M.A. FORD
High Performance Cutting Tools

*Where **high performance** is the **standard**®*

NEW PRODUCT 2022

MADE IN USA

ISO 9001:2015 Certified

APG
ADVANCED PRODUCT GROUP

TuffCut® XV Series XV7 / XV7CB

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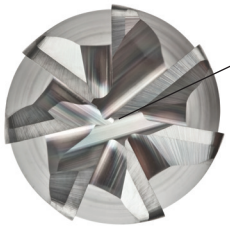
TuffCut® XV Series XV7 / XV7CB



Center-cutting end geometry
for increased ramp angles & improved floor finishes

38° helix, variable pitch geometry
for smooth cutting action & reduced harmonics

Thick core design
for increased strength in tough-to-machine materials

Continuous edge & staggered chipbreaker options
for both roughing & finishing applications

ALtima® Q coating
provides optimal heat & wear resistance allowing for increased tool life

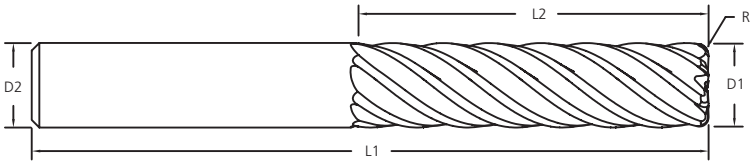
With high performance cutting geometry based off our proven and highly successful 180 series, the XV7 features a unique center-cutting end geometry that allows for aggressive helical ramp angles (up to 3-5°) in difficult-to-machine materials such as titanium, high temp alloys, and stainless steels while also providing superior floor finishes. The newly developed ALtima® Q coating provides increased heat and wear resistance and has shown tool life increases of over 66% in certain workpiece materials.

Suitable materials

Applications

The XV7 was developed for optimal metal removal rates and strength in dynamic milling strategies in tough-to-machine materials such as stainless steels, titanium, and high temp alloys. Offered in a multitude of flute lengths ranging from 1xD up to 4xD, as well as a full range of standard aerospace corner radius options, the XV7 is an extremely versatile offering that is sure to give a boost in both productivity and tool life.

TuffCut® XV Series XV7



ALtima® Q		Diameter		Shank	OAL	Flute Length	Corner Radius
		D1		D2 (h6)	L1	L2	R
Tool No.	EDP	Inch	Decimal	Inch	Inch	Inch	Inch
XV737500AQ	38100	3/8	.3750	3/8	2	1/2	-
XV737502AQ	38101	3/8	.3750	3/8	2	1/2	.015
XV737504AQ	38102	3/8	.3750	3/8	2	1/2	.030
XV737506AQ	38103	3/8	.3750	3/8	2	1/2	.060
XV737507AQ	38104	3/8	.3750	3/8	2	1/2	.090
XV737510AQ	38105	3/8	.3750	3/8	2-1/2	7/8	-
XV737512AQ	38106	3/8	.3750	3/8	2-1/2	7/8	.015
XV737514AQ	38107	3/8	.3750	3/8	2-1/2	7/8	.030
XV737516AQ	38108	3/8	.3750	3/8	2-1/2	7/8	.060
XV737517AQ	38109	3/8	.3750	3/8	2-1/2	7/8	.090
XV737520AQ	38110	3/8	.3750	3/8	3	1-1/4	-
XV737522AQ	38111	3/8	.3750	3/8	3	1-1/4	.015
XV737524AQ	38112	3/8	.3750	3/8	3	1-1/4	.030
XV737526AQ	38113	3/8	.3750	3/8	3	1-1/4	.060
XV737527AQ	38114	3/8	.3750	3/8	3	1-1/4	.090
XV750000AQ	38115	1/2	.5000	1/2	2-1/2	5/8	-
XV750002AQ	38116	1/2	.5000	1/2	2-1/2	5/8	.015
XV750004AQ	38117	1/2	.5000	1/2	2-1/2	5/8	.030
XV750006AQ	38118	1/2	.5000	1/2	2-1/2	5/8	.060
XV750007AQ	38119	1/2	.5000	1/2	2-1/2	5/8	.090
XV750008AQ	38120	1/2	.5000	1/2	2-1/2	5/8	.120
XV750020AQ	38121	1/2	.5000	1/2	3	1-1/4	-
XV750022AQ	38122	1/2	.5000	1/2	3	1-1/4	.015
XV750024AQ	38123	1/2	.5000	1/2	3	1-1/4	.030

