

TuffCut® Endmills

Twister® Drills

TrueSize® Reamers

Countersinks

Edgehog® Burrs



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

M.A. FORD MAX
RANGE

Performance, Precision, Economy



ISO 9001:2008 Certified



M.A. FORD Quality Policy

Ultimately we are judged by our customer. The product that we supply must satisfy our customers needs and meet their requirements, or they will find an alternative source. The customer will define quality. It therefore becomes everyone's quality mission to know their customer, to fully understand their requirements, and to commit to continued improvement in satisfying those needs and requirements.



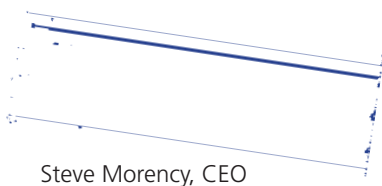
The M.A. Ford Quality Policy is:

Know our customers.

Know their requirements.

Make continual improvements in satisfying those requirements.

These are the responsibilities of every individual who works at M.A. Ford.



Steve Morency, CEO

M.A. Ford

For more than 90 years, M.A. Ford has been at the cutting edge of tooling design and manufacture and has developed an enviable global reputation for performance and precision in advanced solid carbide tooling.

Our innovative cutting geometries, materials and coating technologies are providing effective manufacturing solutions to an expanding and increasingly diverse range of industries from agriculture and construction to aerospace, power generation and automotive, to name but a few.

As our tooling is designed and produced both in the USA and in the UK at M.A. Ford Europe's Group Company Ashton Tools Limited, we not only have a fully integrated and seamless approach to quality and manufacturing excellence, but also in the high standards of customer service and support we provide on a daily basis.

Across our business, we supply tooling to more than 60 countries world wide to help customers improve productivity, reduce costs and maximise margins. From our European HQ and custom tooling production facilities in the UK, we ensure that our customers not only obtain the latest cutting tool technologies direct from our extensive stocks, but also have access to specialist tooling design and manufacturing for unique applications.

With the M.A. FordMax range, we're continuing our reputation for excellence and making our tooling even more accessible and relevant for our existing and new customers looking to improve performance and productivity in an economic package without compromising quality.

M.A. Ford – Where high performance is the standard.

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ashtontools	105
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Specialist manufacturers of precision cutting tools.

Approved M.A. Ford Regrinding & Recoating Service
Custom Tool Division

A subsidiary of M.A. Ford Europe Ltd.



Product contents

FordMax Carbide Endmills								
Shank Form	Z	Application Length	Ø Range (mm)	Tool Illustration	Coating	Material Groups	Series	Page
HA	2		0.20 - 20.00		X		164	8
HA	2		1.00 - 20.00		ALtima®		164A	8
HA	3		1.00 - 20.00		X		169	8
HA	3		1.00 - 20.00		ALtima®		169A	8
HA	4		1.00 - 20.00		X		163	8
HA	4		1.00 - 20.00		ALtima®		163A	8
HA	2		1.00 - 20.00		X		166	9
HA	2		1.00 - 20.00		ALtima®		166A	9
HA	4		1.00 - 20.00		X		165	9
HA	4		1.00 - 20.00		ALtima®		165A	9
HA	4		3.00 - 20.00		HP ALTiN		V4S	10
HB	3 - 4		8.00 - 20.00		ALtima®		192A	10
HA	2		0.20 - 25.00		X		121	11
HA	2		1.00 - 25.00		ALtima®		121A	11
HA	3		1.00 - 25.00		X		116	11
HA	3		1.00 - 25.00		ALtima®		116A	11
HA	4		0.20 - 25.00		X		111	11
HA	4		1.00 - 25.00		ALtima®		111A	11
HA	2		0.40 - 25.00		X		150	12
HA	2		1.00 - 25.00		ALtima®		150A	12
HA	3		1.00 - 25.00		X		145	12
HA	3		1.00 - 25.00		ALtima®		145A	12
HA	4		1.00 - 25.00		X		140	12
HA	4		1.00 - 25.00		ALtima®		140A	12
HA	4		6.00 - 20.00		X		V4L	13
HA	4		6.00 - 20.00		ALTiN		V4L	13
HA	4		6.00 - 20.00		X		V4LB	13
HA	4		6.00 - 20.00		ALTiN		V4LB	13
Technical Information								16 - 19

Product contents

FordMax Carbide Endmills For Aluminium

Shank Form	Z	Application Length	Ø Range (mm)	Tool Illustration	Coating	Material Groups	Series	Page
HA	2		3.00 - 20.00		X		GT2	14
HA	2		3.00 - 20.00		X		GT2B	14
HA	3		3.00 - 20.00		X		GT3	14
HA	3		3.00 - 20.00		X		GT3B	14
HA	3		6.00 - 25.00		X		134	15
Technical Information								20

FordMax Carbide Chamfer Mills

Shank Form	Z	Included Angle	Application	Tool Length	Ø Range (mm)	Tool Illustration	Coating	Material Groups	Series	Page
HA	4-6	60°			4.00-16.00		X		VCM60	15
							ALTiN			
HA	4-6	90°			4.00-16.00		X		VCM90	15
							ALTiN			

FordMax High Performance Drills

Type	Shank Form	Drilling Depth	Ø Range (mm)	Internal Coolant	Tool Illustration	Coating	Material Groups	Series	Page
HP (Micro)	HA	Various	0.10 - 3.00	X		X		305	22 - 23
HP (Micro)	HA	Various	0.10 - 3.00	X		ALtima® Micro		305AM	24
HP	HA	Spot Drill	3.00 - 16.00	X		ALtima®		200S	24
A.P.G.	HA	3 x D	2.50 - 20.00	X		ALtima®		XD SSM	25 - 27
A.P.G.	HA	3 x D	3.00 - 16.00			ALtima®		XD CSM	25 - 27
HP	DIN 6537L	5 x D	3.00 - 16.00	X		NEW HP ALTiN		HPDSR	28 - 30
HP	DIN 6537L	5 x D	3.00 - 16.00			NEW HP ALTiN		HPDCR	28 - 30
A.P.G.	HA	5 x D	0.50 - 16.00	X		ALtima®		XD SRM	31 - 33
A.P.G.	HA	5 x D	3.00 - 20.00			ALtima®		XD CRM	31 - 33
A.P.G.	HA	7+ x D	3.00 - 12.00			ALtima®		XD CLM	34 - 35
A.P.G. (Micro MD)	HA	10 x D	2.00 - 2.95			ALtima®		MD CLM	36
A.P.G.	HA	12+ x D	4.00 - 12.70			ALtima®		XD CEM	37
HP	HA	4-5 x D	2.00 - 16.00	X		X		229	38
Technical Information									50 - 56

Product contents

FordMax General Purpose Drills

Type	Shank Form	Drilling Depth	Ø Range (mm)	Internal Coolant	Tool Illustration	Coating	Material Groups	Series	Page
GP (Micro)	PCB	Various	0.10 - 3.15	X		X		302	39
GP	Parallel	3 x D	0.80 - 20.00	X		X		200	40 - 41
GP	Parallel	3 x D	2.40 - 12.00	X		X		207	42
GP	Parallel	5 x D	0.30 - 20.00	X		X		205	43 - 44
GP (Micro)	Parallel	5 x D	0.50 - 3.15	X		X		300	45
GP	Parallel	5 x D	0.30 - 20.00	X		X		224	46 - 47
GP	Parallel	Centre Drill	0.50 - 5.00	X		X		402	48
GP	Parallel	Spot Drill 90°	5.00 - 12.00	X		X		404	48
GP	Parallel	Spot Drill 120°	5.00 - 12.00	X		X		403	49
Technical Information									57 - 60

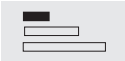
FordMax Carbide Reamers

Type	Shank Form	Tolerance	Ø Range (mm)	Internal Coolant	Tool Illustration	Coating	Material Groups	Series	Page
272	M.A.Ford Standard	H7	0.33 - 16.00	X		X		272	62 - 71
Technical Information									72

Product contents

FordMax Countersinks - Carbide & HSS									
Tool Material	Z	Included Angles	Ø Range (mm)	Tool Illustration	Type	Surface Treatment	Material Groups	Series	Page
VHM	1	60°, 82°, 90°, 100°	3.20 - 25.40		UniFlute®	X		60	74
HSS	1	60°, 82°, 90°, 100°, 120°	3.20 - 76.20		UniFlute®	Steam Treated		61	74
HSS	1	60°, 82°, 90°, 100°, 120°	3.20 - 25.40		UniFlute®	ALtima® Blaze		61B	75
HSS	1	60°, 82°, 90°, 100°, 120°	3.20 - 25.40		UniFlute®	TiN		61T	75
HSS	1	60°, 82°, 90°	4.30 - 31.00		Single Flute	Bright Finish		88	81
HSS	1	60°, 82°, 90°	4.30 - 31.00		Single Flute	TiN		88T	82
HSS	3	60°, 82°, 90°, 100°, 120°	6.40 - 50.80		Aircraft 3 Flute	Bright Finish		92	80
HSS	3	60°, 82°, 90°	4.30 - 31.00		3 Flute	Bright Finish		89	83
HSS	3	60°, 82°, 90°	4.30 - 31.00		3 Flute	TiN		89T	84
VHM	6	60°, 82°, 90°, 100°, 120°	3.20 - 38.10		Vibration Free 6 Flute	X		78	77
HSS	6	60°, 82°, 90°, 100°, 120°	3.20 - 76.20		Vibration Free 6 Flute	Steam Treated		79	77
HSS	6	60°, 82°, 90°, 100°, 120°	3.20 - 25.40		Vibration Free 6 Flute	ALtima® Blaze		79B	78
HSS	6	60°, 82°, 90°, 100°, 120°	3.20 - 25.40		Vibration Free 6 Flute	TiN		79T	78
UniFlute® HSS Countersink Sets - Series 61, 61T						Steam Treated		61 Set	76
						TiN		61T Set	76
Vibration Free HSS Countersink Sets - Series 79, 79T						Steam Treated		79 Set	79
						TiN		79T Set	79
3 Flute Aircraft HSS Countersink Sets - Series 92						Bright Finish		92 Set	80
3 Flute HSS 90° Countersink Sets - Series 89, 89T						Bright Finish		89 Set	85
						TiN		89T Set	85
UniFlute® Resharpener Fixture						Regrinding Accessory		65	76
Technical Information									86 - 87

Product contents

FordMax Carbide Burrs					
Diameter Range	Available Shank Ø	Lengths	Tool Illustration	Series	Page
Ø1.6 - Ø25.0	3.0			SA	90
	6.0				
	8.0*				
Ø3.0 - Ø25.0	3.0			SB	91
	6.0				
	8.0*				
Ø2.4 - Ø25.0	3.0			SC	92
	6.0				
	8.0*				
Ø2.4 - Ø25.0	3.0			SD	93
	6.0				
	8.0*				
Ø3.0 - Ø19.0	3.0			SE	94
	6.0				
	8.0*				
Ø3.0 - Ø19.0	3.0			SF	95
	6.0				
	8.0*				
Ø3.0 - Ø19.0	3.0			SG	96
	6.0				
	8.0*				
Ø3.0 - Ø19.0	3.0			SH	97
	6.0				
	8.0*				
Ø3.0 - Ø25.0	3.0			SJ	98
	6.0				
	8.0*				
Ø3.0 - Ø25.0	3.0			SK	99
	6.0				
	8.0*				
Ø3.0 - Ø19.0	3.0			SL	100
	6.0				
	8.0*				
Ø3.0 - Ø16.0	3.0			SM	101
	6.0				
	8.0*				
Ø2.4 - Ø19.0	3.0			SN	102
	6.0				
	8.0*				
Technical Information					103 - 104

* Burrs 12.0mm and above are available with an 8.0mm shank on request as a non-stock standard.

TuffCut®

Carbide Endmills

TuffCut® endmills are designed to provide the outstanding performance and results to minimise process downtime while maximising productivity and cost efficiency. Included in the range are high performance endmills developed for specific applications such as stainless steels and high temperature alloys, hardened steel and aluminium and softer alloys.

We also carry a complete family of standard carbide endmills designed for efficient general purpose milling of all steels, cast irons and most other materials.

M.A. Ford solid carbide endmills are ideal for tough or abrasive work. On many jobs they can run faster than HSS or Cobalt due to their high heat resistance, resulting higher production rates. With more than fifty different styles available, we can deliver the correct combination of size, flute length, numbers of flutes, geometry and coating to meet your precise needs.

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TuffCut® GP Endmills Stub/Short Length Series 166, 165	9
TuffCut® GP Endmills Stub/Short Length Series V4S	10
TuffCut® GP Endmills Stub/Short & Standard Length Series 192	10
TuffCut® GP Endmills Standard Length Series 121, 116, 111	11
TuffCut® GP Endmills Standard Length Series 150, 145, 140	12
TuffCut® GP Endmills Long Length (Anti- Vibration) Series V4L & V4LB	13

TuffCut® GP Endmills For Aluminium Standard Length

TuffCut® GP Endmills Standard Length Series GT2, GT3 & GT2B, GT3B	14
TuffCut® GP Endmills Standard Length Series 134	15

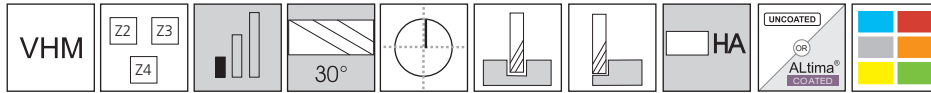
TuffCut® GP Chamfer Mills

TuffCut® GP Chamfer Mills Standard Length Series VCM60, VCM90	15
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Technical Information	16 - 20
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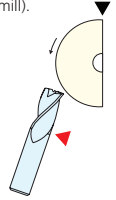
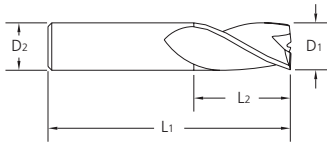
 VHM Tool Material	 Z2 Z3 Number of Flutes	 55° Helix Angle	 Centre Cutting
 Lengths	 Cutting Direction	 Profiling	 Slotting
 3D Scanning	 HA Shank	 <48HRC Material Hardness	 ALtima® Coating
 Uncoated or Coated	 P01 Technical Information		
 Workpiece Material Group	 Steel	 Cast Iron	
	 Hardened Steels (35-65Rc)	 Special Alloys	
	 Stainless Steels	 Non-Ferrous	

TuffCut® GP Endmills - Stub/Short Length



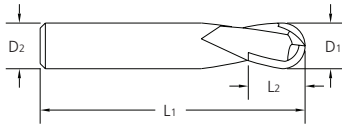
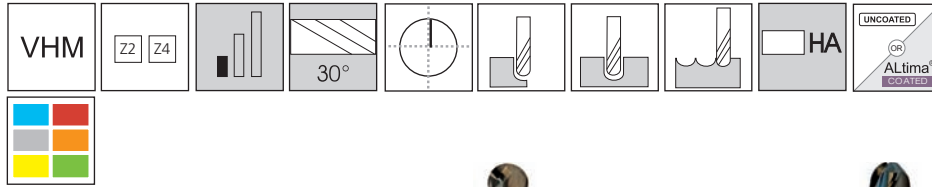
Series
164, 169, 163

Example Ordering Code -
Select series number
then add tool number
(E.g. 164 0600 - 6.0mm
2 Flute Uncoated Endmill).



