

NEW Series 137V



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



High Performance Endmills For Aluminum & Aluminum Alloys



NEW From M.A.Ford



Series 137V - 3 Flute Vari-Spiral Endmills For High Performance Machining Of Aluminium and Aluminium Alloys.

Using the very latest CNC grinding technology and manufactured in the UK at our subsidiary company Ashton Tools, the new series 137V from M.A.Ford incorporates a unique Vari-Spiral geometry which allows for smooth vibration free cutting in Aluminium and Aluminium Alloys. The unique flute design allows for increased feed/tooth loading achieving maximum metal removal rates.

Available in 3 different lengths with 3 x Ø (N3), 4 x Ø (N4) and 5 x Ø (N5) neck relieved shanks to cater for a wide range of component depth applications.

Series 137V available diameters are from Ø3.0mm – Ø20.0mm with a full range of industry standard corner radii from R0.2 – R4.0, all available from stock!

137V offers high metal removal rates (Q - cm³/min) as shown below

Field Test

Material – Aluminium Alloy – 3.2315 (AlMgSi1), H30, 6181

Ø16.0mm x 4 x Ø Neck Relieved Shank x R0.5mm – 137V 16N4-0.5R










Vc – 880m/min
n – 17,500 RPM

fz – 0.25mm/z
Vf – 13,125mm/min

ap – 8.0mm
ae – 13.0mm

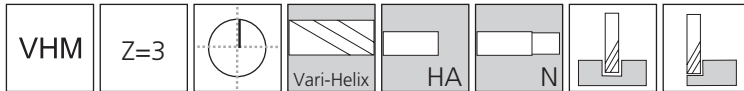
Q – 1,365 cm³/min

Where **high performance is the standard**

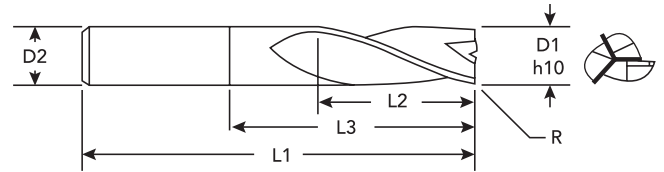
Shank Form	Z	Application Length	Ø Range (mm)	Corner Radius (mm)	Tool Illustration	Material Groups	Series	Page
HA	3		3.0 - 20.0	R0.2 - R4.0			137V N3	4
HA	3		3.0 - 20.0	R0.2 - R4.0			137V N4	5
HA	3		3.0 - 20.0	R0.2 - R4.0			137V N5	6
Technical Information								7



