	110	9840	40NCD3
1.6523	21NiCrMo2	362	8620	20NCD2
1.6546	40NiCrMo2-2		8740	
1.6566	17NiCrMo6-4			
1.6587	17CrNiMo6			18NCD6
1.6657	10NiCrMo13-4			
1.7015	10Cr3		5015	12C3
1.7033	34Cr4	18B	5132	32C4
1.7035	41Cr4	18	5140	42C4
1.7131	16MnCr5		5115	16MC5
1.7139	16MnCrS5			
1.7176	55Cr3	48	5155	55C3
1.7225	42CrMo4	42 CrMo 4	4140	42 CD 4
1.7228	55NiCrMoV6G	33		
1.7380	10CrMo9-10		A182F22	12CD9-10
1.7715	14MoV6-3			
1.8159	50CrV4	47	6150	50CrV4
1.8161	58CrV4			
1.8509	41CrAlMo7	41B	A355A	40CAD6-12
1.8523	39CrMoV13-9	40C		
P2.1.2	Low-alloy steel, heat-treated, Rm 930 N/mm², 275 HB			
1.5415	15Mo3		A204Gr.A	15D3
1.5423	16Mo5		4520	
1.5622	14Ni6		A350-LF5	16N6
1.5732	14NilCr10		3415	14NC11
1.5752	14NiCr14	36A	3310	12NC15
1.5755	31NiCr14			18NC13
1.6565	40NiCrMo6	24	4340	35NCD6
1.6587	17CrNiMo6			18NCD6
1.6657	10NiCrMo13-4			
1.6957	26NiCrMoV14-5			
1.7015	10Cr3		5015	12C3
1.7262	15CrMo5			12CD4
1.7335	13CrMo4-4		A182-F11	15CD4-5
1.7380	10CrMo9-10		A182F22	12CD9-10
1.7715	14MoV6-3			
1.7733	24CrMoV55			20CDV6
1.7755	GS-45CrMoV10-4			
1.8070	21CrMoV511			
P2.1.3	Low-alloy steel, heat-treated, Rm 1020 N/mm², 300 HB			
1.1730	C45W3		C45W	XC48
1.2332	47CrMo4	19A	4142	42CD4
1.5736	36NiCr10		3435	30NC11
1.6523	21NiCrMo2	362	8620	20NCD2
1.7033	34Cr4	18B	5132	32C4
1.7218	25CrMo4		4130	25CD4
1.8515	32CrMo12	40B		30CD12
P2.1.4	Low-alloy steel, heat-treated, Rm 1190 N/mm², 350 HB			
1.0904	55Si7	45	9255	55S7
1.0961	60SiCr7		9262	60SC6
1.2067	100Cr6		L3	Y100C6
1.2419	105WCr6			105WC13
1.2542	45WCrV7		S1	
1.2713	55NiCrMoV6		L6	55NCDV7
1.4882	X50CrMnNiNbN219			Z50CMNNb21-09
1.5120	38MnSi4			