Tool Dimensions				Series 164		Series 169		Series 163		Regrind	Regrind & Recoat
				Uncoated	Coated	Uncoated	Coated	Uncoated	Coated		
Ø D ¹	Ø D ²	L ¹	L ²	Tool No	Tool No	Tool No	Tool No	Tool No	Tool No	Available On Request - POA	Available On Request - POA
0.2	3.0	38.0	0.4	164 0020	-	-	-	-	-		
0.3	3.0	38.0	0.6	164 0030	-	-	-	-	-	Available On Request - POA	Available On Request - POA
0.4	3.0	38.0	0.8	164 0040	-	-	-	-	-		
0.5	3.0	38.0	1.0	164 0050	-	-	-	-	-		
0.6	3.0	38.0	1.2	164 0060	-	-	-	-	-		
0.7	3.0	38.0	1.4	164 0070	-	-	-	-	-		
0.8	3.0	38.0	1.6	164 0080	-	-	-	-	-		
0.9	3.0	38.0	1.8	164 0090	-	-	-	-	-		
1.0	3.0	38.0	2.0	164 0100	-	169 0100	-	163 0100	-		
1.1	3.0	38.0	2.2	164 0110	-	-	-	-	-		
1.2	3.0	38.0	2.4	164 0120	-	-	-	-	-		
1.3	3.0	38.0	2.6	164 0130	-	-	-	-	-		
1.4	3.0	38.0	2.8	164 0140	-	-	-	-	-		
1.5	3.0	38.0	3.0	164 0150	-	169 0150	-	163 0150	-		
1.6	3.0	38.0	3.2	164 0160	-	-	-	-	-		
1.7	3.0	38.0	3.4	164 0170	-	-	-	-	-		
1.8	3.0	38.0	3.6	164 0180	-	-	-	-	-		
1.9	3.0	38.0	3.8	164 0190	-	-	-	-	-		
2.0	3.0	38.0	4.0	164 0200	-	169 0200	-	163 0200	-		
2.5	3.0	38.0	5.0	164 0250	-	169 0250	-	163 0250	-		
3.0	3.0	38.0	6.0	164 0300	164 0300A	169 0300	169 0300A	163 0300	163 0300A		
3.5	4.0	51.0	7.0	164 0350	-	169 0350	-	163 0350	-		
4.0	4.0	51.0	8.0	164 0400	164 0400A	169 0400	169 0400A	163 0400	163 0400A		
4.5	5.0	51.0	9.0	164 0450	-	169 0450	-	163 0450	-		
5.0	5.0	51.0	11.0	164 0500	164 0500A	169 0500	169 0500A	163 0500	163 0500A		
5.5	6.0	51.0	12.0	164 0550	-	169 0550	-	163 0550	-		
6.0	6.0	51.0	13.0	164 0600	164 0600A	169 0600	169 0600A	163 0600	163 0600A		
7.0	8.0	51.0	13.0	164 0700	-	169 0700	-	163 0700	-		
8.0	8.0	51.0	13.0	164 0800	164 0800A	169 0800	169 0800A	163 0800	163 0800A		
9.0	9.0	51.0	14.0	164 0900	-	169 0900	-	163 0900	-		
10.0	10.0	51.0	14.0	164 1000	164 1000A	169 1000	169 1000A	163 1000	163 1000A		
11.0	11.0	64.0	16.0	164 1100	-	169 1100	-	163 1100	-		
12.0	12.0	64.0	16.0	164 1200	164 1200A	169 1200	169 1200A	163 1200	163 1200A		
14.0	14.0	70.0	18.0	164 1400	-	169 1400	-	163 1400	-		
16.0	16.0	76.0	20.0	164 1600	164 1600A	169 1600	169 1600A	163 1600	163 1600A		
18.0	18.0	76.0	25.0	164 1800	-	169 1800	-	163 1800	-		
20.0	20.0	76.0	25.0	164 2000	164 2000A	169 2000	169 2000A	163 2000	163 2000A		

TuffCut® GP Endmills - Stub/Short Length



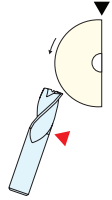
Z2



Z4

Series 166, 165

Example Ordering Code -
Select series number
then add tool number
(E.g. 165 0600A = 6.0mm
4 Flute Ballnose Endmill
ALtima Coated)



Tool Dimensions				Series 166		Series 165		Regrind	Regrind & Recoat
				Uncoated	Coated	Uncoated	Coated		
Ø D ¹	Ø D ²	L ¹	L ²	Tool No	Tool No	Tool No	Tool No	Available On Request - POA	Available On Request - POA
1.0	3.0	38.0	2.0	166 0100	-	165 0100	-		
1.5	3.0	38.0	3.0	166 0150	-	165 0150	-		
2.0	3.0	38.0	4.0	166 0200	-	165 0200	-		
2.5	3.0	38.0	5.0	166 0250	-	165 0250	-		
3.0	3.0	38.0	6.0	166 0300	166 0300A	165 0300	165 0300A		
3.5	4.0	51.0	7.0	166 0350	-	165 0350	-		
4.0	4.0	51.0	8.0	166 0400	166 0400A	165 0400	165 0400A		
4.5	5.0	51.0	9.0	166 0450	-	165 0450	-		
5.0	5.0	51.0	11.0	166 0500	166 0500A	165 0500	165 0500A		
5.5	6.0	51.0	12.0	166 0550	-	165 0550	-		
6.0	6.0	51.0	13.0	166 0600	166 0600A	165 0600	165 0600A		
7.0	8.0	51.0	13.0	166 0700	-	165 0700	-		
8.0	8.0	51.0	13.0	166 0800	166 0800A	165 0800	165 0800A		
9.0	9.0	51.0	14.0	166 0900	-	165 0900	-		
10.0	10.0	51.0	14.0	166 1000	166 1000A	165 1000	165 1000A		
11.0	11.0	64.0	16.0	166 1100	-	165 1100	-		
12.0	12.0	64.0	16.0	166 1200	166 1200A	165 1200	165 1200A		
14.0	14.0	70.0	18.0	166 1400	-	165 1400	-		
16.0	16.0	76.0	20.0	166 1600	166 1600A	165 1600	165 1600A		
18.0	18.0	76.0	25.0	166 1800	-	165 1800	-		
20.0	20.0	76.0	25.0	166 2000	166 2000A	165 2000	165 2000A		



Endmills

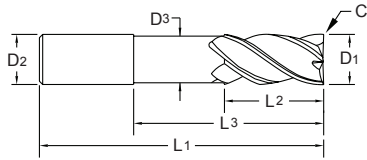
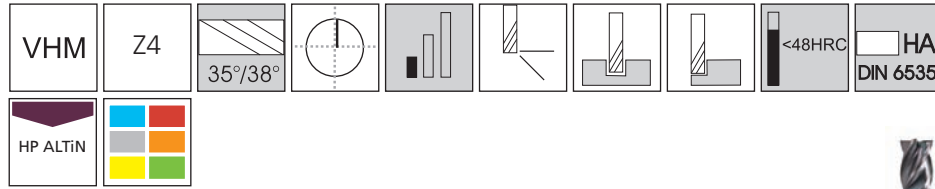
Drills

Reamers

Countersinks

Burrs

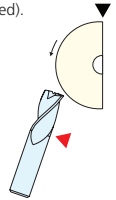
TuffCut® GP Endmills - Stub/Short Length



Z4

Series V4S

Example Ordering Code -
Select series number then
add tool number
(E.g. V4S 0600A = 6.0mm
4 Flute Endmill ALTiMa Coated).



Tool Dimensions							Series V4S
Ø D ¹	Ø D ²	L ¹	L ²	L ³	Ø D ³	C	Tool No.
3.0	6.0	45.0	6.0	-	-	0.1 x 45°	V4S 0300A
4.0	6.0	45.0	8.0	-	-	0.1 x 45°	V4S 0400A
5.0	6.0	45.0	10.0	-	-	0.1 x 45°	V4S 0500A
6.0	6.0	55.0	9.0	14.0	5.7	0.25 x 45°	V4S 0600A
8.0	8.0	58.0	12.0	18.0	7.7	0.25 x 45°	V4S 0800A
10.0	10.0	66.0	15.0	22.0	9.7	0.25 x 45°	V4S 1000A
12.0	12.0	73.0	18.0	26.0	11.7	0.5 x 45°	V4S 1200A
16.0	16.0	82.0	24.0	34.0	15.7	0.5 x 45°	V4S 1600A
20.0	20.0	93.0	30.0	42.0	19.7	0.5 x 45°	V4S 2000A

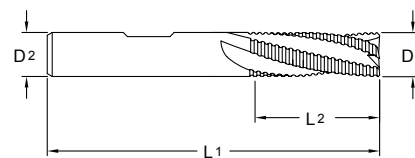
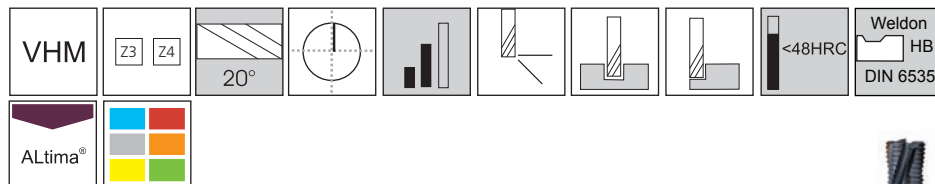
Regrind
& Recoat

Available On Request - POA



P18

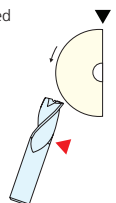
TuffCut® GP Endmills - Stub/Short & Standard Length



Z3 Z4

Series 192

Example Ordering Code -
Select series number
then add tool number
(E.g. 192 1200A = 12.0mm
4 Flute Endmill ALTiMa Coated
- Standard Length).



Tool Dimensions					Series 192
Ø D ¹	Ø D ²	L ¹	L ²	Z	Tool No.
8.0	8.0	51.0	8.0	3	192 0800A
8.0	8.0	64.0	16.0	3	192 0801A
10.0	10.0	51.0	10.0	4	192 1000A
10.0	10.0	70.0	20.0	4	192 1001A
12.0	12.0	64.0	12.0	4	192 1200A
12.0	12.0	76.0	25.0	4	192 1201A
16.0	16.0	76.0	16.0	4	192 1600A
16.0	16.0	89.0	32.0	4	192 1601A
20.0	20.0	76.0	20.0	4	192 2000A
20.0	20.0	102.0	38.0	4	192 2001A

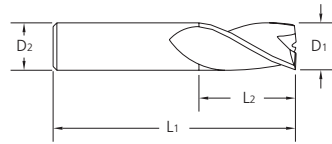
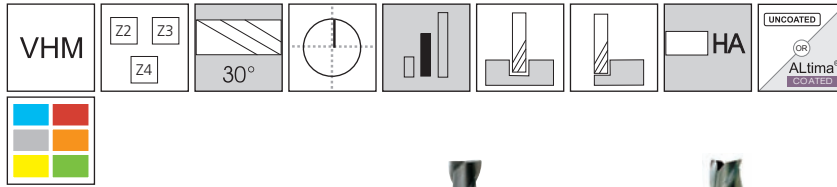
Regrind
& Recoat

Available On Request - POA



P19

TuffCut® GP Endmills - Standard Length



Z2



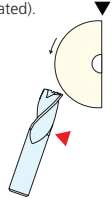
Z3



Z4

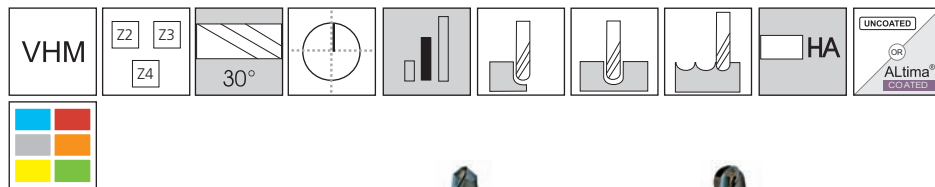
Series 121, 116, 111

Example Ordering Code -
Select series number
then add tool number
(E.g. 111 0600A = 6.0mm
4 Flute Endmill ALtima Coated).



