

Blender Application Guide (inch) • Speed & Feed

ISO Classification	Work Material	Type of Cut	Axial DOC	Radial DOC	Number of Flutes	Speed (SFM)	Feed (Inches per Tooth)				
							3/8	1/2	5/8	3/4	1
S	Titanium Alloys 6Al-4V, 6-2-4	Fillet Radius Finishing	.005 - .007	.25 x D	5	250	.0018	.0024	.0030	.0036	.0048
		Fillet Radius Finishing	Final floor depth	See below*	5	250	.0018	.0024	.0030	.0036	.0048
	Hi-Temp Alloys Inconel, Hastelloy	Fillet Radius Finishing	.005 - .007	.25 x D	5	150	.0020	.0027	.0033	.0040	.0053
		Fillet Radius Finishing	Final floor depth	See below*	5	150	.0020	.0027	.0033	.0040	.0053
M	Austenitic Stainless Steels, FeNi Alloys 303, 304, 316, Invar, Kovar	Fillet Radius Finishing	.005 - .010	.25 x D	5	300	.0018	.0024	.0030	.0036	.0048
		Fillet Radius Finishing	Final floor depth	See below*	5	300	.0018	.0024	.0030	.0036	.0048
	Precipitation Hardening Stainless Steels 17-4, 15-5, 13-8	Fillet Radius Finishing	.005 - .010	.25 x D	5	300	.0019	.0025	.0032	.0038	.0051
		Fillet Radius Finishing	Final floor depth	See below*	5	300	.0019	.0025	.0032	.0038	.0051
P	Martensitic & Ferritic Stainless Steels 410, 416, 440	Fillet Radius Finishing	.005 - .015	.25 x D	5	300	.0019	.0025	.0032	.0038	.0051
		Fillet Radius Finishing	Final floor depth	See below*	5	300	.0019	.0025	.0032	.0038	.0051
	Tool and Die Steels A2, D2, O1, S7, P20, H13	Fillet Radius Finishing	.005 - .015	.25 x D	5	300	.0020	.0027	.0033	.0040	.0053
		Fillet Radius Finishing	Final floor depth	See below*	5	300	.0020	.0027	.0033	.0040	.0053

D = Tool diameter

Tool Tips:

- * Radial cut guide for finishing fillet radii: **First pass** = Max radial cut of .25 x mill diameter, leaving .010" on wall; **Second pass** = Remove the final .010" of material; **Third pass (if needed)** = Run a "spring" pass to ensure finish and fillet dimensional accuracy.
- Reduce speed and feed rates by 20% when your tool has an overall length greater than 10x the diameter.
 - Rough the part to +.010" above and adjacent to the fillet radius.
 - Maintain a total indicator runout (TIR) <.0005" for maximum tool life and a superior surface finish.
 - Using a tool radius smaller than the fillet radius will require extra passes.

Common Machining Formulas

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

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

$$\text{SFM} = \text{RPM} \times D \times .262$$

$$\text{IPM} = \text{RPM} \times \text{IPT} \times Z$$

$$\text{MRR} = \text{RDOC} \times \text{ADOC} \times \text{IPM}$$