



# CHART A:

## Safe Starting Parameters for the MIL-TEC Freedom Cutter®

| Workpiece Material                   |             |      |       | Recommended Chip Load Per Blade                   |                     |       |
|--------------------------------------|-------------|------|-------|---|---------------------|-------|
|                                      |             |      |       | Type of Octagon Insert                            |                     |       |
|                                      |             | SFPM |       | SS45L   | PS45L               | NP45L |
|                                      |             | Min. | Max.  |   |                     |       |
| Die & High Carbon Steels             | Below 28RC  | 800  | 1200  | .004  | .006                | .012  |
|                                      | 32 to 42 RC | 450  | 900   | N/A   | .006                | .010  |
| Low Carbon Steels                    |             | 850  | 1200  | .004  | .006                | .010  |
| Austenitic Stainless Steels          |             | 800  | 1800  | .004  | .008                | .012  |
| "PH" Type Stainless Steels           |             | 800  | 1500  | .004  | .008                | .012  |
| 400 Series Stainless Steel           |             | 800  | 1500  | .004  | .008                | .012  |
| Aluminum & Al. Alloys                |             | 800  | 12000 | <i>Super Shear Only - Maximum Chip Load: .018</i> |                     |       |
| Cast Iron (Soft) Approx. 187 Brinell |             | 650  | 1200  | N/A   | .008                | .012  |
| Plastic, Non Metals & Wood           |             | 800  | 8000  | <i>Super Shear Only - Maximum Chip Load: .015</i> |                     |       |
| Ductile Iron & Nodular Iron          |             | 900  | 1500  | .004  | .008                | .015  |
| Nickel Based Alloys                  |             | 80   | 500   | N/A   | .003 <sub>005</sub> | N/A   |
| Copper & Brass                       |             | 1000 | 2500  | .003  | .005                | N/A   |
| Titanium                             |             | 80   | 500   | N/A   | .003 <sub>008</sub> | N/A   |

- STEP 1** SELECT THE WORKPIECE MATERIAL  
**STEP 2** A) USING UNCOATED CARBIDE, SELECT THE MINIMUM SFPM  
 B) USING COATED CARBIDE, SELECT THE MID-RANGE SFPM  
**STEP 3** GO TO CHART B.

### MIL-TEC CARBIDE "MTC"

| Type of Material | Heavy Feeds | Moderate Feeds | General Purpose |
|------------------|-------------|----------------|-----------------|
| Steel            | 317 A2      | 357 A2         | 54 A2           |
| Aluminum         | 21          | 20             | 51              |
| Cast Iron        | 317 A2      | 327 A2         | 327 A2          |