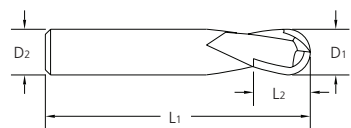
Tool Dimensions				Series 121		Series 116		Series 111		Regrind	Regrind & Recoat
				Uncoated	Coated	Uncoated	Coated	Uncoated	Coated		
Ø D¹	Ø D²	L¹	L²	Tool No.	Tool No.	Tool No.	Tool No.	Tool No.	Tool No.		
0.2	3.0	38.0	0.6	121 0020	-	-	-	111 0020	-	Available On Request - POA	Available On Request - POA
0.3	3.0	38.0	0.9	121 0030	-	-	-	111 0030	-		
0.4	3.0	38.0	1.2	121 0040	-	-	-	111 0040	-		
0.5	3.0	38.0	1.5	121 0050	-	-	-	111 0050	-		
0.6	3.0	38.0	1.8	121 0060	-	-	-	111 0060	-		
0.7	3.0	38.0	2.1	121 0070	-	-	-	111 0070	-		
0.8	3.0	38.0	2.4	121 0080	-	-	-	111 0080	-		
0.9	3.0	38.0	2.7	121 0090	-	-	-	111 0090	-		
1.0	3.0	38.0	3.0	121 0100	121 0100A	116 0100	116 0100A	111 0100	111 0100A		
1.1	3.0	38.0	3.3	121 0110	-	-	-	111 0110	-		
1.2	3.0	38.0	3.6	121 0120	-	-	-	111 0120	-		
1.3	3.0	38.0	3.9	121 0130	-	-	-	111 0130	-		
1.4	3.0	38.0	4.2	121 0140	-	-	-	111 0140	-		
1.5	3.0	38.0	4.5	121 0150-1	-	-	-	111 0150-1	-		
1.5	3.0	38.0	6.0	121 0150	121 0150A	116 0150	116 0150A	111 0150	111 0150A		
1.6	3.0	38.0	4.8	121 0160	-	-	-	111 0160	-		
1.7	3.0	38.0	5.1	121 0170	-	-	-	111 0170	-		
1.8	3.0	38.0	5.4	121 0180	-	-	-	111 0180	-		
1.9	3.0	38.0	5.7	121 0190	-	-	-	111 0190	-		
2.0	3.0	38.0	6.0	121 0200-1	-	-	-	111 0200-1	-		
2.0	3.0	38.0	9.0	121 0200	121 0200A	116 0200	116 0200A	111 0200	111 0200A		
2.5	3.0	38.0	12.0	121 0250	121 0250A	116 0250	116 0250A	111 0250	111 0250A		
3.0	3.0	38.0	12.0	121 0300	121 0300A	116 0300	116 0300A	111 0300	111 0300A		
3.5	4.0	51.0	12.0	121 0350	121 0350A	116 0350	116 0350A	111 0350	111 0350A		
4.0	4.0	51.0	14.0	121 0400	121 0400A	116 0400	116 0400A	111 0400	111 0400A		
4.5	5.0	51.0	14.0	121 0450	-	116 0450	-	111 0450	-		
5.0	5.0	51.0	20.0	121 0500	121 0500A	116 0500	116 0500A	111 0500	111 0500A		
5.5	6.0	64.0	20.0	121 0550	-	116 0550	-	111 0550	-		
6.0	6.0	64.0	20.0	121 0600	121 0600A	116 0600	116 0600A	111 0600	111 0600A		
7.0	8.0	64.0	20.0	121 0700	-	116 0700	-	111 0700	-		
8.0	8.0	64.0	20.0	121 0800	121 0800A	116 0800	116 0800A	111 0800	111 0800A		
9.0	9.0	64.0	20.0	121 0900	-	116 0900	-	111 0900	-		
10.0	10.0	70.0	25.0	121 1000	121 1000A	116 1000	116 1000A	111 1000	111 1000A		
11.0	11.0	70.0	25.0	121 1100	-	116 1100	-	111 1100	-		
12.0	12.0	76.0	25.0	121 1200	121 1200A	116 1200	116 1200A	111 1200	111 1200A		
14.0	14.0	89.0	30.0	121 1400	-	116 1400	-	111 1400	-		
16.0	16.0	89.0	30.0	121 1600	121 1600A	116 1600	116 1600A	111 1600	111 1600A		
18.0	18.0	102.0	35.0	121 1800	-	116 1800	-	111 1800	-		
20.0	20.0	102.0	38.0	121 2000	121 2000A	116 2000	116 2000A	111 2000	111 2000A		
22.0	22.0	102.0	40.0	121 2200	-	116 2200	-	111 2200	-		
25.0	25.0	102.0	40.0	121 2500	121 2500A	116 2500	116 2500A	111 2500	111 2500A		

TuffCut® GP Endmills - Standard Length



Series
150, 145, 140

Example Ordering Code -
Select series number
then add tool number
(E.g. 140 0600A = 6.0mm
4 Flute Ballnose Endmill ALtimate
Coated - Standard Length).



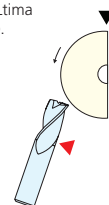
Z2



Z3

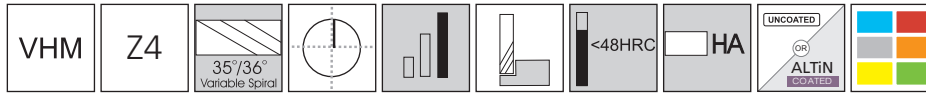


Z4



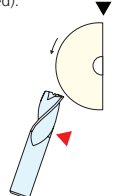
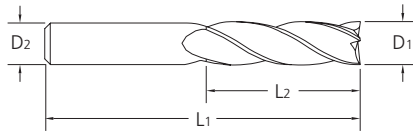
Tool Dimensions				Series 150		Series 145		Series 140		Regrind	Regrind & Recoat
Ø D ¹	Ø D ²	L ¹	L ²	Uncoated Tool No.	Coated Tool No.	Uncoated Tool No.	Coated Tool No.	Uncoated Tool No.	Coated Tool No.		
0.4	3.0	38.0	1.2	150 0040	-	-	-	-	-	Available On Request - POA	Available On Request - POA
0.5	3.0	38.0	1.5	150 0050	-	-	-	-	-		
0.6	3.0	38.0	1.8	150 0060	-	-	-	-	-		
0.7	3.0	38.0	2.1	150 0070	-	-	-	-	-		
0.8	3.0	38.0	2.4	150 0080	-	-	-	-	-		
0.9	3.0	38.0	2.7	150 0090	-	-	-	-	-		
1.0	3.0	38.0	3.0	150 0100	150 0100A	145 0100	-	140 0100	140 0100A		
1.1	3.0	38.0	3.3	150 0110	-	-	-	-	-		
1.2	3.0	38.0	3.6	150 0120	-	-	-	-	-		
1.3	3.0	38.0	3.9	150 0130	-	-	-	-	-		
1.4	3.0	38.0	4.2	150 0140	-	-	-	-	-		
1.5	3.0	38.0	4.5	150 0150-1	-	-	-	-	-		
1.5	3.0	38.0	6.0	150 0150	150 0150A	145 0150	-	140 0150	140 0150A		
1.6	3.0	38.0	4.8	150 0160	-	-	-	-	-		
1.7	3.0	38.0	5.1	150 0170	-	-	-	-	-		
1.8	3.0	38.0	5.4	150 0180	-	-	-	-	-		
1.9	3.0	38.0	5.7	150 0190	-	-	-	-	-		
2.0	3.0	38.0	6.0	150 0200-1	-	-	-	-	-		
2.0	3.0	38.0	9.0	150 0200	150 0200A	145 0200	-	140 0200	140 0200A		
2.5	3.0	38.0	12.0	150 0250	150 0250A	-	-	140 0250	140 0250A		
3.0	3.0	38.0	12.0	150 0300	150 0300A	145 0300	145 0300A	140 0300	140 0300A		
3.5	4.0	51.0	12.0	150 0350	150 0350A	-	-	140 0350	140 0350A		
4.0	4.0	51.0	14.0	150 0400	150 0400A	145 0400	145 0400A	140 0400	140 0400A		
4.5	5.0	51.0	14.0	150 0450	150 0450A	-	-	140 0450	-		
5.0	5.0	51.0	20.0	150 0500	150 0500A	145 0500	145 0500A	140 0500	140 0500A		
5.5	6.0	64.0	20.0	150 0550	-	-	-	140 0550	-		
6.0	6.0	64.0	20.0	150 0600	150 0600A	145 0600	145 0600A	140 0600	140 0600A		
7.0	8.0	64.0	20.0	150 0700	-	-	-	140 0700	-		
8.0	8.0	64.0	20.0	150 0800	150 0800A	145 0800	145 0800A	140 0800	140 0800A		
9.0	9.0	64.0	20.0	150 0900	-	-	-	140 0900	-		
10.0	10.0	70.0	25.0	150 1000	150 1000A	145 1000	145 1000A	140 1000	140 1000A		
11.0	11.0	70.0	25.0	150 1100	-	-	-	140 1100	-		
12.0	12.0	76.0	25.0	150 1200	150 1200A	-	-	140 1200	140 1200A		
14.0	14.0	89.0	30.0	150 1400	-	-	-	140 1400	-		
16.0	16.0	89.0	30.0	150 1600	150 1600A	-	-	140 1600	140 1600A		
18.0	18.0	102.0	35.0	150 1800	-	-	-	140 1800	-		
20.0	20.0	102.0	38.0	150 2000	150 2000A	-	-	140 2000	140 2000A		
22.0	22.0	102.0	40.0	150 2200	-	-	-	140 2200	-		
25.0	25.0	102.0	40.0	150 2500	150 2500A	-	-	140 2500	140 2500A		

TuffCut® GP Endmills - Long Length (Anti-Vibration)



Series
V4L

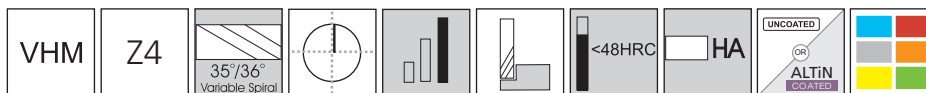
Example Ordering Code -
Select series number
then add tool number
(E.g. V4L 0600B = 6.0mm
4 Flute Endmill AlTiN Coated).



Tool Dimensions				Series V4L		Regrind	Regrind & Recoat
Ø D¹	Ø D²	L¹	L²	Uncoated Tool No.	Coated Tool No.		
6.0	6.0	75.0	25.0	V4L 0600	V4L 0600B	Available On Request - POA	Available On Request - POA
8.0	8.0	75.0	25.0	V4L 0800	V4L 0800B		
10.0	10.0	100.0	40.0	V4L 1000	V4L 1000B		
12.0	12.0	100.0	50.0	V4L 1200	V4L 1200B		
12.0	12.0	150.0	75.0	V4L 1201	V4L 1201B		
16.0	16.0	150.0	75.0	V4L 1600	V4L 1600B		
20.0	20.0	150.0	75.0	V4L 2000	V4L 2000B		

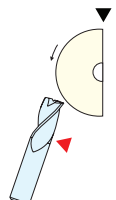
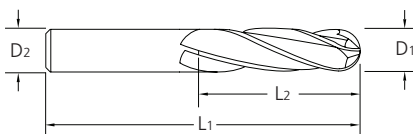


TuffCut® GP Endmills - Long Length (Anti-Vibration)



Series
V4LB

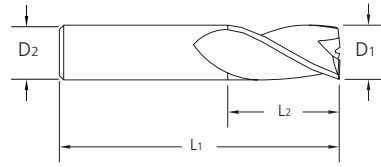
Example Ordering Code -
Select series number
then add tool number
(E.g. V4LB 0600B = 6.0mm
4 Flute Ballnose Endmill
ALTiN Coated).



Tool Dimensions				Series V4LB		Regrind	Regrind & Recoat
Ø D¹	Ø D²	L¹	L²	Uncoated Tool No.	Coated Tool No.		
6.0	6.0	75.0	25.0	V4LB 0600	V4LB 0600B	Available On Request - POA	Available On Request - POA
8.0	8.0	75.0	25.0	V4LB 0800	V4LB 0800B		
10.0	10.0	100.0	40.0	V4LB 1000	V4LB 1000B		
12.0	12.0	100.0	50.0	V4LB 1200	V4LB 1200B		
12.0	12.0	150.0	75.0	V4LB 1201	V4LB 1201B		
16.0	16.0	150.0	75.0	V4LB 1600	V4LB 1600B		
20.0	20.0	150.0	75.0	V4LB 2000	V4LB 2000B		

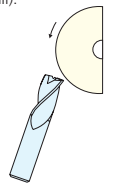


TuffCut® GP Endmills - Standard Length



Series
GT2, GT3

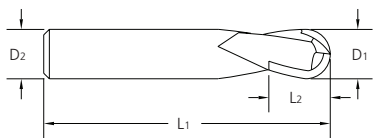
Example Ordering Code -
Select series number then
add tool number
(E.g. GT2 0600 = 6.0mm
2 Flute Endmill).



Tool Dimensions				Series GT2	Series GT3	Regrind
Ø D ¹	Ø D ²	L ¹	L ²	Tool No.	Tool No.	
3.0	3.0	51.0	12.0	GT2 0300	GT3 0300	Available On Request - POA
4.0	4.0	51.0	15.0	GT2 0400	GT3 0400	
5.0	5.0	57.0	20.0	GT2 0500	GT3 0500	
6.0	6.0	64.0	20.0	GT2 0600	GT3 0600	
8.0	8.0	64.0	20.0	GT2 0800	GT3 0800	
10.0	10.0	73.0	25.0	GT2 1000	GT3 1000	
12.0	12.0	73.0	25.0	GT2 1200	GT3 1200	
14.0	14.0	84.0	30.0	GT2 1400	GT3 1400	
16.0	16.0	93.0	35.0	GT2 1600	GT3 1600	
20.0	20.0	105.0	40.0	GT2 2000	GT3 2000	

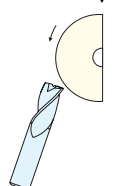


TuffCut® GP Endmills - Standard Length



Series
GT2B, GT3B

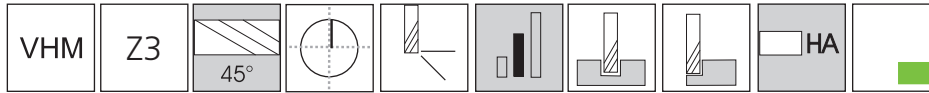
Example Ordering Code -
Select series number then
add tool number
(E.g. GT3B 0600 = 6.0mm
2 Flute Ballnose Endmill).



Tool Dimensions				Series GT2B	Series GT3B	Regrind
Ø D ¹	Ø D ²	L ¹	L ²	Tool No.	Tool No.	
3.0	3.0	51.0	12.0	GT2B 0300	GT3B 0300	Available On Request - POA
4.0	4.0	51.0	15.0	GT2B 0400	GT3B 0400	
5.0	5.0	57.0	20.0	GT2B 0500	GT3B 0500	
6.0	6.0	64.0	20.0	GT2B 0600	GT3B 0600	
8.0	8.0	64.0	20.0	GT2B 0800	GT3B 0800	
10.0	10.0	73.0	25.0	GT2B 1000	GT3B 1000	
12.0	12.0	73.0	25.0	GT2B 1200	GT3B 1200	
14.0	14.0	84.0	30.0	GT2B 1400	GT3B 1400	
16.0	16.0	93.0	35.0	GT2B 1600	GT3B 1600	
20.0	20.0	105.0	40.0	GT2B 2000	GT3B 2000	

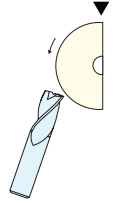
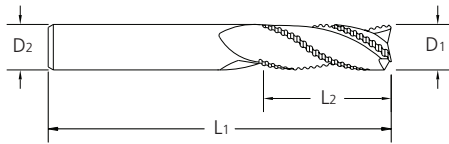


TuffCut® GP Endmills - Standard Length



Series
134

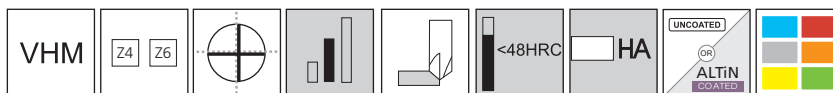
Example Ordering Code -
Select series number
then add tool number
(E.g. 134 1200 = 12.0mm
3 Flute Endmill).