TuffCut® X-AL Vari-Spiral Endmills

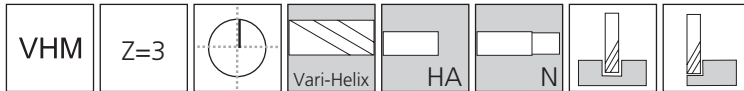


Series
137V N3
 3 x Ø Neck Relieved

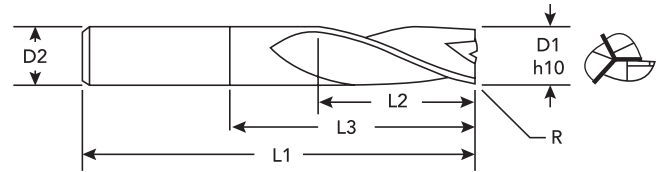


Tool No.	Ø D1	Ø D2	L1	L2	L3	R
137V 03N3	3	3	51	8	11	-
137V 03N3-0.2R	3	3	51	8	11	0.2
137V 03N3-0.5R	3	3	51	8	11	0.5
137V 03N3-1.0R	3	3	51	8	11	1.0
137V 04N3	4	4	51	11	14	-
137V 04N3-0.2R	4	4	51	11	14	0.2
137V 04N3-0.5R	4	4	51	11	14	0.5
137V 04N3-1.0R	4	4	51	11	14	1.0
137V 05N3	5	5	57	13	17	-
137V 05N3-0.2R	5	5	57	13	17	0.2
137V 05N3-0.5R	5	5	57	13	17	0.5
137V 05N3-1.0R	5	5	57	13	17	1.0
137V 06N3	6	6	64	13	20	-
137V 06N3-0.2R	6	6	64	13	20	0.2
137V 06N3-0.5R	6	6	64	13	20	0.5
137V 06N3-1.0R	6	6	64	13	20	1.0
137V 06N3-1.5R	6	6	64	13	20	1.5
137V 06N3-2.0R	6	6	64	13	20	2.0
137V 08N3	8	8	64	19	26	-
137V 08N3-0.2R	8	8	64	19	26	0.2
137V 08N3-0.5R	8	8	64	19	26	0.5
137V 08N3-1.0R	8	8	64	19	26	1.0
137V 08N3-1.5R	8	8	64	19	26	1.5
137V 08N3-2.0R	8	8	64	19	26	2.0
137V 08N3-3.0R	8	8	64	19	26	3.0
137V 10N3	10	10	73	22	32	-
137V 10N3-0.2R	10	10	73	22	32	0.2
137V 10N3-0.5R	10	10	73	22	32	0.5
137V 10N3-1.0R	10	10	73	22	32	1.0
137V 10N3-1.5R	10	10	73	22	32	1.5
137V 10N3-2.0R	10	10	73	22	32	2.0
137V 10N3-3.0R	10	10	73	22	32	3.0
137V 10N3-4.0R	10	10	73	22	32	4.0
137V 12N3	12	12	84	26	38	-
137V 12N3-0.2R	12	12	84	26	38	0.2
137V 12N3-0.5R	12	12	84	26	38	0.5
137V 12N3-1.0R	12	12	84	26	38	1.0
137V 12N3-1.5R	12	12	84	26	38	1.5
137V 12N3-2.0R	12	12	84	26	38	2.0
137V 12N3-3.0R	12	12	84	26	38	3.0
137V 12N3-4.0R	12	12	84	26	38	4.0
137V 16N3	16	16	93	32	50	-
137V 16N3-0.2R	16	16	93	32	50	0.2
137V 16N3-0.5R	16	16	93	32	50	0.5
137V 16N3-1.0R	16	16	93	32	50	1.0
137V 16N3-1.5R	16	16	93	32	50	1.5
137V 16N3-2.0R	16	16	93	32	50	2.0
137V 16N3-3.0R	16	16	93	32	50	3.0
137V 16N3-4.0R	16	16	93	32	50	4.0
137V 20N3	20	20	105	38	62	-
137V 20N3-0.2R	20	20	105	38	62	0.2
137V 20N3-0.5R	20	20	105	38	62	0.5
137V 20N3-1.0R	20	20	105	38	62	1.0
137V 20N3-1.5R	20	20	105	38	62	1.5
137V 20N3-2.0R	20	20	105	38	62	2.0
137V 20N3-3.0R	20	20	105	38	62	3.0
137V 20N3-4.0R	20	20	105	38	62	4.0