TuffCut® XV Series XV7

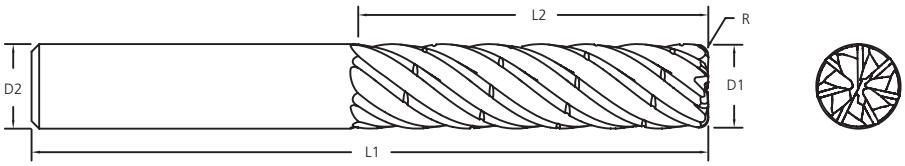
ALtima® Q		Diameter		Shank	OAL	Flute Length	Corner Radius
		D1		D2 (h6)	L1	L2	R
Tool No.	EDP	Inch	Decimal	Inch	Inch	Inch	Inch
XV750026AQ	38124	1/2	.5000	1/2	3	1-1/4	.060
XV750027AQ	38125	1/2	.5000	1/2	3	1-1/4	.090
XV750028AQ	38126	1/2	.5000	1/2	3	1-1/4	.120
XV750030AQ	38127	1/2	.5000	1/2	3-1/2	1-5/8	-
XV750032AQ	38128	1/2	.5000	1/2	3-1/2	1-5/8	.015
XV750034AQ	38129	1/2	.5000	1/2	3-1/2	1-5/8	.030
XV750036AQ	38130	1/2	.5000	1/2	3-1/2	1-5/8	.060
XV750037AQ	38131	1/2	.5000	1/2	3-1/2	1-5/8	.090
XV750038AQ	38132	1/2	.5000	1/2	3-1/2	1-5/8	.120
XV750040AQ	38133	1/2	.5000	1/2	4	2-1/8	-
XV750042AQ	38134	1/2	.5000	1/2	4	2-1/8	.015
XV750044AQ	38135	1/2	.5000	1/2	4	2-1/8	.030
XV750046AQ	38136	1/2	.5000	1/2	4	2-1/8	.060
XV750047AQ	38137	1/2	.5000	1/2	4	2-1/8	.090
XV750048AQ	38138	1/2	.5000	1/2	4	2-1/8	.120
XV762500AQ	38139	5/8	.6250	5/8	3	3/4	-
XV762504AQ	38140	5/8	.6250	5/8	3	3/4	.030
XV762506AQ	38141	5/8	.6250	5/8	3	3/4	.060
XV762508AQ	38142	5/8	.6250	5/8	3	3/4	.120
XV762510AQ	38143	5/8	.6250	5/8	3-1/2	1-3/8	-
XV762514AQ	38144	5/8	.6250	5/8	3-1/2	1-3/8	.030
XV762516AQ	38145	5/8	.6250	5/8	3-1/2	1-3/8	.060
XV762518AQ	38146	5/8	.6250	5/8	3-1/2	1-3/8	.120
XV762530AQ	38147	5/8	.6250	5/8	4	2-1/8	-
XV762534AQ	38148	5/8	.6250	5/8	4	2-1/8	.030
XV762536AQ	38149	5/8	.6250	5/8	4	2-1/8	.060
XV762538AQ	38150	5/8	.6250	5/8	4	2-1/8	.120
XV762540AQ	38151	5/8	.6250	5/8	5	2-5/8	-
XV762544AQ	38152	5/8	.6250	5/8	5	2-5/8	.030
XV762546AQ	38153	5/8	.6250	5/8	5	2-5/8	.060
XV762548AQ	38154	5/8	.6250	5/8	5	2-5/8	.120
XV775000AQ	38155	3/4	.7500	3/4	3	1	-
XV775004AQ	38156	3/4	.7500	3/4	3	1	.030
XV775006AQ	38157	3/4	.7500	3/4	3	1	.060

