GÜHRING

ExclusiveLine micro-precision drill XL

30xD deep hole drilling to the highest standard

ExclusiveLine
micro-precision drill XL

30xD deep hole drilling to the highest standard

The tool that raises the bar

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

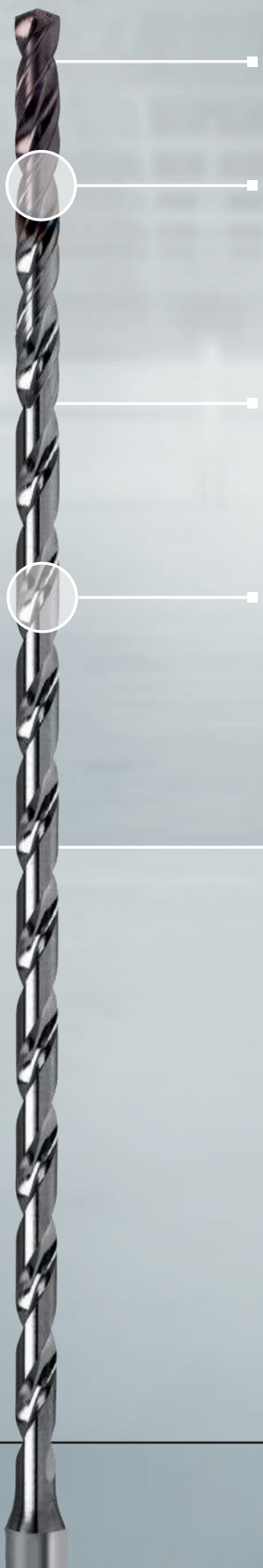
It has been specially developed for universal applications with drilling depths up to 30xD in long-chipping and short-chipping materials. The tool's geometry is designed for reliable chip removal. We have achieved this thanks to an optimised point and flute profile geometry, double margin and a polished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

- **Tool life** increased by up to 40 %
- **Maximum process reliability** thanks to short chips

- 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

20xD and 30xD available in diameter range
Ø 1.00 – 3.00 mm

optimal chip removal
thanks to reinforced core and polished flute

Application example

Component:	Manifold block / food industry, high-grade steel 1.4301, drilling depth: 42.5 mm	
Tool:	#6494, Ø 1.5 mm, 30xD	
Customer target:	Process reliability & increased tool life	
Difficulty:	Poor chip removal, low tool lives & uncontrolled breakages	
Cutting data:	**Gühring** v_c 55 m/min **n** 11,671 U/min **vf** 350 mm/min	**Competitor** v_c 45 m/min **n** 9,549 U/min **vf** 229 mm/min
Tool life:	2,800 holes, approx. 120 m	2,000 holes, approx. 85 m

ExclusiveLine micro-precision drills XL with coolant ducts

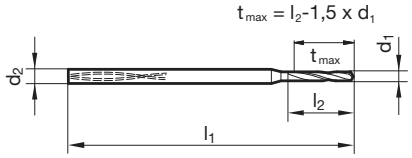
Article no. **6493**

Cutting data page 6

P	M	K	N	S	H
●	●	●	○	○	

VHM | A | N | 20xD | WN | 135° | h7 | R | Cyl

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



Article no.	6493

d1 mm	d2 h6 mm	l1 mm	l2 mm	Order no.
1.000	3.0	59.0	23.0	6493 1.000
1.050	3.0	59.0	24.2	6493 1.050
1.100	3.0	59.0	25.3	6493 1.100
1.150	3.0	63.0	26.5	6493 1.150
1.190	3.0	63.0	27.4	6493 1.190
1.200	3.0	63.0	27.6	6493 1.200
1.250	3.0	63.0	28.8	6493 1.250
1.300	3.0	68.0	29.9	6493 1.300
1.350	3.0	68.0	31.1	6493 1.350
1.400	4.0	70.0	32.2	6493 1.400
1.450	4.0	70.0	33.4	6493 1.450
1.500	4.0	70.0	34.5	6493 1.500
1.550	4.0	70.0	35.7	6493 1.550
1.590	4.0	70.0	36.6	6493 1.590
1.600	4.0	70.0	36.8	6493 1.600
1.650	4.0	70.0	38.0	6493 1.650
1.700	4.0	79.0	39.4	6493 1.700
1.750	4.0	79.0	40.3	6493 1.750
1.800	4.0	79.0	41.4	6493 1.800
1.850	4.0	79.0	42.6	6493 1.850
1.900	4.0	79.0	43.7	6493 1.900
1.950	4.0	79.0	44.9	6493 1.950
1.980	4.0	79.0	45.6	6493 1.980
2.000	4.0	79.0	46.0	6493 2.000