Tool Dimensions				Series 134	Regrind
Ø D1	Ø D2	L1	L2	Tool No.	
6.0	6.0	64.0	20.0	134 0600	Available On Request - POA
8.0	8.0	64.0	20.0	134 0800	
10.0	10.0	70.0	25.0	134 1000	
12.0	12.0	76.0	25.0	134 1200	
14.0	14.0	89.0	30.0	134 1400	
16.0	16.0	89.0	30.0	134 1600	
18.0	18.0	102.0	35.0	134 1800	
20.0	20.0	102.0	38.0	134 2000	
25.0	25.0	102.0	50.0	134 2500	

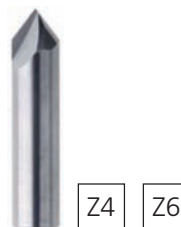
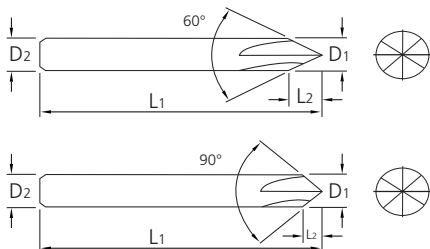


TuffCut® GP Chamfer Mills - 60° & 90° Standard Length



Series
VCM60, VCM90

Example Ordering Code -
Select series number then
add tool number
(E.g. VCM90 0800A =
8.0mm 90° 4 Flute Chamfer
Mill ALTiN Coated)



Tool Dimensions						Series VCM60		Series VCM90	
Ø D1	Ø D2	Angle	L1	L2	Z	Uncoated	Coated	Uncoated	Coated
4.0	4.0	60°	51.0	3.3	4	VCM60 0400	VCM60 0400A	-	-
4.0	4.0	90°	51.0	1.8	4	-	-	VCM90 0400	VCM90 0400A
6.0	6.0	60°	64.0	5.0	4	VCM60 0600	VCM60 0600A	-	-
6.0	6.0	90°	64.0	2.8	4	-	-	VCM90 0600	VCM90 0600A
8.0	8.0	60°	64.0	6.8	4	VCM60 0800	VCM60 0800A	-	-
8.0	8.0	90°	64.0	3.8	4	-	-	VCM90 0800	VCM90 0800A
10.0	10.0	60°	73.0	8.5	6	VCM60 1000	VCM60 1000A	-	-
10.0	10.0	90°	73.0	4.8	6	-	-	VCM90 1000	VCM90 1000A
12.0	12.0	60°	84.0	10.0	6	VCM60 1200	VCM60 1200A	-	-
12.0	12.0	90°	84.0	5.8	6	-	-	VCM90 1200	VCM90 1200A
16.0	16.0	60°	93.0	13.5	6	VCM60 1600	VCM60 1600A	-	-
16.0	16.0	90°	93.0	7.8	6	-	-	VCM90 1600	VCM90 1600A

Technical Data

TuffCut® FORDMAX Carbide Endmills

Series 164, 169, 163, 166, 165, 121, 116, 111, 150, 145, 140, V4L, V4LB - Recommended Cutting Data

Tool Lengths	2 Flute (Z2)		3 Flute (Z3)		4 Flute (Z4)	
	GP Series		GP Series		GP Series	
Stub/Short	164	166	169	-	163 *	165 *
Standard	121	150	116	145	111 *	140 *
Long	-	-	-	-	V4L **	V4LB **

* Please Note - 4 Flute (Z4) Endmills Are Not Recommended For Full Diameter Engagement/Slotting Applications
Please use series V4S or choose from our high performance range of XR endmills

** V4L & V4LB long series Endmills are for profile milling
For V4L & V4LB reduce speed by 20%
For V4L & V4LB - Maximum Radial Cut (Ae) = 0.01 x D

Please use lower Vc values shown for uncoated tools.
Please use higher Vc values shown for ALtima® coated tools

Cutting Speeds By Material Group				Feed Recommendations				
				Tool Diameter (mm)				
Workpiece Material Group		Material Type	Vc (m/min)	3.0	5.0	6.0	8.0	10.0
				Feed/Tooth (fz - mm)				
Steels	P	Low Carbon	100 - 150	.013 - .020	.025 - .030	.038 - .051	.038 - .051	.053 - .076
		Medium Carbon	90 - 125					
		Mould/Tool Steel	60 - 75					
Stainless Steels	M	Free Machining	70 - 90	.013 - .020	.025 - .030	.038 - .051	.038 - .051	.053 - .076
		Ferritic	60 - 85					
		Austenitic	55 - 70	.008 - .013	.020 - .025	.030 - .038	.036 - .046	.046 - .051
		Martensitic	45 - 60					
		PH Stainless	40 - 50					
Cast Irons	K	Grey Cast Iron	120 - 140	.013 - .020	.025 - .030	.038 - .051	.038 - .051	.053 - .076
		Ductile Cast Iron	90 - 120					
		Malleable Iron	70 - 90					
Special Alloys	S	High Temp Alloys	10 - 20	.005 - .010	.005 - .012	.005 - .015	.015 - .030	.015 - .030
		Titanium Alloys	20 - 50	.008 - .010	.010 - .015	.015 - .020	.020 - .030	.020 - .030
Hardened Steels	H	35 - 45 HRC	60 - 75	.008 - .013	.010 - .030	.010 - .030	.025 - .050	.025 - .050
		45 - 55 Rc Steel	45 - 60					
Non-Ferrous	N	Aluminium Alloys	150 - 200	.020 - .040	.040 - .050	.050 - .060	.060 - .070	.070 - .080
		Brass / Bronze	120 - 180					
		Magnesium & Alloys	200 - 300					

RPM Formula For Metric Endmills - $RPM = (Vc \times 318.0) \div \text{Endmill } \varnothing$
Feedrate Formula For Metric Endmills - $\text{Feedrate} = RPM \times fz \times \text{Number Of Cutting Teeth}$

Technical Data

TuffCut® FORDMAX Carbide Endmills

Series 164, 169, 163, 166, 165, 121, 116, 111, 150, 145, 140, V4L, V4LB - Recommended Cutting Data

Please use lower Vc values shown for uncoated tools.
Please use higher Vc values shown for ALtima® coated tools.

Cutting Speeds By Material Group				Feed Recommendations			
				Tool Diameter (mm)			
Workpiece Material Group		Material Type	Vc (m/min)	12.0	16.0	20.0	25.0
				Feed/Tooth (fz - mm)			
Steels	P	Low Carbon	100 – 150	.051 - .089	.058 - .102	.056 - .110	.080 - .130
		Medium Carbon	90 – 125				
		Mould/Tool Steel	60 - 75	.051 - .058	.058 - .076	.061 - .081	.061 - .081
Stainless Steels	M	Free Machining	70 - 90	.051 - .089	.058 - .102	.056 - .110	.080 - .130
		Ferritic	60 - 85				
		Austenitic	55 - 70	.051 - .058	.058 - .076	.061 - .081	.061 - .081
		Martensitic	45 - 60				
		PH Stainless	40 - 50				
Cast Irons	K	Grey Cast Iron	120 - 140	.051 - .089	.058 - .102	.056 - .109	.081 - .127
		Ductile Cast Iron	90 - 120				
		Malleable Iron	70 - 90				
Special Alloys	S	High Temp Alloys	10 - 20	.020 - .030	.030 - .040	.030 - .045	.045 - .050
		Titanium Alloys	20 - 50	.030 - .040	.040 - .045	.045 - .050	.050 - .075
Hardened Steels	H	35 - 45 HRC	60 - 75	.030 - .060	.050 - .070	.060 - .080	.070 - .090
		45 - 55 Rc Steel	45 - 60				
Non-Ferrous	N	Aluminium Alloys	150 - 200	.080 - .100	.100 - .200	.200 - .250	.200 - .250
		Brass / Bronze	120 - 180				
		Magnesium & Alloys	200 - 300				

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

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

Technical Data

TuffCut® FORDMAX Carbide Endmills

Series V4S - Recommended Cutting Data

Workpiece Material Group		Material Type	Coolant									
			Max	Air	MMS	Vc (m/min)						
Steels	P	Low Carbon	●	●	●	210	200	450	350	300	250	200
		Medium Carbon	●	●	●	180	170	270	250	230	200	170
		Alloy Steels	●	●	●	160	150	250	230	210	180	150
		Die/Tool Steels	●	●	●	130	120	225	200	170	130	120
Stainless Steels	M	Free Machining	●	-	○	110	100	150	150	120	105	100
		Austenitic	●	-	○	100	90	130	120	110	100	90
		Difficult Stainless	●	-	○	70	60	100	90	80	70	60
		PH Stainless	●	-	○	100	90	130	120	110	100	90
		Cobalt Chrome Alloys	●	-	○	70	60	100	90	80	70	60
		Duplex (22%)	●	-	○	70	60	100	90	80	70	60
		Super Duplex (25%)	●	-	○	50	40	60	55	50	45	40
Cast Irons	K	Grey Cast Iron	●	○	○	180	160	360	360	240	190	160
		Ductile Cast Iron	●	○	○	170	150	270	270	190	170	150
		Malleable Iron	●	○	○	130	120	160	150	140	130	120
Special Alloys	S	High Temp Alloys	●	-	-	30	25	50	40	35	30	25
		Titanium Alloys	●	-	-	70	60	120	120	90	75	60
Hardened Steels	H	Hardened Steels 45 - 50 Rc	●	○	○	50	45	135	135	90	50	45
		Hardened Steels 50 - 55 Rc	●	○	○	45	40	115	115	75	45	40

● Preferred ○ Possible - Not Possible

Workpiece Material Group		Material Type	Tool Diameter									
			1.5mm	3mm	5mm	6mm	8mm	10mm	12mm	16mm	20mm	25mm
			Feed/Tooth (fz - mm)									
Steels	P	Profiling	0.005	0.018	0.025	0.06	0.08	0.1	0.12	0.16	0.2	0.25
		Slotting	0.003	0.009	0.012	0.03	0.04	0.05	0.06	0.08	0.1	0.125
Stainless Steels	M	Profiling	0.005	0.018	0.025	0.06	0.08	0.1	0.12	0.16	0.2	0.25
		Slotting	0.003	0.009	0.012	0.03	0.04	0.05	0.06	0.08	0.1	0.125
Cast Irons	K	Profiling	0.005	0.018	0.025	0.06	0.08	0.1	0.12	0.16	0.2	0.25
		Slotting	0.003	0.009	0.013	0.03	0.04	0.05	0.06	0.08	0.1	0.125
Special Alloys	S	Profiling	0.003	0.009	0.013	0.032	0.038	0.044	0.064	0.076	0.089	0.127
		Slotting	0.0015	0.0045	0.007	0.016	0.019	0.022	0.032	0.038	0.045	0.065
		Profiling	0.005	0.018	0.025	0.06	0.08	0.1	0.12	0.16	0.2	0.25
		Slotting	0.003	0.009	0.013	0.03	0.04	0.05	0.06	0.08	0.1	0.125
Hardened Steels	H	Profiling <50HRC	0.005	0.016	0.023	0.057	0.069	0.08	0.114	0.137	0.16	0.229
		Slotting <50HRC	0.003	0.008	0.013	0.028	0.035	0.04	0.065	0.07	0.08	0.115
		Profiling >55HRC	0.003	0.01	0.015	0.041	0.051	0.058	0.084	0.102	0.119	0.17
		Slotting >55HRC	0.002	0.005	0.008	0.02	0.025	0.028	0.042	0.05	0.06	0.08

RPM Formula For Metric Endmills - $RPM = (Vc \times 318.0) \div \text{Endmill } \varnothing$
 Feedrate Formula For Metric Endmills - $\text{Feedrate} = RPM \times fz \times \text{Number Of Cutting Teeth}$

Technical Data

TuffCut® FORDMAX Carbide Endmills

Series 192 - Recommended Cutting Data

Workpiece Material Group		Material Type	Coolant									
			Max	Air	MMS	Vc (m/min)						
Steels	P	Low Carbon	●	●	●	210	210	450	450	350	300	250
		Medium Carbon	●	●	●	180	180	270	270	250	230	200
		Alloy Steels	●	●	●	160	160	250	250	230	210	180
		Die/Tool Steels	●	●	●	130	130	225	225	200	170	130
Stainless Steels	M	Free Machining	●	-	○	110	110	150	150	130	120	105
		Austenitic	●	-	○	100	100	130	130	120	110	100
		Difficult Stainless	●	-	○	70	70	100	100	90	80	70
		PH Stainless	●	-	○	100	100	130	130	120	110	100
		Cobalt Chrome Alloys	●	-	○	70	70	100	100	90	80	70
		Duplex (22%)	●	-	○	70	70	100	100	90	80	70
		Super Duplex (25%)	●	-	○	50	50	60	60	55	50	45
Cast Irons	K	Grey Cast Iron	●	○	○	30	30	50	50	40	35	30
		Ductile Cast Iron	●	○	○	30	30	50	50	40	35	30
		Malleable Iron	●	○	○	70	70	120	120	110	90	75
Special Alloys	S	High Temp Alloys	●	-	-	180	180	360	360	340	240	190
		Inconel	●	-	-	170	170	270	270	240	190	170
		Titanium Alloys	●	-	-	130	130	160	160	150	140	130
Hardened Steels	H	Hardened Steels 45 - 50 Rc	●	○	○	55	55	135	135	125	90	50
		Hardened Steels 50 - 55 Rc	●	○	○	45	45	115	115	105	75	45

● Preferred ○ Possible - Not Possible

Workpiece Material Group		Material Type	Type of Machining	Tool Diameter						
				6mm	8mm	10mm	12mm	16mm	20mm	25mm
				Feed/Tooth (fz - mm)						
Steels	P	Low Carbon	Profiling	0.085	0.100	0.120	0.170	0.200	0.230	0.330
		Medium Carbon								
		Alloy Steels	Slotting	0.043	0.050	0.060	0.085	0.100	0.125	0.165
		Die/Tool Steels								
Stainless Steels	M	Free Machining	Profiling	0.085	0.100	0.120	0.170	0.200	0.230	0.330
		Austenitic								
		Difficult Stainless	Slotting	0.043	0.050	0.060	0.085	0.100	0.125	0.165
		PH Stainless	Profiling	0.064	0.076	0.086	0.125	0.150	0.175	0.250
		Cobalt Chrome Alloys								
		Duplex (22%)	Slotting	0.032	0.038	0.045	0.060	0.075	0.085	0.125
		Super Duplex (25%)								
Cast Irons	K	Grey Cast Iron	Profiling	0.085	0.100	0.120	0.170	0.200	0.230	0.208
		Ductile Cast Iron								
		Malleable Iron	Slotting	0.043	0.050	0.060	0.085	0.100	0.125	0.165
Special Alloys	S	High Temp Alloys	Profiling	0.043	0.050	0.060	0.085	0.100	0.120	0.165
			Slotting	0.022	0.025	0.030	0.045	0.050	0.060	0.080
		Titanium Alloys	Profiling	0.085	0.100	0.120	0.170	0.200	0.230	0.330
			Slotting	0.022	0.025	0.030	0.045	0.050	0.060	0.080
Hardened Steels	H	Hardened Steels 45 - 50 Rc	Profiling	0.076	0.090	0.100	0.150	0.180	0.200	0.300
			Slotting	0.035	0.045	0.050	0.075	0.090	0.100	0.150
		Hardened Steels 50 - 55 Rc	Profiling	0.053	0.066	0.076	0.100	0.132	0.155	0.220
			Slotting	0.025	0.033	0.036	0.050	0.065	0.080	0.110