# CHART B:

## CHART OF SURFACE FEET PER MINUTE

| RPM    | CUTTER DIAMETER IN INCHES |       |       |        |        |        |        |        |        |  |
|--------|---------------------------|-------|-------|--------|--------|--------|--------|--------|--------|--|
|        | 0.5                       | 1     | 2     | 3      | 4      | 5      | 6      | 8      | 10     |  |
| 50     | 7                         | 13    | 26    | 39     | 52     | 65     | 79     | 105    | 131    |  |
| 100    | 13                        | 26    | 52    | 79     | 105    | 131    | 157    | 209    | 262    |  |
| 200    | 26                        | 52    | 105   | 157    | 209    | 262    | 314    | 419    | 524    |  |
| 300    | 39                        | 79    | 157   | 236    | 314    | 393    | 471    | 628    | 785    |  |
| 400    | 52                        | 105   | 209   | 314    | 419    | 524    | 628    | 838    | 1,047  |  |
| 500    | 65                        | 131   | 262   | 393    | 524    | 654    | 785    | 1,047  | 1,309  |  |
| 600    | 79                        | 157   | 314   | 471    | 628    | 785    | 942    | 1,257  | 1,571  |  |
| 700    | 92                        | 183   | 366   | 550    | 733    | 916    | 1,099  | 1,466  | 1,832  |  |
| 800    | 105                       | 209   | 419   | 628    | 838    | 1,047  | 1,257  | 1,675  | 2,094  |  |
| 900    | 118                       | 236   | 471   | 707    | 942    | 1,178  | 1,414  | 1,885  | 2,356  |  |
| 1,000  | 131                       | 262   | 524   | 785    | 1,047  | 1,309  | 1,571  | 2,094  | 2,618  |  |
| 1,500  | 196                       | 393   | 785   | 1,178  | 1,571  | 1,963  | 2,356  | 3,141  | 3,927  |  |
| 2,000  | 262                       | 524   | 1,047 | 1,571  | 2,094  | 2,618  | 3,141  | 4,188  | 5,236  |  |
| 2,500  | 327                       | 654   | 1,309 | 1,963  | 2,618  | 3,272  | 3,927  | 5,236  | 6,545  |  |
| 3,000  | 393                       | 785   | 1,571 | 2,356  | 3,141  | 3,927  | 4,712  | 6,283  | 7,853  |  |
| 3,500  | 458                       | 916   | 1,832 | 2,749  | 3,665  | 4,581  | 5,497  | 7,330  | 9,162  |  |
| 4,000  | 524                       | 1,047 | 2,094 | 3,141  | 4,188  | 5,236  | 6,283  | 8,377  | 10,471 |  |
| 4,500  | 589                       | 1,178 | 2,356 | 3,534  | 4,712  | 5,890  | 7,068  | 9,424  | 11,780 |  |
| 5,000  | 654                       | 1,309 | 2,618 | 3,927  | 5,236  | 6,545  | 7,853  | 10,471 | 13,089 |  |
| 5,500  | 720                       | 1,440 | 2,880 | 4,319  | 5,759  | 7,199  | 8,639  | 11,518 | 14,398 |  |
| 6,000  | 785                       | 1,571 | 3,141 | 4,712  | 6,283  | 7,853  | 9,424  | 12,565 | 15,707 |  |
| 6,500  | 851                       | 1,702 | 3,403 | 5,105  | 6,806  | 8,508  | 10,209 | 13,613 | 17,016 |  |
| 7,000  | 916                       | 1,832 | 3,665 | 5,497  | 7,330  | 9,162  | 10,995 | 14,660 | 18,325 |  |
| 7,500  | 982                       | 1,963 | 3,927 | 5,890  | 7,853  | 9,817  | 11,780 | 15,707 | 19,634 |  |
| 8,000  | 1,047                     | 2,094 | 4,188 | 6,283  | 8,377  | 10,471 | 12,565 | 16,754 | 20,942 |  |
| 8,500  | 1,113                     | 2,225 | 4,450 | 6,675  | 8,901  | 11,126 | 13,351 | 17,801 | 22,51  |  |
| 9,000  | 1,178                     | 2,356 | 4,712 | 7,068  | 9,424  | 11,780 | 14,136 | 18,848 | 23,560 |  |
| 9,500  | 1,243                     | 2,487 | 4,974 | 7,461  | 9,948  | 12,435 | 14,921 | 19,895 | 24,869 |  |
| 10,000 | 1,309                     | 2,618 | 5,236 | 7,853  | 10,471 | 13,089 | 15,707 | 20,942 | 26,178 |  |
| 10,500 | 1,374                     | 2,749 | 5,497 | 8,246  | 10,995 | 13,743 | 16,492 | 21,990 | 27,487 |  |
| 11,000 | 1,440                     | 2,880 | 5,759 | 8,639  | 11,518 | 14,398 | 17,277 | 23,037 | 28,796 |  |
| 11,500 | 1,505                     | 3,010 | 6,021 | 9,031  | 12,042 | 15,052 | 18,063 | 24,084 | 30,105 |  |
| 12,000 | 1,571                     | 3,141 | 6,283 | 9,424  | 12,565 | 15,707 | 18,848 | 25,131 | 31,414 |  |
| 12,500 | 1,636                     | 3,272 | 6,545 | 9,817  | 13,089 | 16,361 | 19,634 | 26,178 | 32,723 |  |
| 13,000 | 1,702                     | 3,403 | 6,806 | 10,209 | 13,613 | 17,016 | 20,419 | 27,225 | 34,031 |  |
| 13,500 | 1,767                     | 3,534 | 7,068 | 10,602 | 14,136 | 17,670 | 21,204 | 28,272 | 35,340 |  |
| 14,000 | 1,832                     | 3,665 | 7,330 | 10,995 | 14,660 | 18,325 | 21,990 | 29,319 | 36,649 |  |
| 14,500 | 1,898                     | 3,796 | 7,592 | 11,387 | 15,183 | 18,979 | 22,775 | 30,366 | 37,958 |  |
| 15,000 | 1,963                     | 3,927 | 7,853 | 11,780 | 15,707 | 19,634 | 23,560 | 31,414 | 39,267 |  |

