M7 Application Guide (inch) • Speed & Feed

ISO Classification	Number of Flutes	EM Dia.	Type of Cut	Axial Max	Radial Max	Speed (SFM)	RMP	IPT	IPM
H 51 HRC–63 HRC	5	1/8	Rough	0.1250	0.0075	350	10,696	0.00035	18.7
			Rough < 10,000	0.1250	0.0075	325	9,932	0.00035	17.4
			Finish	0.2500	0.0010	300	9,168	0.00030	13.7
	5	3/16	Rough	0.1875	0.0130	250	5,093	0.00070	17.8
			Finish	0.3750	0.0015	300	6,112	0.00040	12.2
	6	1/4	Rough	0.2500	0.0150	400	6,112	0.00100	36.6
			Finish	0.5000	0.0020	300	4,584	0.00050	13.8
	6	5/16	Rough	0.3125	0.0220	400	4,890	0.00125	36.6
			Finish	0.6250	0.0020	300	3,667	0.00060	13.2
	6	3/8	Rough	0.3750	0.0300	400	4,074	0.00150	36.6
			Finish	0.7500	0.0030	300	3,056	0.00070	12.8
	6	1/2	Rough	0.5000	0.0400	400	3,056	0.00200	36.6
			Finish	1.0000	0.0030	300	2,292	0.00100	13.7
	6	5/8	Rough	0.6250	0.0500	400	2,445	0.00250	36.6
			Finish	1.2500	0.0050	300	1,833	0.00130	14.3
	6	3/4	Rough	0.7500	0.0600	400	2,037	0.00300	36.6
			Finish	1.5000	0.0050	300	1,528	0.00150	13.7
	6	1	Rough	1.0000	0.0800	400	1,528	0.00400	36.6
			Finish	2.0000	0.0080	300	1,146	0.00200	13.7
H 43 HRC–50 HRC	5	1/8	Rough	0.1250	0.0100	500	15,280	0.0006	45.8
			Rough < 10,000	0.1250	0.0100	325	9,932	0.0006	29.8
			Finish	0.2500	0.0010	400	12,224	0.0003	18.3
			Finish < 10,000	0.2500	0.0010	325	9,932	0.0003	14.9
	5	3/16	Rough	0.1875	0.0150	500	10,186	0.0009	45.8
			Rough < 10,000	0.1875	0.0150	480	9,780	0.0009	44.0
			Finish	0.3750	0.0015	400	8,150	0.0005	20.4
	6	1/4	Rough	0.2500	0.0200	500	7,640	0.0012	55.0
			Finish	0.5000	0.0030	400	6,112	0.0007	25.7
	6	5/16	Rough	0.3125	0.0250	500	6,112	0.0014	51.3
			Finish	0.6250	0.0030	400	4,889	0.0007	20.5
	6	3/8	Rough	0.7500	0.0300	500	5,093	0.0017	52.0
			Finish	0.7500	0.0050	400	4,074	0.0010	24.4
	6	1/2	Rough	0.5000	0.0400	500	3,820	0.0023	52.7
			Finish	1.0000	0.0070	400	3,056	0.0014	25.6
	6	5/8	Rough	0.6250	0.0500	500	3,056	0.0029	53.2
			Finish	1.2500	0.0080	400	2,445	0.0018	26.4
	6	3/4	Rough	0.7500	0.0600	500	2,547	0.0034	52.0
			Finish	1.5000	0.0090	400	2,037	0.0020	24.4
	6	1	Rough	1.0000	0.0800	500	1,910	0.0046	52.7
			Finish	2.0000	0.0100	400	1,528	0.0023	21.0
P M 36 HRC–42 HRC	5	1/8	Rough	0.1250	0.0100	600	18,336	0.0010	91.7
			Rough < 10,000	0.1250	0.0100	325	9,932	0.0010	49.6
			Finish	0.2500	0.0015	450	13,752	0.0005	34.4
			Finish < 10,000	0.2500	0.0015	325	9,932	0.0005	24.8
	5	3/16	Rough	0.1875	0.0150	600	12,224	0.0013	79.5
			Rough < 10,000	0.1875	0.0150	475	9,677	0.0013	63.0
			Finish	0.3750	0.0020	450	9,168	0.0008	36.7
	6	1/4	Rough	0.2500	0.0250	600	9,168	0.0020	110.0
			Rough < 10,000	–	–	–	–	–	–
			Finish	0.5000	0.0030	500	7,640	0.0010	45.8
	6	5/16	Rough	0.3125	0.0310	600	7,334	0.0025	110.0
			Finish	0.6250	0.0030	500	6,112	0.0013	47.6
	6	3/8	Rough	0.3750	0.0370	600	6,112	0.0030	110.0
			Finish	0.7500	0.0030	500	5,093	0.0015	45.8
	6	1/2	Rough	0.5000	0.0500	600	4,584	0.0040	110.0
			Finish	1.0000	0.0050	500	3,820	0.0020	45.8
	6	5/8	Rough	0.6250	0.0625	600	3,667	0.0050	110.0
			Finish	1.2500	0.0050	500	3,056	0.0025	45.8
	6	3/4	Rough	0.7500	0.0750	600	3,056	0.0060	110.0
			Finish	1.5000	0.0050	500	2,546	0.0030	45.8
	6	1	Rough	1.0000	0.1000	600	2,292	0.0080	110.0
			Finish	2.0000	0.0070	500	1,910	0.0040	45.8

D = Tool Diameter

Common Machining Formulas

$$RPM = \frac{SFM \times 3.82}{D}$$

$$SFM = RPM \times D \times .262$$

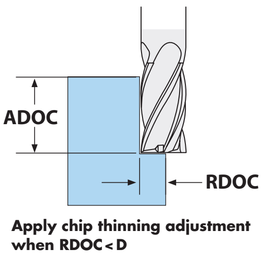
$$IPM = RPM \times IPT \times Z$$

$$MRR = RDOC \times ADOC \times IPM$$

D Tool Cutting Diameter
R Tool Radius
Z Number of Flutes
RPM Revolutions per Minute
SFM Surface Feet per Minute
IPM Inches per Minute
MRR Metal Removal Rate
RDOC Radial Depth of Cut
ADOC Axial Depth of Cut

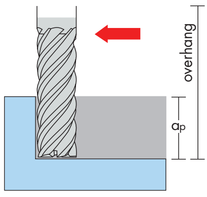
Radial Chip Thinning Adjustment

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



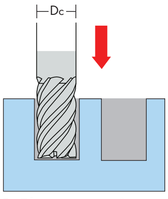
Apply chip thinning adjustment when RDOC < D

Adjustments – Apply these adjustments when programming the following applications.



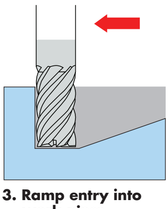
1. Long reach mills with large overhang

- 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