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

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

Technical Data

TuffCut® FORDMAX Carbide Endmills for Aluminium

Series 134 - Recommended Cutting Data

Material Group						Tool Diameter (mm)				
Workpiece Material			Material Type							
Non Ferrous			N			Aluminium/Aluminium Alloys ≤ 10% Si				
Series	Type Of Cut		ap	ae	Vc (m/min)	Feed/Tooth (fz - mm)				
						6.0	8.0	10.0	12.0	16.0
134		Slotting	0.5 x D	1 x D	300 - 500	0.06	0.08	0.09	0.12	0.17
			1 x D	1 x D	300 - 500	0.05	0.07	0.08	0.10	0.15
		Profiling	1 x D	0.2 x D	300 - 500	0.07	0.12	0.13	0.15	0.20
			1 x D	0.5 x D	300 - 500	0.06	0.08	0.09	0.12	0.17

						Tool Diameter (mm)	
						20.0	25.0
Series	Type Of Cut		ap	ae	Vc (m/min)	Feed/Tooth (fz - mm)	
134		Slotting	0.5 x D	1 x D	300 - 500	0.20	0.25
			1 x D	1 x D	300 - 500	0.15	0.20
		Profiling	1 x D	0.2 x D	300 - 500	0.22	0.28
			1 x D	0.5 x D	300 - 500	0.20	0.25

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

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

Series GT2 GT3 & GT2B GT3B - Recommended Cutting Data

Material Group						Tool Diameter (mm)				
Workpiece Material			Material Type							
Non Ferrous			N			Aluminium/Aluminium Alloys				
Series	Type Of Cut		ap	ae	Vc (m/min)	3.0	4.0	5.0	6.0	8.0
						Feed/Tooth (fz - mm)				
GT2 & GT3 GT2B & GT3B		Slotting	0.5 x D	1 x D	300 - 500	0.02	0.03	0.04	0.05	0.07
			1 x D	0.2 x D	300 - 500	0.03	0.045	0.06	0.075	0.105
		Profiling	1 x D	0.5 x D	300 - 500	0.02	0.03	0.04	0.05	0.07
			1 x D	0.5 x D	300 - 500	0.02	0.03	0.04	0.05	0.07

					Tool Diameter (mm)					
					10.0	12.0	14.0	16.0	20.0	
Series	Type Of Cut		ap	ae	Vc (m/min)	Feed/Tooth (fz - mm)				
GT2 & GT3 GT2B & GT3B		Slotting	0.5 x D	1 x D	300 - 500	0.10	0.12	0.15	0.16	0.20
		Profiling	1 x D	0.2 x D	300 - 500	0.15	0.18	0.225	0.24	0.30
			1 x D	0.5 x D	300 - 500	0.10	0.12	0.15	0.16	0.20

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

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

Twister®

High Performance & General Purpose Drills

When you need to drill holes, the M.A. Ford Twister® drills have all the answers.

We have one of the most complete range of drills across the industry, from high-precision micro and circuit board drills up to to high performance, large diameter drills for machining aluminium, stainless steel and exotic alloys.

In addition, our ALtima® and HP AlTiN coated high performance drills ensure that whatever your application we can provide the correct size, coating, drill length and specification to meet all of your hole making requirements.

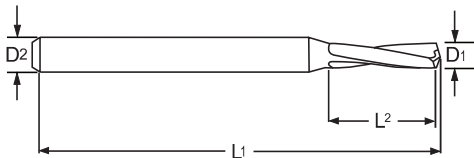
The range also incorporates our family of coolant fed drills, which allows coolant to be delivered right to the cutting edge, enabling you to increase speeds up to four times that of standard HSS drills and 1.5 times that of standard solid carbide drills. In addition, deeper holes can also be machined without peck drilling as a result of the improved coolant flow and swarf evacuation characteristics.

Within the range you'll find centre drills, standard drills and specialised drills for composites alongside solid carbide drills in diameters ranging from 0.1mm to 20.00mm and coolant fed products from 2.0mm to 20.00mm.

 Drill Length	 Solid Carbide	 Coolant Feed	 Drill Point Angle									
 Helix Angle	 Coatings	 DIN Specs	 Technical Information									
<table border="0"> <tbody> <tr> <td> Workpiece Material Group</td> <td> Steel</td> <td> Cast Iron</td> </tr> <tr> <td></td> <td> Hardened Steels (35-65Rc)</td> <td> Special Alloys</td> </tr> <tr> <td></td> <td> Stainless Steels</td> <td> Non-Ferrous</td> </tr> </tbody> </table>				 Workpiece Material Group	 Steel	 Cast Iron		 Hardened Steels (35-65Rc)	 Special Alloys		 Stainless Steels	 Non-Ferrous
 Workpiece Material Group	 Steel	 Cast Iron										
	 Hardened Steels (35-65Rc)	 Special Alloys										
	 Stainless Steels	 Non-Ferrous										

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Twister® Micro-Tuff™ Drill



Series 305 Uncoated

Example Ordering Code - Select series number then add tool number.
(example 305 0100 = 1.0mm Uncoated Micro-Tuff™ drill)

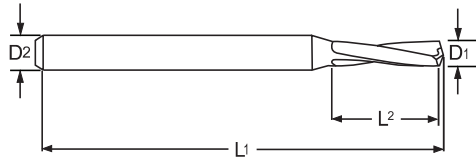
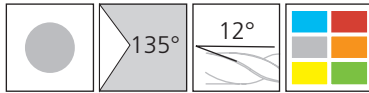
Drill Dimensions				Series 305	
Ø D ¹	Ø D ²	L ¹	L ²	Tool No	
0.10	3.0	38.0	1.7	305 0010	o
0.11				305 0011	o
0.12				305 0012	o
0.13				305 0013	o
0.14	3.0	38.0	1.7	305 0014	o
0.15	3.0	38.0	2.5	305 0015	o
0.16				305 0016	o
0.17				305 0017	o
0.18				305 0018	o
0.19				305 0019	o
0.20				305 0020	o
0.21				305 0021	o
0.22				305 0022	o
0.23				305 0023	o
0.24	3.0	38.0	2.5	305 0024	o
0.25	3.0	38.0	3.2	305 0025	o
0.26				305 0026	o
0.27				305 0027	o
0.28				305 0028	o
0.29	3.0	38.0	3.2	305 0029	o
0.30	3.0	38.0	4.8	305 0030	o
0.31				305 0031	o
0.32				305 0032	o
0.33				305 0033	o
0.34				305 0034	o
0.35				305 0035	o
0.36				305 0036	o
0.37				305 0037	o
0.38				305 0038	o
0.39				305 0039	o
0.40	3.0	38.0	4.8	305 0040	o
0.41	3.0	38.0	6.4	305 0041	o
0.42				305 0042	o
0.43				305 0043	o
0.44				305 0044	o
0.45				305 0045	o
0.46				305 0046	o
0.47				305 0047	o
0.48				305 0048	o
0.49				305 0049	o
0.50				305 0050	o
0.51				305 0051	o
0.52				305 0052	o
0.53				305 0053	o
0.54	3.0	38.0	6.4	305 0054	o

Drill Dimensions				Series 305	
Ø D ¹	Ø D ²	L ¹	L ²	Tool No	
0.55	3.0	38.0	6.4	305 0055	o
0.56				305 0056	o
0.57				305 0057	o
0.58				305 0058	o
0.59				305 0059	o
0.60				305 0060	o
0.61				305 0061	o
0.62				305 0062	o
0.63				305 0063	o
0.64				305 0064	o
0.65	3.0	38.0	6.4	305 0065	o
0.66	3.0	38.0	8.1	305 0066	o
0.67				305 0067	o
0.68				305 0068	o
0.69				305 0069	o
0.70				305 0070	o
0.71				305 0071	o
0.72				305 0072	o
0.73				305 0073	o
0.74				305 0074	o
0.75	3.0	38.0	8.1	305 0075	o
0.76	3.0	38.0	10.2	305 0076	o
0.77				305 0077	o
0.78				305 0078	o
0.79				305 0079	o
0.80				305 0080	o
0.81				305 0081	o
0.82				305 0082	o
0.83				305 0083	o
0.84				305 0084	o
0.85				305 0085	o
0.86				305 0086	o
0.87				305 0087	o
0.88				305 0088	o
0.89				305 0089	o
0.90				305 0090	o
0.91				305 0091	o
0.92				305 0092	o
0.93				305 0093	o
0.94				305 0094	o
0.95				305 0095	o
0.96				305 0096	o
0.97				305 0097	o
0.98				305 0098	o
0.99	3.0	38.0	10.2	305 0099	o

o Non-Stocked Standard - Delivery 3-5 Days



Twister® Micro-Tuff™ Drill



Series

305 Uncoated

Example Ordering Code - Select series number then add tool number.
(example 305 0100 = 1.0mm Uncoated Micro-Tuff™ drill)

Drill Dimensions				Series 305	
Ø D ¹	Ø D ²	L ¹	L ²	Tool No	
1.00	3.0	38.0	10.2	305 0100	○
1.05				305 0105	○
1.10				305 0110	○
1.15				305 0115	○
1.20				305 0120	○
1.25				305 0125	○
1.30				305 0130	○
1.35				305 0135	○
1.40				305 0140	○
1.45				305 0145	○
1.50				305 0150	○
1.55	3.0	38.0	10.2	305 0155	○
1.60	3.0	38.0	12.2	305 0160	○
1.65				305 0165	○
1.70				305 0170	○
1.75				305 0175	○
1.80				305 0180	○
1.85				305 0185	○
1.90				305 0190	○
1.95				305 0195	○
2.00	3.0	38.0	12.2	305 0200	○

Drill Dimensions				Series 305	
Ø D ¹	Ø D ²	L ¹	L ²	Tool No	
2.05	3.0	38.0	12.2	305 0205	○
2.10				305 0210	○
2.15				305 0215	○
2.20				305 0220	○
2.25				305 0225	○
2.30				305 0230	○
2.35				305 0235	○
2.40				305 0240	○
2.45				305 0245	○
2.50				305 0250	○
2.55				305 0255	○
2.60				305 0260	○
2.65				305 0265	○
2.70				305 0270	○
2.75				305 0275	○
2.80				305 0280	○
2.85				305 0285	○
2.90				305 0290	○
2.95				305 0295	○
3.00	3.0	38.0	12.2	305 0300	○



○ Non-Stocked Standard - Delivery 3-5 Days

Endmills

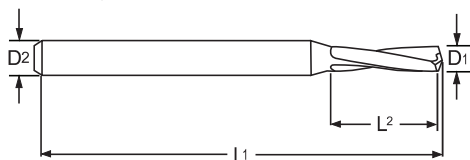
Drills

Reamers

Countersinks

Burrs

Twister® Micro-Tuff™ Drill



Series 305AM Coated

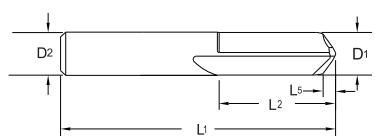
Example Ordering Code - Select series number then add tool number.
(example 305 0100AM = 1.0mm diameter Micro-Tuff™ drill)

Drill Dimensions				Series 305
Ø D ¹	Ø D ²	L ¹	L ²	Tool No
0.10	3.0	38.0	1.7	305 0010AM
0.15			2.5	305 0015AM
0.20			2.5	305 0020AM
0.25			3.2	305 0025AM
0.30			4.8	305 0030AM
0.35				305 0035AM
0.40			4.8	305 0040AM
0.45			6.4	305 0045AM
0.50				305 0050AM
0.55				305 0055AM
0.60				305 0060AM
0.65			6.4	305 0065AM
0.70			8.1	305 0070AM
0.75			8.1	305 0075AM
0.80			10.2	305 0080AM
0.85				305 0085AM
0.90				305 0090AM
0.95				305 0095AM
1.00				305 0100AM
1.05				305 0105AM
1.10				305 0110AM
1.15				305 0115AM
1.20				305 0120AM
1.25				305 0125AM
1.30				305 0130AM
1.35				305 0135AM
1.40				305 0140AM
1.45				305 0145AM
1.50				305 0150AM
1.55	3.0	38.0	10.2	305 0155AM

Drill Dimensions				Series 305
Ø D ¹	Ø D ²	L ¹	L ²	Tool No
1.60	3.0	38.0	12.2	305 0160AM
1.65				305 0165AM
1.70				305 0170AM
1.75				305 0175AM
1.80				305 0180AM
1.85				305 0185AM
1.90				305 0190AM
1.95				305 0195AM
2.00				305 0200AM
2.05				305 0205AM
2.10				305 0210AM
2.15				305 0215AM
2.20				305 0220AM
2.25				305 0225AM
2.30				305 0230AM
2.35				305 0235AM
2.40				305 0240AM
2.45				305 0245AM
2.50				305 0250AM
2.55				305 0255AM
2.60				305 0260AM
2.65				305 0265AM
2.70				305 0270AM
2.75				305 0275AM
2.80				305 0280AM
2.85				305 0285AM
2.90				305 0290AM
2.95				305 0295AM
3.00	3.0	38.0	12.2	305 0300AM



Twister® XD Spot Drill



Series 200S

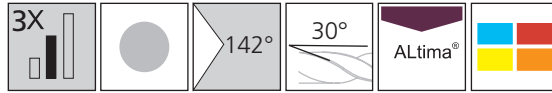
Example Ordering Code - Select series number then add tool number.
(example 200S 0600A = 6.0mm XD Spot Drill)

Drill Dimensions					Series 200S
Ø D ¹	Ø D ²	L ¹	L ²	L ³	Tool No.
3.00	3.0	38.0	16.0	0.4	200S 0300A
6.00	6.0	51.0	19.0	0.8	200S 0600A
8.00	8.0	64.0	19.0	1.1	200S 0800A
10.00	10.0	70.0	25.0	1.4	200S 1000A
12.00	12.0	76.0	25.0	1.7	200S 1200A
16.00	16.0	89.0	32.0	2.2	200S 1600A

