

## Slot Milling - 2 fl. Reg length, 2 fl. Stub length, 2 fl. Double End Reg & Stub length, 2 fl. Corner Radius

- Notes:**
- Increase Speeds and Feeds 20% for 3 fl. Reg. Length
  - Reduce Speeds and Feeds 25% for 2 fl. Long length
  - Reduce Speeds and Feeds 50% for 2 fl. Extra long length

| Hardness      |      | Tensile Strength: Up to 750N/mm <sup>2</sup> |             | Up to 30 HRC               |             | 30 to 38 HRC                                    |             | 38 to 45 HRC   |             |   |             |                 |             |
|---------------|------|--|-------------|----------------------------|-------------|---|-------------|--|-------------|---|-------------|-----------------|-------------|
| Work Material |      | Cast Iron                                    |             | Mild Steels, Carbon Steels |             | Alloy Steels, Tool Steels, Ti Alloys (Annealed) |             | Hardened Steels, Prehardened Steels, Ti Alloys (Solution Treated and Aged) |             | Hardened Steels, Prehardened Steels, Stainless Steels, Inconel, Ni Based Alloys |             | Aluminum Alloys |             |
| Depth of Cut  |      |  |             | Ad                         |             | D < 1/8   |             | 0.3D   |             |   |             |                 |             |
|               |      |  |             |                            |             | 1/8 ≤ D   |             | 0.5D   |             |   |             |                 |             |
| Dia. (in)     | (mm) | 170 SFM                                      |             | 155 SFM                    |             | 130 SFM   |             | 110 SFM  |             | 90 SFM  |             | 390 SFM         |             |
|               |      | Speed RPM                                    | Feed in/min | Speed RPM                  | Feed in/min | Speed RPM                                       | Feed in/min | Speed RPM  | Feed in/min | Speed RPM   | Feed in/min | Speed RPM       | Feed in/min |
|               | 0.5  | 32,000                                       | 6.6         | 30,000                     | 4.5         | 25,230  | 1.9         | 21,350   | 1.4         | 16,890  | 1.2         | 50,000          | 9.4         |
| 1/32          | 0.8  | 20,790                                       | 6.6         | 18,950                     | 4.5         | 15,900  | 1.9         | 13,450   | 1.4         | 10,640  | 1.2         | 47,700          | 9.4         |
|               | 1    | 16,800                                       | 6.6         | 15,000                     | 4.5         | 12,600  | 1.9         | 10,680   | 1.4         | 8,400   | 1.2         | 37,800          | 9.4         |
| 3/64          |      | 15,225                                       | 6.6         | 13,590                     | 4.5         | 11,430  | 1.9         | 9,660  | 1.4         | 7,595   | 1.2         | 34,140          | 9.4         |
| 1/16          | 1.5  | 11,970                                       | 6.6         | 10,660                     | 4.6         | 9,000   | 2.0         | 7,540  | 1.4         | 5,925   | 1.2         | 26,520          | 9.4         |
| 5/64          | 2    | 8,705  | 6.6         | 7,730                      | 4.7         | 6,570   | 2.1         | 5,415  | 1.4         | 4,260   | 1.2         | 18,900          | 9.4         |
| 3/32          |      | 7,480  | 6.8         | 6,635                      | 4.7         | 5,650   | 2.4         | 4,650  | 1.4         | 3,645   | 1.2         | 16,305          | 9.4         |
| 7/64          |      | 6,335  | 6.9         | 5,610                      | 4.7         | 4,790   | 2.6         | 3,935  | 1.4         | 3,075   | 1.2         | 13,925          | 9.4         |
| 1/8           | 3    | 5,445  | 7.1         | 4,815                      | 4.7         | 4,125   | 3.0         | 3,375  | 1.4         | 2,640   | 1.2         | 12,060          | 10.3        |
