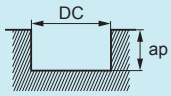
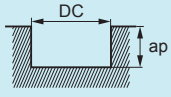
RECOMMENDED CUTTING CONDITIONS

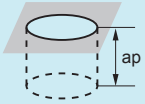
Slotting

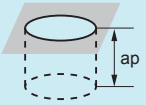
Work material	Carbon steel (−30HRC) AISI 1035, AISI 1050, ASTM 283					Alloy steel, Pre-hardened steel AISI H13, AISI 4140, AISI P21					Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, AISI 316L, Ti-6Al-4V etc.				
DC (inch)	High speed cutting		General purpose cutting		Depth of cut ap (inch)	High speed cutting		General purpose cutting		Depth of cut ap (inch)	High speed cutting		General purpose cutting		Depth of cut ap (inch)
	Revolution (min^{-1})	Feed rate (IPM)	Revolution (min^{-1})	Feed rate (IPM)		Revolution (min^{-1})	Feed rate (IPM)	Revolution (min^{-1})	Feed rate (IPM)		Revolution (min^{-1})	Feed rate (IPM)	Revolution (min^{-1})	Feed rate (IPM)	
1/4	7500	55.8	5000	24.4	.25	6000	29.8	5000	16.5	.25	5000	21.9	3000	8.7	.25
5/16	6000	49.6	4000	21.7	.31	4800	28.3	4000	15.7	.31	4000	23.6	2400	9.4	.31
3/8	5000	46.1	3300	20.1	.38	4000	25.5	3300	13.8	.38	3300	25.3	2000	10.2	.38
1/2	3800	35.9	2500	15.7	.50	3000	22.3	2500	12.2	.50	2500	23.6	1500	9.4	.50
Depth of cut															

Work material	Precipitation hardening martensitic stainless steel, Co-Cr-Mo alloy ASTM S 17400, ASTM S 17700, 17-4PH, 15-5PH etc.					Copper, Copper alloy					Heat resistant alloy Inconel718 etc.				
DC (inch)	High speed cutting		General purpose cutting		Depth of cut ap (inch)	High speed cutting		General purpose cutting		Depth of cut ap (inch)	High speed cutting		General purpose cutting		Depth of cut ap (inch)
	Revolution (min^{-1})	Feed rate (IPM)	Revolution (min^{-1})	Feed rate (IPM)		Revolution (min^{-1})	Feed rate (IPM)	Revolution (min^{-1})	Feed rate (IPM)		Revolution (min^{-1})	Feed rate (IPM)	Revolution (min^{-1})	Feed rate (IPM)	
1/4	3000	14.9	2500	8.3	.25	9000	67.0	6000	29.5	.25	1500	5.3	1300	3.0	.075
5/16	2400	14.2	2000	7.9	.31	7200	59.5	4800	26.4	.31	1200	5.7	1000	3.1	.094
3/8	2000	12.8	1700	7.1	.38	6000	55.3	4000	24.4	.38	1000	6.1	840	3.4	.11
1/2	1500	11.2	1300	6.3	.50	4500	42.5	3000	18.9	.50	750	5.7	630	3.1	.15
Depth of cut															

1) SMART MIRACLE coating has reduced electric conductivity; therefore an external contact type (electric transmitted) tool setter may not work. When measuring the tool length, please use an internal contact type (non-electricity type) tool setter or a laser type tool setter.
2) Effective cutting of stainless steel, titanium alloy, and heat-resistant alloy can be achieved with the use of water-soluble cutting fluid.
3) Higher feeds and speeds can be used for smaller depth of cut.
4) Vibration can still occur if the machine rigidity and clamping method are insufficient. In these cases the feed and speed should be reduced proportionately.

Plunging

Work material	Carbon steel (−30HRC) AISI 1035, AISI 1050, ASTM 283							Alloy steel, Pre-hardened steel AISI H13, AISI 4140, AISI P21							Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, AISI 316L, Ti-6Al-4V etc.						
DC (inch)	High speed cutting			General purpose cutting			Hole Depth ap (inch)	High speed cutting			General purpose cutting			Hole Depth ap (inch)	High speed cutting			General purpose cutting			Hole Depth ap (inch)
	Revolution (min^{-1})	Feed rate (IPM)	Step (inch)	Revolution (min^{-1})	Feed rate (IPM)	Step (inch)		Revolution (min^{-1})	Feed rate (IPM)	Step (inch)	Revolution (min^{-1})	Feed rate (IPM)	Step (inch)		Revolution (min^{-1})	Feed rate (IPM)	Step (inch)	Revolution (min^{-1})	Feed rate (IPM)	Step (inch)	
1/4	5000	35.4	.13	5000	35.4	.024	.38	3500	16.5	.050	3500	16.5	.024	.38	3000	3.5	.024	3000	3.5	.012	.38
5/16	4000	28.3	.16	4000	28.3	.028	.47	2800	13.2	.063	2800	13.2	.028	.47	2400	2.8	.024	2400	2.8	.012	.47
3/8	3300	23.4	.19	3300	23.4	.030	.56	2300	11.0	.094	2300	11.0	.030	.56	2000	2.3	.024	2000	2.3	.012	.56
1/2	2500	17.7	.20	2500	17.7	.030	.75	1800	8.5	.13	1800	8.5	.030	.75	1500	2.0	.024	1500	2.0	.012	.75
Hole depth																					

Work material	Precipitation hardening martensitic stainless steel, Co-Cr-Mo alloy ASTM S 17400, ASTM S 17700, 17-4PH, 15-5PH etc.							Copper, Copper alloy						
DC (inch)	High speed cutting			General purpose cutting			Hole Depth ap (inch)	High speed cutting			General purpose cutting			Hole Depth ap (inch)
	Revolution (min^{-1})	Feed rate (IPM)	Step (inch)	Revolution (min^{-1})	Feed rate (IPM)	Step (inch)		Revolution (min^{-1})	Feed rate (IPM)	Step (inch)	Revolution (min^{-1})	Feed rate (IPM)	Step (inch)	
1/4	2000	2.3	.024	2000	2.3	.012	.38	6000	42.5	.13	6000	42.5	.0024	.38
5/16	1600	2.0	.024	1600	2.0	.012	.47	4800	34.0	.16	4800	34.0	.0028	.47
3/8	1300	1.5	.024	1300	1.5	.012	.56	4000	28.3	.19	4000	28.3	.003	.56
1/2	1000	1.2	.024	1000	1.2	.012	.75	3000	21.3	.20	3000	21.3	.003	.75
Hole depth														

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