Mat. no.	DIN	EN	AISI/ASTM/SAE	AFNOR
P2.1.4	Low-alloy steel, heat-treated, Rm 1190 N/mm², 350 HB			
1.5710	36NiCr6	111A	3135	35NC6
1.5755	31NiCr14			18NC13
1.6511	36CrNiMo4	110	9840	40NCD3
1.6546	40NiCrMo2-2		8740	
1.7035	41Cr4	18	5140	42C4
1.7176	55Cr3	48	5155	55C3
1.7220	34CrMo4		4135	35CD4
1.7223	41CrMo4		4142	
1.7225	42CrMo4	42 CrMo 4	4140	42 CD 4
1.7361	32CrMo12	40B		30CD12
1.8159	50CrV4	47	6150	50CrV4
1.8161	58CrV4			
1.8509	41CrAlMo7	41B	A355A	40CAD6-12
1.8523	39CrMoV13-9	40C		
P3.1.1	High-alloy steel and tool steel, annealed, Rm 680 N/mm², 200 HB			
1.2080	X210Cr12	X210Cr12	D3	Z200C12
1.2162	21MnCr5			20MC5
1.2311	40CrMnMo7			40CMD8
1.2312	40CrMnMoS8.6		P20+S	40CMD8S
1.2316	X36CrMo17	X38CrMo16		
1.2343	X38CrMoV5-1		H11	Z38CDV5
1.2344	X40CrMoV5-1		H13	Z40CDV5
1.2363	X100CrMoV5-1		A2	Z100CDV5
1.2379	X155CrVMo121		D2	Z160CDV12
1.2436	X210CrW12		D4(D6)	Z200CD12
1.2510	100MnCrW4		O1	90 MWCV 5
1.2581	X30WCrV9-3		H21	Z30WCV9
1.2601	X165CrMoV12			
1.2606	X37CrMoW51		H12	Z35CWDV5
1.2764	X19NiCrMo4			
1.2767	X45NiCrMo4			45NCD16
1.2842	90MnCrV8		O2	90MV8
1.3243	S6-5-2-5		T15	KCV06-05-05-04-02
1.3249	S18-1-2-5		T4	Z80WKCV18-05-04
1.3343	S6-5-2		M2	Z85WDCV
1.3348	S2-9-2		M7	Z100DCWV09-04-02
1.3355	S18-0-1		T1	Z80WCV18-4-01
1.4718	X45CrSi9-3	52	HNV3	Z45CS9
1.5662	X8Ni9		ASMA353	9Ni
1.5680	12Ni19		2515	Z18N5
P3.1.2	High-alloy steel and tool steel, hardened and tempered, Rm 1100 N/mm², 325 HB			
1.2080	X210Cr12	X210Cr12	D3	Z200C12
1.2344	X40CrMoV5-1		H13	Z40CDV5
1.2363	X100CrMoV5-1		A2	Z100CDV5
1.2436	X210CrW12		D4(D6)	Z200CD12
1.2581	X30WCrV9-3		H21	Z30WCV9
1.2601	X165CrMoV12			
1.2714	55NiCrMoV7		6F3/L6	55NiCrMoV7
1.3202	S12-1-4-5			
1.3207	S10-4-3-10			Z130WKCDV
1.3243	S6-5-2-5		T15	KCV06-05-05-04-02
1.3246	S7-4-2-5		M35	Z110WKCDV07-05-04
1.3247	S2-10-1-8		M42	Z110DKCWV09-08-04
1.3255	S18-1-2-5		T4	Z80WKCV18-05-04
1.3343	S6-5-2		M2	Z85WDCV
1.3348	S2-9-2		M7	Z100DCWV09-04-02
1.3355	S18-0-1		T1	Z80WCV18-4-01
1.4718	X45CrSi9-3	52	HNV3	Z45CS9
1.4935	X20CrMoWV121		422	
1.5680	12Ni19		2515	Z18N5

The multiple naming of materials results from the different heat treatment states.

