

TuffCut DM®

157 Series Recommended Cutting Data - Profile Milling - Inch

| Workpiece Material Group | ISO | Hardness | Coolant | | | Profile Milling (ae)* | | | | | End Mill Diameter (inch) | | | | |
|---|-----|-------------|---|----------------|---------------|-----------------------|-----|-----|-----|-----|---|-------|-------|-------|-------|
| | | | ● Preferred ○ Possible x Not Possible | | | | | | | | 1/8 | 1/4 | 3/8 | 1/2 | 5/8 |
| | | | Emulsion | Compressed Air | MQL | 5% | 10% | 20% | 30% | 50% | *Axial depth during profile milling: OD < 1/4" .25D ap OD > 1/4" 1D ap | | | | |
| | | | | | | 2.3 | 1.8 | 1.2 | 1.1 | 1 | ← 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 - SFM | | | | | fz - in/tooth | | | | | | | | | | |
| Free Machining & Low Carbon Steels 1006, 1008, 1015, 1018, 1020, 1022, 1025, 1117, 1140, 1141, 11L08, 11L14, 1213, 12L13, 12L14, 1215, 1330 | P | up to 28 Rc | ● | ● | ● | 600 | 550 | 500 | 450 | 400 | .0011 | .0022 | .0035 | .0042 | .0059 |
| Medium Carbon & High Carbon Steels, Alloy Steels & Easy to Machine Tool Steels 1030, 1035, 1040, 1045, 1050, 1052, 1055, 1060, 1085, 1095, 1541, 1551, 9255, 2515, 3135, 3415, 4130, 4137, 4140, 4150, 4320, 4340, 4520, 5015, 5115, 5120, 5132, 5140, 5155, 6150, 8620, 9262, 9840, 52100, O1, O2, O6, S2, W1 to W310 | P | 28 to 38 Rc | ● | ● | ● | 600 | 550 | 500 | 450 | 400 | .0011 | .0022 | .0035 | .0042 | .0059 |
| Tool Steels & Die Steels O7, M1, M2, M3, M4, M7, T1, T2, T4, T5, T8, T15, A2, A3, A6, A7, H10, H11, H12, H13, H19, H21, L3, L6, L7, P2, P20, S1, S5, S7, 52100, A128, D2, D3, D4, D5, D7 | P | 28 to 44 Rc | ● | ● | ● | 550 | 500 | 450 | 400 | 375 | .0011 | .0020 | .0033 | .0040 | .0055 |
| Hardened Steels | H | 40-50 Rc | ● | ○ | ○ | 360 | 340 | 300 | 280 | 260 | .0007 | .0014 | .0024 | .0030 | .0040 |
| Hardened Steels | | 50-55 Rc | ● | ○ | ○ | 360 | 340 | 300 | 280 | 260 | .0004 | .0008 | .0016 | .0018 | .0024 |
| Hardened Steels | | >55 Rc | ● | ○ | ○ | 320 | 300 | 280 | 260 | 240 | .0003 | .0006 | .0010 | .0015 | .0018 |
| Stainless Steel - Ferritic | M | up to 28 Rc | ● | x | ○ | 550 | 525 | 500 | 450 | 425 | .0010 | .0020 | .0033 | .0040 | .0055 |
| Stainless Steel - Martensitic | M | up to 28 Rc | ● | x | ○ | 550 | 525 | 500 | 450 | 425 | .0010 | .0020 | .0033 | .0040 | .0055 |
| Stainless Steel - PH 302B, 304B, 309, 310, 316, 316B, 316L, 316Ti, 317, 317L, 321, PH13-8Mo, Nitronics | M | over 28 Rc | ● | x | ○ | 550 | 525 | 500 | 450 | 425 | .0010 | .0020 | .0033 | .0040 | .0055 |
| High Temp Alloys Nimonic, Inconel, Monel, Hastelloy | S | up to 42 Rc | ● | x | x | 165 | 165 | 130 | 115 | 100 | .0004 | .0008 | .0016 | .0018 | .0024 |
| Titanium Alloys 6Al-4V, 5Al-2.5 Sn, 6Al-2 Sn-4Zr-6Mo, 3Al-8V-6Cr-4Mo-4Zr, 10V-2Fe-3Al, 13V-11Cr-3Al | S | up to 42 Rc | ● | x | x | 400 | 375 | 350 | 300 | 250 | .0004 | .0008 | .0016 | .0018 | .0024 |

