

STANDARD SPINDLE			
Feed Rates and Spindle Speeds for End Mills on ½ and 1 ounce FR4/G10			
END MILLS	0.5 oz Copper Feed Rate (inches per minute)	1.0 oz Copper Feed Rate (inches per minute)	Standard Spindle Spindle Speed (rotations per minute)
EM-0050 (0.005" / 0.13mm)*	2	2	24000
EM-0060 (0.006" / 0.15mm)*	2	2	24000
EM-0070 (0.007" / 0.18mm)*	3-4	2-3	24000
EM-0080 (0.008" / 0.20mm)	4-5	3-4	24000
EM-0090 (0.009" / 0.23mm)	5-10	4-5	24000
EM-0100 (0.010" / 0.25mm)	5-10	4-5	24000
EM-0110 (0.011" / 0.28mm)	5-10	4-5	24000
EM-0150 (0.015" / 0.38mm)	20-30	10-20	24000
EM-0200 (0.020" / 0.50mm)	50-60	30-40	24000
EM-0310 (0.31" / 0.80mm)	60	60	24000
EM-0500 (0.050" / 1.3mm)	60	60	24000
EM-0625 (0.0625" / 1.6mm)	60	60	24000
EM-1250 (0.125" / 3.175mm)	60	60	12000 - 18000

* May have better results by scoring first at 0.003" to 0.004" with MILL-T8

Notes on Rates:

1. The "Traverse Rate" can be set at 60 inches per minute for all milling or drilling files.
2. The "Feed Rates" listed in this chart are recommended starting points. Individual results will vary, adjust accordingly.
3. This chart is based on FR4. Other materials will require different Feed Rates.
4. When using the Standard Spindle make sure the tool is oriented in the holder so that the cutting edge is in line with the screw. Failure to do so will result in poor tool performance and decreased tool life. This is especially important when using tools smaller than EM-0080.

HIGH SPEED SPINDLE			
Feed Rates and Spindle Speeds for End Mills on ½ and 1 ounce FR4/G10			
END MILLS	0.5 oz Copper Feed Rate (inches per minute)	1.0 oz Copper Feed Rate (inches per minute)	High Speed Spindle Speed (rotations per minute)
EM-0050 (0.005" / 0.13mm)*	2-3	2	40,000 - 50,000
EM-0060 (0.006" / 0.15mm)*	2-3	2	40,000 - 50,000
EM-0070 (0.007" / 0.18mm)*	3-4	2-3	40,000 - 50,000
EM-0080 (0.008" / 0.20mm)	4-5	3-4	40,000 - 50,000
EM-0090 (0.009" / 0.23mm)	5-10	4-5	50,000 - 60,000
EM-0100 (0.010" / 0.25mm)	5-10	4-5	50,000 - 60,000
EM-0110 (0.011" / 0.28mm)	5-10	4-5	50,000 - 60,000
EM-0150 (0.015" / 0.38mm)	30-40	10-20	50,000 - 60,000
EM-0200 (0.020" / 0.50mm)	50-60	30-40	50,000 - 60,000
EM-0310 (0.31" / 0.80mm)	60	60	50,000 - 60,000
EM-0500 (0.050" / 1.3mm)	60	60	30,000 - 46,000
EM-0625 (0.0625" / 1.6mm)	60	60	25,000 - 40,000
EM-1250 (0.125" / 3.175mm)	60	60	12,000 - 18,000

* May have better results by scoring first at 0.003" to 0.004" with MILL-T8

Notes:

1. The "Traverse Rate" can be set at 60 inches per minute for all milling or drilling files.
2. The "Feed Rates" listed in this chart are recommended starting points. Individual results will vary, adjust accordingly.
3. This chart is based on FR4. Other materials will require different Feed Rates.
4. When using the High Speed Spindle set screw tool holder make sure the tool is oriented in the holder so that the cutting edge is in line with the screw. Failure to do so will result in poor tool performance and decreased tool life. This is especially important when using tools smaller than EM-0080.

STANDARD SPINDLE OR HIGH SPEED SPINDLE			
Feed Rates and Spindle Speeds for Pointed Milling Tools on ½ and 1 ounce FR4/G10			
<u>Pointed Milling Tool</u> Width of cut	0.5 oz Copper Feed Rate (inches per minute)	1.0 oz Copper Feed Rate (inches per minute)	Standard Spindle or High Speed Spindle Speed (rotations per minute)
<u>MILL -T1</u> 0.008" (0.20mm) to 0.010" (0.25mm)	45	35	24,000
0.011" (0.28mm) to 0.013" (0.33mm)	55	45	24,000
<u>MILL-T2</u> 0.008" (0.20mm) to 0.010" (0.25mm)	45	35	24,000
0.011" (0.28mm) to 0.013" (0.33mm)	55	45	24,000
<u>MILL-T3</u> 0.008" (0.20mm) to 0.010" (0.25mm)	45	35	24,000
0.011" (0.28mm) to 0.013" (0.33mm)	55	45	24,000
<u>MILL-T4</u> 0.004" (0.10mm) to 0.006" (0.15mm)	5	Not Recommended	24,000
<u>MILL-T8</u> 0.004" (0.10mm) to 0.006" (0.15mm)	45	30	24,000
0.007" (0.18mm) to 0.011" (0.28mm)	60	35	24,000

Notes:

1. The Pointed Milling Tools were designed to run at 24,000 RPM.
2. The "Traverse Rate" can be set at 60 inches per minute for all milling or drilling files.
3. The "Feed Rates" listed in this chart are recommended starting points. Individual results will vary, adjust accordingly.
4. This chart is based on FR4. Other materials will require different Feed Rates.
5. When using the Standard Spindle or High Speed Spindle set screw tool holder make sure the tool is oriented in the holder so that the cutting edge is in line with the screw. Failure to do so will result in poor tool performance and decreased tool life. This is especially important when making fine width cuts.

STANDARD SPINDLE			
Feed Rates and Spindle Speeds for Contour Routers on ½ and 1 ounce FR4/G10			
Routers	<u>Feed Rate</u> (inches per minute) 0.5 oz Copper	<u>Feed Rate</u> (inches per minute) 1.0 oz Copper	<u>Spindle Speed</u> (rotations per minute) Standard Spindle
CR-0310	10-20	5-10	24,000
CR-0620	30-40	30-40	24,000

HIGH SPEED SPINDLE			
Feed Rates and Spindle Speeds for Contour Routers on ½ and 1 ounce FR4/G10			
Routers	<u>Feed Rate</u> (inches per minute) 0.5 oz Copper	<u>Feed Rate</u> (inches per minute) 1.0 oz Copper	<u>Spindle Speed</u> (rotations per minute) High Speed Spindle
CR-0310	20-40	20-30	48,000
CR-0620	45-60	45-60	36,000

DRILL SIZES

Entry Material Recommended

0.013 (0.3mm) to 0.031" (0.79mm)

YES

0.032" (0.81mm) to 0.125" (3.175mm)

NO