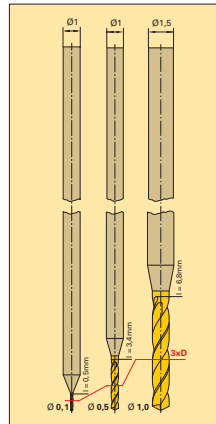


Micro-Precision Tools

Micro-precision drill geometry
to DIN 1899
Dimensions in mm

Attention!

Special tables with feed column
nos for micro-precision drills.

Drill Ø mm	Feed col. no. Guhring no. 6400/6401/6408/6412								
	60	61	62	63	64	65	66	67	68
	f (mm/rev.)								
0.80	0.04	0.05	0.06	0.07	0.08	0.08	0.08	0.09	0.09
1.00	0.06	0.07	0.08	0.09	0.10	0.10	0.11	0.11	0.12
1.50	0.09	0.10	0.12	0.13	0.15	0.15	0.16	0.17	0.18
2.00	0.12	0.14	0.16	0.18	0.20	0.21	0.22	0.23	0.24
2.50	0.15	0.17	0.20	0.22	0.25	0.26	0.27	0.28	0.30
3.00	0.18	0.21	0.24	0.27	0.30	0.31	0.33	0.34	0.36

Drill Ø mm	Feed column no. Guhring no. 301/303/660/701								
	1	2	3	4	5	6	7	8	9
	f (mm/rev.)								
0.10	0.002	0.003	0.003	0.004	0.006	0.007	0.010	0.013	0.016
0.16	0.002	0.003	0.004	0.005	0.007	0.009	0.012	0.016	0.022
0.25	0.003	0.004	0.005	0.007	0.009	0.011	0.014	0.019	0.024
0.30	0.004	0.005	0.007	0.009	0.011	0.015	0.019	0.025	0.033
0.50	0.005	0.007	0.008	0.011	0.014	0.019	0.024	0.031	0.041
0.63	0.007	0.009	0.012	0.015	0.020	0.026	0.034	0.044	0.057
0.80	0.010	0.013	0.016	0.020	0.024	0.031	0.038	0.048	0.060
1.00	0.020	0.024	0.029	0.035	0.041	0.050	0.060	0.072	0.086
1.50	0.030	0.035	0.040	0.046	0.052	0.060	0.069	0.080	0.092
2.00	0.040	0.046	0.053	0.061	0.070	0.080	0.093	0.106	0.122

Cooling:

- ☐ without coolant ducts
☒ with coolant ducts

Coolant:

- Air
 ● Neat oil
 ● Soluble oil

Cutting direction:

- ☒ right-hand cutting
☐ left-hand cutting

Material group	Material examples, new description (old description in brackets) <i>Figures in bold = material no. to DIN EN</i>	Tensile strength Hardness MPa (N/mm ²)	Cool- ant
Common structural steels	1.0035 S185(S133), 1.0486 P275N(SiE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2) 1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WSiE500)	≤500 >500-850	●
Free-cutting steels	1.0718 11SMnPb30 (9SMnPb28), 1.0736 11SMn37 (9SMn36) 1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤850 850-1000	●
Unalloyed heat-treatable steels	1.0402 C22, 1.1178 C30E (Ck30) 1.0503 C45, 1.1191 C45E (Ck45) 1.0601 C60, 1.1221 C60E (Ck60)	≤ 700 700-850 850-1000	●
Alloyed heat-treatable steels	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	850 ≤1000 1000-1200	●
Unalloyed case hardened steels	1.0301 (C10), 1.1121 C10E (Ck10)	≤750	●
Alloyed case hardened steels	1.7043 38Cr4 1.5752 15NiCr13, 1.7131 16MnCr5, 1.7264 20CrMo5	850 ≤1000 1000-1200	●
Nitriding steels	1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7	≥850 ≤1000 > 1000-1200	●
Tool steels	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤850 >850-1000	●
High speed steels	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≥650-1000	●
Spring steels	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)	≤330 HB	●
Stainless steels, sulphured austenitic martensitic	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X8CrNiS18-9 1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A) 1.4057 X20CrNi17-2 (X17CrNi16-2), 1.4122 X39CrNiMo17-1, 1.4521 X2CrMoTi18-2	≤850 ≤850 ≤850	●
Hardened steels	-	≤40-48 HRC ≥48-60 HRC	●
Special alloys	Nimonic, Inconel, Monel, Hastelloy	≤1200	●
Cast iron	0.6010 EN-GJL 100(GG10), 0.6020 EN-GJL 200(GG20) 0.6025 EN-GJL 250(GG25), 0.6035 EN-GJL 350(GG35)	≤240 HB ≤300 HB	●
Spheroidal graphite iron and malleable cast iron	0.7050 EN-GJS 500-7(GGG50), 0.8035 EN-GJMW 350-4(GTW35) 0.7070 EN-GJS 700-2(GGG70), 0.8170 EN-GJMB 700-2(GTS70)	≤240 HB ≤300 HB	●
Chilled cast iron	-	≤350 HB	●
Ti and Ti-alloys	3.7024 Ti99.5, 3.7114 TiAl5Sn2.5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4M4Sn2.5, -TiAl8Mo1V1	≤850 >850-1200	●
Aluminium and Al-alloys	3.0255 Al99.5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400	●
Al wrought alloys	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1.5	≤450	●
Al cast alloys ≤ 10 % Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9	≤600	●
> 10 % Si	3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, -G-AlSi12CuNiMg	≤600	●
Magnesium alloys	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤450	●
Copper, low-alloyed	2.7007 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5Zn2Pb	≤400	●
Brass, short-chipping	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2	≤600	●
long-chipping	2.0350 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0.5	≤600	●
Bronze, short-chipping	2.1090 CuSn7Zn2Pb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn 2.0790 CuNi18Zn19Pb	≤600 >600-850	●
Bronze, long-chipping	2.0916 CuAl5, 2.0960 CuAl9Mn2, 2.1050 CuSn10 2.0980 CuAl11Ni, 2.1247 CuBe2	≤850 >850-1000	●
Duroplastics	Bakelit, Resopal, Pertinax, Moltopren	-	●
Thermoplastics	Plexiglass, Hostalen, Novodur, Makralon	-	●
Kevlar	Kevlar	-	●
Glass, carbon concentrated plastics	GRT/CRP	-	●

○ bright

● steam tempered

● nitrided lands

● nitrided

● golden brown

● TiAlN