| 9/64          |      | 4,870  | 7.3         | 4,310                      | 4.7         | 3,700   | 3.4         | 3,020  | 1.4         | 2,380   | 1.2         | 10,845          | 12.1        |
| 5/32          | 4    | 4,300  | 7.5         | 3,815                      | 4.7         | 3,270   | 3.7         | 2,660  | 1.4         | 2,115   | 1.2         | 9,630           | 14.0        |
| 11/64         |      | 3,945  | 7.6         | 3,490                      | 4.7         | 2,990   | 3.8         | 2,440  | 1.4         | 1,940   | 1.2         | 8,835           | 14.2        |
| 3/16          |      | 3,615  | 7.7         | 3,180                      | 4.7         | 2,735   | 3.8         | 2,225  | 1.4         | 1,775   | 1.2         | 8,075           | 14.2        |
| 13/64         | 5    | 3,320  | 8.0         | 2,920                      | 4.7         | 2,505   | 3.8         | 2,040  | 1.4         | 1,630   | 1.2         | 7,415           | 14.2        |
| 7/32          |      | 3,080  | 8.6         | 2,730                      | 4.7         | 2,345   | 3.8         | 1,895  | 1.4         | 1,510   | 1.2         | 6,915           | 14.2        |
| 1/4           | 6    | 2,690  | 9.5         | 2,400                      | 4.7         | 2,060   | 3.8         | 1,660  | 1.4         | 1,320   | 1.2         | 6,070           | 14.2        |
| 9/32          |      | 2,405  | 10.2        | 2,140                      | 4.7         | 1,845   | 3.8         | 1,490  | 1.4         | 1,185   | 1.2         | 5,430           | 14.2        |
| 5/16          | 8    | 2,115  | 10.8        | 1,875                      | 4.7         | 1,630   | 3.8         | 1,330  | 1.4         | 1,055   | 1.2         | 4,785           | 14.2        |
| 11/32         |      | 1,940  | 10.9        | 1,725                      | 4.7         | 1,485   | 3.8         | 1,220  | 1.4         | 970   | 1.2         | 4,385           | 14.2        |
| 3/8           |      | 1,775  | 10.9        | 1,580                      | 4.7         | 1,340   | 3.8         | 1,120  | 1.4         | 885   | 1.2         | 4,005           | 14.2        |
| 13/32         | 10   | 1,630  | 10.9        | 1,455                      | 4.7         | 1,230   | 3.8         | 1,035  | 1.4         | 815   | 1.2         | 3,680           | 14.2        |
| 7/16          |      | 1,510  | 10.9        | 1,360                      | 4.7         | 1,155   | 3.8         | 965  | 1.4         | 755   | 1.2         | 3,440           | 14.2        |
| 1/2           | 12   | 1,310  | 10.9        | 1,190                      | 4.7         | 1,020   | 3.8         | 840  | 1.4         | 660   | 1.2         | 3,010           | 14.2        |
| 9/16          |      | 1,175  | 10.9        | 1,060                      | 4.7         | 905   | 3.8         | 740  | 1.4         | 585   | 1.2         | 2,645           | 14.2        |
| 5/8           | 16   | 1,080  | 11.1        | 960                        | 4.7         | 815   | 3.8         | 670  | 1.6         | 520   | 1.2         | 2,355           | 14.2        |
| 11/16         |      | 980  | 11.1        | 870                        | 4.7         | 740   | 3.8         | 610  | 1.7         | 470   | 1.2         | 2,160           | 14.2        |
| 3/4           | 20   | 880  | 11.1        | 780                        | 4.7         | 665   | 3.8         | 545  | 1.7         | 425   | 1.2         | 1,920           | 14.2        |
| 7/8           | 22   | 765  | 11.1        | 675                        | 4.7         | 580   | 3.8         | 480  | 1.7         | 370   | 1.2         | 1,660           | 14.2        |
| 1             | 25   | 670  | 10.9        | 590                        | 4.7         | 500   | 3.8         | 420  | 1.7         | 330   | 1.2         | 1,475           | 14.2        |

