M527 Series Application Guide (metric) • Speed & Feed

ISO Classification	Work Material	Type of Cut	Axial DOC	Radial DOC	Number of Flutes	Speed (M/Min)	Feed (MM per Tooth) 6,0	10,0	12,0	16,0	20,0	25,0
S	Titanium Alloys	Slotting	.5 x D	1 x D	7	76	.0167	.0277	.0334	.0444	.0554	.0668
	6Al-4V, 6-2-4	Peripheral - Rough	1 x D	.3 x D	7	91	.0228	.0378	.0455	.0606	.0756	.0911
		Peripheral - HEM*	3 x D	.05 x D	7	101	.0802	.1331	.1603	.2132	.2662	.3207
		Finish	1.5 x D	.015 x D	7	91	.0232	.0385	.0463	.0616	.0769	.0927
	Difficult to machine Titanium Alloys	Slotting	.25 x D	1 x D	7	61	.0123	.0205	.0247	.0328	.0409	.0493
	10-2-3	Peripheral - Rough	1 x D	.25 x D	7	76	.0178	.0296	.0356	.0474	.0591	.0712
		Peripheral - HEM*	3 x D	.05 x D	7	84	.0622	.1032	.1244	.1654	02064	.2487
		Finish	1.5 x D	.01 x D	7	76	.0209	.0347	.0418	.0556	.0695	.0837
M	Austenitic Stainless Steels, FeNi Alloys	Slotting	.5 x D	1 x D	7	84	.0218	.0361	.0435	.0579	.0723	.0871
	303, 304, 316, Invar, Kovar	Peripheral - Rough	1.25 x D	.3 x D	7	107	.0297	.0493	.0594	.0790	.0986	.1188
		Peripheral - HEM*	3 x D	.05 x D	7	119	.1058	.1757	.2117	.2815	.3514	.4233
		Finish	2 x D	.015 x D	7	107	.0302	.0502	.0605	.0804	.1004	.1209
	Precipitation Hardening Stainless Steels	Slotting	.5 x D	1 x D	7	76	.0181	.0301	.0363	.0483	.0602	.0726
	17-4, 15-5, 13-8	Peripheral - Rough	1.25 x D	.3 x D	7	99	.0247	.0411	.0495	.0658	.0822	.0990
		Peripheral - HEM*	3 x D	.05 x D	7	110	.0847	.1405	.1693	.2252	.2811	.3387
		Finish	1.5 x D	.015 x D	7	99	.0252	.0418	.0504	.0670	.0836	.1008
P	Low Carbon Steels <= 38 Rc	Slotting	.5 x D	1 x D	7	99	.0254	.0422	.0508	.0676	.0843	.1016
	1018, 1020, 12L14, 5120, 8620	Peripheral - Rough	1.25 x D	.3 x D	7	122	.0346	.0575	.0693	.0921	.1150	.1386
		Peripheral - HEM*	3 x D	.05 x D	7	137	.1111	.1845	.2223	.2957	.3690	.4446
		Finish	2 x	.015 x D	7	122	.0353	.0585	.0705	.0938	.1171	.1411
	Medium Carbon Steels <= 48 HRC	Slotting	.5 x D	1 x D	7	91	.0232	.0386	.0465	.0618	.0771	.0929
	1045, 4140, 4340, 5140	Peripheral - Rough	1.25 x D	.3 x D	7	114	.0317	.0526	.0634	.0843	.1052	.1267
		Peripheral - HEM*	3 x D	.05 x D	7	126	.1089	.1808	.2178	.2897	.3616	.4357
		Finish	2 x D	.015 x D	7	114	.0322	.0535	.0645	.0858	.1071	.1290
	Tool and Die Steels <= 48 Rc	Slotting	.5 x D	1 x D	7	84	.0196	.0325	.0392	.0521	.0651	.0784
	A2, D2, O1, S7, P20, H13	Peripheral - Rough	1.25 x D	.3 x D	7	107	.0267	.0444	.0535	.0711	.0887	.1069
		Peripheral - HEM*	3 x D	.05 x D	7	119	.0934	.1550	.1867	.2483	.3100	.3735
		Finish	2 x D	.015 x D	7	107	.0272	.0452	.0544	.0724	.0903	.1088
	Martensitic & Ferritic Stainless Steels	Slotting	.5 x D	1 x D	7	91	.0232	.0386	.0465	.0618	.0771	.0929
	410, 416, 440	Peripheral - Rough	1.25 x D	.3 x D	7	114	.0317	.0526	.0634	.0843	.1052	.1267
		Peripheral - HEM*	3 x D	.05 x D	7	126	.1089	.1808	.2178	.2897	.3616	.4357
K	Cast Iron	Slotting	.5 x D	1 x D	7	91	.0225	.0374	.0450	.0599	.0747	.0900
	Gray	Peripheral - Rough	1.25 x D	.3 x D	7	114	.0298	.0495	.0596	.0792	.0989	.1192
		Finish	2 x D	.015 x D	7	137	.0303	.0503	.0607	.0807	.1007	.1213
	Cast Iron	Slotting	.5 x D	1 x D	7	84	.0181	.0301	.0363	.0483	.0602	.0726
	Malleable	Peripheral - Rough	1.25 x D	.3 x D	7	107	.0247	.0411	.0495	.0658	.0822	.0990
		Peripheral - HEM*	3 x D	.05 x D	7	119	.0722	.1199	.1445	.1922	.2399	.2890
		Finish	2 x D	.015 x D	7	107	.0252	.0418	.0504	.0670	.0836	.1008

