

## RECOMMENDED CUTTING CONDITIONS

Drill Dia. (mm)	Mild Steel ( $\leq 180\text{HB}$ ), Carbon steel, Alloy steel (180–280HB) Ck10, Ck45, 42CrMo4				Ferritic, Martensitic Stainless Steel ( $>200\text{HB}$ ) X20CrNi17-2, X30Cr13			
	Cutting Speed (m/min)	Revolution ( $\text{min}^{-1}$ )	Feed rate (Min.—Max.) (mm/rev)	Table Feed (mm/min)	Cutting Speed (m/min)	Revolution ( $\text{min}^{-1}$ )	Feed rate (Min.—Max.) (mm/rev)	Table Feed (mm/min)
1.0	40	12700	0.030 (0.020–0.040)	380	20	6400	0.030 (0.020–0.040)	190
1.2	50	13300	0.035 (0.025–0.050)	465	30	8000	0.035 (0.025–0.050)	280
1.6	60	11900	0.050 (0.030–0.065)	595	40	8000	0.050 (0.030–0.065)	400
2.0	70	11100	0.060 (0.040–0.080)	665	50	8000	0.060 (0.040–0.080)	480
2.5	80	10200	0.075 (0.050–0.100)	765	60	7600	0.075 (0.050–0.100)	570
3.2	80	8000	0.100 (0.070–0.130)	800	60	6000	0.100 (0.070–0.130)	600
4.0	80	6400	0.100 (0.090–0.110)	640	60	4800	0.090 (0.080–0.090)	430
5.0	80	5100	0.130 (0.110–0.140)	665	60	3800	0.110 (0.100–0.120)	420
6.3	80	4000	0.160 (0.140–0.180)	640	60	3000	0.140 (0.130–0.150)	420
8.0	80	3200	0.200 (0.180–0.230)	640	60	2400	0.170 (0.160–0.190)	410
10.0	80	2600	0.250 (0.220–0.280)	650	60	1900	0.220 (0.200–0.230)	420
12.0	80	2100	0.300 (0.270–0.340)	630	60	1600	0.260 (0.240–0.280)	415

Drill Dia. (mm)	Pre-hardened steel (35–45HRC), Alloy tool steel ( $\leq 350\text{HB}$ ) NAK, X36CrMo17, X210Cr12, 55NiCrMoV6				Hardened Steel (40–55HRC), PH Stainless Steel ( $<450\text{HB}$ ) X20CrNi17-2, X30Cr13 X5CrNiCuNb164, X7CrNiAl17-7			
	Cutting Speed (m/min)	Revolution ( $\text{min}^{-1}$ )	Feed rate (Min.—Max.) (mm/rev)	Table Feed (mm/min)	Cutting Speed (m/min)	Revolution ( $\text{min}^{-1}$ )	Feed rate (Min.—Max.) (mm/rev)	Table Feed (mm/min)
1.0	20	6400	0.025 (0.020–0.030)	160	40	12700	0.020 (0.015–0.025)	255
1.2	30	8000	0.030 (0.020–0.035)	240	40	10600	0.025 (0.020–0.030)	265
1.6	40	8000	0.040 (0.030–0.045)	320	50	10000	0.035 (0.025–0.040)	350
2.0	50	8000	0.045 (0.035–0.060)	360	50	8000	0.040 (0.030–0.050)	320
2.5	60	7600	0.060 (0.045–0.075)	455	60	7600	0.050 (0.040–0.065)	380
3.2	60	6000	0.080 (0.060–0.090)	480	60	6000	0.060 (0.050–0.080)	360
4.0	60	4800	0.080 (0.070–0.100)	385	60	4800	0.080 (0.060–0.100)	385
5.0	60	3800	0.110 (0.090–0.130)	420	60	3800	0.100 (0.080–0.130)	380
6.3	60	3000	0.130 (0.110–0.160)	390	60	3000	0.110 (0.090–0.130)	330
8.0	60	2400	0.170 (0.140–0.200)	410	60	2400	0.140 (0.120–0.160)	335
10.0	60	1900	0.210 (0.170–0.250)	400	60	1900	0.170 (0.140–0.200)	325
12.0	60	1600	0.250 (0.210–0.300)	400	60	1600	0.210 (0.170–0.240)	335

Drill Dia. (mm)	Hardened Steel (40–55HRC), Heat Resistant Alloy X40CrMoV51, 55NiCrMoV7, Inconel718			
	Cutting Speed (m/min)	Revolution ( $\text{min}^{-1}$ )	Feed rate (Min.—Max.) (mm/rev)	Table Feed (mm/min)
1.0	10	3200	0.015 (0.015–0.020)	50
1.2	10	2700	0.020 (0.015–0.025)	55
1.6	10	2000	0.025 (0.020–0.030)	50
2.0	20	3200	0.035 (0.025–0.040)	110
2.5	20	2600	0.040 (0.030–0.050)	105
3.2	20	2000	0.050 (0.040–0.070)	100
4.0	30	2400	0.070 (0.050–0.080)	170
5.0	30	1900	0.080 (0.060–0.100)	150
6.3	30	1500	0.090 (0.080–0.110)	135
8.0	40	1600	0.120 (0.100–0.130)	190
10.0	40	1300	0.150 (0.130–0.170)	195
12.0	40	1100	0.180 (0.150–0.200)	200

(Note 1) When using the drill with a length over  $l/d$  10, it is necessary to use a prep hole as a guide. (If no prep hole is used then drill breakage can occur)

(Note 2) Use the shortest flute drill in the respective size as a pilot drill.