- STEP 1** FIND THE DIAMETER OF YOUR CUTTER ON THE TOP ROW.  
**STEP 2** LOOK DOWN THAT COLUMN TO FIND THE SFPM FIGURE CLOSEST TO THE ONE SELECTED FOR YOUR WORKPIECE MATERIAL.  
**STEP 3** LOOK LEFT TO THE FIRST COLUMN TO FIND THE APPROPRIATE RPM FOR APPLICATION (NOW GO TO CHART C).

# CHART C:

## BLADES PER MINUTE

| RPM    | BLADES PER CUTTER |        |        |        |        |        |         |         |         |         |
|--------|-------------------|--------|--------|--------|--------|--------|---------|---------|---------|---------|
|        | 1                 | 2      | 3      | 4      | 5      | 6      | 7       | 8       | 9       | 10      |
| 50     | 50                | 100    | 150    | 200    | 250    | 300    | 350     | 400     | 450     | 500     |
| 100    | 100               | 200    | 300    | 400    | 500    | 600    | 700     | 800     | 900     | 1,000   |
| 200    | 200               | 400    | 600    | 800    | 1,000  | 1,200  | 1,400   | 1,600   | 1,800   | 2,000   |
| 300    | 300               | 600    | 900    | 1,200  | 1,500  | 1,800  | 2,100   | 2,400   | 2,700   | 3,000   |
| 400    | 400               | 800    | 1,200  | 1,600  | 2,000  | 2,400  | 2,800   | 3,200   | 3,600   | 4,000   |
| 500    | 500               | 1,000  | 1,500  | 2,000  | 2,500  | 3,000  | 3,500   | 4,000   | 4,500   | 5,000   |
| 600    | 600               | 1,200  | 1,800  | 2,400  | 3,000  | 3,600  | 4,200   | 4,800   | 5,400   | 6,000   |
| 700    | 700               | 1,400  | 2,100  | 2,800  | 3,500  | 4,200  | 4,900   | 5,600   | 6,300   | 7,000   |
| 800    | 800               | 1,600  | 2,400  | 3,200  | 4,000  | 4,800  | 5,600   | 6,400   | 7,200   | 8,000   |
| 900    | 900               | 1,800  | 2,700  | 3,600  | 4,500  | 5,400  | 6,300   | 7,200   | 8,100   | 9,000   |
| 1,000  | 1,000             | 2,000  | 3,000  | 4,000  | 5,000  | 6,000  | 7,000   | 8,000   | 9,000   | 10,000  |
| 1,500  | 1,500             | 3,000  | 4,500  | 6,000  | 7,500  | 9,000  | 10,500  | 12,000  | 13,500  | 15,000  |
| 2,000  | 2,000             | 4,000  | 6,000  | 8,000  | 10,000 | 12,000 | 14,000  | 16,000  | 18,000  | 20,000  |
| 2,500  | 2,500             | 5,000  | 7,500  | 10,000 | 12,500 | 15,000 | 17,500  | 20,000  | 22,500  | 25,000  |
| 3,000  | 3,000             | 6,000  | 9,000  | 12,000 | 15,000 | 18,000 | 21,000  | 24,000  | 27,000  | 30,000  |
| 3,500  | 3,500             | 7,000  | 10,500 | 14,000 | 17,500 | 21,000 | 24,500  | 28,000  | 31,500  | 35,000  |
| 4,000  | 4,000             | 8,000  | 12,000 | 16,000 | 20,000 | 24,000 | 28,000  | 32,000  | 36,000  | 40,000  |
| 4,500  | 4,500             | 9,000  | 13,500 | 18,000 | 22,500 | 27,000 | 31,500  | 36,000  | 40,500  | 45,000  |