- For side milling, increase Feeds 25% or more.

## Slot Milling - 2 fl. Miniature Endmills

| Hardness      |       | Tensile Strength: Up to 750N/mm <sup>2</sup> |             | Up to 30 HRC               |             | 30 to 38 HRC                                    |             | 38 to 45 HRC   |             |   |             |                 |             |               |             |
|---------------|-------|--|-------------|----------------------------|-------------|---|-------------|--|-------------|---|-------------|-----------------|-------------|---------------|-------------|
| Work Material |       | Cast Iron                                    |             | Mild Steels, Carbon Steels |             | Alloy Steels, Tool Steels, Ti Alloys (Annealed) |             | Hardened Steels, Prehardened Steels, Ti Alloys (Solution Treated and Aged) |             | Hardened Steels, Prehardened Steels, Stainless Steels, Inconel, Ni Based Alloys |             | Aluminum Alloys |             | Copper Alloys |             |
| Depth of Cut  |       |  |             | Ad                         |             | D < 0.04  |             | 0.1D   |             |   |             |                 |             |               |             |
|               |       |  |             |                            |             | 0.04 ≤ D  |             | 0.3D   |             |   |             |                 |             |               |             |
| Dia. (in)     |       | 145 SFM                                      |             | 130 SFM                    |             | 110 SFM   |             | 90 SFM   |             | 70 SFM  |             | 330 SFM         |             | 130 SFM       |             |
|               |       | Speed RPM                                    | Feed in/min | Speed RPM                  | Feed in/min | Speed RPM                                       | Feed in/min | Speed RPM  | Feed in/min | Speed RPM   | Feed in/min | Speed RPM       | Feed in/min | Speed RPM     | Feed in/min |
|               | 0.015 | 31,500                                       | 2.2         | 31,500                     | 2.2         | 27,425  | 1.5         | 22,900   | 0.9         | 18,210  | 0.7         | 32,000          | 3.0         | 31,500        | 2.2         |
|               | 0.020 | 27,180                                       | 2.7         | 25,830                     | 2.4         | 22,140  | 1.6         | 17,950   | 1.0         | 14,260  | 0.8         | 32,000          | 4.0         | 25,830        | 2.4         |
|               | 0.025 | 22,450                                       | 3.0         | 20,035                     | 2.6         | 17,210  | 1.6         | 13,885   | 1.0         | 11,015  | 0.8         | 32,000          | 5.0         | 20,035        | 2.6         |
|               | 0.030 | 18,640                                       | 3.1         | 16,545                     | 2.7         | 14,355  | 1.6         | 11,665   | 1.0         | 9,270   | 0.8         | 32,000          | 6.0         | 16,545        | 2.7         |
|               | 0.035 | 15,940                                       | 3.4         | 14,165                     | 3.0         | 12,165  | 1.6         | 10,065   | 1.1         | 7,970   | 0.9         | 32,000          | 7.1         | 14,165        | 3.0         |
|               | 0.040 | 13,800                                       | 3.7         | 12,340                     | 3.3         | 10,380  | 1.6         | 8,780  | 1.2         | 6,900   | 1.0         | 31,560          | 8.0         | 12,340        | 3.3         |
|               | 0.045 | 12,210                                       | 3.7         | 11,070                     | 3.3         | 9,425   | 1.6         | 7,825  | 1.2         | 6,140   | 1.0         | 28,065          | 7.9         | 11,070        | 3.3         |
|               | 0.050 | 11,325                                       | 3.7         | 9,990                      | 3.3         | 8,545   | 1.6         | 7,030  | 1.2         | 5,520   | 1.0         | 25,100          | 7.9         | 9,990         | 3.3         |
|               | 0.055 | 11,005                                       | 3.7         | 9,070                      | 3.3         | 7,715   | 1.7         | 6,365  | 1.2         | 5,010   | 1.0         | 22,560          | 7.9         | 9,070         | 3.3         |
|               | 0.060 | 9,725  | 3.9         | 8,365                      | 3.5         | 7,110   | 1.8         | 5,850  | 1.2         | 4,595   | 1.0         | 20,640          | 7.9         | 8,365         | 3.3         |

# SUGGESTED SPEEDS AND FEEDS - 4 FL. SQUARE END & 4 FL. CORNER RADIUS AND 3 FL. 60° BLUE SERIES CARBIDE END MILLS

## Side Milling - 4 fl. Reg length, 4 fl. Stub length, 4 fl. Double End Reg & Stub length, 4 fl. Corner Radius

- Notes:**
- Reduce Speeds and Feeds 25% for 4 fl. **LONG LENGTH**
  - Reduce Speeds and Feeds 50% for 4 fl. **EXTRA LONG LENGTH**

