

## TuffCut® XT9

### 380 / 380CB Series Recommended Cutting Data - Profile Milling - Inch

| Workpiece Material Group       | ISO | Coolant<br>● Preferred<br>○ Possible<br>x Not Possible |                |    | RWOC (Ae) |      | End Mill Diameter (inch) |       |       |       |
|--------------------------------|-----|--------------------------------------------------------|----------------|----|-----------|------|--------------------------|-------|-------|-------|
|                                |     |                                                        |                |    |           |      | 3/8                      | 1/2   | 5/8   | 3/4   |
|                                |     |                                                        |                |    | 5%        | 10%  |                          |       |       |       |
|                                |     |                                                        |                |    | 2.3       | 1.67 |                          |       |       |       |
|                                |     | Emulsion                                               | Compressed Air | ML | Vc - SFM  |      | fz - in/tooth            |       |       |       |
| Low Carbon Steels              | P   | ○                                                      | ●              | ○  | 1475      | 1150 | .0023                    | .0030 | .0038 | .0045 |
| Medium Carbon Steels           |     | ○                                                      | ●              | ○  | 1130      | 900  | .0023                    | .0030 | .0038 | .0045 |
| Alloy Steels                   |     | ○                                                      | ●              | ○  | 1035      | 840  | .0023                    | .0030 | .0038 | .0045 |
| Die / Tool Steels              |     | ○                                                      | ●              | ○  | 900       | 725  | .0023                    | .0030 | .0038 | .0045 |
| Free Machining Stainless Steel | M   | ●                                                      | ●              | ○  | 675       | 545  | .0023                    | .0030 | .0038 | .0045 |
| Austenitic Stainless Steel     |     | ●                                                      | x              | ○  | 525       | 430  | .0019                    | .0025 | .0031 | .0038 |
| Difficult Stainless Steel      |     | ●                                                      | x              | ○  | 410       | 330  | .0015                    | .0020 | .0025 | .0030 |
| PH Stainless Steels            |     | ●                                                      | ●              | ○  | 525       | 430  | .0015                    | .0020 | .0025 | .0030 |
| Cobalt Chrome Alloys           |     | ●                                                      | x              | ○  | 410       | 325  | .0015                    | .0020 | .0025 | .0030 |
| Duplex (22%)                   |     | ●                                                      | x              | ○  | 330       | 295  | .0015                    | .0020 | .0025 | .0030 |
| Super Duplex (25%)             | S   | ●                                                      | x              | ○  | 245       | 195  | .0015                    | .0020 | .0025 | .0030 |
| High Temp Alloys               |     | ●                                                      | x              | x  | 180       | 150  | .0009                    | .0013 | .0016 | .0019 |
| Titanium Alloys                | K   | ●                                                      | x              | x  | 375       | 330  | .0015                    | .0020 | .0025 | .0030 |
| Gray Cast Iron                 |     | ●                                                      | ○              | ○  | 1625      | 1295 | .0023                    | .0030 | .0038 | .0045 |
| Ductile Cast Iron              |     | ●                                                      | ○              | ○  | 975       | 885  | .0023                    | .0030 | .0038 | .0045 |
| Malleable Cast Irons           | H   | ●                                                      | ○              | ○  | 575       | 490  | .0023                    | .0030 | .0038 | .0045 |
| Hardened Steels 45-50 HRC      |     | ○                                                      | ●              | ○  | 610       | 495  | .0019                    | .0025 | .0031 | .0038 |
| Hardened Steels 50-55 HRC      |     | ○                                                      | ●              | ○  | 510       | -    | .0013                    | .0018 | .0022 | .0026 |
| Hardened Steels 55-60 HRC      |     | ○                                                      | ●              | ○  | 330       | -    | .0008                    | .0010 | .0013 | .0015 |

Notes: For machining materials above 50 HRC, reduce stepover (ae) to 2-3% of DC for optimal performance.

Spindle Maximum - Should the calculated spindle speed be more than your actual spindle maximum, use this formula: (Calculated Feed x Spindle Maximum)/Calculated Speed.

### 380 Series Recommended Cutting Data - Chip Thickness Compensation Factors

| RWOC (Ae) | Chip Thickness Compensation Factor |
|-----------|------------------------------------|
| 2%        | 3.57                               |
| 3%        | 2.93                               |
| 5%        | 2.30                               |
| 7%        | 1.96                               |
| 8%        | 1.84                               |
| 10%       | 1.67                               |

During profile milling with a radial width of less than 50% of the cutter diameter, the actual chip thickness at the cutting edge is less than the programmed chipload.

The accompanying table shows the increase in chipload by given radial width percentage to adjust for chip thinning. Multiply your recommended chip thickness by the appropriate feed factor to establish the correct feed rate.

Technical data provided should be considered advisory only as variations may be necessary depending on the particular application.



