

Material	End Mill	Feed Rate	Plunge Rate	Spindle Speed	Pass Depth
Wood - Softer (Birch Plywood)	1/8" Flat	23.622 in/min	1.575 in/min	12000 RPM	0.01"
Fix: Scotch for thinner	1/16" Flat	23.622 in/min	1.575 in/min	12000 RPM	0.01"
P-02 or hot glue for >0.1"	1/32" Flat	23.622 in/min	1.575 in/min	12000 RPM	0.01"
	1/64" Flat	23.622 in/min	1.575 in/min	12000 RPM	0.01"
	Engraving (1/200")	39.37 in/min	1.575 in/min	12000 RPM	0.003"

Material	End Mill	Feed Rate	Plunge Rate	Spindle Speed	Pass Depth
Aluminum (6061)					
Fix: Hot glue and P-02	1/8" Flat	7.087 in/min	0.591 in/min	12000 RPM	0.002"
Note: Use align. bracket	1/16" Flat	7.087 in/min	0.591 in/min	12000 RPM	0.002"
only cutout with 1/8"	1/32" Flat	7.087 in/min	0.591 in/min	12000 RPM	0.002"
Ensure piece isn't warped	1/64" Flat	1.417 in/min	0.157 in/min	12000 RPM	0.001"
Don't engrave > 0.005in	1/100" Flat	1.417 in/min	0.157 in/min	12000 RPM	0.001"
Brass (360)	1/8" Flat	7.874 in/min	0.656 in/min	12000 RPM	0.002"
Fix: Hot glue and P-02	1/16" Flat	7.874 in/min	0.656 in/min	12000 RPM	0.002"
Note: Use align. bracket	1/32" Flat	7.874 in/min	0.656 in/min	12000 RPM	0.002"
only cutout with 1/8"	1/64" Flat	1.575 in/min	0.157 in/min	12000 RPM	0.001"
Ensure piece isn't warped	1/100" Flat	1.575 in/min	0.157 in/min	12000 RPM	0.001"
Don't engrave > 0.01in	Engraving (1/200")	7.874 in/min	0.656 in/min	12000 RPM	0.002"

Material	End Mill	Feed Rate	Plunge Rate	Spindle Speed	Pass Depth
FR-1 (PCB blanks)	1/8" Flat	14.173 in/min	1.81 in/min	12000 RPM	0.005"
Fix: scotch tape (mostly)	1/16" Flat	14.173 in/min	1.81 in/min	12000 RPM	0.005"
Note: Ensure board is flat;	1/32" Flat	14.173 in/min	1.81 in/min	12000 RPM	0.006"
use hot glue bead or P-02	1/64" Flat	5.669 in/min	0.472 in/min	12000 RPM	0.002"
to hold flat if needed	1/100" Flat	5.669 in/min	0.472 in/min	12000 RPM	0.002"
Machinable Foam	1/8" Flat	31.496 in/min	1.575 in/min	12000 RPM	0.011"
Fix: P-02 and hot glue	1/16" Flat	31.496 in/min	1.575 in/min	12000 RPM	0.012"
Note: only cutout with 1/8"	1/32" Flat	31.496 in/min	1.575 in/min	12000 RPM	0.013"
and 1/16", use align. brack.	1/64" Flat	31.496 in/min	1.575 in/min	12000 RPM	0.004"
Be careful with engraving	Engraving (1/200")	31.496 in/min	1.575 in/min	12000 RPM	0.003"
Machining Wax	1/8" Flat	37.402 in/min	1.575 in/min	12000 RPM	0.013"
Fix: P-02 and hot glue	1/16" Flat	37.402 in/min	1.575 in/min	12000 RPM	0.014"
Note: only cutout with 1/8"	1/32" Flat	37.402 in/min	1.575 in/min	12000 RPM	0.016"
and 1/16", use align. brack.	1/64" Flat	37.402 in/min	1.575 in/min	12000 RPM	0.005"
Be careful with engraving	Engraving (1/200")	39.370 in/min	1.575 in/min	12000 RPM	0.003"

Material	End Mill	Feed Rate	Plunge Rate	Spindle Speed	Pass Depth
ABS					
<i>Fix: scotch for thin</i>	1/16" Flat	23.622 in/min	1.575 in/min	12000 RPM	0.009"
<i>P-02 for thick (>0.1")</i>	1/32" Flat	23.622 in/min	1.575 in/min	12000 RPM	0.009"
<i>Note: Don't use 1/8" bits</i>	1/64" Flat	23.622 in/min	1.575 in/min	12000 RPM	0.009"
<i>or hot glue for fixture</i>	Engraving (1/200")	40 in/min	1.575 in/min	12000 RPM	0.006"
Acrylic					
<i>Fix: scotch for thin</i>	1/8" Flat*	59 in/min	1.81 in/min	16400 RPM	0.005"
<i>P-02 for thick (>0.1")</i>	1/16" Flat*	43.3 in/min	1.81 in/min	16400 RPM	0.003"
<i>Note: Pause to clean scraps</i>	1/32" Flat	23.622 in/min	1.575 in/min	12000 RPM	0.01"
<i>during larger jobs</i>	1/64" Flat	23.622 in/min	1.575 in/min	12000 RPM	0.01"
Delrin					
<i>Fix: hot glue for engraving</i>	1/8" Flat	23.622 in/min	1.575 in/min	12000 RPM	0.008"
<i>P-02 for cutouts</i>	1/16" Flat	23.622 in/min	1.575 in/min	12000 RPM	0.02"
	1/32" Flat	23.622 in/min	1.575 in/min	12000 RPM	0.02"
	1/64" Flat	23.622 in/min	1.575 in/min	12000 RPM	0.003"
	1/100" Flat	23.622 in/min	1.575 in/min	12000 RPM	0.003"
	Engraving (1/200")	23.622 in/min	1.575 in/min	12000 RPM	0.003"
HDPE					
<i>Fix: hot glue for engraving</i>	1/8" Flat	23.622 in/min	1.575 in/min	12000 RPM	0.008"
<i>P-02 for cutouts</i>	1/16" Flat	23.622 in/min	1.575 in/min	12000 RPM	0.009"
	1/32" Flat	23.622 in/min	1.575 in/min	12000 RPM	0.010"
	1/64" Flat	23.622 in/min	1.575 in/min	12000 RPM	0.003"
	1/100" Flat	23.622 in/min	1.575 in/min	12000 RPM	0.003"
	Engraving (1/200")	39.370 in/min	1.575 in/min	12000 RPM	0.003"
Polycarbonate					
<i>Fix: hot glue for engraving</i>	1/8" Flat	39.370 in/min	1.81 in/min	12000 RPM	0.01"
<i>P-02 for cutouts</i>	1/16" Flat	14.173 in/min	1.81 in/min	12000 RPM	0.01"
<i>Note: Pause to clean scraps</i>	1/32" Flat	23.62 in/min	1.575 in/min	12000 RPM	0.01"
<i>during larger jobs</i>	1/64" Flat	23.62 in/min	1.575 in/min	12000 RPM	0.01"
	Engraving (1/200")	39.37 in/min	1.575 in/min	12000 RPM	0.006"