






# TuffCut® AL / X-AL

## 136 / 138 / 138N / 138R / 138NR Recommended Cutting Data - Profile Milling Inch

| Workpiece Material Group                          | ISO      | Coolant<br>● Preferred | Profile Milling (ae)  |   |   |   | End Mill Diameter   |  |       |       |       |       |       |       |       |
|---|----------|------------------------|---|---|---|---|---|--|-------|-------|-------|-------|-------|-------|-------|
|   |          |                        |  |  |  |  | 1/8*  | 3/16*  | 1/4*  | 5/16  | 3/8   | 1/2   | 5/8   | 3/4   | 1     |
|   |          |                        | 10%   | 20%   | 30%   | 50%   | ae > .3D use <1D ap<br>ae < .2D use <2D ap<br>*Profile Milling at > 25% ap is not recommended for diameters 1/4" and below. |  |       |       |       |       |       |       |       |
|   |          |                        |  | 3.8   | 3.1   | 2   | 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. |       |       |       |       |       |       |       |
| Max.  | vc - SFM |                        |   |   | fz - in/tooth   |   |   |  |       |       |       |       |       |       |       |
| Non-Ferrous - Aluminum / Aluminum Alloys < 10% Si | N        | ●                      | 2000  | 1800  | 1200  | 900   | .0025   | .0037  | .0050 | .0062 | .0075 | .0100 | .0125 | .0150 | .0200 |
| Non-Ferrous - Aluminum / Aluminum Alloys > 10% Si | N        | ●                      | 1500  | 1200  | 1000  | 800   | .0025   | .0037  | .0050 | .0062 | .0075 | .0100 | .0125 | .0150 | .0200 |
| Non-Ferrous - Brass                               | N        | ●                      | 900   | 800   | 600   | 500   | .0025   | .0037  | .0050 | .0062 | .0075 | .0100 | .0125 | .0150 | .0200 |
| Non-Ferrous - Cu/Cu Alloys / Magnesium            | N        | ●                      | 1000  | 800   | 600   | 500   | .0025   | .0037  | .0050 | .0062 | .0075 | .0100 | .0125 | .0150 | .0200 |
| Non-Ferrous - Plastics                            | N        | ●                      | 900   | 800   | 600   | 500   | .0025   | .0037  | .0050 | .0062 | .0075 | .0100 | .0125 | .0150 | .0200 |

Above 20,000 RPM, Tool Balancing Required

## 136 / 138 / 138N / 138R / 138NR Recommended Cutting Data - Profile Milling Metric

| Workpiece Material Group                          | ISO        | Coolant<br>● Preferred | Profile Milling (ae)  |   |   |   | End Mill Diameter (mm)   |  |       |       |       |       |       |
|---|------------|------------------------|---|---|---|---|--|--|-------|-------|-------|-------|-------|
|   |            |                        |  |  |  |  | 3*   | 5*   | 6*    | 8     | 10    | 14    | 16    |
|   |            |                        | 10%   | 20%   | 30%   | 50%   | ae > .3D use <1D ap<br>ae < .2D use <2D ap<br>*Profile Milling at > 25% ap is not recommended for diameters 6mm and below. |  |       |       |       |       |       |
|   |            |                        |  | 3.8   | 3.1   | 2   | 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. |       |       |       |       |       |
| Max.  | vc - m/min |                        |   |   | fz - mm/tooth   |   |  |  |       |       |       |       |       |
| Non-Ferrous - Aluminum / Aluminum Alloys < 10% Si | N          | ●                      | 600   | 550   | 365   | 275   | .0600  | .1000  | .1200 | .1600 | .2000 | .2800 | .3200 |
| Non-Ferrous - Aluminum / Aluminum Alloys > 10% Si | N          | ●                      | 450   | 365   | 305   | 250   | .0600  | .1000  | .1200 | .1600 | .2000 | .2800 | .3200 |
| Non-Ferrous - Brass                               | N          | ●                      | 275   | 250   | 180   | 150   | .0600  | .1000  | .1200 | .1600 | .2000 | .2800 | .3200 |
| Non-Ferrous - Cu/Cu Alloys / Magnesium            | N          | ●                      | 300   | 250   | 180   | 150   | .0600  | .1000  | .1200 | .1600 | .2000 | .2800 | .3200 |
| Non-Ferrous - Plastics                            | N          | ●                      | 275   | 250   | 180   | 150   | .0600  | .1000  | .1200 | .1600 | .2000 | .2800 | .3200 |





