
CNC SYSTEM

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Licensed TenonCam® Bit Manufacturer • R & B Tool Supply • Keith Beezley

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625-240T - 5/8 Compression, Two Flute, 1/4 TenonCam® bit for 3/4 material

| | | | |
|----------------|------------|------------|------------|
| Feed Rate: | 840 ipm | 14 ips | 21 mpm |
| Decent Rate: | 240 ipm | 4 ips | 6 mpm |
| Spindle Speed: | 16,000 rpm | 16,000 rpm | 15,750 rpm |
| Chip Load: | 0.02625 | 0.02625 | 0.02625 |

625-181T - 5/8 Compression, Two Flute, 3/16 TenonCam® bit for 5/8 material

| | | | |
|----------------|------------|------------|------------|
| Feed Rate: | 840 ipm | 14 ips | 21 mpm |
| Decent Rate: | 240 ipm | 4 ips | 6 mpm |
| Spindle Speed: | 16,000 rpm | 16,000 rpm | 15,750 rpm |
| Chip Load: | 0.02625 | 0.02625 | 0.02625 |

500-120T - 1/2 Compression, Two Flute, 1/8 TenonCam® bit for 1/2 material

| | | | |
|----------------|------------|------------|------------|
| Feed Rate: | 840 ipm | 14 ips | 21 mpm |
| Decent Rate: | 240 ipm | 4 ips | 6 mpm |
| Spindle Speed: | 16,000 rpm | 16,000 rpm | 15,750 rpm |
| Chip Load: | 0.02625 | 0.02625 | 0.02625 |

Patented TenonCam router bits are only available under License from R & B Tool Supply. The TenonCam router bits are throw away, as sharpening will change the geometry of the bits and render them useless. TenonCam bit life can be anywhere from one to four hundred sheets of material, depending upon the type and quality of the materials being cut.

Recommended Standard Bit Manufacturer • Vortex Tool Company • Lynn Wilkowski

5605 Jelinek Avenue • Schofield, WI 54476 • Ph: (800) 355-7708 • Fx: (715) 355-7353

3189 - ½ Compression, Two Flute, with ¼ Up Cut

| | | | |
|----------------|------------|------------|------------|
| Feed Rate: | 960 ipm | 16 ips | 25 mpm |
| Decent Rate: | 300 ipm | 5 ips | 8 mpm |
| Spindle Speed: | 18,675 rpm | 18,675 rpm | 19,150 rpm |
| Chip Load: | 0.0257 | 0.0257 | 0.0257 |
| Feed Rate: | 900 ipm | 15 ips | 23 mpm |
| Decent Rate: | 300 ipm | 5 ips | 8 mpm |
| Spindle Speed: | 17,500 rpm | 17,500 rpm | 17,500 rpm |
| Chip Load: | 0.0257 | 0.0257 | 0.0257 |

3289m - ½ Compression, Three Flute, with ¼ Up Cut

| | | | |
|----------------|------------|------------|------------|
| Feed Rate: | 1,200 ipm | 20 ips | 31 mpm |
| Decent Rate: | 300 ipm | 5 ips | 8 mpm |
| Spindle Speed: | 16,000 rpm | 16,000 rpm | 16,275 rpm |
| Chip Load: | 0.025 | 0.025 | 0.025 |

1350 - ½ Down Cut, Two Flute

| | | | |
|----------------|------------|------------|------------|
| Feed Rate: | 960 ipm | 16 ips | 25 mpm |
| Decent Rate: | 300 ipm | 5 ips | 8 mpm |
| Spindle Speed: | 18,675 rpm | 18,675 rpm | 19,150 rpm |
| Chip Load: | 0.0257 | 0.0257 | 0.0257 |
| Feed Rate: | 900 ipm | 15 ips | 23 mpm |
| Decent Rate: | 300 ipm | 5 ips | 8 mpm |
| Spindle Speed: | 17,500 rpm | 17,500 rpm | 17,500 rpm |
| Chip Load: | 0.0257 | 0.0257 | 0.0257 |

1950 - ½ Down Cut, Three Flute

| | | | |
|----------------|------------|------------|------------|
| Feed Rate: | 1,200 ipm | 20 ips | 31 mpm |
| Decent Rate: | 300 ipm | 5 ips | 8 mpm |
| Spindle Speed: | 16,000 rpm | 16,000 rpm | 16,275 rpm |
| Chip Load: | 0.025 | 0.025 | 0.025 |

1330 - ¼ Down Cut, Two Flute

| | | | |
|----------------|------------|------------|------------|
| Feed Rate: | 480 ipm | 8 ips | 12 mpm |
| Decent Rate: | 240 ipm | 4 ips | 6 mpm |
| Spindle Speed: | 18,000 rpm | 18,000 rpm | 18,000 rpm |
| Chip Load: | 0.013 | 0.013 | 0.013 |

1320 - $\frac{3}{16}$ Down Cut, Two Flute, $\frac{1}{4}$ Shank

| | | | |
|----------------|------------|------------|------------|
| Feed Rate: | 360 ipm | 6 ips | 9 mpm |
| Decent Rate: | 180 ipm | 3 ips | 5 mpm |
| Spindle Speed: | 18,000 rpm | 18,000 rpm | 17,715 rpm |
| Chip Load: | 0.010 | 0.010 | 0.010 |