TuffCut® XV Series XV7

ALtima® Q		Diameter		Shank	OAL	Flute Length	Corner Radius
		D1		D2 (h6)	L1	L2	R
Tool No.	EDP	Inch	Decimal	Inch	Inch	Inch	Inch
XV775007AQ	38158	3/4	.7500	3/4	3	1	.090
XV775008AQ	38159	3/4	.7500	3/4	3	1	.120
XV775020AQ	38160	3/4	.7500	3/4	4	1-5/8	-
XV775024AQ	38161	3/4	.7500	3/4	4	1-5/8	.030
XV775026AQ	38162	3/4	.7500	3/4	4	1-5/8	.060
XV775027AQ	38163	3/4	.7500	3/4	4	1-5/8	.090
XV775028AQ	38164	3/4	.7500	3/4	4	1-5/8	.120
XV775030AQ	38165	3/4	.7500	3/4	5	2-3/8	-
XV775034AQ	38166	3/4	.7500	3/4	5	2-3/8	.030
XV775036AQ	38167	3/4	.7500	3/4	5	2-3/8	.060
XV775037AQ	38168	3/4	.7500	3/4	5	2-3/8	.090
XV775038AQ	38169	3/4	.7500	3/4	5	2-3/8	.120
XV775050AQ	38170	3/4	.7500	3/4	6	3-1/4	-
XV775054AQ	38171	3/4	.7500	3/4	6	3-1/4	.030
XV775056AQ	38172	3/4	.7500	3/4	6	3-1/4	.060
XV775057AQ	38173	3/4	.7500	3/4	6	3-1/4	.090
XV775058AQ	38174	3/4	.7500	3/4	6	3-1/4	.120

M.A. Ford follows the ANSI B94.19-1985 specifications when adding a Weldon flat to any inch size end mill. All request for locations not matching these specifications must be sent to customquotes@maford.com

TuffCut® XV Series XV7CB



ALtima® Q		Diameter		Shank	OAL	Flute Length	Corner Radius
		D1		D2 (h6)	L1	L2	R
Tool No.	EDP	Inch	Decimal	Inch	Inch	Inch	Inch
XV7CB37524AQ	38200	3/8	.3750	3/8	3	1-1/4	.030
XV7CB37526AQ	38201	3/8	.3750	3/8	3	1-1/4	.060
XV7CB50034AQ	38202	1/2	.5000	1/2	3-1/2	1-5/8	.030
XV7CB50036AQ	38203	1/2	.5000	1/2	3-1/2	1-5/8	.060
XV7CB50044AQ	38204	1/2	.5000	1/2	4	2-1/8	.030
XV7CB50046AQ	38205	1/2	.5000	1/2	4	2-1/8	.060
XV7CB62534AQ	38206	5/8	.6250	5/8	4	2-1/8	.030
XV7CB62536AQ	38207	5/8	.6250	5/8	4	2-1/8	.060
XV7CB62544AQ	38208	5/8	.6250	5/8	5	2-5/8	.030
XV7CB62546AQ	38209	5/8	.6250	5/8	5	2-5/8	.060
XV7CB75034AQ	38210	3/4	.7500	3/4	5	2-3/8	.030
XV7CB75036AQ	38211	3/4	.7500	3/4	5	2-3/8	.060
XV7CB75054AQ	38212	3/4	.7500	3/4	6	3-1/4	.030
XV7CB75056AQ	38213	3/4	.7500	3/4	6	3-1/4	.060

M.A. Ford follows the ANSI B94.19-1985 specifications when adding a Weldon flat to any inch size end mill. All request for locations not matching these specifications must be sent to customquotes@maford.com