Mat. no.	DIN	EN	AISI/ASTM/SAE	AFNOR
M1.1.1	Stainless steel, ferritic/martensitic, with machining additives			
1.4005	X12CrS13		416	Z11CF13
1.4029	X29CrS13			
1.4035	X46CrS13			
1.4104	X14CrMoS17		430F	Z10CF17
1.4105	X6CrMoS17			
1.4523	X2CrMoTiS18-2			
M1.1.2	Stainless steel, ferritic/martensitic, annealed, Rm 680 N/mm², 200 HB			
1.4000	X6Cr13		403	Z6C13
1.4001	X7Cr14		410 S	Z8C13
1.4002	X6CrAl13		405	Z6CA13
1.4006	X12Cr13	56A	410	Z10C13
1.4016	X6Cr17	X8Cr17	430	Z8C17
1.4027	GX20Cr14			Z20C13M
1.4028	X30Cr13		420	Z30C13
1.4034	X46Cr13			Z40C14
1.4057	X19CrNi17-2	57	431	Z15CN16-02
1.4086	GX120Cr29			
1.4112	X90CrMoV18		440B	
1.4113	X6CrMo17		434	Z8CD17-01
1.4313	X3CrNi13-4		CA6-NM	Z4CND13-04M
1.4340	GX40CrNi274			
1.4417	X2CrNiM0Si195		S31500	
1.4418	X4CrNiMo165			Z6CND16-04-01
1.4510	X6CrTi17		XM8	Z4CT17
1.4511	X6CrNb17			Z4CNb17
1.4512	X6CrTi12		409	Z3CT12
1.4720	X20CrMo13			
1.4724	X10CrAl13		405	Z10C13
1.4742	X10CrAl18	60	430	Z10CAS18
1.4747	X80CrNiSi20	59	HNV6	Z80CSN20-02
1.4749	X18CrN28		446	
1.4762	X10CrAl24		446	Z10CAS24
1.4871	X53CrMnNiN21-9		EV8	Z52CMN21-09
M1.1.3	Stainless steel, ferritic/martensitic, heat-treated, Rm 810 N/mm², 240 HB			
1.4000	X6Cr13		403	Z6C13
1.4001	X7Cr14		410 S	Z8C13
1.4006	X12Cr13	56A	410	Z10C13
1.4016	X6Cr17	X8Cr17	430	Z8C17
1.4021	X20Cr13		420	Z20C13
1.4027	GX20Cr14			Z20C13M
1.4031	X40Cr13		420	Z40C14
1.4034	X46Cr13			Z40C14
1.4057	X19CrNi17-2	57	431	Z15CN16-02
1.4113	X6CrMo17		434	Z8CD17-01
1.4313	X3CrNi13-4		CA6-NM	Z4CND13-04M
1.4544	A 700		321	Z 10 CNT 18 11
1.4546	X5CrNiNb18-10		348	
M2.1.1	Stainless steel, austenitic, quenched, 180 HB			
1.4020	X13MnNiN18-13-2			
1.4301	X5CrNi18-10		304	Z5CN18-09
1.4303	X4CrNi18-12			
1.4305	X8CrNiS18-9	58M	303	Z8CNF18-09
1.4306	X2CrNi19-11	X3CrNi1810KD	304L	Z2CN18-09
1.4307	X2CrNi18-9			
1.4310	X10CrNi18-8		301	Z12CN17-07
1.4311	X2CrNiN18-10		304LN	Z2CN18-10
1.4315	X5CrNiN19-9			
1.4318	X2CrNiN18-7			