| 5,000  | 5,000             | 10,000 | 15,000 | 20,000 | 25,000 | 30,000 | 35,000  | 40,000  | 45,000  | 50,000  |
| 5,500  | 5,500             | 11,000 | 16,500 | 22,000 | 27,500 | 33,000 | 38,500  | 44,000  | 49,500  | 55,000  |
| 6,000  | 6,000             | 12,000 | 18,000 | 24,000 | 30,000 | 36,000 | 42,000  | 48,000  | 54,000  | 60,000  |
| 6,500  | 6,500             | 13,000 | 19,500 | 26,000 | 32,500 | 39,000 | 45,500  | 52,000  | 58,500  | 65,000  |
| 7,000  | 7,000             | 14,000 | 21,000 | 28,000 | 35,000 | 42,000 | 49,000  | 56,000  | 63,000  | 70,000  |
| 7,500  | 7,500             | 15,000 | 22,500 | 30,000 | 37,500 | 45,000 | 52,500  | 60,000  | 67,500  | 75,000  |
| 8,000  | 8,000             | 16,000 | 24,000 | 32,000 | 40,000 | 48,000 | 56,000  | 64,000  | 72,000  | 80,000  |
| 8,500  | 8,500             | 17,000 | 25,500 | 34,000 | 42,500 | 51,000 | 59,500  | 68,000  | 76,500  | 85,000  |
| 9,000  | 9,000             | 18,000 | 27,000 | 36,000 | 45,000 | 54,000 | 63,000  | 72,000  | 81,000  | 90,000  |
| 9,500  | 9,500             | 19,000 | 28,500 | 38,000 | 47,500 | 57,000 | 66,500  | 76,000  | 85,500  | 95,000  |
| 10,000 | 10,000            | 20,000 | 30,000 | 40,000 | 50,000 | 60,000 | 70,000  | 80,000  | 90,000  | 100,000 |
| 10,500 | 10,500            | 21,000 | 31,500 | 42,000 | 52,500 | 63,000 | 73,500  | 84,000  | 94,500  | 105,000 |
| 11,000 | 11,000            | 22,000 | 33,000 | 44,000 | 55,000 | 66,000 | 77,000  | 88,000  | 99,000  | 110,000 |
| 11,500 | 11,500            | 23,000 | 34,500 | 46,000 | 57,500 | 69,000 | 80,500  | 92,000  | 103,500 | 115,000 |
| 12,000 | 12,000            | 24,000 | 36,000 | 48,000 | 60,000 | 72,000 | 84,000  | 96,000  | 108,000 | 120,000 |
| 12,500 | 12,500            | 25,000 | 37,500 | 50,000 | 62,500 | 75,000 | 87,500  | 100,000 | 112,500 | 125,000 |
| 13,000 | 13,000            | 26,000 | 39,000 | 52,000 | 65,000 | 78,000 | 91,000  | 104,000 | 117,000 | 130,000 |
| 13,500 | 13,500            | 27,000 | 40,500 | 54,000 | 67,500 | 81,000 | 94,500  | 108,000 | 121,500 | 135,000 |
| 14,000 | 14,000            | 28,000 | 42,000 | 56,000 | 70,000 | 84,000 | 98,000  | 112,000 | 126,000 | 140,000 |
| 14,500 | 14,500            | 29,000 | 43,500 | 58,000 | 72,500 | 87,000 | 101,500 | 116,000 | 130,500 | 145,000 |
| 15,000 | 15,000            | 30,000 | 45,000 | 60,000 | 75,000 | 90,000 | 105,000 | 120,000 | 135,000 | 150,000 |

- STEP 1** USING THE RPM FIGURE FROM CHART B, GO ACROSS THE ROW TO THE COLUMN INDICATING THE NUMBER OF BLADES IN YOUR CUTTER  
**STEP 2** THE RESULTING FIGURE IS THE BLADES PER MINUTE.  
**STEP 3** GO TO THE FEED RATE CHART (CHART D).