Article no.	6493

d1 mm	d2 h6 mm	l1 mm	l2 mm	Order no.
2.050	4.0	79.0	47.2	6493 2.050
2.100	4.0	91.0	48.3	6493 2.100
2.150	4.0	91.0	49.5	6493 2.150
2.200	4.0	91.0	50.6	6493 2.200
2.250	4.0	91.0	51.8	6493 2.250
2.300	4.0	91.0	52.9	6493 2.300
2.320	4.0	91.0	54.1	6493 2.320
2.350	4.0	91.0	54.1	6493 2.350
2.380	4.0	91.0	54.8	6493 2.380
2.400	4.0	91.0	55.2	6493 2.400
2.450	4.0	91.0	56.4	6493 2.450
2.500	4.0	91.0	57.5	6493 2.500
2.550	4.0	91.0	58.7	6493 2.550
2.600	4.0	102.0	59.8	6493 2.600
2.650	4.0	102.0	61.0	6493 2.650
2.700	4.0	102.0	62.1	6493 2.700
2.750	4.0	102.0	63.3	6493 2.750
2.780	4.0	102.0	64.0	6493 2.780
2.800	4.0	102.0	64.4	6493 2.800
2.850	4.0	102.0	65.6	6493 2.850
2.900	4.0	102.0	66.7	6493 2.900
2.950	4.0	102.0	67.9	6493 2.950
3.000	4.0	102.0	69.0	6493 3.000

