

RECOMMENDED CUTTING CONDITIONS

Work material	Mild Steel ($\leq 180\text{HB}$), Carbon Steel, Alloy Steel(180–250HB)				Alloy tool steel ($\leq 30\text{HRC}$)				Alloy tool steel ($< 40\text{HRC}$)				Gray Cast Iron ($\leq 350\text{MPa}$)			
	ASTM A36, AISI 1010 AISI 1045, AISI 4140 etc				AISI H13, AISI L6 etc				AISI H13, AISI L6 etc				No 45 B etc			
Dia. DC (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/rev)	Table Feed (mm/min)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/rev)	Table Feed (mm/min)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/rev)	Table Feed (mm/min)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/rev)	Table Feed (mm/min)
1.0	16	5000	0.02	100	13	4000	0.01	40	9	2800	0.007	15	16	5000	0.02	100
1.5	20	4200	0.03	125	15	3200	0.02	60	10	2100	0.01	20	20	4200	0.03	125
2.0	20	3200	0.05	160	16	2500	0.03	75	11	1800	0.02	35	20	3200	0.05	160
3.0	20	2100	0.1	210	17	1800	0.06	105	11	1200	0.04	45	22	2300	0.1	230
4.0	20	1600	0.12	190	17	1350	0.08	105	11	900	0.06	50	22	1750	0.12	210
5.0	20	1300	0.14	180	17	1100	0.1	110	11	700	0.08	55	22	1400	0.14	195
6.0	20	1050	0.17	175	17	900	0.12	105	11	600	0.1	60	22	1150	0.18	205
7.0	20	900	0.19	170	17	780	0.14	105	11	500	0.11	55	22	1000	0.19	190
8.0	20	800	0.2	160	17	670	0.15	100	11	450	0.12	50	22	890	0.2	175
9.0	20	700	0.21	145	17	600	0.16	95	11	400	0.13	50	22	780	0.21	160
10.0	20	650	0.22	140	17	540	0.17	90	11	350	0.14	45	22	700	0.22	150

Work material	Ferritic, Precipitation hardening stainless steel ($\leq 200\text{HB}$)				Austenitic Stainless Steel ($\leq 200\text{HB}$)				Copper, Copper alloy				Aluminium Alloy (Si<5%)			
	AISI 410, AISI 430 etc				AISI 304, AISI 316 etc											
Dia. DC (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/rev)	Table Feed (mm/min)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/rev)	Table Feed (mm/min)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/rev)	Table Feed (mm/min)	Cutting speed (m/min)	Revolution (min^{-1})	Feed rate (mm/rev)	Table Feed (mm/min)
1.0	13	4000	0.02	80	9	3000	0.02	60	16	5000	0.02	100	22	7000	0.04	280
1.5	14	3000	0.03	90	9	2000	0.03	60	20	4200	0.03	125	28	6000	0.06	360
2.0	14	2200	0.05	110	9	1500	0.04	60	20	3200	0.05	160	30	4800	0.08	380
3.0	15	1600	0.07	110	9	1000	0.06	60	20	2100	0.1	210	40	4200	0.13	545
4.0	15	1200	0.11	130	9	700	0.08	55	20	1600	0.12	190	40	3200	0.16	510
5.0	15	950	0.13	120	9	600	0.09	50	20	1300	0.14	180	40	2550	0.2	510
6.0	15	800	0.14	110	10	530	0.1	50	20	1050	0.18	185	40	2100	0.23	480
7.0	15	700	0.15	105	10	450	0.11	45	20	900	0.19	170	40	1800	0.25	450
8.0	15	600	0.16	95	10	400	0.13	50	20	800	0.2	160	40	1600	0.28	445
9.0	15	520	0.17	85	10	360	0.14	50	20	700	0.21	145	40	1400	0.3	420
10.0	15	480	0.18	85	10	310	0.15	45	20	650	0.22	140	40	1280	0.33	420

(Note) The intermediate diameter revolution is not tabulated. It is matched to the large diameter side and closest drill diameter conditions or by calculating the cutting speed of the closest drill diameter. Set the feedrate per revolution to a suitable value with the recommended feedrate of the closest drill diameter as the standard.

- 1) Lower the revolution and feedrate accordingly, when the work material is not rigid or there are restrictions on the machine.
- 2) When drilling holes greater than 3 x drill diameter hole depths, please use a peck feed.
- 3) The cutting conditions mentioned above are standard with the tool protrusion length was made 2 times the flute length.
- 4) Use of water-soluble cutting fluid is recommended. Please reduce the revolution when using water-insoluble cutting fluid.
- 5) Use sufficient cutting fluid. Please reduce the revolution when insufficient cutting fluid.
- 6) When using a guide bush, please confirm the flute length > A. In case of short flute length, please conduct machining without the bush. And, when not being able to dismount the bush, please use LSD or GWSL.