| Hardness      |      | Tensile Strength: Up to 750N/mm2                         |             | Up to 30 HRC               |             | 30 to 38 HRC                                    |             | 38 to 45 HRC   |             |   |             |                 |             |
|---------------|------|--|-------------|----------------------------|-------------|---|-------------|--|-------------|---|-------------|-----------------|-------------|
| Work Material |      | Cast Iron  |             | Mild Steels, Carbon Steels |             | Alloy Steels, Tool Steels, Ti Alloys (Annealed) |             | Hardened Steels, Prehardened Steels, Ti Alloys (Solution Treated and Aged) |             | Hardened Steels, Prehardened Steels, Stainless Steels, Inconel, Ni Based Alloys |             | Aluminum Alloys |             |
| Depth of Cut  |      | <p><math>Ad = 1.5D</math><br/><math>Rd = 0.1D</math></p> |             |                            |             |   |             |  |             |   |             |                 |             |
| Dia. (in)     | (mm) | 160 SFM  |             | 175 SFM                    |             | 130 SFM   |             | 120 SFM  |             | 95 SFM  |             | 470 SFM         |             |
|               |      | Speed RPM  | Feed in/min | Speed RPM                  | Feed in/min | Speed RPM                                       | Feed in/min | Speed RPM  | Feed in/min | Speed RPM   | Feed in/min | Speed RPM       | Feed in/min |
| 1/32          | 0.5  | 32,000   | 23.9        | 32,000                     | 11.8        | 25,240  | 10.9        | 23,300   | 4.5         | 19,400  | 3.5         | 50,000          | 39.4        |
|               | 0.8  | 21,150   | 23.9        | 23,240                     | 11.8        | 15,900  | 10.9        | 14,600   | 4.5         | 12,200  | 3.5         | 50,000          | 39.4        |
|               | 1    | 15,600   | 23.9        | 17,400                     | 11.8        | 12,600  | 10.9        | 11,400   | 4.5         | 9,000   | 3.5         | 44,400          | 39.4        |
| 3/64          |      | 14,140   | 23.9        | 15,680                     | 11.8        | 11,390  | 10.9        | 10,305   | 4.5         | 8,145   | 3.5         | 40,275          | 39.4        |
| 1/16          | 1.5  | 11,115   | 23.9        | 12,105                     | 11.8        | 8,895   | 10.9        | 8,045  | 4.5         | 6,390   | 3.5         | 31,710          | 39.4        |
| 5/64          | 2    | 8,090  | 23.9        | 8,535                      | 11.8        | 6,395   | 10.9        | 5,780  | 4.5         | 4,625   | 3.5         | 23,135          | 39.4        |
| 3/32          |      | 6,970  | 23.9        | 7,320                      | 12.6        | 5,495   | 10.9        | 4,965  | 4.4         | 3,960   | 3.4         | 19,820          | 40.6        |
| 7/64          |      | 5,920  | 23.9        | 6,200                      | 13.5        | 4,660   | 10.9        | 4,205  | 4.3         | 3,340   | 3.4         | 16,725          | 41.8        |
| 1/8           | 3    | 5,090  | 24.6        | 5,330                      | 14.4        | 4,005   | 10.9        | 3,610  | 4.3         | 2,870   | 3.3         | 14,370          | 42.9        |
| 9/64          |      | 4,545  | 26.3        | 4,785                      | 15.4        | 3,580   | 10.9        | 3,225  | 4.3         | 2,585   | 3.3         | 12,935          | 43.8        |
