TuffCut® XV

XV7 / XV7CB Series Recommended Cutting Data - Profile Milling with ≤ 2xD Cutting Length - **Inch**

Workpiece Material Group	ISO	Hardness	• Preferred o Possible x Not Possible			RWOC (ae)			End Mill Diameter (inch)				
									1/4	3/8	1/2	5/8	3/4
			Emulsion	Compressed Air	MQL	5%	10%	15%	← 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.				
						2.3	1.67	1.4					
						Vc - SFM			fz - in/tooth				
Low Carbon Steels 12L14, 1018, A36	P	≤ 28 HRC	o	•	o	1475	1150	985	.0015	.0023	.0030	.0038	.0045
Medium Carbon Steels 1045, 1050, 1070	P	≤ 38 HRC	o	•	o	885	850	785	.0015	.0023	.0030	.0038	.0045
Alloy Steels 4130, 4140, 4340	P	≤ 38 HRC	o	•	o	850	785	720	.0015	.0023	.0030	.0038	.0045
Die / Tool Steels A2, D2, H13, P20	P	≤ 45 HRC	o	•	o	720	655	590	.0015	.0023	.0030	.0038	.0045
Stainless Steels - Free Machining 303, 400 Series	M	≤ 28 HRC	•	•	o	675	590	500	.0015	.0023	.0030	.0038	.0045
Stainless Steels - Austenitic 304, 316	M	≤ 28 HRC	•	x	o	525	460	330	.0013	.0019	.0025	.0031	.0038
Stainless Steels - Difficult to Machine 13-8PH, Nitronics	M	≤ 45 HRC	•	x	o	360	295	230	.0010	.0015	.0020	.0025	.0030
Stainless Steels - Precipitation Hardened 15-5 PH, 17-4 PH, 17-7 PH	M	≤ 45 HRC	•	•	o	525	460	330	.0010	.0015	.0020	.0025	.0030
Cobalt Chrome Alloys	M	≤ 45 HRC	•	x	o	400	330	265	.0010	.0015	.0020	.0025	.0030
Duplex (22%)	M	≤ 45 HRC	•	x	o	245	215	195	.0010	.0015	.0020	.0025	.0030
Super Duplex (25%)	M	≤ 45 HRC	•	x	o	230	195	180	.0010	.0015	.0020	.0025	.0030
High Temp Alloys Inconel, Hastelloy, Monel	S	≤ 42 HRC	•	x	x	150	130	-	.0010	.0015	.0020	.0025	.0030
Titanium Alloys 6Al-4V	S	≤ 42 HRC	•	x	x	400	330	265	.0010	.0015	.0020	.0025	.0030
Cast Iron - Gray	K	≤ 240 HB	•	o	o	1350	1180	790	.0015	.0023	.0030	.0038	.0045
Cast Iron - Ductile	K	> 240 HB	•	o	o	975	885	625	.0015	.0023	.0030	.0038	.0045
Cast Iron - Malleable	K	> 240 HB	•	o	o	525	490	460	.0015	.0023	.0030	.0038	.0045
Hardened Steels	H	45-50 HRC	o	•	o	490	445	-	.0013	.0019	.0025	.0031	.0038
Hardened Steels	H	50-55 HRC	o	•	o	375	-	-	.0006	.0009	.0013	.0016	.0019

Notes

- The XV7 / XV7CB should only be used in accurate tool holders with high gripping power. ER collet type holders are not recommended.

Helical interpolation recommendations:

- Under optimal conditions, with proper coolant flow/air blast techniques, up to 3° helical ramp angles are achievable with the XV7 / XV7CB in most materials.
- A reduction of 30-50% in both cutting speed (Vc) & feed per tooth (fz) are recommended.
- Recommended hole diameter = 1.9 x D.

TuffCut® XV

XV7 / XV7CB Series Recommended Cutting Data - Profile Milling with 3xD Cutting Length - **Inch**

Workpiece Material Group	ISO	Hardness	• Preferred o Possible x Not Possible			RWOC (ae)		End Mill Diameter (inch)				
								1/4	3/8	1/2	5/8	3/4
			Emulsion	Compressed Air	MQL	5%	10%	← 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.				
						2.3	1.67					
						Vc - SFM		fz - in/tooth				
Low Carbon Steels 12L14, 1018, A36	P	≤ 28 HRC	o	•	o	1150	985	.0012	.0019	.0025	.0031	.0038
Medium Carbon Steels 1045, 1050, 1070	P	≤ 38 HRC	o	•	o	850	785	.0012	.0019	.0025	.0031	.0038
Alloy Steels 4130, 4140, 4340	P	≤ 38 HRC	o	•	o	785	720	.0012	.0019	.0025	.0031	.0038
Die / Tool Steels A2, D2, H13, P20	P	≤ 45 HRC	o	•	o	720	655	.0012	.0019	.0025	.0031	.0038
Stainless Steels - Free Machining 303, 400 Series	M	≤ 28 HRC	•	•	o	675	590	.0012	.0019	.0025	.0031	.0038
Stainless Steels - Austenitic 304, 316	M	≤ 28 HRC	•	x	o	525	460	.0010	.0015	.0020	.0025	.0030
Stainless Steels - Difficult to Machine 13-8PH, Nitronics	M	≤ 45 HRC	•	x	o	360	295	.0007	.0012	.0016	.0019	.0023
Stainless Steels - Precipitation Hardened 15-5 PH, 17-4 PH, 17-7 PH	M	≤ 45 HRC	•	•	o	525	460	.0007	.0012	.0016	.0019	.0023
Cobalt Chrome Alloys	M	≤ 45 HRC	•	x	o	330	265	.0007	.0012	.0016	.0019	.0023
Duplex (22%)	M	≤ 45 HRC	•	x	o	245	215	.0007	.0012	.0016	.0019	.0023
Super Duplex (25%)	M	≤ 45 HRC	•	x	o	180	155	.0007	.0012	.0016	.0019	.0023
High Temp Alloys Inconel, Hastelloy, Monel	S	≤ 42 HRC	•	x	x	130	-	.0007	.0012	.0016	.0019	.0023
Titanium Alloys 6Al-4V	S	≤ 42 HRC	•	x	x	330	265	.0007	.0012	.0016	.0019	.0023
Cast Iron - Gray	K	≤ 240 HB	•	o	o	1085	945	.0012	.0019	.0025	.0031	.0038
Cast Iron - Ductile	K	> 240 HB	•	o	o	815	710	.0012	.0019	.0025	.0031	.0038
Cast Iron - Malleable	K	> 240 HB	•	o	o	420	390	.0012	.0019	.0025	.0031	.0038
Hardened Steels	H	45-50 HRC	o	•	o	390	350	.0011	.0017	.0022	.0028	.0033
Hardened Steels	H	50-55 HRC	o	•	o	300	-	.0005	.0008	.0011	.0014	.0017