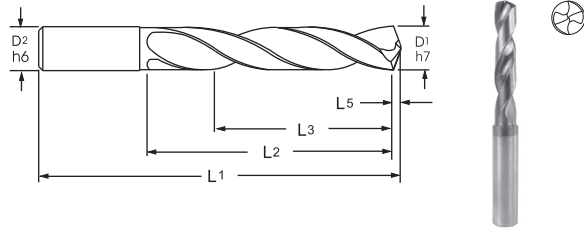
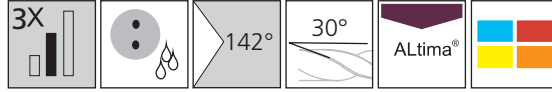


Twister® XD High Performance Drills - 3xD

Series
XD SSM



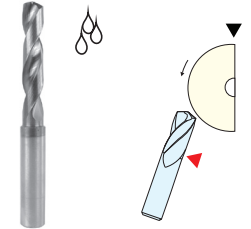
Series
XD CSM



A.P.G. An M.A.FORD Advanced Product Group

Series
XD SSM, XD CSM

Example Ordering Code - Select series number then add tool number.
(example 2XDSSM0600A = 6.0mm 3 x D Solid Carbide Drill)



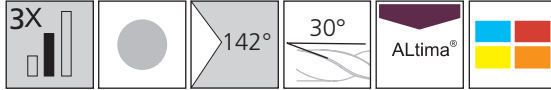
Drill Dimensions XD SSM					Series 2XDSSM	Drill Dimensions XD CSM				Series 2XDSCSM	Regrind & Recoat
Ø D1	Ø D2	L1	L2	L3	Tool No.	Ø D2	L1	L2	L3	Tool No.	
2.50	2.5	43.0	14.0	11.0	2XDSSM0250A	-	-	-	-	-	N/A
2.90	2.9	46.0	16.0	12.0	2XDSSM0290A	-	-	-	-	-	
3.00	3.0	57.0	16.0	13.0	2XDSSM0300A	3.0	57.0	16.0	13.0	2XDSCSM0300A	
3.10	4.0	63.0	22.0	18.0	2XDSSM0310A	4.0	63.0	22.0	18.0	2XDSCSM0310A	
3.20					2XDSSM0320A					2XDSCSM0320A	
3.30					2XDSSM0330A					2XDSCSM0330A	
3.40					2XDSSM0340A					2XDSCSM0340A	
3.50					2XDSSM0350A					2XDSCSM0350A	
3.60					2XDSSM0360A					2XDSCSM0360A	
3.70					2XDSSM0370A					2XDSCSM0370A	
3.80					2XDSSM0380A					2XDSCSM0380A	Available On Request - POA
3.90					2XDSSM0390A					2XDSCSM0390A	
4.00	4.0	63.0	22.0	18.0	2XDSSM0400A	4.0	63.0	22.0	18.0	2XDSCSM0400A	
4.10	5.0	63.0	26.0	21.0	2XDSSM0410A	5.0	63.0	26.0	21.0	2XDSCSM0410A	
4.20					2XDSSM0420A					2XDSCSM0420A	
4.30					2XDSSM0430A					2XDSCSM0430A	
4.40					2XDSSM0440A					2XDSCSM0440A	
4.50					2XDSSM0450A					2XDSCSM0450A	
4.60					2XDSSM0460A					2XDSCSM0460A	
4.70					2XDSSM0470A					2XDSCSM0470A	
4.80					2XDSSM0480A					2XDSCSM0480A	
4.90					2XDSSM0490A					2XDSCSM0490A	
5.00	5.0	63.0	26.0	21.0	2XDSSM0500A	5.0	63.0	26.0	21.0	2XDSCSM0500A	Available On Request - POA
5.10	6.0	76.0	30.0	24.0	2XDSSM0510A	6.0	66.0	28.0	20.0	2XDSCSM0510A	
5.20					2XDSSM0520A					2XDSCSM0520A	
5.30					2XDSSM0530A					2XDSCSM0530A	
5.40					2XDSSM0540A					2XDSCSM0540A	
5.50					2XDSSM0550A					2XDSCSM0550A	
5.70					2XDSSM0570A					2XDSCSM0570A	
5.80					2XDSSM0580A					2XDSCSM0580A	
5.90					2XDSSM0590A					2XDSCSM0590A	
6.00	6.0	76.0	30.0	24.0	2XDSSM0600A	6.0	66.0	28.0	20.0	2XDSCSM0600A	
6.10	8.0	82.0	35.0	28.0	2XDSSM0610A	8.0	79.0	34.0	24.0	2XDSCSM0610A	Available On Request - POA
6.20					2XDSSM0620A					2XDSCSM0620A	
6.30					2XDSSM0630A					2XDSCSM0630A	
6.40					2XDSSM0640A					2XDSCSM0640A	
6.50					2XDSSM0650A					2XDSCSM0650A	
6.60					2XDSSM0660A					2XDSCSM0660A	
6.70					2XDSSM0670A					2XDSCSM0670A	
6.80					2XDSSM0680A					2XDSCSM0680A	
6.90					2XDSSM0690A					2XDSCSM0690A	
7.00	8.0	82.0	35.0	28.0	2XDSSM0700A	8.0	79.0	34.0	24.0	2XDSCSM0700A	
7.10	8.0	82.0	38.0	31.0	2XDSSM0710A	8.0	79.0	41.0	29.0	2XDSCSM0710A	Available On Request - POA
7.20					2XDSSM0720A					2XDSCSM0720A	
7.30	8.0	82.0	38.0	31.0	2XDSSM0730A	8.0	79.0	41.0	29.0	2XDSCSM0730A	



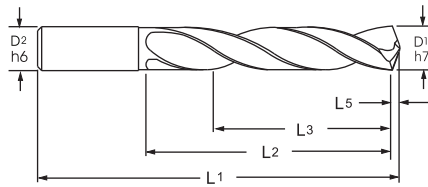
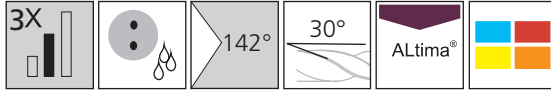
○ Non-Stocked Standard - Delivery 3-5 Days

Twister[®] XD High Performance Drills - 3xD

Series
XD SSM



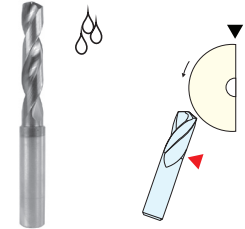
Series
XD CSM



A.P.G. An M.A.FORD Advanced Product Group

Series
XD SSM, XD CSM

Example Ordering Code - Select series number then add tool number.
(example 2XDSSM0800A = 8.0mm 3 x D Solid Carbide Drill)



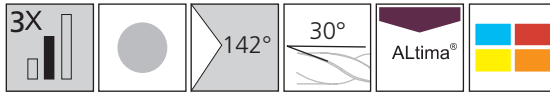
Drill Dimensions XD SSM					Series 2XDSSM	Drill Dimensions XD CSM				Series 2XDSCSM	Regrind & Recoat
Ø D1	Ø D2	L1	L2	L3	Tool No.	Ø D2	L1	L2	L3	Tool No.	
7.40	8.0	82.0	38.0	31.0	2XDSSM0740A	8.0	79.0	41.0	29.0	2XDSCSM0740A	o
7.50					2XDSSM0750A					2XDSCSM0750A	o
7.60					2XDSSM0760A					2XDSCSM0760A	o
7.70	8.0	82.0	38.0	31.0	2XDSSM0770A	8.0	79.0	41.0	29.0	2XDSCSM0770A	o
7.80	8.0	89.0	43.0	35.0	2XDSSM0780A	8.0	79.0	41.0	29.0	2XDSCSM0780A	o
7.90					2XDSSM0790A					2XDSCSM0790A	o
8.00	8.0	89.0	43.0	35.0	2XDSSM0800A	8.0	79.0	41.0	29.0	2XDSCSM0800A	o
8.10	10.0	89.0	43.0	35.0	2XDSSM0810A	10.0	89.0	47.0	35.0	2XDSCSM0810A	o
8.20					2XDSSM0820A					2XDSCSM0820A	o
8.30					2XDSSM0830A					2XDSCSM0830A	o
8.40					2XDSSM0840A					2XDSCSM0840A	o
8.50					2XDSSM0850A					2XDSCSM0850A	o
8.60					2XDSSM0860A					2XDSCSM0860A	o
8.70					2XDSSM0870A					2XDSCSM0870A	o
8.80					2XDSSM0880A					2XDSCSM0880A	o
8.90					2XDSSM0890A					2XDSCSM0890A	o
9.00					2XDSSM0900A					2XDSCSM0900A	o
9.10					2XDSSM0910A					2XDSCSM0910A	o
9.20					2XDSSM0920A					2XDSCSM0920A	o
9.25					2XDSSM0925A					2XDSCSM0925A	o
9.30					2XDSSM0930A					2XDSCSM0930A	o
9.40					2XDSSM0940A					2XDSCSM0940A	o
9.50					2XDSSM0950A					2XDSCSM0950A	o
9.60					2XDSSM0960A					2XDSCSM0960A	o
9.70					2XDSSM0970A					2XDSCSM0970A	o
9.80					2XDSSM0980A					2XDSCSM0980A	o
9.90					2XDSSM0990A					2XDSCSM0990A	o
10.00	10.0	89.0	43.0	35.0	2XDSSM1000A	10.0	89.0	47.0	35.0	2XDSCSM1000A	o
10.10	12.0	101.0	51.0	41.0	2XDSSM1010A	12.0	102.0	55.0	40.0	2XDSCSM1010A	o
10.20					2XDSSM1020A					2XDSCSM1020A	o
10.30					2XDSSM1030A					2XDSCSM1030A	o
10.40					2XDSSM1040A					2XDSCSM1040A	o
10.50					2XDSSM1050A					2XDSCSM1050A	o
10.60					2XDSSM1060A					2XDSCSM1060A	o
10.70					2XDSSM1070A					2XDSCSM1070A	o
10.80					2XDSSM1080A					2XDSCSM1080A	o
10.90					2XDSSM1090A					2XDSCSM1090A	o
11.00					2XDSSM1100A					2XDSCSM1100A	o
11.10					2XDSSM1110A					2XDSCSM1110A	o
11.20					2XDSSM1120A					2XDSCSM1120A	o
11.30					2XDSSM1130A					2XDSCSM1130A	o
11.40					2XDSSM1140A					2XDSCSM1140A	o
11.50					2XDSSM1150A					2XDSCSM1150A	o
11.60					2XDSSM1160A					2XDSCSM1160A	o
11.70	12.0	101.0	51.0	41.0	2XDSSM1170A	12.0	102.0	55.0	40.0	2XDSCSM1170A	o

o Non-Stocked Standard - Delivery 3-5 Days

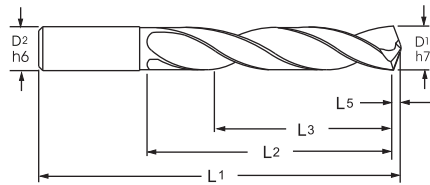
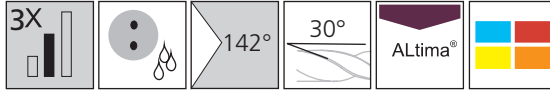
Available On Request - POA

Twister® XD High Performance Drills - 3xD

Series
XD SSM



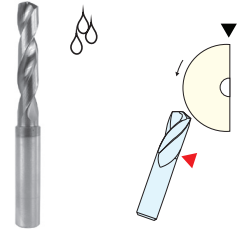
Series
XD CSM



A.P.G. An M.A.FORD Advanced Product Group

Series
XD SSM, XD CSM

Example Ordering Code - Select series number then add tool number.
(example 2XDSSM1600A = 16.0mm 3 x D Solid Carbide Drill)



Drill Dimensions XD SSM					Series 2XDSSM	Drill Dimensions XD CSM				Series 2XDSCSM	Regrind & Recoat
Ø D ¹	Ø D ²	L ¹	L ²	L ³	Tool No.	Ø D ²	L ¹	L ²	L ³	Tool No.	
11.80	12.0	101.0	51.0	41.0	2XDSSM1180A	12.0	102.0	55.0	40.0	2XDSCSM1180A	○
11.90					2XDSSM1190A					2XDSCSM1190A	○
12.00	12.0	101.0	51.0	41.0	2XDSSM1200A	12.0	102.0	55.0	40.0	2XDSCSM1200A	○
12.10	14.0	107.0	54.0	43.0	2XDSSM1210A	14.0	107.0	60.0	43.0	2XDSCSM1210A	○
12.50					2XDSSM1250A					2XDSCSM1250A	○
12.80	14.0	107.0	54.0	43.0	2XDSSM1280A					2XDSCSM1280A	○
12.83	-	-	-	-	2XDSSM1283A	14.0	107.0	60.0	43.0	2XDSCSM1283A	○
12.90	14.0	107.0	54.0	43.0	2XDSSM1290A	14.0	107.0	60.0	43.0	2XDSCSM1290A	○
13.00					2XDSSM1300A					2XDSCSM1300A	○
13.50					2XDSSM1350A					2XDSCSM1350A	○
13.70					2XDSSM1370A					2XDSCSM1370A	○
14.00	14.0	107.0	54.0	43.0	2XDSSM1400A	14.0	107.0	60.0	43.0	2XDSCSM1400A	○
14.50	16.0	117.0	60.0	48.0	2XDSSM1450A	16.0	115.0	65.0	45.0	2XDSCSM1450A	○
14.70					2XDSSM1470A					2XDSCSM1470A	○
15.00					2XDSSM1500A					2XDSCSM1500A	○
15.30					2XDSSM1530A					2XDSCSM1530A	○
15.50					2XDSSM1550A					2XDSCSM1550A	○
15.70					2XDSSM1570A					2XDSCSM1570A	○
16.00	16.0	117.0	60.0	48.0	2XDSSM1600A	16.0	115.0	65.0	45.0	2XDSCSM1600A	○
16.08	18.0	122.0	63.0	51.0	2XDSSM1608A						
16.30					2XDSSM1630A						
16.50					2XDSSM1650A						
17.00					2XDSSM1700A						
17.50					2XDSSM1750A						
18.00	18.0	122.0	63.0	51.0	2XDSSM1800A						
18.50	20.0	133.0	70.0	56.0	2XDSSM1850A						
19.16					2XDSSM1916A						
19.25					2XDSSM1925A						
19.30					2XDSSM1930A						
19.50					2XDSSM1950A						
20.00	20.0	133.0	70.0	56.0	2XDSSM2000A						