Above 20,000 RPM, Tool Balancing Required

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® AL / X-AL

## 136 / 138 / 138N / 138R / 138NR Recommended Cutting Data - Slotting Inch

| Workpiece Material Group                          | I<br>S<br>O | Coolant<br>• Preferred  | Slotting  |   |   | End Mill Diameter  |       |       |       |       |       |       |       |       |
|---|-------------|---|---|---|---|--|-------|-------|-------|-------|-------|-------|-------|-------|
|   |             |   |  |  |  | 1/8*   | 3/16* | 1/4*  | 5/16  | 3/8   | 1/2   | 5/8   | 3/4   | 1     |
|   |             |  | 25%   | 50%   | 100%  | *Slotting at > 25% ap is not recommended for diameters 1/4" and below. |       |       |       |       |       |       |       |       |
|   |             | Max.  | vc - SFM  |   |   | fz - in/tooth  |       |       |       |       |       |       |       |       |
| Non-Ferrous - Aluminum / Aluminum Alloys < 10% Si | N           | •   | 2000  | 1500  | 1000  | .0012  | .0018 | .0025 | .0032 | .0037 | .0050 | .0065 | .0075 | .0100 |
| Non-Ferrous - Aluminum / Aluminum Alloys > 10% Si | N           | •   | 1500  | 1200  | 800   | .0012  | .0018 | .0025 | .0032 | .0037 | .0050 | .0065 | .0075 | .0100 |
| Non-Ferrous - Brass                               | N           | •   | 600   | 500   | 400   | .0018  | .0025 | .0032 | .0037 | .0050 | .0065 | .0075 | .0100 | .0120 |
| Non-Ferrous - Cu/Cu Alloys / Magnesium            | N           | •   | 500   | 400   | 300   | .0018  | .0025 | .0032 | .0037 | .0050 | .0065 | .0075 | .0100 | .0120 |
| Non-Ferrous - Plastics                            | N           | •   | 1200  | 1000  | 800   | .0018  | .0025 | .0032 | .0037 | .0050 | .0065 | .0075 | .0100 | .0120 |

Above 20,000 RPM, Tool Balancing Required

## 136 / 138 / 138N / 138R / 138NR Recommended Cutting Data - Slotting Metric

| Workpiece Material Group                          | I<br>S<br>O | Coolant<br>• Preferred  | Slotting  |   |   | End Mill Diameter (mm)  |       |       |       |       |       |       |       |
|---|-------------|---|---|---|---|---|-------|-------|-------|-------|-------|-------|-------|
|   |             |   |  |  |  | 3*  | 5*    | 6*    | 8     | 10    | 14    | 16    | 20    |
|   |             |  | 25%   | 50%   | 100%  | *Slotting at > 25% ap is not recommended for diameters 6mm and below. |       |       |       |       |       |       |       |
|   |             | Max.  | vc - m/min  |   |   | fz - mm/tooth   |       |       |       |       |       |       |       |
| Non-Ferrous - Aluminum / Aluminum Alloys < 10% Si | N           | •   | 600   | 450   | 300   | .0300   | .0450 | .0630 | .0810 | .0930 | .1270 | .1650 | .1900 |
| Non-Ferrous - Aluminum / Aluminum Alloys > 10% Si | N           | •   | 450   | 365   | 250   | .0300   | .0450 | .0630 | .0810 | .0930 | .1270 | .1650 | .1900 |
| Non-Ferrous - Brass                               | N           | •   | 180   | 150   | 120   | .0450   | .0630 | .0810 | .0930 | .1270 | .1650 | .1900 | .2540 |
| Non-Ferrous - Cu/Cu Alloys / Magnesium            | N           | •   | 150   | 120   | 90  | .0450   | .0630 | .0810 | .0930 | .1270 | .1650 | .1900 | .2540 |
| Non-Ferrous - Plastics                            | N           | •   | 365   | 300   | 250   | .0450   | .0630 | .0810 | .0930 | .1270 | .1650 | .1900 | .2540 |

Above 20,000 RPM, Tool Balancing Required

Spindle Maximum - Should the calculated spindle speed be more than your actual spindle maximum, use this formula:  

$$\frac{\text{Calculated Feed} \times \text{Spindle Maximum}}{\text{Calculated Speed}}$$

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

For product information, call your local distributor.