TuffCut® X-AL Vari-Spiral Endmills

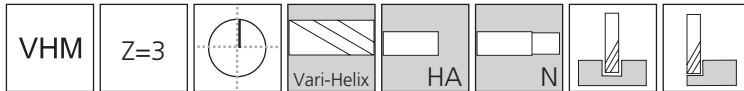


Series
137V N4
 4 x Ø Neck Relieved

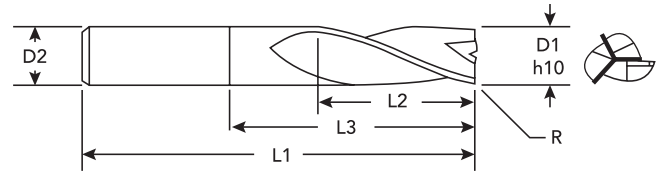


Tool No.	Ø D1	Ø D2	L1	L2	L3	R
137V 03N4	3	3	51	4.5	14	-
137V 03N4-0.2R	3	3	51	4.5	14	0.2
137V 03N4-0.5R	3	3	51	4.5	14	0.5
137V 03N4-1.0R	3	3	51	4.5	14	1.0
137V 04N4	4	4	51	6	18	-
137V 04N4-0.2R	4	4	51	6	18	0.2
137V 04N4-0.5R	4	4	51	6	18	0.5
137V 04N4-1.0R	4	4	51	6	18	1.0
137V 05N4	5	5	57	7.5	22	-
137V 05N4-0.2R	5	5	57	7.5	22	0.2
137V 05N4-0.5R	5	5	57	7.5	22	0.5
137V 05N4-1.0R	5	5	57	7.5	22	1.0
137V 06N4	6	6	64	9	26	-
137V 06N4-0.2R	6	6	64	9	26	0.2
137V 06N4-0.5R	6	6	64	9	26	0.5
137V 06N4-1.0R	6	6	64	9	26	1.0
137V 06N4-1.5R	6	6	64	9	26	1.5
137V 06N4-2.0R	6	6	64	9	26	2.0
137V 08N4	8	8	70	12	34	-
137V 08N4-0.2R	8	8	70	12	34	0.2
137V 08N4-0.5R	8	8	70	12	34	0.5
137V 08N4-1.0R	8	8	70	12	34	1.0
137V 08N4-1.5R	8	8	70	12	34	1.5
137V 08N4-2.0R	8	8	70	12	34	2.0
137V 08N4-3.0R	8	8	70	12	34	3.0
137V 10N4	10	10	90	15	42	-
137V 10N4-0.2R	10	10	90	15	42	0.2
137V 10N4-0.5R	10	10	90	15	42	0.5
137V 10N4-1.0R	10	10	90	15	42	1.0
137V 10N4-1.5R	10	10	90	15	42	1.5
137V 10N4-2.0R	10	10	90	15	42	2.0
137V 10N4-3.0R	10	10	90	15	42	3.0
137V 10N4-4.0R	10	10	90	15	42	4.0
137V 12N4	12	12	100	18	50	-
137V 12N4-0.2R	12	12	100	18	50	0.2
137V 12N4-0.5R	12	12	100	18	50	0.5
137V 12N4-1.0R	12	12	100	18	50	1.0
137V 12N4-1.5R	12	12	100	18	50	1.5
137V 12N4-2.0R	12	12	100	18	50	2.0
137V 12N4-3.0R	12	12	100	18	50	3.0
137V 12N4-4.0R	12	12	100	18	50	4.0
137V 16N4	16	16	120	24	66	-
137V 16N4-0.2R	16	16	120	24	66	0.2
137V 16N4-0.5R	16	16	120	24	66	0.5
137V 16N4-1.0R	16	16	120	24	66	1.0
137V 16N4-1.5R	16	16	120	24	66	1.5
137V 16N4-2.0R	16	16	120	24	66	2.0
137V 16N4-3.0R	16	16	120	24	66	3.0
137V 16N4-4.0R	16	16	120	24	66	4.0
137V 20N4	20	20	135	30	82	-
137V 20N4-0.2R	20	20	135	30	82	0.2
137V 20N4-0.5R	20	20	135	30	82	0.5
137V 20N4-1.0R	20	20	135	30	82	1.0
137V 20N4-1.5R	20	20	135	30	82	1.5
137V 20N4-2.0R	20	20	135	30	82	2.0
137V 20N4-3.0R	20	20	135	30	82	3.0
137V 20N4-4.0R	20	20	135	30	82	4.0