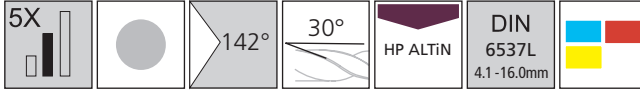
Available On Request - POA



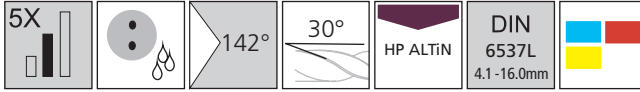
○ Non-Stocked Standard - Delivery 3-5 Days

Twister® Performance Drills - 5xD

Series
HPDSR



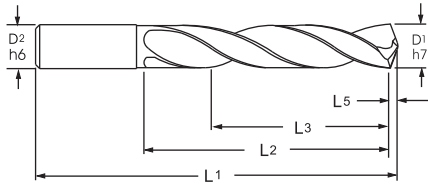
Series
HPDCR



Series

HPDSR, HPDCR

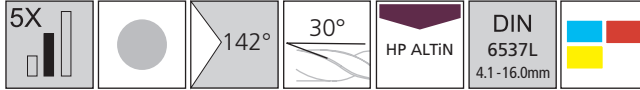
Example Ordering Code - Select series number then add tool number.
(example HPDSR 0600A = 6.0mm 5 x D Solid Carbide Drill)



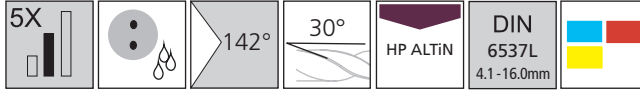
Drill Dimensions					Series HPDSR	Series HPDCR	Regrind & Recoat
Ø D ¹	Ø D ²	L ¹	L ²	L ³	Tool No.	Tool No.	
3.00	3.0	66.0	28.0	23.0	HPDSR0300A	HPDCR0300A	N/A
3.10	4.0				HPDSR0310A	HPDCR0310A	
3.20					HPDSR0320A	HPDCR0320A	
3.30					HPDSR0330A	HPDCR0330A	
3.40					HPDSR0340A	HPDCR0340A	
3.50					HPDSR0350A	HPDCR0350A	
3.60					HPDSR0360A	HPDCR0360A	
3.70		66.0	28.0	23.0	HPDSR0370A	HPDCR0370A	
3.80		74.0	36.0	29.0	HPDSR0380A	HPDCR0380A	
3.90					HPDSR0390A	HPDCR0390A	
4.00	4.0				HPDSR0400A	HPDCR0400A	Available On Request - POA
4.10	6.0				HPDSR0410A	HPDCR0410A	
4.20					HPDSR0420A	HPDCR0420A	
4.30					HPDSR0430A	HPDCR0430A	
4.40					HPDSR0440A	HPDCR0440A	
4.50					HPDSR0450A	HPDCR0450A	
4.60					HPDSR0460A	HPDCR0460A	
4.70		74.0	36.0	29.0	HPDSR0470A	HPDCR0470A	
4.80		82.0	44.0	35.0	HPDSR0480A	HPDCR0480A	
4.90					HPDSR0490A	HPDCR0490A	
5.00					HPDSR0500A	HPDCR0500A	
5.10					HPDSR0510A	HPDCR0510A	
5.20					HPDSR0520A	HPDCR0520A	
5.30					HPDSR0530A	HPDCR0530A	
5.40					HPDSR0540A	HPDCR0540A	
5.50					HPDSR0550A	HPDCR0550A	
5.60					HPDSR0560A	HPDCR0560A	
5.70					HPDSR0570A	HPDCR0570A	
5.80					HPDSR0580A	HPDCR0580A	
5.90					HPDSR0590A	HPDCR0590A	
6.00	6.0	82.0	44.0	35.0	HPDSR0600A	HPDCR0600A	
6.10	8.0	91.0	53.0	43.0	HPDSR0610A	HPDCR0610A	
6.20					HPDSR0620A	HPDCR0620A	
6.30					HPDSR0630A	HPDCR0630A	
6.40					HPDSR0640A	HPDCR0640A	
6.50					HPDSR0650A	HPDCR0650A	
6.60					HPDSR0660A	HPDCR0660A	
6.70					HPDSR0670A	HPDCR0670A	
6.80					HPDSR0680A	HPDCR0680A	
6.90					HPDSR0690A	HPDCR0690A	
7.00					HPDSR0700A	HPDCR0700A	
7.10					HPDSR0710A	HPDCR0710A	
7.20					HPDSR0720A	HPDCR0720A	
7.30					HPDSR0730A	HPDCR0730A	
7.40	8.0	91.0	53.0	43.0	HPDSR0740A	HPDCR0740A	

Twister® Performance Drills - 5xD

Series
HPDSR



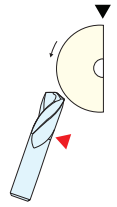
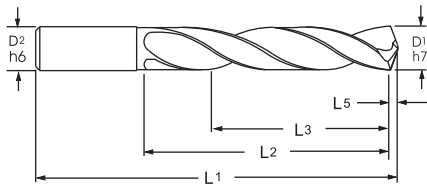
Series
HPDCR



Series

HPDSR, HPDCR

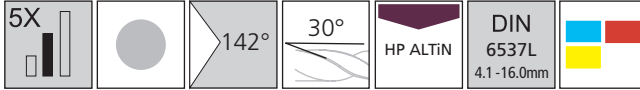
Example Ordering Code - Select series number then add tool number.
(example HPDSR 0800A = 8.0mm 5 x D Solid Carbide Drill)



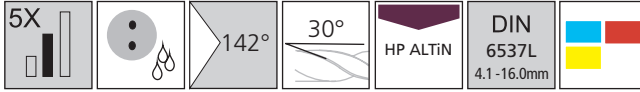
Tool Dimensions					Series HPDSR	Series HPDCR	Regrind & Recoat
Ø D ¹	Ø D ²	L ¹	L ²	L ³	Tool No.	Tool No.	
7.50	8.0	91.0	53.0	43.0	HPDSR0750A	HPDCR0750A	Available On Request - POA
7.60	8.0	91.0	53.0	43.0	HPDSR0760A	HPDCR0760A	
7.70					HPDSR0770A	HPDCR0770A	
7.80					HPDSR0780A	HPDCR0780A	
7.90					HPDSR0790A	HPDCR0790A	
8.00	8.0	91.0	53.0	43.0	HPDSR0800A	HPDCR0800A	
8.10	10.0	103.0	61.0	49.0	HPDSR0810A	HPDCR0810A	
8.20					HPDSR0820A	HPDCR0820A	
8.30					HPDSR0830A	HPDCR0830A	
8.40					HPDSR0840A	HPDCR0840A	
8.50					HPDSR0850A	HPDCR0850A	
8.60					HPDSR0860A	HPDCR0860A	
8.70					HPDSR0870A	HPDCR0870A	
8.80					HPDSR0880A	HPDCR0880A	
8.90					HPDSR0890A	HPDCR0890A	
9.00					HPDSR0900A	HPDCR0900A	
9.10					HPDSR0910A	HPDCR0910A	
9.20					HPDSR0920A	HPDCR0920A	
9.30					HPDSR0930A	HPDCR0930A	
9.40					HPDSR0940A	HPDCR0940A	
9.50					HPDSR0950A	HPDCR0950A	
9.60					HPDSR0960A	HPDCR0960A	
9.70					HPDSR0970A	HPDCR0970A	
9.80					HPDSR0980A	HPDCR0980A	
9.90					HPDSR0990A	HPDCR0990A	
10.00	10.0	103.0	61.0	49.0	HPDSR1000A	HPDCR1000A	
10.10	12.0	118.0	71.0	56.0	HPDSR1010A	HPDCR1010A	
10.20					HPDSR1020A	HPDCR1020A	
10.30					HPDSR1030A	HPDCR1030A	
10.40					HPDSR1040A	HPDCR1040A	
10.50					HPDSR1050A	HPDCR1050A	
10.60					HPDSR1060A	HPDCR1060A	
10.70					HPDSR1070A	HPDCR1070A	
10.80					HPDSR1080A	HPDCR1080A	
10.90					HPDSR1090A	HPDCR1090A	
11.00					HPDSR1100A	HPDCR1100A	
11.10					HPDSR1110A	HPDCR1110A	
11.20					HPDSR1120A	HPDCR1120A	
11.30					HPDSR1130A	HPDCR1130A	
11.40					HPDSR1140A	HPDCR1140A	
11.50					HPDSR1150A	HPDCR1150A	
11.60					HPDSR1160A	HPDCR1160A	
11.70					HPDSR1170A	HPDCR1170A	
11.80					HPDSR1180A	HPDCR1180A	
11.90	12.0	118.0	71.0	56.0	HPDSR1190A	HPDCR1190A	

Twister® Performance Drills - 5xD

Series
HPDSR



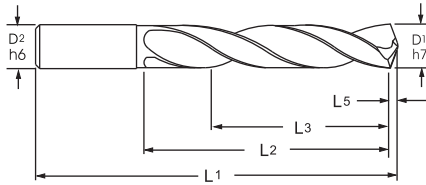
Series
HPDCR



Series

HPDSR, HPDCR

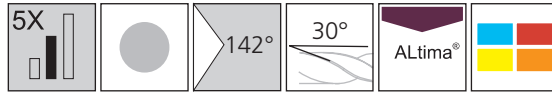
Example Ordering Code - Select series number then add tool umbr.
(example HPDSR 1200A = 12.0mm 5 x D Solid Carbide Drill)



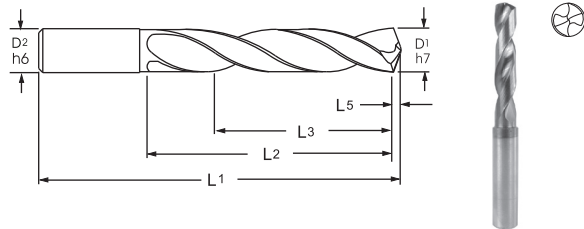
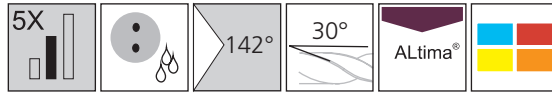
Tool Dimensions					Series HPDSR	Series HPDCR	Regrind & Recoat
Ø D ¹	Ø D ²	L ¹	L ²	L ³	Tool No.	Tool No.	
12.00	12.0	118.0	71.0	56.0	HPDSR1200A	HPDCR1200A	Available On Request - POA
12.10	14.0	124.0	77.0	60.0	HPDSR1210A	HPDCR1210A	
12.20					HPDSR1220A	HPDCR1220A	
12.30					HPDSR1230A	HPDCR1230A	
12.40					HPDSR1240A	HPDCR1240A	
12.50					HPDSR1250A	HPDCR1250A	
12.60					HPDSR1260A	HPDCR1260A	
12.70					HPDSR1270A	HPDCR1270A	
12.80					HPDSR1280A	HPDCR1280A	
12.90					HPDSR1290A	HPDCR1290A	
13.00					HPDSR1300A	HPDCR1300A	
13.10					HPDSR1310A	HPDCR1310A	
13.20					HPDSR1320A	HPDCR1320A	
13.30					HPDSR1330A	HPDCR1330A	
13.40					HPDSR1340A	HPDCR1340A	
13.50					HPDSR1350A	HPDCR1350A	
13.60					HPDSR1360A	HPDCR1360A	
13.70					HPDSR1370A	HPDCR1370A	
13.80					HPDSR1380A	HPDCR1380A	
13.90					HPDSR1390A	HPDCR1390A	
14.00	14.0	124.0	77.0	60.0	HPDSR1400A	HPDCR1400A	
14.10	16.0	133.0	83.0	63.0	HPDSR1410A	HPDCR1410A	
14.20					HPDSR1420A	HPDCR1420A	
14.30					HPDSR1430A	HPDCR1430A	
14.40					HPDSR1440A	HPDCR1440A	
14.50					HPDSR1450A	HPDCR1450A	
14.60					HPDSR1460A	HPDCR1460A	
14.70					HPDSR1470A	HPDCR1470A	
14.80					HPDSR1480A	HPDCR1480A	
14.90					HPDSR1490A	HPDCR1490A	
15.00					HPDSR1500A	HPDCR1500A	
15.10					HPDSR1510A	HPDCR1510A	
15.20					HPDSR1520A	HPDCR1520A	
15.30					HPDSR1530A	HPDCR1530A	
15.40					HPDSR1540A	HPDCR1540A	
15.50					HPDSR1550A	HPDCR1550A	
15.60					HPDSR1560A	HPDCR1560A	
15.70					HPDSR1570A	HPDCR1570A	
15.80					HPDSR1580A	HPDCR1580A	
15.90					HPDSR1590A	HPDCR1590A	
16.00	16.0	133.0	83.0	63.0	HPDSR1600A	HPDCR1600A	

Twister® XD High Performance Drills - 5xD

Series
XD SRM



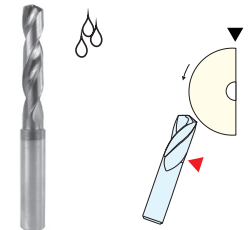
Series
XD CRM



A.P.G. An M.A.FORD Advanced Product Group

Series
XD SRM, XD CRM

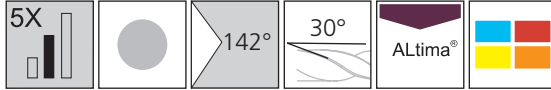
Example Ordering Code - Select series number then add tool number.
(example 2XDSRM0300A = 3.0mm 5 x D Solid Carbide Drill)



