

# M7 Application Guide (metric) • Speed & Feed

ISO Classification	Number of Flutes	EM Dia.	Type of Cut	Axial Max	Radial Max	Speed (M/Min)	RMP	MMPT	MM/Min
<b>H</b> 51 HRC-63 HRC	5	3,0	Rough	3.0	0.18	106	11,318	0.0089	5039.5
			Rough < 10,000	3.0	0.18	94	9,973	0.0089	443.8
			Finish	6.0	0.025	91	9,701	0.0075	363.8
	5	4,0	Rough	4.0	0.275	64	5,093	0.0180	458.4
			Finish	8.0	0.032	91	7,241	0.0097	351.2
	6	5,0	Rough	5.0	0.345	80	5,093	0.0200	509.3
			Finish	10.0	0.050	91	5,793	0.0107	309.9
	6	6,0	Rough	6.0	0.380	122	6,472	0.0254	986.3
			Finish	12.0	0.050	91	4,828	0.0127	367.9
	6	8,0	Rough	8.0	0.558	121	4,814	0.0330	953.2
			Finish	16.0	0.050	91	3,621	0.0152	330.2
	6	10,0	Rough	10.0	0.800	121	3,851	0.0400	924.3
			Finish	20.0	0.076	91	2,897	0.0200	347.6
	6	12,0	Rough	12.0	0.960	121	3,210	0.0480	924.3
			Finish	24.0	0.076	91	2,414	0.0240	347.6
	6	16,0	Rough	16.0	1.270	121	2,407	0.0635	917.1
			Finish	32.0	0.127	91	1,810	0.0330	358.4
	6	20,0	Rough	20.0	1.524	121	1,926	0.0760	878.1
Finish			40.0	0.127	91	1,448	0.0380	330.2	
<b>H</b> 43 HRC-50 HRC	5	3,0	Rough	3.0	0.254	152	16,127	0.0152	1225.7
			Rough < 10,000	3.0	0.254	94	9,973	0.0152	758.0
			Finish	6.0	0.025	121	12,838	0.0076	487.8
			Finish < 10,000	6.0	0.025	94	9,973	0.0076	379.0
	5	4,0	Rough	4.0	0.320	152	12,095	0.0192	1161.2
			Rough < 10,000	4.0	0.320	125	9,947	0.0192	954.9
			Finish	8.0	0.025	121	9,629	0.0103	495.9
	6	5,0	Rough	5.0	0.400	152	9,676	0.0239	1156.3
			Finish	10.0	0.040	121	7,703	0.0132	508.4
	6	6,0	Rough	6.0	0.480	152	8,064	0.0305	1475.6
			Finish	12.0	0.075	121	6,419	0.0170	654.7
	6	8,0	Rough	8.0	0.640	152	6,048	0.0355	1288.2
			Finish	16.0	0.080	121	4,814	0.0175	505.5
	6	10,0	Rough	10.0	0.800	152	4,838	0.0453	1315.0
			Finish	20.0	0.130	121	3,851	0.0266	614.7
	6	12,0	Rough	12.0	0.970	152	4,032	0.0552	1335.3
			Finish	24.0	0.180	121	3,210	0.0336	647.0
	6	16,0	Rough	16.0	1.280	152	3,024	0.0736	1335.3
Finish			32.0	0.200	121	2,407	0.0455	657.2	
6	20,0	Rough	20.0	1.600	152	2,419	0.0863	1252.6	
		Finish	40.0	0.230	121	1,926	0.0508	587.0	
<b>P</b> <b>M</b> 36 HRC-42 HRC	5	3,0	Rough	3.0	0.240	182	19,310	0.0254	2452.4
			Rough < 10,000	3.0	0.240	94	9,973	0.0254	1266.6
			Finish	6.0	0.038	137	14,536	0.0127	923.0
			Finish < 10,000	6.0	0.038	94	9,973	0.0127	633.3
	5	4,0	Rough	4.0	0.320	182	14,483	0.0280	2027.6
			Rough < 10,000	4.0	0.320	125	9,947	0.0280	1392.6
			Finish	8.0	0.043	125	9,947	0.0170	845.5
	6	5,0	Rough	5.0	0.400	182	11,586	0.0345	1998.6
			Rough < 10,000	5.0	0.400	157	9,995	0.0345	1724.1
	6	6,0	Finish	10.0	0.053	137	8,721	0.0212	924.5
			Rough	6.0	0.600	183	9,708	0.0510	2970.7
	6	8,0	Finish	12.0	0.076	152	8,064	0.0254	1228.9
			Rough	8.0	0.800	183	7,281	0.0635	2774.1
	6	10,0	Finish	16.0	0.076	152	6,048	0.0330	1197.4
			Rough	10.0	1.000	183	5,825	0.0800	2795.9
	6	12,0	Finish	20.0	0.076	152	4,838	0.0400	1161.2
			Rough	12.0	1.200	183	4,854	0.0960	2795.9
	6	16,0	Finish	24.0	0.120	152	4,032	0.0480	1161.2
Rough			16.0	1.600	183	3,641	0.1270	2774.1	
6	20,0	Finish	32.0	0.127	152	3,024	0.0635	1152.1	
		Rough	20.0	2.000	183	2,912	0.1524	2663.1	
6	20,0	Finish	40.0	0.127	152	2,419	0.0762	1106.0	

