

Application recommendations Gun drills

The sequence of operations for deep hole drilling

- production of pilot hole (L = 1.5 x D, tolerance H8)
- enter at low revolutions, approx. 200 rev./min, feed rate approx. 500 mm/min. With tools for drilling depths in excess than 40 x D enter the pilot hole revolving in left hand direction.
- setting of coolant pressure and revolutions
- uninterrupted drilling to required drilling depth without wood pecking. When applying gun drills with increased length-diameter-ratio, we recommend machining with reduced cutting parameters (approx. 75% of the optimal cutting speed) up to a drilling depth of approx. 25 mm.
- switching off coolant supply after reaching the required hole depth
- withdrawal in top gear with stationary spindle

Drill Ø mm from	Feed column no.							
	11	12	13	14	15	16	17	18
	f (mm/rev.)							
1.50	0.002	0.004	0.006	0.008	0.012	0.020	0.032	0.045
2.00	0.003	0.005	0.007	0.010	0.016	0.028	0.046	0.055
2.50	0.004	0.006	0.008	0.012	0.018	0.030	0.054	0.070
4.00	0.005	0.007	0.010	0.016	0.025	0.043	0.065	0.085
6.00	0.007	0.009	0.013	0.024	0.035	0.061	0.085	0.120
8.00	0.010	0.014	0.022	0.032	0.045	0.068	0.100	0.150
10.00	0.012	0.016	0.028	0.040	0.055	0.075	0.120	0.160
14.00	0.020	0.025	0.035	0.050	0.065	0.085	0.130	0.180
18.00	0.025	0.030	0.040	0.055	0.070	0.095	0.145	0.200
20.00	0.026	0.035	0.045	0.060	0.080	0.110	0.180	0.250
24.00	0.027	0.036	0.047	0.065	0.085	0.130	0.185	0.300
28.00	0.028	0.038	0.049	0.068	0.090	0.140	0.195	0.350
30.00	0.030	0.040	0.050	0.070	0.100	0.150	0.200	0.400
35.00	0.035	0.045	0.055	0.075	0.120	0.180	0.250	0.450
40.00	0.040	0.050	0.060	0.080	0.150	0.200	0.300	0.500

Material dependent coolants

- air
- neat oil
- soluble oil

Std. range page

E100

Single-fluted gun drill
Solid carbide

0.9 ... 12.0

253

Application advice

- For drilling depths in excess than 40 x D we recommend the use of two or more gun drills, e. g. Ø 10 x 400 mm and Ø 9.95 x 800 mm.
- Gun drills for drilling depths of more than 40 x D should enter the pilot hole revolving in the left hand direction.
- When changing tools for drilling depths of more than 40 x D, the tool can be damped by switching on coolant supply for just one second.
- For machining of long-chipping materials we recommend the use of gun drills with polished flutes.
- Generally we recommend the use of soluble oil with a minimum oil content of 10 %.
- Single-fluted gun drills for long-chipping aluminium should be supplied with point grind 180° and coolant chamber.
- When spotting in aluminium with an Si-content of less than 1%, i.e. with recommended cutting rates v_c > 160 m/min we recommend to advance to the final speed in several steps. In addition, a deeper pilot hole of approximately 3 x D should be produced.



All deep hole drills must have support for the pilot hole. Deep hole drills must never operate at full speed without support in the machine shop.

E80

Single-fluted gun drill
Solid carbide head

2.0 ... 40.0

260

Z80

two-fluted gun drill
Solid carbide head

6.0 ... 27.0

252

E800

Single-fluted gun drill
with indexable inserts

12.0 ... 40.0

264

*The feed rates always relate to tools with the recommended coating. In some cases the successful application of un-coated tools cannot be guaranteed.