XV7 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)			
									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				
			Emulsion	Compressed air	MQL	Vc - SFM			fz - in/tooth			
Low Carbon Steels 12L14, 1018, A36	P	≤ 28 HRC	o	•	o	1475	1150	985	.0023	.0030	.0038	.0045
Medium Carbon Steels 1045, 1050, 1070	P	≤ 38 HRC	o	•	o	885	850	785	.0023	.0030	.0038	.0045
Alloy Steels 4130, 4140, 4340	P	≤ 38 HRC	o	•	o	850	785	720	.0023	.0030	.0038	.0045
Die / Tool Steels A2, D2, H13, P20	P	≤ 45 HRC	o	•	o	720	655	590	.0023	.0030	.0038	.0045
Stainless Steels - Free Machining 303, 400 Series	M	≤ 28 HRC	•	•	o	675	590	500	.0023	.0030	.0038	.0045
Stainless Steels - Austenitic 304, 316	M	≤ 28 HRC	•	x	o	525	460	330	.0019	.0025	.0031	.0038
Stainless Steels - Difficult to Machine 13-8PH, Nitronics	M	≤ 45 HRC	•	x	o	360	295	230	.0015	.0020	.0025	.0030
Stainless Steels - Precipitation Hardened 15-5 PH, 17-4 PH, 17-7 PH	M	≤ 45 HRC	•	•	o	525	460	330	.0015	.0020	.0025	.0030
Cobalt Chrome Alloys	M	≤ 45 HRC	•	x	o	400	330	265	.0015	.0020	.0025	.0030
Duplex (22%)	M	≤ 45 HRC	•	x	o	245	215	195	.0015	.0020	.0025	.0030
Super Duplex (25%)	M	≤ 45 HRC	•	x	o	230	195	180	.0015	.0020	.0025	.0030
High Temp Alloys Inconel, Hastelloy, Monel	S	≤ 42 HRC	•	x	x	150	130	-	.0015	.0020	.0025	.0030
Titanium Alloys 6Al-4V	S	≤ 42 HRC	•	x	x	400	330	265	.0015	.0020	.0025	.0030
Cast Iron - Gray	K	≤ 240 HB	•	o	o	1350	1180	790	.0023	.0030	.0038	.0045
Cast Iron - Ductile	K	> 240 HB	•	o	o	975	885	625	.0023	.0030	.0038	.0045
Cast Iron - Malleable	K	> 240 HB	•	o	o	525	490	460	.0023	.0030	.0038	.0045
Hardened Steels	H	45-50 HRC	o	•	o	490	445	-	.0019	.0025	.0031	.0038
Hardened Steels	H	50-55 HRC	o	•	o	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	• Preferred o Possible x Not Possible			RWOC (ae)		End Mill Diameter (inch)			
								3/8	1/2	5/8	3/4
						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				
			Emulsion	Compressed air	MQL	Vc - SFM		fz - in/tooth			
Low Carbon Steels 12L14, 1018, A36	P	≤ 28 HRC	o	•	o	1150	985	.0019	.0025	.0031	.0038
Medium Carbon Steels 1045, 1050, 1070	P	≤ 38 HRC	o	•	o	850	785	.0019	.0025	.0031	.0038
Alloy Steels 4130, 4140, 4340	P	≤ 38 HRC	o	•	o	785	720	.0019	.0025	.0031	.0038
Die / Tool Steels A2, D2, H13, P20	P	≤ 45 HRC	o	•	o	720	655	.0019	.0025	.0031	.0038
Stainless Steels - Free Machining 303, 400 Series	M	≤ 28 HRC	•	•	o	675	590	.0019	.0025	.0031	.0038
Stainless Steels - Austenitic 304, 316	M	≤ 28 HRC	•	x	o	525	460	.0015	.0020	.0025	.0030
Stainless Steels - Difficult to Machine 13-8PH, Nitronics	M	≤ 45 HRC	•	x	o	360	295	.0012	.0016	.0019	.0023
Stainless Steels - Precipitation Hardened 15-5 PH, 17-4 PH, 17-7 PH	M	≤ 45 HRC	•	•	o	525	460	.0012	.0016	.0019	.0023
Cobalt Chrome Alloys	M	≤ 45 HRC	•	x	o	330	265	.0012	.0016	.0019	.0023
Duplex (22%)	M	≤ 45 HRC	•	x	o	245	215	.0012	.0016	.0019	.0023
Super Duplex (25%)	M	≤ 45 HRC	•	x	o	180	155	.0012	.0016	.0019	.0023
High Temp Alloys Inconel, Hastelloy, Monel	S	≤ 42 HRC	•	x	x	130	-	.0012	.0016	.0019	.0023
Titanium Alloys 6Al-4V	S	≤ 42 HRC	•	x	x	330	265	.0012	.0016	.0019	.0023
Cast Iron - Gray	K	≤ 240 HB	•	o	o	1085	945	.0019	.0025	.0031	.0038
Cast Iron - Ductile	K	> 240 HB	•	o	o	815	710	.0019	.0025	.0031	.0038
Cast Iron - Malleable	K	> 240 HB	•	o	o	420	390	.0019	.0025	.0031	.0038
Hardened Steels	H	45-50 HRC	o	•	o	390	350	.0017	.0022	.0028	.0033
Hardened Steels	H	50-55 HRC	o	•	o	300	-	.0008	.0011	.0014	.0017

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

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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

- 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 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

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.

Notes

M.A. FORD
High Performance Cutting Tools

*Where **high performance** is the **standard***®

Also available:

Safety Note
Always wear the appropriate personal protective equipment such as safety glasses and protective clothing when using solid carbide or HSS cutting tools. Machines should be fully guarded.

⚠ **WARNING:** This product can expose you to chemicals including cobalt, which is known to the State of California to cause cancer. For more information go to www.P65Warnings.ca.gov.

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