Spindle Maximum - Should the calculated spindle speed be more than your actual spindle maximum, use this formula:
 $(\text{Calculated Feed} \times \text{Spindle Maximum}) / \text{Calculated Speed}$

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

TuffCut DM®

157 Series Recommended Cutting Data - Profile Milling - Metric




| Workpiece Material Group | ISO | Hardness | Coolant | | | Profile Milling (ae)* | | | | | End Mill Diameter (mm) | | | | | | |
|---|-----|-------------|---|----------------|---------------|-----------------------|-----|-----|-----|-----|--|-------|-------|-------|-------|-------|-------|
| | | | ● Preferred ○ Possible x Not Possible | | | | | | | | 3 | 6 | 8 | 10 | 12 | 16 | 20 |
| | | | Emulsion | Compressed Air | MQL | 5% | 10% | 20% | 30% | 50% | *Axial depth during profile milling: OD < 6mm .25D ap OD > 6mm 1D ap | | | | | | |
| | | | | | | 2.3 | 1.8 | 1.2 | 1.1 | 1 | ← 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 | | | | | | | | | | | | |
| Free Machining & Low Carbon Steels 1006, 1008, 1015, 1018, 1020, 1022, 1025, 1117, 1140, 1141, 11L08, 11L14, 1213, 12L13, 12L14, 1215, 1330 | P | up to 28 Rc | ● | ● | ● | 183 | 168 | 152 | 137 | 122 | .0280 | .0559 | .0889 | .1067 | .1498 | .1778 | .2032 |
| Medium Carbon & High Carbon Steels, Alloy Steels & Easy to Machine Tool Steels 1030, 1035, 1040, 1045, 1050, 1052, 1055, 1060, 1085, 1095, 1541, 1551, 9255, 2515, 3135, 3415, 4130, 4137, 4140, 4150, 4320, 4340, 4520, 5015, 5115, 5120, 5132, 5140, 5155, 6150, 8620, 9262, 9840, 52100, O1, O2, O6, S2, W1 to W310 | P | 28 to 38 Rc | ● | ● | ● | 183 | 168 | 152 | 137 | 122 | .0280 | .0559 | .0889 | .1067 | .1498 | .1778 | .2032 |
| Tool Steels & Die Steels O7, M1, M2, M3, M4, M7, T1, T2, T4, T5, T8, T15, A2, A3, A6, A7, H10, H11, H12, H13, H19, H21, L3, L6, L7, P2, P20, S1, S5, S7, 52100, A128, D2, D3, D4, D5, D7 | P | 28 to 44 Rc | ● | ● | ● | 168 | 152 | 137 | 122 | 114 | .0254 | .0508 | .0838 | .1016 | .1397 | .1702 | .1905 |
| Hardened Steels | H | 40-50 Rc | ● | ○ | ○ | 110 | 104 | 90 | 85 | 80 | .0178 | .0356 | .0610 | .0762 | .1016 | .1168 | .1524 |
| Hardened Steels | | 50-55 Rc | ● | ○ | ○ | 110 | 104 | 90 | 85 | 80 | .0102 | .0203 | .0406 | .0457 | .0610 | .0762 | .0889 |
| Hardened Steels | | >55 Rc | ● | ○ | ○ | 100 | 90 | 85 | 80 | 75 | .0076 | .0152 | .0254 | .0381 | .0457 | .0559 | .0635 |
| Stainless Steel - Ferritic | M | up to 28 Rc | ● | x | ○ | 168 | 160 | 152 | 137 | 130 | .0254 | .0508 | .0838 | .1016 | .1397 | .1702 | .1905 |
| Stainless Steel - Martensitic | M | up to 28 Rc | ● | x | ○ | 168 | 160 | 152 | 137 | 130 | .0254 | .0508 | .0838 | .1016 | .1397 | .1702 | .1905 |
| Stainless Steel - PH 302B, 304B, 309, 310, 316, 316B, 316L, 316Ti, 317, 317L, 321, PH13-8Mo, Nitronics | M | over 28 Rc | ● | x | ○ | 168 | 160 | 152 | 137 | 130 | .0254 | .0508 | .0838 | .1016 | .1397 | .1702 | .1905 |
| High Temp Alloys Nimonic, Inconel, Monel, Hastelloy | S | up to 42 Rc | ● | x | x | 50 | 50 | 40 | 35 | 30 | .0102 | .0203 | .0406 | .0457 | .0610 | .0762 | .0889 |
| Titanium Alloys 6Al-4V, 5Al-2.5 Sn, 6Al-2 Sn-4Zr-6Mo, 3Al-8V-6Cr-4Mo-4Zr, 10V-2Fe-3Al, 13V-11Cr-3Al | S | up to 42 Rc | ● | x | x | 122 | 114 | 107 | 90 | 75 | .0102 | .0203 | .0406 | .0457 | .0610 | .0762 | .0889 |