Mat. no.	DIN	EN	AISI/ASTM/SAE	AFNOR
M2.1.1	Stainless steel, austenitic, quenched, 180 HB			
1.4325	X9CrNi18-9			
1.4335	X1CrNi25-21			
1.4361	X1CrNiSi18-15-4			
1.4369	X11CrNiMnN19-8-6			
1.4371	X2CrMnNiN17-7-5		202	Z8CMN18-08-05
1.4372	X12CrMnNiN17-7-5			
1.4373	X12CrMnNiN18-9-5			
1.4376	X8CrMnNi19-6-3			
1.4378	X6CrMnNiN8-13-3			
1.4401	X5CrNiMo17-12-2		316	Z3CND17-11-01
1.4404	X2CrNiMo17-12-2		316L	Z2CND17-12
1.4406	X2CrNiMoN17-11-2		316LN	Z2CND17-12AZ
1.4432	X2CrNiMo17-12-3			
1.4434	X2CrNiMoN18-12-4			
1.4435	X2CrNiMo18-14-3		316L	Z3CND17-12-03
1.4438	X2CrNiMo18-15-4		317L	Z2CND19-15-04
1.4439	X2CrNiMoN17-13-5		(s31726)	Z3CND18-14-06AZ
1.4449	X2CrNiMo18-12-3		317	
1.4466	X1CrNiMoN25-22-2			
1.4529	X1NiCrMoCuN25-20-7			
1.4539	X1NiCrMoCu25-20-5			Z2NCDU25-20
1.4541	X6CrNiTi18-10		321	Z6CNT18-10
1.4547	X1CrNiMoCuN20-18-7		S31254	
1.4550	X6CrNiNb18-10	58F	347	Z6CNNb18-10
1.4558	X2NiCrAlTi32-20			
1.4560	X3CrNiCu19-9-2			
1.4563	X1NiCrMoCu31-27-4			
1.4565	X2CrNiMnMoN25-18-6- 5			
1.4567	X3CrNiCu18-9-4			
1.4570	X6CrNiCuS18-9-2			
1.4571	X6CrNiMoTi17-12-2	58J	316Ti	Z6NDT17-12
1.4578	X3CrNiCuMo17-11-3-2			
1.4580	X6CrNiMoNb17-12-2			
1.4597	X8CrMnCuNB17-8-3			
1.4598	X2CrNiMoCuS17-10-2			
1.4615	X3CrMnNiCu15-8-5-3			
1.4618	X9CrMnNiCu17-8-5-2			
1.4640	X5CrNiCu19-6-2			
1.4646	X6CrMnNiCuN18-12-4-2			
1.4650	X2CrNiCu19-10			
1.4652	X1CrNiMoCuN24-22-8			
1.4659	X1CrNiMoCuNW24-22-6			
M2.1.1	Duplex steel, high-strength stainless steels			
1.4062	X2CrNiN22-2			
1.4669	X1CrNiMoCuN25-25-5			
1.4424	X2CrNiMo20-7-2			
1.4362	X2CrNiN23-4		S32304	Z2CN23-04AZ
1.4162	X2CrMnNiMoN25-18-6-5			
1.4482	X2CrMnNiMoN22-5-3			
1.4462	X2CrNiMoN22-5-3			Z3CND22-05Az
1.4662	X1CrNiMoCuN26-25-5			
1.4507	X2CrNiMoCuN25-6-3			
1.4460	X1CrNiMoCuN20-18-7		329	
1.4410	X2CrNiMoN25-7-4			Z5CND20-12M
1.4501	X2CrNiMoCuWN25-7-4			
1.4477	X2CrNiMoCuN25-6-3			
1.4658	X1NiCrMoCu25-20-5			

The multiple naming of materials results from the different heat treatment states.

Mat. no.	DIN	EN	AISI/ASTM/SAE	AFNOR
K1.1.1	Grey cast iron, pearlitic/ferritic, 180 HB			
0.6010	GG10	GJL-100	A48 20 B	Ft 10 D
0.6015	GG15	GJL-150	A48 25 B	Ft 15 D
0.6020	GG20	GJL-200	A48 30 B	Ft 20 D
0.6025	GG25	GJL-250	A48 40 B	Ft 25 D
0.6660	GGL-NiCr 20 2	GJLA-XNiCr 20-2	1050/700/7	L-NC 202
K1.1.2	Grey cast iron, pearlitic/martensitic, 260 HB			
0.6025	GG25	GJL-250	A48 40 B	Ft 25 D
0.6030	GG30	GJL-300	A48 45 B	Ft 30 D
0.6035	GG35	GJL-350	A48 50 B	Ft 35 D
0.6040	GG40	GJL-400	A48 60 B	Ft 40 D
K1.2.1	Cast iron with spheroidal graphite, ferritic, 160 HB			
0.7033	GGG35.3	GJS-350-22-LT	-	FGS 370-17
0.7040	GGG40	GJS-400-15	60-40-18	FCS 400-12
0.7043	GGG40.3	GJS-400-18-LT	60-40-18	FGS 370-17
K1.2.2	Cast iron with spheroidal graphite, pearlitic, 250 HB			
0.7050	GGG50	GJS-500-7	80-55-06	FGS 500-7
0.7060	GGG60	GJS-600-3	80-55-06	FGS 600-3
0.7070	GGG70	GJS-700-2	100-70-03	FGS 700-2
0.7652	GGG NiMn 13-7	GJSA-XNiMn 13-7	-	FGS Ni13 Mn7
0.7660	GGG NiCr 20-2	GJSA-XNiCr 20-2	A436 D2	FGS Ni20 Cr2
K1.3.1	Malleable cast iron, ferritic, 130 HB			
0.8135	GTS-35	GJMB350-10	32510	MN 35-10
K1.3.2	Malleable cast iron, pearlitic, 230 HB			
0.8145	GTS-45	GJMB450-6	A220-40010	MN 450
0.8155	GTS-55	GJMB-550-4	50005	MP 50-5
0.8165	GTS-65	GJMB-650-2	70003	MN 650-3
0.8170	GTS-70	GJMB-700-2	90001	MN 700-2
K2.1.1	Vermicular graphite cast iron (GJV)			
5.2100	GJV-300			
5.2201	GJV-400			
5.2301	GJV-500			
K2.2.1	Austenitic-ferritic spheroidal graphite cast iron (ADI)			
5.3400	GJS-800-10			
5.3402	GJS-900-8			
5.3403	GJS-1050-6			

