

ZrN-Coated and Uncoated 3D Profiling CNC Solid Carbide Router Bits Feed and Chip Load Chart Operating at 18,000 RPM

2 Flute Ball Nose

	1/16" (0.0625")		1/4" (0.250")		Tool Reference #'s	
	IPM*	Chip Load Per Tooth	IPM*	Chip Load Per Tooth		
Aluminum, Copper, Brass, Plastic, Acrylic, Plexglas®	35" - 70"	0.001" - 0.002"	140" - 210"	0.004" - 0.006"	46252	1/16" Dia.
Wood, MDF, Sign-Foam	55" - 90"	0.003" - 0.005"	250" - 320"	0.007" - 0.009"	46283	1/4" Dia.
					46285	1/4" Dia.
					46289	1/4" Dia.
				46294	1/4" Dia.	

3 Flute Ball Nose

	1/32" (0.031") - 1mm (0.0394")		1/8" (0.125") - 3.2mm (.126")		3/16" (0.1875")		6mm (0.2362")		3/8" (0.375")		1/2" (0.500")	
	IPM*	Chip Load Per Tooth	IPM*	Chip Load Per Tooth	IPM*	Chip Load Per Tooth	IPM*	Chip Load Per Tooth	IPM*	Chip Load Per Tooth	IPM*	Chip Load Per Tooth
Aluminum, Copper, Brass, Plastic, Acrylic, Plexglas®	40" - 80"	0.00075" - 0.0015"	50" - 100"	0.0009" - 0.0018"	60" - 100"	0.0015" - 0.0025"	135" - 215"	0.0025" - 0.004"	215" - 320"	0.004" - 0.006"	320" - 430"	0.006" - 0.008"
Wood, MDF, Sign-Foam	15" - 30"	0.0003" - 0.0006"	80" - 100"	0.0015" - 0.0025"	100" - 170"	0.0025" - 0.004"	215" - 320"	0.004" - 0.006"	320" - 430"	0.006" - 0.008"	375" - 490"	0.007" - 0.009"

3 Flute Extra Long Ball Nose & Flat Bottom

	1/4" (0.250")		3/8" (0.375")		1/2" (0.500")		Tool Reference #'s		Tool Reference #'s	
	IPM*	Chip Load Per Tooth	IPM*	Chip Load Per Tooth	IPM*	Chip Load Per Tooth				
Aluminum, Copper, Brass, Plastic, Acrylic, Plexglas®	135" - 190"	0.0025" - 0.0035"	160" - 270"	0.003" - 0.005"	215" - 320"	0.004" - 0.006"	46490	1/4" Dia.	46280	1/32" Dia.
Wood, MDF, Sign-Foam	215" - 320"	0.004" - 0.006"	270" - 370"	0.005" - 0.007"	320" - 430"	0.006" - 0.008"	46491	3/8" Dia.	46284	1/8" Dia.
							46493	1/2" Dia.	46286	1/8" Dia.
							46590	1/4" Dia.	46287	1/8" Dia.
							46593	1/2" Dia.	46288	1/8" Dia.
									46291	1/32" Dia.
									46295	1/8" Dia.
		46298	3/16" Dia.							
		46470	0.8mm Dia.							
		46471	1mm Dia.							
		46474	3.2mm Dia.							
		46479	6mm Dia.							
		46494	3/8" Dia.							
		46495	1/2" Dia.							
		46580	1/32" Dia.							

3 Flute Flat Bottom

	1/32" (0.031")		1/16" (0.0625")		1/8" (0.125")		Tool Reference #'s	
	IPM*	Chip Load Per Tooth	IPM*	Chip Load Per Tooth	IPM*	Chip Load Per Tooth		
Aluminum, Copper, Brass, Plastic, Acrylic, Plexglas®	8" - 15"	0.0002" - 0.0004"	20" - 30"	0.0004" - 0.0006"	55" - 100"	0.001" - 0.002"	46290	1/16" Dia.
Wood, MDF, Sign-Foam	15" - 25"	0.0003" - 0.0005"	30" - 45"	0.0006" - 0.0008"	80" - 135"	0.0015" - 0.0025"	46570	1/32" Dia.
							46574	1/8" Dia.

4 Flute Ball Nose & Flat Bottom

	1.5mm (0.0591")		1/16" (0.0625")		1/8" (0.125")		Tool Reference #'s	
	IPM*	Chip Load Per Tooth	IPM*	Chip Load Per Tooth	IPM*	Chip Load Per Tooth		
Aluminum, Copper, Brass	25" - 30"	0.00037" - 0.00045"	25" - 30"	0.00037" - 0.00045"	25" - 30"	0.00037" - 0.00045"	46282	1/16" Dia.
Plastic, Acrylic, Plexglas®	30" - 45"	0.0004" - 0.0006"	25" - 30"	0.00037" - 0.00045"	25" - 30"	0.00037" - 0.00045"	46292	1/8" Dia.
							46293	1/16" Dia.
Wood, MDF, Sign-Foam	35" - 45"	0.0005" - 0.00065"	35" - 45"	0.0005" - 0.00065"	35" - 45"	0.0005" - 0.00065"	46472	1.5mm Dia.
							46572	1/16" Dia.
							46582	1/16" Dia.

IPM* Inches per minute

Simple Machining Calculations:

To find **RPM** = SFM x 3.82 ÷ diameter of tool

To find **SFM** = 0.262 x diameter of tool x RPM

To find **Feed Rate** = RPM x # of flutes x chip load

To find **Chip Load** = $\frac{\text{IPM}}{\text{RPM} \times \# \text{ of Flutes}}$

Depth of Cut: 1 x D Use recommended chip load

2 x D Reduce chip load by 25%

3 x D Reduce chip load by 50%