Material group	Material examples Figures in bold = material no. to DIN EN 10 027	Tens.str. Hardn. N/mm²	Coolant	recom. coating*	≤35xD		>35xD	
					v _c m/min	Feed col. no.	v _c m/min	Feed col. no.
Common structural steels	1.0035 S185, 1.0486 P275N, 1.0345 P235GH, 1.0425 1.0050 E295), 1.0070 E360, 1.8937 P500NH	≤500	○		100	15	100	15
	1.0050 E295), 1.0070 E360, 1.8937 P500NH	≤1000	○		85	15	85	15
Free-cutting steels	1.0718 11SMnPb30, 1.0736 11SMn37	≤850	○		90	15	90	15
	1.0727 46S20, 1.0728 60S20, 1.0757 46SPb20	≤1000	○		80	15	80	15
Unalloyed heat-treatable steels	1.0402 C22, 1.1178 C30E	≤700	○		80	14	80	14
	1.0503 C45, 1.1191 C45E	≤850	○		75	14	75	14
	1.0601 C60, 1.1221 C60E	≤1000	○		75	14	75	14
Alloyed heat-treatable steels	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4	≤1000	○	ⓐ	75	14	75	14
	1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	≤1400	○	ⓐ	65	14	65	14
Unalloyed case hard. steels	1.0301, 1.1121 C10E	≤850	○	ⓐ	80	15	80	15
Alloyed case hardened steels	1.7276 10CrMo11, 1.5125 11MnSi6	≤1000	○	ⓐ	75	14	75	14
	1.5752 15NiCr13, 1.7131 16MnCr5, 1.7264 20CrMo5	≤1400	○	ⓐ	65	14	65	14
Nitriding steels	1.8504 34CrAl6	≤1000	○	ⓐ	75	14	75	14
	1.8519 31CrMoV9, 1.8550 34CrAlNi7	≤1400	○	ⓐ	65	14	65	14
Tool steels	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9	≤850	○	ⓐ	75	13	75	13
	1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419, 1.2767	≤1400	○	ⓐ	65	13	65	13
High speed steels	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≤1400	○	ⓐ	55	12	55	12
Spring steels	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4	≤350 HB	○	ⓐ	65	13	65	13
Hardened steels	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105	≤48 HRC	○	ⓐ	30	13	30	13
	1.4301 X5CrNi18-10, 1.4541 X6CrNiTi18-10, 1.4571	≤66 HRC	○	ⓐ	25	10	25	14
Stainless steels, sulphured austenitic martensitic	1.4057 X20CrNi172, 1.4122 X39CrMo17-1, 1.4521	≤900	○	ⓐ	40	14	40	14
	-	≤1100	○	ⓐ	35	14	35	14
	-	≤1500	○	ⓐ	35	14	35	14
Cast iron	Nimonic, Inconel, Monel, Hastelloy	≤240 HB	○		85	16	85	16
	0.6010 EN-GJL-100, 0.6020 EN-GJL-200	≤350 HB	○		80	16	85	16
Spheroidal graphite iron and malleable cast iron	0.6025 EN-GJL-250, 0.6035 EN-GJL-350	≤240 HB	○		80	15	80	15
	0.7050 EN-GJS-500-7, 0.8035 EN-GJMw-350-4	≤350 HB	○		70	15	70	15
Chilled cast iron	0.7070 EN-GJS-700-2, 0.8170 EN-GJMB-700-2	≤350 HB	○		55	14	55	14
New cast materials GGV	-	≤220 HB	○					
	3.7024 Ti99.5, 3.7114 TiAl5Sn2.5, 3.7124 TiCu2	≤300 HB	○					
New cast materials ADI	3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184	≤1000	○					
	3.0255 Al99.5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤1400	○					
Special alloys	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245, 3.4365	≤2000	○	ⓐ	20	12	20	12
Ti and Ti-alloys	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9	≤850	○	ⓐ	35	12	35	12
	3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤1400	○	ⓐ	30	12	30	12
Aluminium and Al-alloys	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05	≤400	○		150	17	150	17
Al wrought alloys	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5Zn2Pb	≤650	○		120	19	120	19
Al cast alloys ≤ 10 % Si	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410	≤600	○		120	20	120	20
	2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0.5	≤600	○		130	18	130	18
Magnesium alloys	2.1090 CuSn7Zn2Pb, 2.1170 CuPb5Sn5, 2.1176	≤400	○		110	17	110	17
Copper, low-alloyed	2.0790 CuNi18Zn19Pb	≤500	○	ⓐ	75	15	75	15
Brass, short-chipping	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10	≤600	○		120	18	120	18
	2.0980 CuAl11Ni, 2.1247 CuBe2	≤600	○		90	18	90	18
Bronze, short-chipping	Epoxy resin, Resopal, Pertinax, Moltopren	≤600	○		95	17	95	17
	Plexiglass, Hostalen, Novodur, Makralon	≤850	○		75	17	75	17
Bronze, long-chipping	EN-GJV250 (GGV25), EN-GJV350 (GGV35)	≤850	○		70	17	70	17
	EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo 6	≤1000	○		60	17	60	17
Duroplastics	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000)	≤150	○		75	15	75	15
Thermoplastics	EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	≤100	○		70	15	70	15
	Kevlar	≤1000	○		60	14	60	14
Glass, carbon concentr. plastics	GFK/CFK	≤1000	○		50	14	50	14