Mat. no.	DIN	EN	AISI/ASTM/SAE	AFNOR
N1.1.1	Wrought aluminium alloys, non-hardened, 60 HB			
3.0205	Al99		Al99	
3.0255	Al99.5		1000	A59050C
3.3206	AlMgSi0.5	AW-6060		
3.3315	AlMg1			
N1.1.2	Wrought aluminium alloys, hardened, 100 HB			
3.1325	AlCuMg1			
3.1655	AlCuSiPb			
3.2315	AlMgSi1			
3.4345	AlZnMgCuO,5		7050	AZ4GU/9051
3.4365	AlZnMgCu1,5		7075	7075
N2.1.1	Aluminium casting alloys, non-hardened, ≤ 12 % Si, 75 HB			
3.2163	AlSi9Cu3			
3.2382	AlSi10Mg			
3.2383	AlSi0Mg(Cu)		A360.2	
3.2581	AlSi12			
3.3561	AlMg5			
N2.1.2	Aluminium casting alloys, hardened, ≤ 12 % Si, 90 HB			
2.1871	AlCu4TiMg			
3.1754	AlCu4Ni2Mg			
3.2371	AlSi7Mg		4218B	
3.2373	AlSI9MGWA		SC64D	A-S7G
3.2381	AlSi10Mg			
3.5106	MgAg3SE2Zr1		QE22	
N3.1.1	Copper and copper alloys: Free-machining alloy, Pb > 1 %			
2.0375	CuZn36Pb3			
2.1090	CuSn75pb		C93200	U-E7Z5pb4
2.1096	CuSn5ZnPb		c83600	
2.1098	CuSn2Znpb		C83600	
2.1182	CuPb15Sn		C23000	U-pb15E8
N3.1.2	Copper and copper alloys: CuZn, CuSnZn, 90 HB			
2.0240	CuZn15			
2.0321	CuZn37		C27200	CuZn36,CuZn37
2.0590	CuZn40Fe			
2.0592	CuZn35Al1		C86500	HTB1
2.0596	CuZn34Al2		C86200	U-Z36N3
2.1293	CuCrZr		C18200	U-Cr0-8Zr
N3.1.3	Copper and copper alloys: CuSn, lead-free copper and copper electrolyte			
2.0060	E-Cu57			
2.0966	CuAl10Ni5Fe4		C63000	U-A10N
2.0975	CuAl10Ni		B-148-52	
2.1050	CuSn10		c90700	
2.1052	G-CuSn12		C90800	UE12P
2.1292	G-CuCrF35		C81500	

The multiple naming of materials results from the different heat treatment states.