| 5/32          | 4    | 4,000  | 28.0        | 4,240                      | 16.4        | 3,150   | 10.9        | 2,850  | 4.3         | 2,295   | 3.3         | 11,505          | 44.8        |
| 11/64         |      | 3,670  | 28.1        | 3,885                      | 16.9        | 2,895   | 11.2        | 2,620  | 4.3         | 2,100   | 3.3         | 10,565          | 45.2        |
| 3/16          |      | 3,360  | 28.1        | 3,555                      | 17.2        | 2,655   | 11.6        | 2,405  | 4.3         | 1,910   | 3.3         | 9,660           | 45.6        |
| 13/64         | 5    | 3,090  | 28.1        | 3,260                      | 17.6        | 2,445   | 11.8        | 2,205  | 4.3         | 1,750   | 3.3         | 8,880           | 46.0        |
| 7/32          |      | 2,870  | 28.1        | 3,020                      | 17.9        | 2,285   | 11.8        | 2,045  | 4.3         | 1,630   | 3.3         | 8,280           | 46.3        |
| 1/4           | 6    | 2,520  | 28.1        | 2,640                      | 18.2        | 2,000   | 11.8        | 1,775  | 4.3         | 1,430   | 3.3         | 7,280           | 46.8        |
| 9/32          |      | 2,260  | 28.1        | 2,380                      | 18.3        | 1,785   | 11.8        | 1,580  | 4.3         | 1,295   | 3.3         | 6,520           | 47.0        |
| 5/16          | 8    | 1,995  | 28.1        | 2,115                      | 18.4        | 1,570   | 11.8        | 1,390  | 4.3         | 1,150   | 3.3         | 5,760           | 47.2        |
| 11/32         |      | 1,820  | 28.3        | 1,940                      | 19.4        | 1,445   | 11.8        | 1,290  | 4.3         | 1,055   | 3.3         | 5,280           | 47.2        |
| 3/8           |      | 1,655  | 28.6        | 1,775                      | 20.4        | 1,325   | 11.8        | 1,200  | 4.3         | 965   | 3.3         | 4,830           | 47.2        |
| 13/32         | 10   | 1,515  | 28.9        | 1,630                      | 21.0        | 1,220   | 11.8        | 1,110  | 4.3         | 885   | 3.3         | 4,430           | 48.0        |
| 7/16          |      | 1,420  | 29.1        | 1,510                      | 21.1        | 1,140   | 11.8        | 1,035  | 4.3         | 825   | 3.3         | 4,120           | 49.8        |
| 1/2           | 12   | 1,250  | 30.9        | 1,310                      | 22.5        | 995   | 12.2        | 900  | 4.3         | 720   | 3.3         | 3,585           | 52.0        |
| 9/16          |      | 1,120  | 34.3        | 1,175                      | 24.9        | 880   | 13.1        | 795  | 4.3         | 635   | 3.3         | 3,170           | 52.0        |
| 5/8           | 16   | 1,005  | 35.5        | 1,055                      | 25.7        | 790   | 13.8        | 720  | 4.3         | 570   | 3.3         | 2,840           | 52.0        |
| 11/16         |      | 915  | 38.4        | 960                        | 25.9        | 720   | 13.9        | 650  | 4.3         | 515   | 3.3         | 2,595           | 52.0        |
| 3/4           | 20   | 820  | 39.4        | 860                        | 26.3        | 640   | 13.9        | 580  | 4.1         | 465   | 3.3         | 2,340           | 52.0        |
| 7/8           | 22   | 710  | 35.5        | 750                        | 23.6        | 560   | 12.6        | 510  | 3.7         | 405   | 3.0         | 2,015           | 49.1        |
| 1             | 25   | 630  | 31.2        | 660                        | 20.7        | 490   | 10.9        | 440  | 3.3         | 360   | 2.6         | 1,775           | 43.5        |