D = Tool Diameter *HEM= High-efficiency machining (chip thinning calculations have already been applied to HEM parameters shown)

Common Machining Formulas

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

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

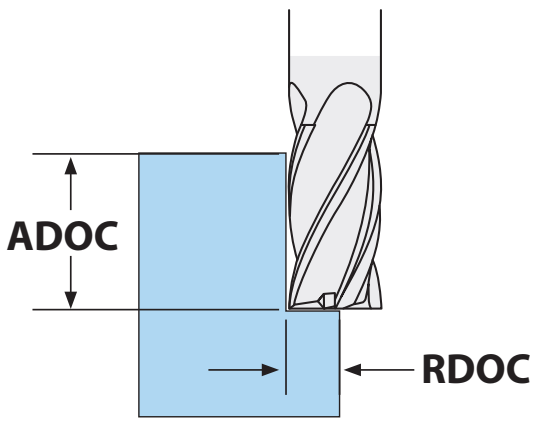
$$MM/MIN = RPM \times MMPT \times Z$$

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

Radial Chip Thinning Adjustment

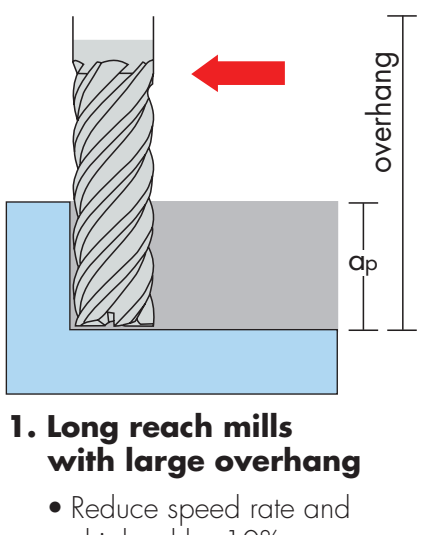
$$MMPT_{adj} = \frac{MMPT \times (D/2)}{\sqrt{(D \times RDOC) - RDOC^2}}$$

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



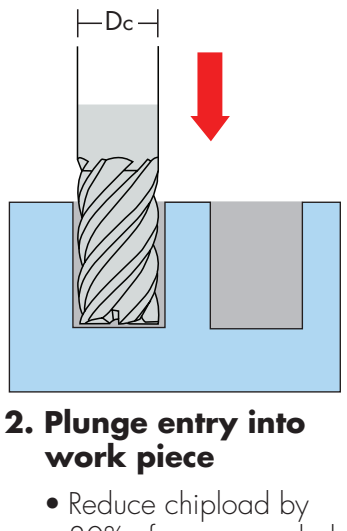
Apply chip thinning adjustment when RDOC < D

Adjustments – Apply these adjustments when programming the following applications.



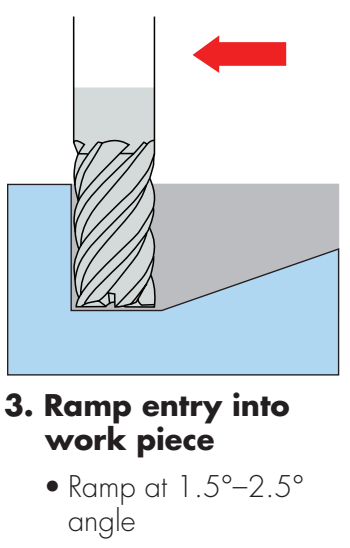
1. Long reach mills with large overhang

- 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