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

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

TuffCut DM®

157 Series Recommended Cutting Data - Slotting - Inch

| Workpiece Material Group | ISO | Hardness | Coolant | | | Slotting** | | | End Mill Diameter (inch) | | | | |
|---|-----|-------------|---|----------------|-----|---|---|---|--|-------|-------|-------|-------|
| | | | ● Preferred ○ Possible x Not Possible | | |  |  |  | 1/8 | 1/4 | 3/8 | 1/2 | 5/8 |
| | | | Emulsion | Compressed Air | MQL | 25% | 50% | 100%* *Trochoidal Milling | **Axial Depth (ap) during slotting: OD > 1/4" .25D ap | | | | |
| | | | | | | vc - SFM | | | fz - in/tooth | | | | |
| Free Machining & Low Carbon Steels 1006, 1008, 1015, 1018, 1020, 1022, 1025, 1117, 1140, 1141, 11L08, 11L14, 1213, 12L13, 12L14, 1215, 1330 | P | up to 28 Rc | ● | ● | ● | 480 | 480 | 400 | .0005 | .0011 | .0017 | .0021 | .0029 |
| Medium Carbon & High Carbon Steels, Alloy Steels & Easy to Machine Tool Steels 1030, 1035, 1040, 1045, 1050, 1052, 1055, 1060, 1085, 1095, 1541, 1551, 9255, 2515, 3135, 3415, 4130, 4137, 4140, 4150, 4320, 4340, 4520, 5015, 5115, 5120, 5132, 5140, 5155, 6150, 8620, 9262, 9840, 52100, O1, O2, O6, S2, W1 to W310 | P | 28 to 38 Rc | ● | ● | ● | 480 | 480 | 400 | .0005 | .0011 | .0017 | .0020 | .0029 |
| Tool Steels & Die Steels O7, M1, M2, M3, M4, M7, T1, T2, T4, T5, T8, T15, A2, A3, A6, A7, H10, H11, H12, H13, H19, H21, L3, L6, L7, P2, P20, S1, S5, S7, 52100, A128, D2, D3, D4, D5, D7 | P | 28 to 44 Rc | ● | ● | ● | 420 | 420 | 380 | .0005 | .0010 | .0016 | .0020 | .0027 |
| Hardened Steels | H | 40-50 Rc | ● | ○ | ○ | 350 | 350 | 300 | .0003 | .0006 | .0012 | .0015 | .0020 |
| Hardened Steels | | 50-55 Rc | ● | ○ | ○ | 180 | 180 | 150 | .0002 | .0004 | .0008 | .0009 | .0012 |
| Hardened Steels | | >55 Rc | ● | ○ | ○ | 150 | 150 | 100 | .00015 | .0003 | .0005 | .0007 | .0009 |
| Stainless Steel - Ferritic | M | up to 28 Rc | ● | x | ○ | 420 | 420 | 400 | .0005 | .0010 | .0016 | .0020 | .0027 |
| Stainless Steel - Martensitic | M | up to 28 Rc | ● | x | ○ | 420 | 420 | 400 | .0005 | .0010 | .0016 | .0020 | .0027 |
| Stainless Steel - PH 302B, 304B, 309, 310, 316, 316B, 316L, 316Ti, 317, 317L, 321, PH13-8Mo, Nitronics | M | over 28 Rc | ● | x | ○ | 400 | 400 | 380 | .0005 | .0010 | .0016 | .0020 | .0027 |
| High Temp Alloys Nimonic, Inconel, Monel, Hastelloy | S | up to 42 Rc | ● | x | x | 120 | 120 | 95 | .0002 | .0004 | .0008 | .0009 | .0012 |
| Titanium Alloys 6Al-4V, 5Al-2.5 Sn, 6Al-2 Sn-4Zr-6Mo, 3Al-8V-6Cr4Mo-4Zr, 10V-2Fe-3Al, 13V-11Cr-3Al | S | up to 42 Rc | ● | x | x | 200 | 200 | 175 | .0002 | .0004 | .0008 | .0009 | .0012 |