- For slot milling, reduce Feeds 20% to 50%.

### 3 Flute 60° High Helix

#### Side Milling

#### Slotting

| Work Material |    | Aluminum   |             | Medium Carbon Steels Mild Steels |             | Pre-hardened Steels Stainless Steels Die & Alloy Steels  |             | Pre-hardened Steels Stainless Steels Die & Alloy Steels |             | Hardened Steels   |             | Medium Carbon Steels Mild Steels |             | Pre-hardened Steels Stainless Steels Die & Alloy Steels |             | Pre-hardened Steels Stainless Steels Die & Alloy Steels |             | Hardened Steels               |             |  |  |
|---------------|----|--|-------------|----------------------------------|-------------|--|-------------|---|-------------|---|-------------|----------------------------------|-------------|---|-------------|---|-------------|-------------------------------|-------------|--|--|
| Hardness      |    |  |             |                                  |             | < HRC35  |             | HRC35-45  |             | HRC45-55  |             |                                  |             | < HRC35   |             | HRC35-45  |             | HRC45-55                      |             |  |  |
| Depth of Cut  |    | <p><math>Ad = 1.5D</math><br/><math>Rd = 0.1D</math></p> |             |                                  |             | <p><math>Ad = 1.5D</math><br/><math>Rd = 0.1D</math></p> |             |   |             | <p>up to 1/2" <math>Ad = 1.0D</math><br/>over 1/2" <math>Ad = 0.5D</math></p> |             |                                  |             | <p><math>Ad = 0.5D</math></p>                           |             |   |             | <p><math>Ad = 0.5D</math></p> |             |  |  |
| Dia. (inch)   | mm | 390-460 SFM  |             | 130-164 SFM                      |             | Up to 100 SFM  |             | Up to 66 SFM  |             | Up to 50 SFM  |             | 110-140 SFM                      |             | Up to 85 SFM  |             | Up to 56 SFM  |             | Up to 43 SFM                  |             |  |  |
|               |    | Speed RPM  | Feed in/min | Speed RPM                        | Feed in/min | Speed RPM  | Feed in/min | Speed RPM   | Feed in/min | Speed RPM   | Feed in/min | Speed RPM                        | Feed in/min | Speed RPM   | Feed in/min | Speed RPM   | Feed in/min | Speed RPM                     | Feed in/min |  |  |
| 1/4           | 6  | 6900   | 21.7        | 2400                             | 10.6        | 1600   | 6.7         | 1060  | 3.0         | 800   | 1.2         | 2040                             | 7.9         | 1360  | 4.7         | 900   | 2.0         | 680                           | 0.8         |  |  |
| 5/16          | 8  | 5200   | 21.7        | 1800                             | 10.6        | 1200   | 6.7         | 800   | 3.0         | 600   | 1.2         | 1530                             | 7.9         | 1020  | 4.7         | 680   | 2.0         | 510                           | 0.8         |  |  |
| 3/8           | 10 | 4200   | 23.6        | 1400                             | 13.4        | 950  | 6.7         | 640   | 3.0         | 480   | 1.2         | 1190                             | 9.1         | 810   | 4.7         | 540   | 2.0         | 410                           | 0.8         |  |  |
| 1/2           | 12 | 3500   | 23.6        | 1200                             | 14.2        | 800  | 7.1         | 530   | 3.0         | 400   | 1.2         | 1020                             | 9.8         | 680   | 5.1         | 450   | 2.0         | 340                           | 0.8         |  |  |
| 5/8           | 16 | 2600   | 23.6        | 900                              | 15.7        | 600  | 7.1         | 400   | 3.0         | 300   | 1.2         | 760                              | 10.6        | 510   | 5.1         | 340   | 2.0         | 260                           | 0.8         |  |  |
| 3/4           | 20 | 2100   | 23.6        | 720                              | 16.1        | 480  | 7.9         | 320   | 3.0         | 240   | 1.2         | 620                              | 11.0        | 410   | 5.5         | 270   | 2.0         | 200                           | 0.8         |  |  |
| 1             | 25 | 1700   | 23.6        | 580                              | 13.8        | 380  | 7.1         | 250   | 3.0         | 190   | 1.2         | 500                              | 9.4         | 320   | 5.1         | 210   | 2.0         | 160                           | 0.8         |  |  |