1310 - $\frac{1}{8}$ Down Cut, Two Flute, $\frac{1}{4}$ Shank

| | | | |
|----------------|------------|------------|------------|
| Feed Rate: | 240 ipm | 4 ips | 6 mpm |
| Decent Rate: | 180 ipm | 3 ips | 5 mpm |
| Spindle Speed: | 20,000 rpm | 20,000 rpm | 19,685 rpm |
| Chip Load: | 0.006 | 0.006 | 0.006 |

| | | | |
|----------------|------------|------------|------------|
| Feed Rate: | 180 ipm | 3 ips | 5 mpm |
| Decent Rate: | 180 ipm | 3 ips | 5 mpm |
| Spindle Speed: | 15,000 rpm | 15,000 rpm | 16,400 rpm |
| Chip Load: | 0.006 | 0.006 | 0.006 |

7060 - 45° Insert V-Groove Cutter, $\frac{3}{4}$ Shank (Replacement Insert Number: IVB-40)

| | | | |
|----------------|------------|------------|------------|
| Feed Rate: | 240 ipm | 4 ips | 6 mpm |
| Decent Rate: | 240 ipm | 4 ips | 6 mpm |
| Spindle Speed: | 15,000 rpm | 15,000 rpm | 15,000 rpm |

7080 - 22 $\frac{1}{2}$ ° Insert V-Groove Cutter, $\frac{1}{2}$ Shank (Replacement Insert Number: IVB-20)

| | | | |
|----------------|------------|------------|------------|
| Feed Rate: | 240 ipm | 4 ips | 6 mpm |
| Decent Rate: | 240 ipm | 4 ips | 6 mpm |
| Spindle Speed: | 15,000 rpm | 15,000 rpm | 15,000 rpm |

7030 - 3" Insert Spoilboard Cutter, $\frac{3}{4}$ Shank (Replacement Insert Number: 13273)

| | | | |
|----------------|------------|------------|------------|
| Feed Rate: | 600 ipm | 10 ips | 15 mpm |
| Decent Rate: | 120 ipm | 2 ips | 3 mpm |
| Spindle Speed: | 15,000 rpm | 15,000 rpm | 15,000 rpm |

The Vortex router bits listed above are generic and can be supplied by the tooling manufacturer of your choice.

Carbide Tipped Drill Bits

4mm x 70mm Thru-Hole drills - One Required in the Cross Cut Axes

Left Hand: DTH04070LO

Right Hand: DTH04070RB

Feed Rate: 240 ipm 4 ips 6 mpm

Spindle Speed: 4,000 rpm 4,000 rpm 4,000 rpm

5mm x 57mm Brad Point drills - Per Quantity of Drill Positions in the Rip Axes

Left Hand: DDB05057LO

Right Hand: DDB05057RB

Feed Rate: 240 ipm 4 ips 6 mpm

Spindle Speed: 4,000 rpm 4,000 rpm 4,000 rpm

5mm x 70mm Thru-Hole drills - One Required in the Cross Cut Axes

Left Hand: DTH05070LO

Right Hand: DTH05070RB

Feed Rate: 240 ipm 4 ips 6 mpm

Spindle Speed: 4,000 rpm 4,000 rpm 4,000 rpm

6mm x 70mm Thru-Hole drills - One Required in the Cross Cut Axes

Left Hand: DTH06070LO

Right Hand: DTH06070RB

Feed Rate: 240 ipm 4 ips 6 mpm

Spindle Speed: 4,000 rpm 4,000 rpm 4,000 rpm

8mm x 57mm Brad Point drills - One Required in the Cross Cut Axes

Left Hand: DDB08057LO

Right Hand: DDB08057RB

Feed Rate: 240 ipm 4 ips 6 mpm

Spindle Speed: 4,000 rpm 4,000 rpm 4,000 rpm

The Vortex drill bits listed above are generic and can be supplied by the tooling manufacturer of your choice.

The following information should be used as a guideline or starting point. Actual Feed Rates (ipm) and Spindle Speeds (rpm) will vary as a result of “contributing factors” such as machine rigidity, horsepower, spindle integrity, vacuum holding power and the quality of the material being cut. In general, solid carbide spiral tooling will perform better at faster Feed Rates.

Feed Rates are measured in Inches Per Minute = ipm

Spindle Speeds are measured in Revolutions Per Minute = rpm

Chip Load is a measurement of the chip size of the material being removed by each flute during a cut.

In general, normal operating spindle speeds are between 10,000 and 20,000 rpm. Usually, the higher the rpm, the cleaner the cut. However, the higher the rpm, the greater the friction generated between the tool and the material. Friction is what causes a cutting edge to become dull. The objective is the correct balance of the fastest Feed Rate at the slowest Spindle Speed within the Chip Load range of the type of material to be milled, that will yield a clean cut, without breaking or prematurely dulling the bit.

| | |
|---|-----------------------------------|
| 1/8” Tool Diameter for Plywood Core | Chip Load = .004” to .007” |
| 1/8” Tool Diameter for Particle Board | Chip Load = .004” to .007” |
| 1/4” Tool Diameter for Plywood Core | Chip Load = .011” to .013” |
| 1/4” Tool Diameter for Particle Board | Chip Load = .013” to .016” |
| 3/8” Tool Diameter for Plywood Core | Chip Load = .017” to .020” |
| 3/8” Tool Diameter for Particle Board | Chip Load = .020” to .023” |
| 1/2” (and larger) Tool Diameter for Plywood Core | Chip Load = .021” to .025” |
| 1/2” (and larger) Tool Diameter for Particle Board | Chip Load = .025” to .027” |

Formulas:

Chip Load = ipm / (rpm x number of flutes)

Feed Rate (ipm) = rpm x number of flutes x chip load

Spindle Speed (rpm) = ipm / (number of flutes x chip load)

Inches Per Second (ips) = Inches Per Minute (ipm) / 60

Meters Per Minute (mpm) = Inches Per Minute (ipm) / 39.374