# TuffCut® XT9

## 380 / 380CB Series Recommended Cutting Data - Profile Milling - Metric

| Workpiece<br>Material<br>Group | ISO | Coolant<br>● Preferred<br>○ Possible<br>x Not Possible |                   |     | RWOC<br>(Ae)                                                                      |                                                                                   | End Mill Diameter (mm)                                                                                                                                                                                                                 |               |       |       |       |
|--------------------------------|-----|--------------------------------------------------------|-------------------|-----|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|-------|-------|-------|
|                                |     |                                                        |                   |     |  |  | 10                                                                                                                                                                                                                                     | 12            | 16    | 20    |       |
|                                |     |                                                        |                   |     | 5%                                                                                | 10%                                                                               |                                                                                                                                                                                                                                        |               |       |       |       |
|                                |     | Emulsion                                               | Compressed<br>Air | MQL | 2.3                                                                               | 1.67                                                                              |  Multiply fz by this Factor based on ae. When finishing, use the standard fz per chart below. Only add chip thinning when roughing or semi-finishing. |               |       |       |       |
|                                |     |                                                        |                   |     | vc - m/min                                                                        |                                                                                   |                                                                                                                                                                                                                                        | fz - mm/tooth |       |       |       |
| Low Carbon Steels              | P   | ○                                                      | ●                 | ○   | 450                                                                               | 350                                                                               |                                                                                                                                                                                                                                        | 0.060         | 0.072 | 0.096 | 0.120 |
| Medium Carbon Steels           | P   | ○                                                      | ●                 | ○   | 345                                                                               | 275                                                                               |                                                                                                                                                                                                                                        | 0.060         | 0.072 | 0.096 | 0.120 |
| Alloy Steels                   | P   | ○                                                      | ●                 | ○   | 315                                                                               | 255                                                                               |                                                                                                                                                                                                                                        | 0.060         | 0.072 | 0.096 | 0.120 |
| Die / Tool Steels              | P   | ○                                                      | ●                 | ○   | 275                                                                               | 220                                                                               | 0.060                                                                                                                                                                                                                                  | 0.072         | 0.096 | 0.120 |       |
| Free Machining Stainless Steel | M   | ●                                                      | ●                 | ○   | 205                                                                               | 165                                                                               | 0.060                                                                                                                                                                                                                                  | 0.072         | 0.096 | 0.120 |       |
| Austenitic Stainless Steel     | M   | ●                                                      | x                 | ○   | 160                                                                               | 130                                                                               | 0.050                                                                                                                                                                                                                                  | 0.060         | 0.080 | 0.100 |       |
| Difficult Stainless Steel      | M   | ●                                                      | x                 | ○   | 125                                                                               | 100                                                                               | 0.040                                                                                                                                                                                                                                  | 0.048         | 0.064 | 0.080 |       |
| PH Stainless Steels            | M   | ●                                                      | ●                 | ○   | 160                                                                               | 130                                                                               | 0.040                                                                                                                                                                                                                                  | 0.048         | 0.064 | 0.080 |       |
| Cobalt Chrome Alloys           | M   | ●                                                      | x                 | ○   | 125                                                                               | 100                                                                               | 0.040                                                                                                                                                                                                                                  | 0.048         | 0.064 | 0.080 |       |
| Duplex (22%)                   | M   | ●                                                      | x                 | ○   | 100                                                                               | 90                                                                                | 0.040                                                                                                                                                                                                                                  | 0.048         | 0.064 | 0.080 |       |
| Super Duplex (25%)             | M   | ●                                                      | x                 | ○   | 75                                                                                | 60                                                                                | 0.040                                                                                                                                                                                                                                  | 0.048         | 0.064 | 0.080 |       |
| High Temp Alloys               | S   | ●                                                      | x                 | x   | 55                                                                                | 45                                                                                | 0.025                                                                                                                                                                                                                                  | 0.030         | 0.040 | 0.050 |       |
| Titanium Alloys                | S   | ●                                                      | x                 | x   | 115                                                                               | 100                                                                               | 0.040                                                                                                                                                                                                                                  | 0.048         | 0.064 | 0.080 |       |
| Gray Cast Iron                 | K   | ●                                                      | ○                 | ○   | 495                                                                               | 395                                                                               | 0.060                                                                                                                                                                                                                                  | 0.072         | 0.096 | 0.120 |       |
| Ductile Cast Iron              | K   | ●                                                      | ○                 | ○   | 295                                                                               | 270                                                                               | 0.060                                                                                                                                                                                                                                  | 0.072         | 0.096 | 0.120 |       |
| Malleable Cast Irons           |     | ●                                                      | ○                 | ○   | 175                                                                               | 150                                                                               | 0.060                                                                                                                                                                                                                                  | 0.072         | 0.096 | 0.120 |       |
| Hardened Steels 45-50 HRC      | H   | ○                                                      | ●                 | ○   | 185                                                                               | 150                                                                               | 0.050                                                                                                                                                                                                                                  | 0.060         | 0.080 | 0.100 |       |
| Hardened Steels 50-55 HRC      |     | ○                                                      | ●                 | ○   | 155                                                                               | -                                                                                 | 0.035                                                                                                                                                                                                                                  | 0.042         | 0.056 | 0.070 |       |
| Hardened Steels 55-60 HRC      |     | ○                                                      | ●                 | ○   | 100                                                                               | -                                                                                 | 0.020                                                                                                                                                                                                                                  | 0.024         | 0.032 | 0.040 |       |

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