## Profiling - 2 fl. Reg length, 2 fl. Stub length, 2 fl. Double End Reg & Stub length Ball Nose Endmills

| Hardness      |      | Tensile Strength:<br>Up to 750N/mm <sup>2</sup> |                | Up to 30 HRC               |                | 30 to 38 HRC  |                | 38 to 45 HRC   |                |   |                |                 |                |  |      |      |  |  |  |  |  |  |
|---------------|------|---|----------------|----------------------------|----------------|---|----------------|--|----------------|---|----------------|-----------------|----------------|--|------|------|--|--|--|--|--|--|
| Work Material |      | Cast Iron                                       |                | Mild Steels, Carbon Steels |                | Alloy Steels, Tool Steels, Ti Alloys (Annealed)   |                | Hardened Steels, Prehardened Steels, Ti Alloys (Solution Treated and Aged) |                | Hardened Steels, Prehardened Steels, Stainless Steels, Inconel, Ni Based Alloys |                | Aluminum Alloys |                |  |      |      |  |  |  |  |  |  |
| Depth of Cut  |      |   |                |                            |                | <table border="1"> <tr> <td>D &lt; 1/8</td> <td>Ad</td> <td>pf</td> </tr> <tr> <td>1/8 ≤ D</td> <td>0.1D</td> <td>0.2D</td> </tr> <tr> <td></td> <td>0.3D</td> <td>0.7D</td> </tr> </table> |                | D < 1/8  | Ad             | pf  | 1/8 ≤ D        | 0.1D            | 0.2D           |  | 0.3D | 0.7D |  |  |  |  |  |  |
| D < 1/8       | Ad   | pf  |                |                            |                |   |                |  |                |   |                |                 |                |  |      |      |  |  |  |  |  |  |
| 1/8 ≤ D       | 0.1D | 0.2D  |                |                            |                |   |                |  |                |   |                |                 |                |  |      |      |  |  |  |  |  |  |
|               | 0.3D | 0.7D  |                |                            |                |   |                |  |                |   |                |                 |                |  |      |      |  |  |  |  |  |  |
| Dia. (in)     | (mm) | 160 SFM   |                | 160 SFM                    |                | 120 SFM   |                | 100 SFM  |                | 80 SFM  |                | 490 SFM         |                |  |      |      |  |  |  |  |  |  |
|               |      | Speed<br>RPM                                    | Feed<br>in/min | Speed<br>RPM               | Feed<br>in/min | Speed<br>RPM  | Feed<br>in/min | Speed<br>RPM   | Feed<br>in/min | Speed<br>RPM  | Feed<br>in/min | Speed<br>RPM    | Feed<br>in/min |  |      |      |  |  |  |  |  |  |
|               | 0.5  | 31,000  | 4.8            | 31,000                     | 4.5            | 23,300  | 2.5            | 19,400   | 1.2            | 15,500  | 0.9            | 50,000          | 6.8            |  |      |      |  |  |  |  |  |  |
| 1/32          | 0.8  | 19,600  | 4.8            | 19,600                     | 4.5            | 14,680  | 2.5            | 12,200   | 1.2            | 9,780   | 0.9            | 50,000          | 6.8            |  |      |      |  |  |  |  |  |  |
|               | 1    | 15,600  | 5.0            | 15,600                     | 4.7            | 11,400  | 2.8            | 9,540  | 1.4            | 7,620   | 0.9            | 38,400          | 7.1            |  |      |      |  |  |  |  |  |  |
| 3/64          |      | 14,140  | 5.2            | 14,140                     | 4.8            | 10,305  | 3.0            | 8,620  | 1.5            | 6,885   | 1.0            | 35,535          | 8.0            |  |      |      |  |  |  |  |  |  |
| 1/16          | 1.5  | 11,115  | 5.8            | 11,115                     | 5.1            | 8,045   | 3.4            | 6,720  | 1.7            | 5,360   | 1.2            | 29,585          | 9.8            |  |      |      |  |  |  |  |  |  |
| 5/64          | 2    | 8,090   | 6.3            | 8,090                      | 5.4            | 5,780   | 3.7            | 4,810  | 1.8            | 3,840   | 1.4            | 23,630          | 11.7           |  |      |      |  |  |  |  |  |  |
| 3/32          |      | 6,970   | 6.5            | 6,970                      | 5.7            | 4,965   | 3.9            | 4,140  | 1.9            | 3,290   | 1.4            | 20,420          | 11.8           |  |      |      |  |  |  |  |  |  |
| 7/64          |      | 5,920   | 6.7            | 5,920                      | 6.0            | 4,205   | 4.1            | 3,520  | 1.9            | 2,795   | 1.4            | 17,325          | 11.8           |  |      |      |  |  |  |  |  |  |
| 1/8           | 3    | 5,090   | 7.2            | 5,090                      | 6.1            | 3,610   | 4.3            | 3,030  | 1.9            | 2,400   | 1.4            | 14,945          | 11.8           |  |      |      |  |  |  |  |  |  |
| 9/64          |      | 4,545   | 7.9            | 4,545                      | 6.2            | 3,225   | 4.3            | 2,690  | 1.9            | 2,140   | 1.4            | 13,470          | 11.8           |  |      |      |  |  |  |  |  |  |