TuffCut® X-AL Vari-Spiral Endmills



Series
137V N5
 5 x Ø Neck Relieved



Tool No.	Ø D1	Ø D2	L1	L2	L3	R
137V 03N5	3	3	51	4.5	17	-
137V 03N5-0.2R	3	3	51	4.5	17	0.2
137V 03N5-0.5R	3	3	51	4.5	17	0.5
137V 03N5-1.0R	3	3	51	4.5	17	1.0
137V 04N5	4	4	51	6	22	-
137V 04N5-0.2R	4	4	51	6	22	0.2
137V 04N5-0.5R	4	4	51	6	22	0.5
137V 04N5-1.0R	4	4	51	6	22	1.0
137V 05N5	5	5	57	7.5	27	-
137V 05N5-0.2R	5	5	57	7.5	27	0.2
137V 05N5-0.5R	5	5	57	7.5	27	0.5
137V 05N5-1.0R	5	5	57	7.5	27	1.0
137V 06N5	6	6	64	9	32	-
137V 06N5-0.2R	6	6	64	9	32	0.2
137V 06N5-0.5R	6	6	64	9	32	0.5
137V 06N5-1.0R	6	6	64	9	32	1.0
137V 06N5-1.5R	6	6	64	9	32	1.5
137V 06N5-2.0R	6	6	64	9	32	2.0
137V 08N5	8	8	75	12	42	-
137V 08N5-0.2R	8	8	75	12	42	0.2
137V 08N5-0.5R	8	8	75	12	42	0.5
137V 08N5-1.0R	8	8	75	12	42	1.0
137V 08N5-1.5R	8	8	75	12	42	1.5
137V 08N5-2.0R	8	8	75	12	42	2.0
137V 08N5-3.0R	8	8	75	12	42	3.0
137V 10N5	10	10	90	15	52	-
137V 10N5-0.2R	10	10	90	15	52	0.2
137V 10N5-0.5R	10	10	90	15	52	0.5
137V 10N5-1.0R	10	10	90	15	52	1.0
137V 10N5-1.5R	10	10	90	15	52	1.5
137V 10N5-2.0R	10	10	90	15	52	2.0
137V 10N5-3.0R	10	10	90	15	52	3.0
137V 10N5-4.0R	10	10	90	15	52	4.0
137V 12N5	12	12	110	18	62	-
137V 12N5-0.2R	12	12	110	18	62	0.2
137V 12N5-0.5R	12	12	110	18	62	0.5
137V 12N5-1.0R	12	12	110	18	62	1.0
137V 12N5-1.5R	12	12	110	18	62	1.5
137V 12N5-2.0R	12	12	110	18	62	2.0
137V 12N5-3.0R	12	12	110	18	62	3.0
137V 12N5-4.0R	12	12	110	18	62	4.0
137V 16N5	16	16	130	24	82	-
137V 16N5-0.2R	16	16	130	24	82	0.2
137V 16N5-0.5R	16	16	130	24	82	0.5
137V 16N5-1.0R	16	16	130	24	82	1.0
137V 16N5-1.5R	16	16	130	24	82	1.5
137V 16N5-2.0R	16	16	130	24	82	2.0
137V 16N5-3.0R	16	16	130	24	82	3.0
137V 16N5-4.0R	16	16	130	24	82	4.0
137V 20N5	20	20	150	30	102	-
137V 20N5-0.2R	20	20	150	30	102	0.2
137V 20N5-0.5R	20	20	150	30	102	0.5
137V 20N5-1.0R	20	20	150	30	102	1.0
137V 20N5-1.5R	20	20	150	30	102	1.5
137V 20N5-2.0R	20	20	150	30	102	2.0
137V 20N5-3.0R	20	20	150	30	102	3.0
137V 20N5-4.0R	20	20	150	30	102	4.0

TuffCut® X-AL 137V Cutting Data



Material Group		Material Examples		
Category	N	Material Type		
Category	N	Aluminium/Aluminium Alloys ≤ 10% Si	UK - H9, H30, LM5, LM10 DIN - 3.2315 (AlMgSi1), 3.3591 (G-AlMg10), 3.3545 (AlMg4Mn) USA - 5052, 5086, 6082, 6181, 7075	

The cutting data provided below should only be used as a guideline.

Variations may be necessary due to machine tool/spindle condition, component rigidity or other factors of a particular application.

For optimum performance and tool life, M.A.Ford recommends the use of hydraulic, heat shrink or powergrip tool holders.

137VN3 - 3 x D Necked Endmills				Cutting Speed - Vc (m/min)	Tool Diameter (mm)				
Series	Type Of Cut	ap	ae		Ø 3.0	Ø 4.0	Ø 5.0	Ø 6.0	Ø 8.0
					Feed/Tooth (fz - mm/z)				
137V - N3	Slotting	0.25 x D	1 x D	400 - 600	0.03	0.04	0.05	0.06	0.08
		0.5 x D	1 x D	400 - 600	0.03	0.04	0.05	0.06	0.08
		1 x D	1 x D	400 - 600	0.02	0.03	0.04	0.05	0.07
	Rough Profiling	0.5 x D	0.75 x D	500 - 700	0.045	0.06	0.075	0.09	0.12
		1 x D	0.5 x D	500 - 700	0.03	0.04	0.05	0.06	0.08
		1.5 x D	0.5 x D	500 - 700	0.03	0.04	0.05	0.06	0.08
Light Profiling	≤ 0.9 x L ²	≤ 0.1 x D	800 - 1000	0.036	0.054	0.072	0.09	0.126	

