

TuffCut® AL / X-AL

136 / 138 / 138N / 138CE Series Recommended Cutting Data - Profile Milling - Inch

Workpiece Material Group	ISO	Coolant • Preferred	Profile Milling (ae)*				End Mill Diameter (inch)								
							1/8*	3/16*	1/4*	5/16	3/8	1/2	5/8	3/4	1
			10%	20%	30%	50%	If $ae \geq 0.3xDC$, use $ap \leq 2xDC$								
			1.67	1.25	1.09	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											
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 / 138CE Series Recommended Cutting Data - Profile Milling - Metric

Workpiece Material Group	ISO	Coolant • Preferred	Profile Milling (ae)*				End Mill Diameter (mm)						
							3*	5*	6*	8	10	14	16
			10%	20%	30%	50%	If $ae \geq 0.3xDC$, use $ap \leq 2xDC$						
			1.67	1.25	1.09	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									
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 / 138CE Series Recommended Cutting Data - Slotting - Inch

Workpiece Material Group	ISO	Coolant ● Preferred	Slotting*			End Mill Diameter (inch)									
						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.									
			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.

End Mills - Technical Information
Series 136 / 138 / 138N / 138CE

136 / 138 / 138N / 138CE Series Recommended Cutting Data - Slotting - Metric

Workpiece Material Group	ISO	Coolant ● 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.							
			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:
(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.