D = Tool Diameter

## Common Machining Formulas

$$RPM = \frac{M/MIN \times 318.057}{D}$$

$$M/MIN = RPM \times D \times .00314$$

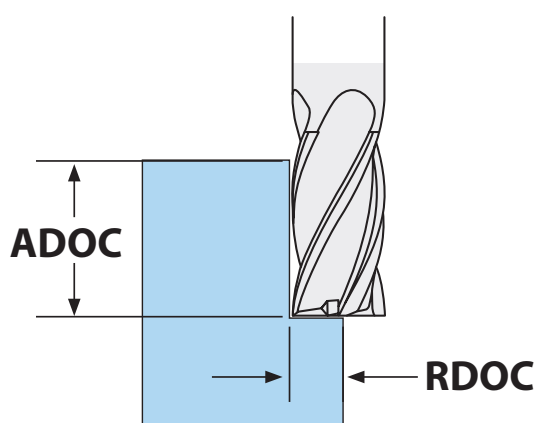
$$MM/MIN = RPM \times MMPT \times Z$$

$$MRR = RDOC \times ADOC \times MM/MIN$$

- D** Tool Cutting Diameter
- R** Tool Radius
- Z** Number of Flutes
- RPM** Revolutions per Minute
- M/MIN** Meters per Minute
- MM/Min** Millimeters per Minute
- MRR** Metal Removal Rate
- RDOC** Radial Depth of Cut
- ADOC** Axial Depth of Cut

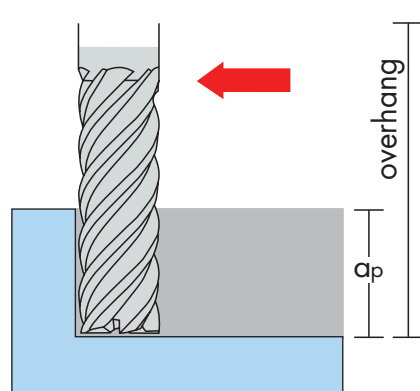
### Radial Chip Thinning Adjustment

$$MMPT_{adj} = \frac{MMPT \times (D/2)}{\sqrt{(D \times RDOC) - RDOC^2}}$$



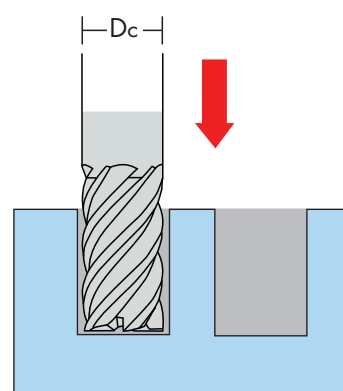
Apply chip thinning adjustment when  $RDOC < D$

**Adjustments** - Apply these adjustments when programming the following applications.



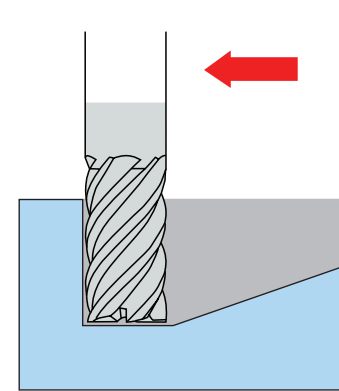
### 1. Long reach mills with large overhang

- Reduce speed rate and chipload by 10%



### 2. Plunge entry into work piece

- Reduce chipload by 80% of recommended slotting rate
- Peck mill if axial DOC (ap) exceeds 50% of Dc



### 3. Ramp entry into work piece

- Ramp at 1.5°-2.5° angle
- Reduce chipload by 20% of recommended slotting rate