ExclusiveLine micro-precision drills XL with coolant ducts

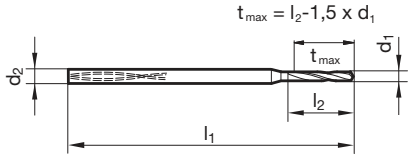
Article no. **6494**

Cutting data page 7

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

ExclusiveLine micro-precision drills XL with coolant ducts, 20xD

Machining group	A	f (mm/rev) with nom. Ø							
	v_c (m/min)	1	1.2	1.5	1.8	2	2.2	2.5	3
P1.1.1 Unalloyed steel, annealed, 0.15 % C, Rm 420 N/mm², 125 HB	100	0.0450	0.0540	0.0675	0.0810	0.0900	0.0990	0.1125	0.1350
P1.1.2 Unalloyed steel, heat-treated, 0.15 % C, Rm 420 N/mm², 125 HB	90	0.0405	0.0485	0.0610	0.0730	0.0810	0.0890	0.1015	0.1215
P1.1.3 Unalloyed steel, annealed, 0.45 % C, Rm 640 N/mm², 190 HB	90	0.0405	0.0485	0.0610	0.0730	0.0810	0.0890	0.1015	0.1215
P1.1.4 Unalloyed steel, heat-treated, 0.45 % C, Rm 640 N/mm², 190 HB	85	0.0385	0.0460	0.0575	0.0690	0.0765	0.0840	0.0955	0.1145
P1.1.5 Unalloyed steel, heat-treated, 0.45 % C, Rm 850 N/mm², 250 HB	85	0.0385	0.0460	0.0575	0.0690	0.0765	0.0840	0.0955	0.1145
P1.1.6 Unalloyed steel, annealed, 0.75 % C, Rm 915 N/mm², 270 HB	80	0.0360	0.0430	0.0540	0.0650	0.0720	0.0790	0.0900	0.1080
P1.1.7 Unalloyed steel, heat-treated, 0.75 % C, Rm 1020 N/mm², 300 HB	75	0.0340	0.0405	0.0505	0.0610	0.0675	0.0745	0.0845	0.1015
P2.1.1 Low-alloy steel, annealed, Rm 610 N/mm², 180 HB	90	0.0350	0.0420	0.0525	0.0630	0.0700	0.0770	0.0875	0.1050
P2.1.2 Low-alloy steel, heat-treated, Rm 930 N/mm², 275 HB	90	0.0350	0.0420	0.0525	0.0630	0.0700	0.0770	0.0875	0.1050
P2.1.3 Low-alloy steel, heat-treated, Rm 1020 N/mm², 300 HB	75	0.0300	0.0355	0.0445	0.0535	0.0595	0.0655	0.0745	0.0895
P2.1.4 Low-alloy steel, heat-treated, Rm 1190 N/mm², 350 HB	70	0.0265	0.0315	0.0395	0.0475	0.0525	0.0580	0.0655	0.0790
P3.1.1 High-alloy steel and tool steel, annealed, Rm 680 N/mm², 200 HB	80	0.0250	0.0300	0.0375	0.0450	0.0500	0.0550	0.0625	0.0750
P3.1.2 High-alloy steel and tool steel, hardened and tempered, Rm 1100 N/mm², 325 HB	70	0.0215	0.0255	0.0320	0.0385	0.0425	0.0470	0.0530	0.0640
M1.1.1 Stainless steel, ferritic/martensitic, with machining additives	80	0.0200	0.0240	0.0300	0.0360	0.0400	0.0440	0.0500	0.0600
M1.1.2 Stainless steel, ferritic/martensitic, annealed, Rm 680 N/mm², 200 HB	70	0.0180	0.0215	0.0270	0.0325	0.0360	0.0395	0.0450	0.0540
M1.1.3 Stainless steel, ferritic/martensitic, heat-treated, Rm 810 N/mm², 240 HB	70	0.0170	0.0205	0.0255	0.0305	0.0340	0.0375	0.0425	0.0510
M2.1.1 Stainless steel, austenitic, quenched, 180 HB	80	0.0200	0.0240	0.0300	0.0360	0.0400	0.0440	0.0500	0.0600
M2.2.1 Duplex steel, high-strength stainless steels	70	0.0170	0.0205	0.0255	0.0305	0.0340	0.0375	0.0425	0.0510
K1.1.1 Grey cast iron, pearlitic/ferritic, 180 HB	140	0.0600	0.0720	0.0900	0.1080	0.1200	0.1320	0.1500	0.1800
K1.1.2 Grey cast iron, pearlitic/martensitic, 260 HB	120	0.0510	0.0610	0.0765	0.0920	0.1020	0.1120	0.1275	0.1530
K1.2.1 Cast iron with spheroidal graphite, ferritic, 160 HB	120	0.0510	0.0610	0.0765	0.0920	0.1020	0.1120	0.1275	0.1530
K1.2.2 Cast iron with spheroidal graphite, pearlitic, 250 HB	110	0.0480	0.0575	0.0720	0.0865	0.0960	0.1055	0.1200	0.1440
K1.3.1 Malleable cast iron, ferritic, 130 HB	110	0.0480	0.0575	0.0720	0.0865	0.0960	0.1055	0.1200	0.1440
K1.3.2 Malleable cast iron, pearlitic, 230 HB	100	0.0420	0.0505	0.0630	0.0755	0.0840	0.0925	0.1050	0.1260
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	0.0600	0.0720	0.0900	0.1080	0.1200	0.1320	0.1500	0.1800
N1.1.2 Wrought aluminium alloys, hardened, 100 HB	135	0.0600	0.0720	0.0900	0.1080	0.1200	0.1320	0.1500	0.1800
N2.1.1 Aluminium casting alloys, non-hardened, ≤ 12 % Si, 75 HB	135	0.0800	0.0960	0.1200	0.1440	0.1600	0.1760	0.2000	0.2400
N2.1.2 Aluminium casting alloys, hardened, ≤ 12 % Si, 90 HB	135	0.0800	0.0960	0.1200	0.1440	0.1600	0.1760	0.2000	0.2400
N2.1.3 Aluminium casting alloys, non-hardened, > 12 % Si, 130 HB	115	0.0680	0.0815	0.1020	0.1225	0.1360	0.1495	0.1700	0.2040
N3.1.1 Copper and copper alloys: Free-machining alloy, Pb > 1 %	130	0.0350	0.0420	0.0525	0.0630	0.0700	0.0770	0.0875	0.1050
N3.1.2 Copper and copper alloys: CuZn, CuSnZn	110	0.0300	0.0355	0.0445	0.0535	0.0595	0.0655	0.0745	0.0895
N3.1.3 Copper and copper alloys: CuSn, lead-free copper and copper electrolyte	105	0.0280	0.0335	0.0420	0.0505	0.0560	0.0615	0.0700	0.0840
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	0.0150	0.0180	0.0225	0.0270	0.0300	0.0330	0.0375	0.0450
S1.1.2 Heat-resistant alloys, Fe-based, hardened, 280 HB	30	0.0120	0.0145	0.0180	0.0215	0.0240	0.0265	0.0300	0.0360
S1.1.3 Heat-resistant alloys, Ni- or Co-based, annealed, 250 HB	35	0.0150	0.0180	0.0225	0.0270	0.0300	0.0330	0.0375	0.0450
S1.1.4 Heat-resistant alloys, Ni- or Co-based, hardened, 350 HB	20	0.0105	0.0125	0.0160	0.0190	0.0210	0.0230	0.0260	0.0315
S1.1.5 Heat-resistant alloys, Ni- or Co-based, cast, 320 HB	25	0.0105	0.0125	0.0160	0.0190	0.0210	0.0230	0.0260	0.0315
S2.1.1 Titanium alloys, pure titanium, Rm 400 N/mm²	35	0.0120	0.0145	0.0180	0.0215	0.0240	0.0265	0.0300	0.0360
S2.1.2 Titanium alloys, Alpha and Beta alloys, hardened, Rm 1050 N/mm²	25	0.0095	0.0115	0.0145	0.0175	0.0190	0.0210	0.0240	0.0290
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 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 drill XL

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