Notes

- The XV7 / XV7CB should only be used in accurate tool holders with high gripping power. ER collet type holders are not recommended.

Helical interpolation recommendations:

- Under optimal conditions, with proper coolant flow/air blast techniques, up to 3° helical ramp angles are achievable with the XV7 / XV7CB in most materials.
- A reduction of 30-50% in both cutting speed (Vc) & feed per tooth (fz) are recommended.
- Recommended hole diameter = 1.9 x D.

TuffCut® XV

XV7 / XV7CB Series Recommended Cutting Data - Profile Milling with 4xD Cutting Length - **Inch**

Workpiece Material Group	ISO	Hardness	• Preferred o Possible x Not Possible			RWOC (ae)	End Mill Diameter (inch)			
							3/8	1/2	5/8	3/4
			Emulsion	Compressed Air	MQL	5%	← 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.			
						2.3				
						Vc - SFM	fz - in/tooth			
Low Carbon Steels 12L14, 1018, A36	P	≤ 28 HRC	o	•	o	985	.0015	.0020	.0025	.0030
Medium Carbon Steels 1045, 1050, 1070	P	≤ 38 HRC	o	•	o	785	.0015	.0020	.0025	.0030
Alloy Steels 4130, 4140, 4340	P	≤ 38 HRC	o	•	o	720	.0015	.0020	.0025	.0030
Die / Tool Steels A2, D2, H13, P20	P	≤ 45 HRC	o	•	o	655	.0015	.0020	.0025	.0030
Stainless Steels - Free Machining 303, 400 Series	M	≤ 28 HRC	•	•	o	590	.0015	.0020	.0025	.0030
Stainless Steels - Austenitic 304, 316	M	≤ 28 HRC	•	x	o	460	.0011	.0015	.0019	.0023
Stainless Steels - Difficult to Machine 13-8PH, Nitronics	M	≤ 45 HRC	•	x	o	295	.0009	.0013	.0016	.0019
Stainless Steels - Precipitation Hardened 15-5 PH, 17-4 PH, 17-7 PH	M	≤ 45 HRC	•	•	o	460	.0009	.0013	.0016	.0019
Cobalt Chrome Alloys	M	≤ 45 HRC	•	x	o	265	.0009	.0013	.0016	.0019
Duplex (22%)	M	≤ 45 HRC	•	x	o	215	.0009	.0013	.0016	.0019
Super Duplex (25%)	M	≤ 45 HRC	•	x	o	155	.0009	.0013	.0016	.0019
High Temp Alloys Inconel, Hastelloy, Monel	S	≤ 42 HRC	•	x	x	100	.0008	.0010	.0013	.0015
Titanium Alloys 6Al-4V	S	≤ 42 HRC	•	x	x	265	.0009	.0013	.0016	.0019
Cast Iron - Gray	K	≤ 240 HB	•	o	o	945	.0015	.0020	.0025	.0030
Cast Iron - Ductile	K	> 240 HB	•	o	o	710	.0015	.0020	.0025	.0030
Cast Iron - Malleable	K	> 240 HB	•	o	o	390	.0015	.0020	.0025	.0030
Hardened Steels	H	45-50 HRC	o	•	o	355	.0015	.0020	.0025	.0030
Hardened Steels	H	50-55 HRC	o	•	o	270	.0008	.0010	.0013	.0015

Notes

- The XV7 / XV7CB should only be used in accurate tool holders with high gripping power. ER collet type holders are not recommended.

Helical interpolation recommendations:

- Under optimal conditions, with proper coolant flow/air blast techniques, up to 2° helical ramp angles are achievable with the XV7 / XV7CB in most materials.
- A reduction of 30-50% in both cutting speed (Vc) & feed per tooth (fz) are recommended.
- Recommended hole diameter = 1.9 x D.

TuffCut® XV

XV7 / XV7CB Series Recommended Cutting Data - Chip Thickness Compensation Factors - **Inch**

RWOC (ae)	Chip Thicknesss Compensation Factor
2%	3.57
3%	2.93
5%	2.30
7%	1.96
8%	1.84
10%	1.67
13%	1.49
15%	1.40

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.