| 5/32          | 4    | 4,000   | 8.6            | 4,000                      | 6.3            | 2,850   | 4.3            | 2,360  | 1.9            | 1,875   | 1.4            | 11,990          | 11.8           |  |      |      |  |  |  |  |  |  |
| 11/64         |      | 3,670   | 9.2            | 3,670                      | 6.6            | 2,620   | 4.3            | 2,160  | 1.9            | 1,725   | 1.4            | 11,020          | 12.7           |  |      |      |  |  |  |  |  |  |
| 3/16          |      | 3,360   | 9.6            | 3,360                      | 6.9            | 2,405   | 4.4            | 1,970  | 1.9            | 1,580   | 1.4            | 10,090          | 13.6           |  |      |      |  |  |  |  |  |  |
| 13/64         | 5    | 3,090   | 10.1           | 3,090                      | 7.1            | 2,205   | 4.4            | 1,810  | 1.9            | 1,455   | 1.4            | 9,275           | 14.2           |  |      |      |  |  |  |  |  |  |
| 7/32          |      | 2,870   | 10.4           | 2,870                      | 7.1            | 2,045   | 4.3            | 1,690  | 1.9            | 1,360   | 1.4            | 8,630           | 14.2           |  |      |      |  |  |  |  |  |  |
| 1/4           | 6    | 2,520   | 11.3           | 2,520                      | 6.9            | 1,775   | 4.2            | 1,490  | 1.9            | 1,205   | 1.4            | 7,570           | 14.6           |  |      |      |  |  |  |  |  |  |
| 9/32          |      | 2,260   | 12.5           | 2,260                      | 6.4            | 1,580   | 4.1            | 1,350  | 1.9            | 1,080   | 1.4            | 6,785           | 15.5           |  |      |      |  |  |  |  |  |  |
| 5/16          | 8    | 1,995   | 13.6           | 1,995                      | 5.9            | 1,390   | 4.0            | 1,200  | 1.9            | 960   | 1.4            | 6,000           | 16.4           |  |      |      |  |  |  |  |  |  |
| 11/32         |      | 1,820   | 13.7           | 1,820                      | 5.8            | 1,290   | 4.0            | 1,100  | 1.9            | 880   | 1.4            | 5,495           | 16.5           |  |      |      |  |  |  |  |  |  |
| 3/8           |      | 1,655   | 13.7           | 1,655                      | 5.7            | 1,200   | 4.0            | 1,005  | 1.9            | 800   | 1.4            | 5,020           | 16.5           |  |      |      |  |  |  |  |  |  |
| 13/32         | 10   | 1,515   | 13.7           | 1,515                      | 5.6            | 1,110   | 3.9            | 920  | 1.9            | 735   | 1.4            | 4,610           | 16.9           |  |      |      |  |  |  |  |  |  |
| 7/16          |      | 1,420   | 13.7           | 1,420                      | 5.4            | 1,035   | 3.7            | 855  | 1.9            | 690   | 1.4            | 4,300           | 17.8           |  |      |      |  |  |  |  |  |  |
| 1/2           | 12   | 1,250   | 13.7           | 1,250                      | 5.2            | 900   | 3.5            | 750  | 1.9            | 600   | 1.4            | 3,750           | 18.9           |  |      |      |  |  |  |  |  |  |
| 9/16          |      | 1,120   | 13.9           | 1,120                      | 5.2            | 795   | 3.5            | 660  | 1.9            | 530   | 1.4            | 3,290           | 18.5           |  |      |      |  |  |  |  |  |  |
| 5/8           | 16   | 1,005   | 13.9           | 1,005                      | 5.2            | 720   | 3.5            | 590  | 1.9            | 470   | 1.4            | 2,960           | 16.7           |  |      |      |  |  |  |  |  |  |
| 11/16         |      | 915   | 13.9           | 915                        | 5.2            | 650   | 3.5            | 540  | 1.9            | 430   | 1.4            | 2,715           | 16.5           |  |      |      |  |  |  |  |  |  |
| 3/4           | 20   | 820   | 12.9           | 820                        | 5.2            | 580   | 3.5            | 485  | 1.9            | 380   | 1.4            | 2,415           | 16.5           |  |      |      |  |  |  |  |  |  |
| 7/8           | 22   | 710   | 11.2           | 710                        | 5.2            | 510   | 3.5            | 425  | 1.8            | 335   | 1.4            | 2,100           | 16.5           |  |      |      |  |  |  |  |  |  |
| 1             | 25   | 630   | 9.8            | 630                        | 5.1            | 440   | 3.5            | 370  | 1.6            | 300   | 1.4            | 1,830           | 16.3           |  |      |      |  |  |  |  |  |  |

- Notes:**
- Increase Speeds and Feeds 20% for 3 fl. Reg. Length
  - Reduce Speeds and Feeds 25% for 2 fl. Ball Nose Long length
  - Reduce Speeds and Feeds 50% for 2 fl. Ball nose Extra long length

- Notes:**
- Increase Speeds and Feeds 40% for 4fl. Ball nose Reg. & Stub Length, also 4fl. Double End Reg. & Stub length
  - Reduce Speeds 25% and Increase Feeds 10% for 4 fl. Ball Nose Long length
  - Reduce Speeds 50% and Increase Feeds 10% for 4 fl. Ball nose Extra long length