

## Shoulder milling (Slotting)

Work material	Carbon steel, Alloy steel, Mild Steel, Pre-hardened steel AISI 1010, AISI 1035, AISI 1050, ASTM 283, AISI H13, AISI 4140, AISI P21						Austenitic stainless steel, Titanium alloy, Hardened stainless steel, Cobalt chromium alloy, Ferritic and Martensitic stainless steels AISI 304, AISI 316, AISI S17400, AISI S17700, AISI 430, AISI 420					
	$\alpha \leq 15^\circ$		$\alpha > 15^\circ$		Depth of cut $a_p$ (inch)	Pick feed $pf$ (inch)	$\alpha \leq 15^\circ$		$\alpha > 15^\circ$		Depth of cut $a_p$ (inch)	Pick feed $pf$ (inch)
	Revolution ( $\text{min}^{-1}$ )	Feed rate (IPM)	Revolution ( $\text{min}^{-1}$ )	Feed rate (IPM)			Revolution ( $\text{min}^{-1}$ )	Feed rate (IPM)	Revolution ( $\text{min}^{-1}$ )	Feed rate (IPM)		
<b>.0625</b>	30000	283.5	20000	118.1	.0098	.0313	22500	189.0	15000	74.8	.0098	.0313
<b>.0938</b>	20000	220.5	13400	102.4	.0165	.0469	15000	137.8	10000	59.1	.0165	.0469
<b>.1250</b>	15000	177.2	10000	82.7	.0197	.0626	11200	126.0	7500	55.1	.0197	.0626
<b>.1563</b>	12000	169.3	8000	74.8	.0315	.0781	9000	126.0	6000	55.1	.0315	.0781
<b>.1875</b>	10000	161.4	6700	70.9	.0394	.0937	7500	118.1	5000	51.2	.0394	.0937
<b>.2500</b>	7600	149.6	5000	70.9	.0472	.125	5600	118.1	3800	51.2	.0472	.125

Work material	Copper, Copper alloys						Heat resistant alloy Inconel718 etc.					
	$\alpha \leq 15^\circ$		$\alpha > 15^\circ$		Depth of cut $a_p$ (inch)	Pick feed $pf$ (inch)	$\alpha \leq 15^\circ$		$\alpha > 15^\circ$		Depth of cut $a_p$ (inch)	Pick feed $pf$ (inch)
	Revolution ( $\text{min}^{-1}$ )	Feed rate (IPM)	Revolution ( $\text{min}^{-1}$ )	Feed rate (IPM)			Revolution ( $\text{min}^{-1}$ )	Feed rate (IPM)	Revolution ( $\text{min}^{-1}$ )	Feed rate (IPM)		
<b>.0625</b>	36000	338.6	24000	141.7	.0098	.0313	6000	25.2	4000	13.4	.0051	.0313
<b>.0938</b>	24000	263.8	16000	122.0	.0165	.0469	4000	20.9	2700	9.8	.0083	.0469
<b>.1250</b>	18000	212.6	12000	98.4	.0197	.0626	3000	19.7	2000	8.3	.0098	.0626
<b>.1563</b>	14000	196.9	9600	90.6	.0315	.0781	2400	16.9	1600	7.5	.0157	.0781
<b>.1875</b>	12000	192.9	8000	82.7	.0394	.0937	2000	16.5	1300	7.1	.0197	.0937
<b>.2500</b>	9100	181.1	6000	86.6	.0472	.125	1500	13.8	1000	5.9	.0236	.0125

- 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) When cutting austenitic stainless steels, the use of water-soluble cutting fluid is especially effective.
- 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.
- 5)  $\alpha$  is the inclination of the machined surface.