Mat. no.	DIN	EN	AISI/ASTM/SAE	AFNOR
S1.1.1	Heat-resistant alloys, Fe-based, annealed, 200 HB			
1.4558	X2NiCrAlTi3220		N08800	
1.4562	X1NiCrMoCu32287		N08031	
1.4563	X1NiCrMoCuN31274		N08028	Z1NCDU31-27-03
1.4864	X12NiCrSi36-16		330	Z12NCS37-18
1.4865	GX40NiCrSi38-18			
1.4958	X5NiCrAlTi3120			
S1.1.2	Heat-resistant alloys, Fe-based, hardened, 280 HB			
1.4977	X40CoCrNi2020			Z42CNKDWNb
S1.1.3	Heat-resistant alloys, Ni- or Co-based, annealed, 250 HB			
2.4360	NiCu30Fe			NU30
2.4603	NiCr 30 FeMo		5390A	NC22FeD
2.4610	NiMo16cR16Ti			
2.4630	NiCr20Ti			NC20T
2.4631	NiCr20TiAl			NC20TA
2.4642	NiC29Fe			Nnc30Fe
2.4856	NiCr22Mo9Nb			NC22FeDNb
S1.1.4	Heat-resistant alloys, Ni- or Co-based, hardened, 350 HB			
2.4375	NiCu30Al		4676	NU30AT
2.4662	NiFe35Cr14MoTi		5660	ZSNCDT42
2.4668	NiCr19Fe19NbMo		5383	NC19eNB
2.4670	S-NiCr13A16MoNb		5391	NC12AD
2.4694	NiCr16fE7TiAl			
2.4955	NiFe25Cr20NbTi			
2.4964	CoCr20W15Ni		5772	KC20WN
S1.1.5	Heat-resistant alloys, Ni- or Co-based, cast, 320 HB			
2.4669	NiCr15Fe7TiAl			NC15TNbA
2.4685	G-NiMo28			
2.4810	G-NiMo30			
2.4973	NiCr19Co11MoTi		AMS 5399	NC19KDT
3.7115	TiAl5Sn2			
S2.1.1	Titanium alloys, pure titanium, Rm 400 N/mm²			
2.4674	NiCo15Cr10MoAlTi		AMS 5397	
3.7025	Ti1		R50250	
3.7225	Ti1pd		R52250	
S2.1.2	Titanium alloys, Alpha and Beta alloys, hardened, Rm 1050 N/mm²			
3.7124	TiCu2			
3.7145	TiAl6Sn2Zr4Mo2Si		R54620	
3.7165	TiAl6V4		AMS R56400	T-A6V
3.7185	TiAl4Mo4Sn2			
3.7195	TiAl3V2.5			

Mat. no.	DIN	EN	AISI/ASTM/SAE	AFNOR
H1.1.1 **H1.1.2** **H1.1.3**	Hardened steel, hardened and tempered, < 55 HRC Hardened steel, hardened and tempered, < 60 HRC Hardened steel, hardened and tempered, > 60 HRC			
1.1231	Ck 67	C 67S	1070	XC 68
1.1248	Ck 75	C 75S	1078, 1080	XC 75
1.1274	Ck 101	C 100S	1095	XC100
1.1545	C 105 W1	C 105U	W1	Y1 105
1.1730	C 45 W3			
1.2067	102CR6	100CR6		
1.2343	X37CrMoV5-1			
1.2361	X91CrMoV18			
1.2379	X155CrMoV12-1			
1.2762	75CrMoNiW67			
1.3401	GX120Mn12		A128(A)	Z120M12
1.6746	32NiCrMo14-5	32nlcRmO145		35NCD14
1.7131	16MnCr5			
1.7176	55Cr3	48	5155	55C3
1.7225	42CrMo4	42 CrMo 4	4140	42 CD 4
H2.1.1	Chilled cast iron, 400 HB			
0.9620	GX260NiCr42	GJN-HV520	A532 IB	FB Ni4 Cr2 BC
0.9625	GX330NiCr42	GJN-HV550	A532 IA	FB Ni4 Cr2 HC
0.9630	GX300 CrNiSi 9 5 2	GJN-HV600	A532 ID	FB Cr9 Ni5
0.9640	GX300CrMoNi1521			
0.9650	GX260Cr27			
0.9655	GX300CrNMo271			
1.4841	X15CrNiSi25-20	X 15 CrNiSi 25 20	310	Z15CNS25-20
H2.1.2	Chilled cast iron, hardened and tempered, < 55 HRC			
0.9635	GX300 CrMo 15 3			
0.9645	GX260 CrMoNi 20 21			

The multiple naming of materials results from the different heat treatment states.

