T | TECH
Quick Circuit Prototyping Systems
510 Guthridge Ct, Norcross, GA 30092 | 770.455.0676 | Fax 770.455.0970

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.

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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 **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 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.

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STANDARD SPINDLE OR HIGH SPEED SPINDLE

Feed Rates and Spindle Speeds for Pointed Milling Tools on ½ and 1 ounce FR4/G10

Pointed Milling Tool Width of cut	**0.5 oz Copper** **Feed Rate** (inches per minute)	**1.0 oz Copper** **Feed Rate** (inches per minute)	**High Speed Spindle** **Spindle Speed** (rotations per minute)
MILL -T1 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**
MILL-T2 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**
MILL-T3 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**
MILL-T4 0.004" (0.10mm) to 0.006" (0.15mm)	**5**	**Not Recommended**	**24,000**
MILL-T8 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**

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

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.

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STANDARD SPINDLE

Feed Rates and Spindle Speeds for Contour Routers on ½ and 1 ounce FR4/G10

Routers	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)
CR-0310	10-20	5-10	24000
CR-0620	30-40	30-40	24000

HIGH SPEED SPINDLE

Feed Rates and Spindle Speeds for Contour Routers on ½ and 1 ounce FR4/G10

Routers	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)
CR-0310	20-40	20-30	48,000
CR-0620	45-60	45-60	36,000

STANDARD SPINDLE or HIGH SPEED SPINDLE

Entry Material Recommendations For Drill Bits on ½ and 1 ounce FR4/G10

Drill Bits	0.5 oz Copper	1.0 oz Copper	Standard or High Speed

DRILL SIZES

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

0.032" (0.81mm) to 0.125" (3.175mm) **NO**