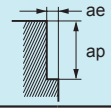
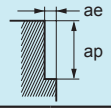
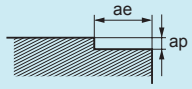
Shoulder milling

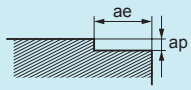
Work material	Carbon steel (−30HRC) AISI 1035, AISI 1050, ASTM 283				Alloy steel, Pre-hardened steel AISI H13, AISI 4140, AISI P21				Precipitation hardening martensitic stainless steel, Co-Cr-Mo alloy ASTM S 17400, ASTM S 17700, 17-4PH, 15-5PH etc.			
DC (inch)	Revolution (min^{-1})	Feed rate (IPM)	Depth of cut ap (inch)	Width of cut ae (inch)	Revolution (min^{-1})	Feed rate (IPM)	Depth of cut ap (inch)	Width of cut ae (inch)	Revolution (min^{-1})	Feed rate (IPM)	Depth of cut ap (inch)	Width of cut ae (inch)
1/4	7500	94.5	.38	.013	6000	47.2	.38	.013	3800	29.9	.38	.013
5/16	6000	99.2	.47	.016	4800	52.9	.47	.016	3000	33.1	.47	.016
3/8	5000	94.5	.56	.019	4000	50.4	.56	.019	2500	31.5	.56	.019
1/2	3800	71.8	.75	.025	3000	42.5	.75	.025	1900	26.9	.75	.025
Depth of cut												

Work material	Copper, Copper alloy				Heat resistant alloy Inconel718 etc.			
DC (inch)	Revolution (min^{-1})	Feed rate (IPM)	Depth of cut ap (inch)	Width of cut ae (inch)	Revolution (min^{-1})	Feed rate (IPM)	Depth of cut ap (inch)	Width of cut ae (inch)
1/4	9000	113	.38	.013	2000	9.5	.38	.008
5/16	7200	119	.47	.016	1600	10.1	.47	.009
3/8	6000	113	.56	.019	1300	11.5	.56	.011
1/2	4500	85.0	.75	.025	1000	10.1	.75	.015
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) If the depth of cut is smaller than this table, feed rate can be increased.
4) The irregular helix flute end mill has a larger effect on controlling vibration when compared to standard end mills. However, if the rigidity of the machine or the workpiece installation is very low, then vibration can occur. In this case, please reduce the revolution and feed rate proportionately, or set a lower depth of cut.

Face milling

Work material	Carbon steel (−30HRC) AISI 1035, AISI 1050, ASTM 283				Alloy steel, Pre-hardened steel AISI H13, AISI 4140, AISI P21				Precipitation hardening martensitic stainless steel, Co-Cr-Mo alloy ASTM S 17400, ASTM S 17700, 17-4PH, 15-5PH etc.			
DC (inch)	Revolution (min^{-1})	Feed rate (IPM)	Depth of cut ap (inch)	Width of cut ae (inch)	Revolution (min^{-1})	Feed rate (IPM)	Depth of cut ap (inch)	Width of cut ae (inch)	Revolution (min^{-1})	Feed rate (IPM)	Depth of cut ap (inch)	Width of cut ae (inch)
1/4	5500	52.0	.013	.2	4500	28.3	.013	.2	2800	17.6	.013	.2
5/16	4400	48.5	.016	.25	3600	28.3	.016	.25	2200	17.3	.016	.25
3/8	3700	46.6	.019	.3	3000	26.0	.019	.3	1800	15.6	.019	.3
1/2	2800	35.3	.025	.4	2300	21.7	.025	.4	1400	13.2	.025	.4
Depth of cut												

Work material	Copper, Copper alloy				Heat resistant alloy Inconel718 etc.			
DC (inch)	Revolution (min^{-1})	Feed rate (IPM)	Depth of cut ap (inch)	Width of cut ae (inch)	Revolution (min^{-1})	Feed rate (IPM)	Depth of cut ap (inch)	Width of cut ae (inch)
1/4	6500	61.4	.013	.2	1500	6.6	.008	.2
5/16	5200	57.3	.016	.25	1200	7.6	.009	.25
3/8	4300	54.2	.019	.3	1000	8.8	.011	.3
1/2	3300	41.6	.025	.4	750	7.6	.015	.4
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) The irregular helix flute end mill has a larger effect on controlling vibration when compared to standard end mills. However, if the rigidity of the machine or the workpiece installation is very low, then vibration can occur. In this case, please reduce the revolution and feed rate proportionately, or set a lower depth of cut.