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ISO codes

P	Steel, high-alloyed steel
M	Stainless steel
K	Grey cast iron, 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

On the programme pages you will find for every tool recommendations regarding suitability for the application groups and details of max. tensile strength and hardness.

● optimal suitability
○ limited suitability

Surfaces

- bright
- steam tempered
- nitrided
- nitrided lands
- golden brown
- P AlCrN
- F FIRE / nanoFIRE
- A TiAlN
- A TiAlN SuperA
- a TiAlN nanoA
- C TiCN
- S TiN
- TiSiN
- X Perrox
- Cb Carbo
- D Cristall C
- Y Signum
- R Raptor
- Ni nickel-plated
- B burnished
- E Endurum
- A Ferrox
- S Sirius
- Z Zenit

Pictograms

	NEW New product; +Ø Dimension extension
Tool material	VHM Solid carbide; HM Carbide; HSS HSCO HSS-E M42 HSS-E-PM High-speed steel; Cermet Cermet; PKD Polycrystalline diamond
Machining depth	3xD 5xD 7xD 8xD 10xD 12xD 15xD 20xD 25xD 80xD ~5xD ~10xD >25xD GL 600 GL 1200 GL 2000 ...
Tolerance on Ø	m7 h5 h6 h7 H7 h8 ISO2/6H 6HX ISO3/6G 6GX 7GX 6H +0,1 ±0,015 +0,004 +0,005 ...
Shank form	HA HB HE B ~HA to DIN 6535; Cyl cylindrical; MK Morse taper; 3 3-flats on shank; TBM-SEH Standard groove rear
Standard	DIN 208 DIN 338 DIN 340 DIN 371 DIN 376 DIN 371/376 DIN 1897 DIN 6527 K DIN 6527 L DIN 6537 K DIN 6537 L DIN 5156 DIN 6528 ~DIN 8094 ... to DIN; WN to Gühring Standard
Type	N H W VA NRf RT 100 HF RT 100 U RT 100 T RT 100 XF GU 3FS GT 500 DZ EB 80 XXL HT 800 WP MTMH3-Z TM SP GE104 ...
Internal coolant	with internal coolant; without internal coolant
Cutting direction	R right-hand; L left-hand; N neutral
Web thinning	
Hole type	Through-hole threads; Blind-hole threads; Through-hole and blind-hole threads
Form	A B C D DR R
Application	Slotting; Roughing; Ramping; Helix; Drilling; Finishing; Copying
Length	short (DIN); 2,5xD long (DIN); 3xD medium length; 4xD 5xD extra length
No. of cutting edges	2 3 4 5 6 6+ 2-4 3-4 4-5 5-6 ... No. of major cutting edges
Helix angle	2-4° 0° 7° 20° 30° 45° 35° 38° 36° 38° 37° 40° 42° 44° 45° 46° ... Size of helix angle/no. of different helix angles
Rake angle	-2° -3° -7° 0° 3° 4° 7° 9° 10° 12° ... Rake angle of circumference cutting edges
Cutting edge form	45° Corner chamfer; R±0,01 R±0,02 R±0,01 R±0,03 R±0,05 ... Radius with tolerance; 60° 82° 90° 120° 135° 140° 160° 125° ... Point angle
Feed	for lateral feed; for lateral feed and oblique plunging; for lateral feed, oblique plunging and drilling
Hardness	48 HRC 55 HRC 62 HRC 63 HRC 65 HRC 66 HRC workable material hardness in HRC

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