

## RECOMMENDED CUTTING CONDITIONS (Standard drilling depth : 5 times or below the drill diameter)

Work material	Structural steel		Carbon steel Ck55 Alloy steel 070M55 Cast iron		Alloy tool steel X210Cr12 (Low-hardness materials) Ferritic stainless steel X10CrAl18, X10CrAl13 Martensitic stainless steel X20Cr13, X10CrAl13		Alloy tool steel X40CrMoV51 (-40HRC) Precipitation hardening stainless steel X7CrNiAl177	
	Drill Dia. (mm)	Revolution (min <sup>-1</sup> )	Feed rate (mm/rev)	Revolution (min <sup>-1</sup> )	Feed rate (mm/rev)	Revolution (min <sup>-1</sup> )	Feed rate (mm/rev)	Revolution (min <sup>-1</sup> )
0.5	17000	0.01	12800	0.01	8000	0.01	6600	0.01
1.0	11000	0.05	8300	0.05	5000	0.05	4100	0.04
2.0	6400	0.09	4800	0.09	2900	0.06	2400	0.05
3.0	4300	0.13	3200	0.13	1900	0.10	1600	0.06
4.0	3200	0.15	2400	0.15	1400	0.10	1200	0.08
5.0	2600	0.18	1900	0.18	1100	0.13	950	0.10
6.0	2100	0.19	1600	0.20	950	0.15	800	0.11
8.0	1600	0.24	1200	0.22	720	0.18	600	0.13
10.0	1300	0.28	950	0.25	570	0.21	480	0.15
12.0	1100	0.34	800	0.30	480	0.25	400	0.17
14.0	910	0.39	680	0.35	410	0.30	340	0.21
15.0	850	0.40	640	0.36	380	0.31	320	0.22
16.0	800	0.42	600	0.38	360	0.32	300	0.23
18.0	710	0.44	530	0.40	320	0.34	270	0.24
20.0	570	0.44	450	0.40	250	0.34	220	0.24
22.0	520	0.46	410	0.42	230	0.36	200	0.25
24.0	480	0.48	370	0.44	210	0.37	190	0.26
26.0	440	0.51	340	0.46	200	0.39	170	0.28
28.0	410	0.53	320	0.48	180	0.41	160	0.29
30.0	380	0.55	300	0.50	170	0.43	150	0.30
32.0	360	0.55	280	0.50	160	0.43	140	0.30

- 1) Please reduce the revolution and feed rate when the workpiece clamping lacks rigidity or the machine has limitations.
- 2) Please use a collet type drill chuck or a milling chuck.
- 3) Use sufficient cutting fluid.
- 4) VAPDSSUS and VAPDMSUS are recommended for austenitic stainless steels (X5CrNi1810).
- 5) When drilling holes greater than 4 x drill diameter hole depths, please use a peck feed.

The above-mentioned cutting conditions are standard when using water-soluble cutting fluid.  
Please reduce the revolutions when using non-water-soluble cutting fluid.