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

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

TuffCut DM®

157 Series Recommended Cutting Data - Slotting - Metric

| Workpiece Material Group | ISO | Hardness | Coolant | | | Slotting** | | | End Mill Diameter (mm) | | | | | | |
|---|-----|-------------|---|----------------|-----|------------|-----|------------------------------|---|-------|-------|-------|-------|-------|-------|
| | | | ● Preferred ○ Possible x Not Possible | | | | | | 3 | 6 | 8 | 10 | 12 | 16 | 20 |
| | | | Emulsion | Compressed Air | MQL | 25% | 50% | 100%* *Trochoidal Milling | **Axial depth (ap) during slotting: OD > 6mm .25D ap | | | | | | |
| | | | | | | vc - m/min | | | fz - mm/tooth | | | | | | |
| Free Machining & Low Carbon Steels 1006, 1008, 1015, 1018, 1020, 1022, 1025, 1117, 1140, 1141, 11L08, 11L14, 1213, 12L13, 12L14, 1215, 1330 | P | up to 28 Rc | ● | ● | ● | 146 | 146 | 122 | .0122 | .0279 | .0432 | .0533 | .0737 | .0762 | .1016 |
| Medium Carbon & High Carbon Steels, Alloy Steels & Easy to Machine Tool Steels 1030, 1035, 1040, 1045, 1050, 1052, 1055, 1060, 1085, 1095, 1541, 1551, 9255, 2515, 3135, 3415, 4130, 4137, 4140, 4150, 4320, 4340, 4520, 5015, 5115, 5120, 5132, 5140, 5155, 6150, 8620, 9262, 9840, 52100, O1, O2, O6, S2, W1 to W310 | P | 28 to 38 Rc | ● | ● | ● | 146 | 146 | 122 | .0122 | .0279 | .0432 | .0533 | .0737 | .0762 | .1016 |
| Tool Steels & Die Steels O7, M1, M2, M3, M4, M7, T1, T2, T4, T5, T8, T15, A2, A3, A6, A7, H10, H11, H12, H13, H19, H21, L3, L6, L7, P2, P20, S1, S5, S7, 52100, A128, D2, D3, D4, D5, D7 | P | 28 to 44 Rc | ● | ● | ● | 128 | 128 | 115 | .0122 | .0254 | .0406 | .0508 | .0686 | .0839 | .0940 |
| Hardened Steels | | 40-50 Rc | ● | ○ | ○ | 106 | 106 | 92 | .0076 | .0152 | .0305 | .0381 | .0508 | .0584 | .0762 |
| Hardened Steels | H | 50-55 Rc | ● | ○ | ○ | 55 | 55 | 45 | .0051 | .0102 | .0203 | .0229 | .0305 | .0381 | .0432 |
| Hardened Steels | | >55 Rc | ● | ○ | ○ | 45 | 45 | 30 | .0038 | .0076 | .0127 | .0178 | .0229 | .0279 | .0305 |
| Stainless Steel - Ferritic | M | up to 28 Rc | ● | x | ○ | 128 | 128 | 122 | .0127 | .0254 | .0406 | .0508 | .0686 | .0838 | .0940 |
| Stainless Steel - Martensitic | M | up to 28 Rc | ● | x | ○ | 128 | 128 | 122 | .0127 | .0254 | .0406 | .0508 | .0686 | .0838 | .0940 |
| Stainless Steel - PH 302B, 304B, 309, 310, 316, 316B, 316L, 316Ti, 317, 317L, 321, PH13-8Mo, Nitronics | M | over 28 Rc | ● | x | ○ | 122 | 122 | 115 | .0127 | .0254 | .0406 | .0508 | .0686 | .0838 | .0940 |
| High Temp Alloys Nimonic, Inconel, Monel, Hastelloy | S | up to 42 Rc | ● | x | x | 36 | 36 | 30 | .0051 | .0102 | .0203 | .0229 | .0305 | .0381 | .0432 |
| Titanium Alloys 6Al-4V, 5Al-2.5 Sn, 6Al-2 Sn-4Zr-6Mo, 3Al-8V-6Cr4Mo-4Zr, 10V-2Fe-3Al, 13V-11Cr-3Al | S | up to 42 Rc | ● | x | x | 60 | 60 | 55 | .0051 | .0102 | .0203 | .0229 | .0305 | .0381 | .0432 |

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

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