

## XV7 Series Recommended Cutting Data - Profile Milling with ≤ 2xD Cutting Length - Inch

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

### Notes

- Cutting data provided should be considered advisory only. Adjustments may be necessary depending on the application, workpiece rigidity, machine tool, etc.
- 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

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

Workpiece Material Group	ISO	Hardness	<ul style="list-style-type: none"> <li>● Preferred</li> <li>○ Possible</li> <li>x Not Possible</li> </ul>			RWOC (ae)		End Mill Diameter (inch)			
			Emulsion	Compressed air	MQL	5%	10%	3/8	1/2	5/8	3/4
						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 - SFM					
<b>Low Carbon Steels</b> 12L14, 1018, A36	<b>P</b>	≤ 28 HRC	○	●	○	1150	985	.0019	.0025	.0031	.0038
<b>Medium Carbon Steels</b> 1045, 1050, 1070		≤ 38 HRC	○	●	○	850	785	.0019	.0025	.0031	.0038
<b>Alloy Steels</b> 4130, 4140, 4340			○	●	○	785	720	.0019	.0025	.0031	.0038
<b>Die / Tool Steels</b> A2, D2, H13, P20		≤ 45 HRC	○	●	○	720	655	.0019	.0025	.0031	.0038
<b>Stainless Steels - Free Machining</b> 303, 400 Series	<b>M</b>	≤ 28 HRC	●	●	○	675	590	.0019	.0025	.0031	.0038
<b>Stainless Steels - Austenitic</b> 304, 316			●	x	○	525	460	.0015	.0020	.0025	.0030
<b>Stainless Steels - Difficult to Machine</b> 13-8PH, Nitronics		≤ 45 HRC	●	x	○	360	295	.0012	.0016	.0019	.0023
<b>Stainless Steels - Precipitation Hardened</b> 15-5 PH, 17-4 PH, 17-7 PH			●	●	○	525	460	.0012	.0016	.0019	.0023
<b>Cobalt Chrome Alloys</b>			●	x	○	330	265	.0012	.0016	.0019	.0023
<b>Duplex (22%)</b>			●	x	○	245	215	.0012	.0016	.0019	.0023
<b>Super Duplex (25%)</b>			●	x	○	180	155	.0012	.0016	.0019	.0023
<b>High Temp Alloys</b> Inconel, Hastelloy, Monel	<b>S</b>	≤ 42 HRC	●	x	x	130	-	.0012	.0016	.0019	.0023
<b>Titanium Alloys</b> 6Al-4V			●	x	x	330	265	.0012	.0016	.0019	.0023
<b>Cast Iron - Gray</b>	<b>K</b>	≤ 240 HB	●	○	○	1085	945	.0019	.0025	.0031	.0038
<b>Cast Iron - Ductile</b>		> 240 HB	●	○	○	815	710	.0019	.0025	.0031	.0038
<b>Cast Iron - Malleable</b>			●	○	○	420	390	.0019	.0025	.0031	.0038
<b>Hardened Steels</b>	<b>H</b>	45-50 HRC	○	●	○	390	350	.0017	.0022	.0028	.0033
<b>Hardened Steels</b>		50-55 HRC	○	●	○	300	-	.0008	.0011	.0014	.0017

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- Recommended hole diameter = 1.9 x D

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

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

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

RWOC (ae)	Chip Thickness 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.