

## 2 Flute Solid Carbide CNC Spiral Ball Nose Router Bits

CNC Operating Spindle Speed: 18,000 RPM / Depth of Cut: 1 x Tool Diameter †

Material	1/16"		1/8"		1/4"		3/8"		1/2"		5/8"		3/4"	
	Feed Rate IPM*	Chip Load Per Tooth	Feed Rate IPM*	Chip Load Per Tooth	Feed Rate IPM*	Chip Load Per Tooth	Feed Rate IPM*	Chip Load Per Tooth	Feed Rate IPM*	Chip Load Per Tooth	Feed Rate IPM*	Chip Load Per Tooth	Feed Rate IPM*	Chip Load Per Tooth
Aluminum	70" - 150"	0.002" - 0.004"	110" - 190"	0.003" - 0.005"	150" - 220"	0.004" - 0.006"	220" - 290"	0.006" - 0.008"	360" - 430"	0.010" - 0.012"	430" - 500"	0.012" - 0.014"	430" - 580"	0.014" - 0.016"
Softwood	110" - 190"	0.003" - 0.005"	190" - 260"	0.005" - 0.007"	260" - 330"	0.007" - 0.009"	290" - 360"	0.008" - 0.010"	330" - 400"	0.009" - 0.011"	360" - 430"	0.010" - 0.012"	400" - 470"	0.011" - 0.013"
Hardwood	70" - 150"	0.002" - 0.004"	110" - 190"	0.003" - 0.005"	190" - 260"	0.005" - 0.007"	220" - 290"	0.006" - 0.008"	260" - 330"	0.007" - 0.009"	290" - 360"	0.008" - 0.010"	330" - 400"	0.009" - 0.011"
MDF	110" - 190"	0.003" - 0.005"	190" - 260"	0.005" - 0.007"	220" - 290"	0.006" - 0.008"	260" - 330"	0.007" - 0.009"	290" - 360"	0.008" - 0.010"	330" - 400"	0.009" - 0.011"	360" - 430"	0.010" - 0.012"
Soft Plastic	70" - 150"	0.002" - 0.004"	70" - 150"	0.002" - 0.004"	150" - 220"	0.004" - 0.006"	150" - 220"	0.004" - 0.006"	220" - 290"	0.006" - 0.008"	360" - 430"	0.010" - 0.012"	430" - 500"	0.012" - 0.014"
Hard Plastic	70" - 150"	0.002" - 0.004"	70" - 150"	0.002" - 0.004"	150" - 220"	0.004" - 0.006"	150" - 220"	0.004" - 0.006"	220" - 290"	0.006" - 0.008"	290" - 360"	0.008" - 0.010"	360" - 430"	0.010" - 0.012"
Sign Foam	110" - 190"	0.003" - 0.005"	110" - 190"	0.005" - 0.007"	220" - 290"	0.006" - 0.008"	260" - 330"	0.007" - 0.009"	290" - 360"	0.008" - 0.010"	330" - 400"	0.009" - 0.011"	360" - 430"	0.010" - 0.012"

\* IPM Inches per minute

† Depth of Cut: 1 x D Use recommended feed rate  
 2 x D Reduce feed rate by 25%  
 3 x D Reduce feed rate by 50%

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 IPM**: RPM x # of flutes x chip load

To find **Chip Load**: Feed Rate IPM / (RPM x # of flutes)

To find **Ramp Down**: Feed Rate IPM / # of flutes

Tool Reference #'s		
Up-Cut	Down-Cut	Dia.
46369	—	1/8"
46373	—	1/16"
46374	46475	1/4"
46375	—	1/8"
46376	46476	1/4"
46378	46478	3/8"
46380	46477	1/2"
46384	—	1/2"
46386	—	5/8"
46387	—	3/4"