137VN3 - 3 x D Necked Endmills				Cutting Speed - Vc (m/min)	Tool Diameter (mm)			
Series	Type Of Cut	ap	ae		Ø 10.0	Ø 12.0	Ø 16.0	Ø 20.0
					Feed/Tooth (fz - mm/z)			
137V - N3	Slotting	0.25 x D	1 x D	400 - 600	0.10	0.12	0.16	0.20
		0.5 x D	1 x D	400 - 600	0.10	0.12	0.16	0.20
		1 x D	1 x D	400 - 600	0.09	0.11	0.15	0.19
	Rough Profiling	0.5 x D	0.75 x D	500 - 700	0.15	0.18	0.24	0.30
		1 x D	0.5 x D	500 - 700	0.10	0.12	0.16	0.20
		1.5 x D	0.5 x D	500 - 700	0.10	0.12	0.16	0.20
Light Profiling	≤ 0.9 x L ²	≤ 0.1 x D	800 - 1000	0.162	0.20	0.27	0.342	

137VN4 - 4 x D Necked Endmills				Cutting Speed - Vc (m/min)	Tool Diameter (mm)				
Series	Type Of Cut	ap	ae		Ø 3.0	Ø 4.0	Ø 5.0	Ø 6.0	Ø 8.0
					Feed/Tooth (fz - mm/z)				
137V - N4	Slotting	0.25 x D	1 x D	400 - 600	0.03	0.04	0.05	0.06	0.08
		0.5 x D	1 x D	400 - 600	0.03	0.04	0.05	0.06	0.08
		1 x D	1 x D	400 - 600	0.02	0.03	0.04	0.05	0.07
	Rough Profiling	0.5 x D	0.75 x D	500 - 700	0.045	0.06	0.075	0.09	0.12
		1 x D	0.5 x D	500 - 700	0.03	0.04	0.05	0.06	0.08
		0.9 x L ²	0.5 x D	500 - 700	0.03	0.04	0.05	0.06	0.08
Light Profiling	≤ 0.9 x L ²	≤ 0.1 x D	800 - 1000	0.036	0.054	0.072	0.09	0.126	

137VN3 - 4 x D Necked Endmills				Cutting Speed - Vc (m/min)	Tool Diameter (mm)			
Series	Type Of Cut	ap	ae		Ø 10.0	Ø 12.0	Ø 16.0	Ø 20.0
					Feed/Tooth (fz - mm/z)			
137V - N4	Slotting	0.25 x D	1 x D	400 - 600	0.10	0.12	0.16	0.20
		0.5 x D	1 x D	400 - 600	0.10	0.12	0.16	0.20
		1 x D	1 x D	400 - 600	0.09	0.11	0.15	0.19
	Rough Profiling	0.5 x D	0.75 x D	500 - 700	0.15	0.18	0.24	0.30
		1 x D	0.5 x D	500 - 700	0.10	0.12	0.16	0.20
		0.9 x L ²	0.5 x D	500 - 700	0.10	0.12	0.16	0.20
Light Profiling	≤ 0.9 x L ²	≤ 0.1 x D	800 - 1000	0.162	0.20	0.27	0.342	

137VN5 - 5 x D Necked Endmills				Cutting Speed - Vc (m/min)	Tool Diameter (mm)				
Series	Type Of Cut	ap	ae		Ø 3.0	Ø 4.0	Ø 5.0	Ø 6.0	Ø 8.0
					Feed/Tooth (fz - mm/z)				
137V - N5	Slotting	≤ 0.2 x D	≤ 1 x D Max	300 - 500	0.02	0.03	0.04	0.05	0.07
	Profiling	≤ 1 x D Max	0.1 - 0.2 x D	300 - 500	0.03	0.06	0.08	0.10	0.14

137VN5 - 5 x D Necked Endmills				Cutting Speed - Vc (m/min)	Tool Diameter (mm)			
Series	Type Of Cut	ap	ae		Ø 10.0	Ø 12.0	Ø 16.0	Ø 20.0
					Feed/Tooth (fz - mm/z)			
137V - N5	Slotting	≤ 0.2 x D	≤ 1 x D Max	300 - 500	0.09	0.11	0.13	0.15
	Profiling	≤ 1 x D Max	0.1 - 0.2 x D	300 - 500	0.16	0.18	0.20	0.23

RPM Formula For Metric Endmills
 $RPM = (Vc \times 318.0) \div \text{Endmill } \varnothing$

Coolant Requirements



Feedrate Formula For Metric Endmills
 $\text{Feedrate} = RPM \times fz \times \text{Number Of Cutting Teeth}$

Feedrate = RPM x fz x Number Of Cutting Teeth



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



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