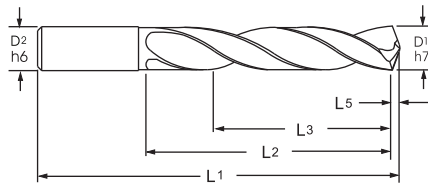
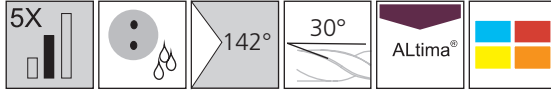
Drill Dimensions					Series 2XDSRM	Drill Dimensions XD CRM				Series 2XDCRM	Regrind & Recoat
Ø D1	Ø D2	L1	L2	L3	Tool No.	Ø D2	L1	L2	L3	Tool No.	
0.50	0.5	26.0	6.0	5.0	2XDSRM0050A	-	-	-	-	-	N/A
0.60	0.6	26.0	7.0	5.0	2XDSRM0060A	-	-	-	-	-	
0.65	0.65	26.0	8.0	6.0	2XDSRM0065A	-	-	-	-	-	
0.95	0.95	32.0	11.0	8.0	2XDSRM0095A	-	-	-	-	-	
1.00	1.0	34.0	12.0	9.0	2XDSRM0100A	-	-	-	-	-	
1.05	1.05	34.0	12.0	9.0	2XDSRM0105A	-	-	-	-	-	
1.25	1.25	38.0	16.0	12.0	2XDSRM0125A	-	-	-	-	-	
1.50	1.5	40.0	18.0	14.0	2XDSRM0150A	-	-	-	-	-	
1.60	1.6	43.0	20.0	15.0	2XDSRM0160A	-	-	-	-	-	
1.80	1.8	46.0	22.0	17.0	2XDSRM0180A	-	-	-	-	-	
1.90	1.9	46.0	22.0	17.0	2XDSRM0190A	-	-	-	-	-	
2.00	2.0	49.0	24.0	18.0	2XDSRM0200A	-	-	-	-	-	
2.05	2.05	49.0	24.0	18.0	2XDSRM0205A	-	-	-	-	-	
2.30	2.3	53.0	27.0	20.0	2XDSRM0230A	-	-	-	-	-	
2.40	2.4	57.0	30.0	23.0	2XDSRM0240A	-	-	-	-	-	
2.50	2.5	57.0	30.0	23.0	2XDSRM0250A	-	-	-	-	-	
2.90	2.9	61.0	33.0	25.0	2XDSRM0290A	-	-	-	-	-	
3.00	3.0	63.0	24.0	19.0	2XDSRM0300A	3.0	75.0	24.0	19.0	2XDCRM0300A	Available On Request - POA
3.10	4.0	69.0	32.0	26.0	2XDSRM0310A	4.0	80.0	32.0	26.0	2XDCRM0310A	
3.20					2XDSRM0320A					2XDCRM0320A	
3.30					2XDSRM0330A					2XDCRM0330A	
3.40					2XDSRM0340A					2XDCRM0340A	
3.50					2XDSRM0350A					2XDCRM0350A	
3.60					2XDSRM0360A					2XDCRM0360A	
3.70					2XDSRM0370A					2XDCRM0370A	
3.80					2XDSRM0380A					2XDCRM0380A	
3.90					2XDSRM0390A					2XDCRM0390A	
4.00	4.0	69.0	32.0	26.0	2XDSRM0400A	4.0	80.0	32.0	26.0	2XDCRM0400A	
4.10	5.0	80.0	38.0	30.0	2XDSRM0410A	5.0	82.0	38.0	30.0	2XDCRM0410A	
4.20					2XDSRM0420A					2XDCRM0420A	
4.30					2XDSRM0430A					2XDCRM0430A	
4.40					2XDSRM0440A					2XDCRM0440A	
4.50					2XDSRM0450A					2XDCRM0450A	
4.60					2XDSRM0460A					2XDCRM0460A	
4.70					2XDSRM0470A					2XDCRM0470A	
4.80					2XDSRM0480A					2XDCRM0480A	
4.90					2XDSRM0490A					2XDCRM0490A	
5.00	5.0	80.0	38.0	30.0	2XDSRM0500A	5.0	82.0	38.0	30.0	2XDCRM0500A	
5.10	6.0	82.0	40.0	32.0	2XDSRM0510A	6.0	82.0	40.0	32.0	2XDCRM0510A	
5.20					2XDSRM0520A					2XDCRM0520A	
5.30					2XDSRM0530A					2XDCRM0530A	
5.40					2XDSRM0540A					2XDCRM0540A	
5.50					2XDSRM0550A					2XDCRM0550A	
5.70					2XDSRM0570A					2XDCRM0570A	
5.80	6.0	82.0	40.0	32.0	2XDSRM0580A	6.0	82.0	40.0	32.0	2XDCRM0580A	

Twister® XD High Performance Drills - 5xD

Series
XD SRM



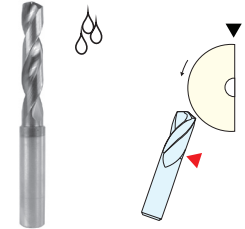
Series
XD CRM



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Series
XD SRM, XD CRM

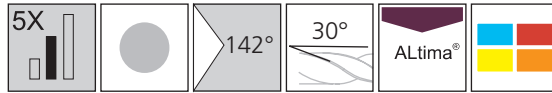
Example Ordering Code - Select series number then add tool number.
(example 2XD SRM0750A = 7.5mm 5 x D Solid Carbide Drill)



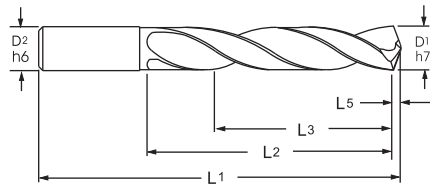
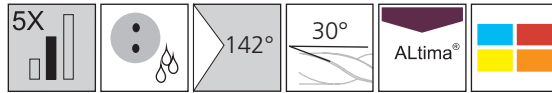
Drill Dimensions					Series 2XD SRM	Drill Dimensions				Series 2XD CRM	Regrind & Recoat
Ø D¹	Ø D²	L¹	L²	L³	Tool No.	Ø D²	L¹	L²	L³	Tool No.	
5.90	6.0	82.0	40.0	32.0	2XD SRM0590A	6.0	82.0	40.0	32.0	2XD CRM0590A	Available On Request - POA
6.00	6.0	82.0	40.0	32.0	2XD SRM0600A	6.0	82.0	40.0	32.0	2XD CRM0600A	
6.10	8.0	91.0	48.0	38.0	2XD SRM0610A	8.0	91.0	48.0	38.0	2XD CRM0610A	
6.20					2XD SRM0620A					2XD CRM0620A	
6.30					2XD SRM0630A					2XD CRM0630A	
6.40					2XD SRM0640A					2XD CRM0640A	
6.50					2XD SRM0650A					2XD CRM0650A	
6.60					2XD SRM0660A					2XD CRM0660A	
6.70					2XD SRM0670A					2XD CRM0670A	
6.80					2XD SRM0680A					2XD CRM0680A	
6.90					2XD SRM0690A					2XD CRM0690A	
7.00					2XD SRM0700A					2XD CRM0700A	
7.10					2XD SRM0710A					2XD CRM0710A	
7.20					2XD SRM0720A					2XD CRM0720A	
7.30					2XD SRM0730A					2XD CRM0730A	
7.40					2XD SRM0740A					2XD CRM0740A	
7.50					2XD SRM0750A					2XD CRM0750A	
7.60					2XD SRM0760A					2XD CRM0760A	
7.70					2XD SRM0770A					2XD CRM0770A	
7.80					2XD SRM0780A					2XD CRM0780A	
7.90					2XD SRM0790A					2XD CRM0790A	
8.00	8.0	91.0	48.0	38.0	2XD SRM0800A	8.0	91.0	48.0	38.0	2XD CRM0800A	
8.10	10.0	103.0	55.0	44.0	2XD SRM0810A	10.0	103.0	55.0	44.0	2XD CRM0810A	
8.20					2XD SRM0820A					2XD CRM0820A	
8.30					2XD SRM0830A					2XD CRM0830A	
8.40					2XD SRM0840A					2XD CRM0840A	
8.50					2XD SRM0850A					2XD CRM0850A	
8.60					2XD SRM0860A					2XD CRM0860A	
8.70					2XD SRM0870A					2XD CRM0870A	
8.80					2XD SRM0880A					2XD CRM0880A	
8.90					2XD SRM0890A					2XD CRM0890A	
9.00					2XD SRM0900A					2XD CRM0900A	
9.10					2XD SRM0910A					2XD CRM0910A	
9.20					2XD SRM0920A					2XD CRM0920A	
9.25					2XD SRM0925A					2XD CRM0925A	
9.30					2XD SRM0930A					2XD CRM0930A	
9.40					2XD SRM0940A					2XD CRM0940A	
9.50					2XD SRM0950A					2XD CRM0950A	
9.60					2XD SRM0960A					2XD CRM0960A	
9.70					2XD SRM0970A					2XD CRM0970A	
9.80					2XD SRM0980A					2XD CRM0980A	
9.90					2XD SRM0990A					2XD CRM0990A	
10.00	10.0	103.0	55.0	44.0	2XD SRM1000A	10.0	103.0	55.0	44.0	2XD CRM1000A	
10.10	12.0	120.0	60.0	48.0	2XD SRM1010A	12.0	120.0	60.0	48.0	2XD CRM1010A	
10.20	12.0	120.0	60.0	48.0	2XD SRM1020A	12.0	120.0	60.0	48.0	2XD CRM1020A	

Twister® XD High Performance Drills - 5xD

Series
XD SRM



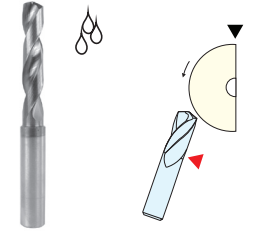
Series
XD CRM



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Series
XD SRM, XD CRM

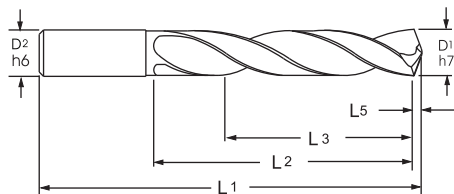
Example Ordering Code - Select series number then add tool number.
(example 2XDSRM1200A = 12.0mm 5 x D Solid Carbide Drill)



Drill Dimensions					Series 2XDSRM	Drill Dimensions				Series 2XDCRM	Regrind & Recoat
Ø D1	Ø D2	L1	L2	L3	Tool No.	Ø D2	L1	L2	L3	Tool No.	
10.30	12.0	120.0	60.0	48.0	2XDSRM1030A	12.0	120.0	60.0	48.0	2XDCRM1030A	Available On Request - POA
10.40					2XDSRM1040A					2XDCRM1040A	
10.50					2XDSRM1050A					2XDCRM1050A	
10.60					2XDSRM1060A					2XDCRM1060A	
10.70	12.0	120.0	60.0	48.0	2XDSRM1070A	12.0	120.0	60.0	48.0	2XDCRM1070A	
10.80	12.0	120.0	60.0	48.0	2XDSRM1080A	12.0	120.0	60.0	48.0	2XDCRM1080A	
10.90					2XDSRM1090A					2XDCRM1090A	
11.00					2XDSRM1100A	12.0	120.0	60.0	48.0	2XDCRM1100A	
11.10					2XDSRM1110A	12.0	120.0	66.0	53.0	2XDCRM1110A	
11.20					2XDSRM1120A					2XDCRM1120A	
11.30					2XDSRM1130A					2XDCRM1130A	
11.40					2XDSRM1140A					2XDCRM1140A	
11.50					2XDSRM1150A					2XDCRM1150A	
11.60					2XDSRM1160A					2XDCRM1160A	
11.70					2XDSRM1170A					2XDCRM1170A	
11.80					2XDSRM1180A					2XDCRM1180A	
11.90					2XDSRM1190A					2XDCRM1190A	
12.00	12.0	120.0	66.0	53.0	2XDSRM1200A	12.0	120.0	66.0	53.0	2XDCRM1200A	
12.10	14.0	126.0	72.0	58.0	2XDSRM1210A	14.0	126.0	72.0	58.0	2XDCRM1210A	
12.50					2XDSRM1250A					2XDCRM1250A	
12.80					2XDSRM1280A					2XDCRM1280A	
12.90					2XDSRM1290A					2XDCRM1290A	
13.00	14.0	126.0	72.0	58.0	2XDSRM1300A	14.0	126.0	72.0	58.0	2XDCRM1300A	Available On Request - POA
13.50	14.0	134.0	77.0	62.0	2XDSRM1350A	14.0	134.0	77.0	62.0	2XDCRM1350A	
13.70					2XDSRM1370A					2XDCRM1370A	
14.00	14.0	134.0	77.0	62.0	2XDSRM1400A	14.0	134.0	77.0	62.0	2XDCRM1400A	
14.50	16.0	140.0	80.0	64.0	2XDSRM1450A	16.0	140.0	80.0	64.0	2XDCRM1450A	
14.70					2XDSRM1470A					2XDCRM1470A	
15.00	16.0	140.0	80.0	64.0	2XDSRM1500A	16.0	140.0	80.0	64.0	2XDCRM1500A	
15.30	16.0	146.0	82.0	66.0	2XDSRM1530A	16.0	146.0	82.0	66.0	2XDCRM1530A	
15.50					2XDSRM1550A					2XDCRM1550A	
15.70					2XDSRM1570A					2XDCRM1570A	
16.00	16.0	146.0	82.0	66.0	2XDSRM1600A	16.0	146.0	82.0	66.0	2XDCRM1600A	Available On Request - POA
16.08	-	-	-	-	-	18.0	158.0	90.0	72.0	2XDCRM1608A	
16.30	-	-	-	-	-					2XDCRM1630A	
16.50	-	-	-	-	-					2XDCRM1650A	
17.00	-	-	-	-	-	18.0	158.0	90.0	72.0	2XDCRM1700A	
17.50	-	-	-	-	-	18.0	158.0	95.0	76.0	2XDCRM1750A	
18.00	-	-	-	-	-	18.0	158.0	95.0	76.0	2XDCRM1800A	
18.50	-	-	-	-	-	20.0	160.0	100.0	80.0	2XDCRM1850A	
19.16	-	-	-	-	-					2XDCRM1916A	
19.25	-	-	-	-	-					2XDCRM1925A	
19.30	-	-	-	-	-					2XDCRM1930A	Available On Request - POA
19.50	-	-	-	-	-					2XDCRM1950A	
20.00	-	-	-	-	-	20.0	160.0	100.0	80.0	2XDCRM2000A	

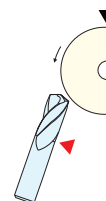
Twister[®] XD High Performance Drills - 7⁺xD

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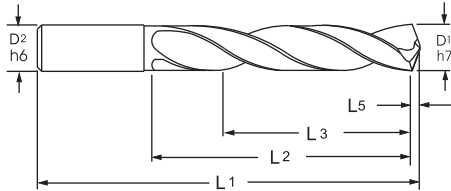
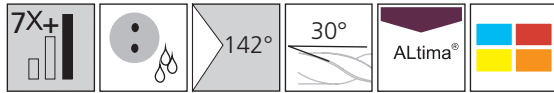
Series XD CLM

Example Ordering Code-Select series number then add tool number.
(Example 2XDCLM0580A = 5.8mm 7 x D Coolant Drill)



Drill Dimensions XD CLM					Series 2XDCLM	Regrind & Recoat
Ø D ¹	Ø D ²	L ¹	L ²	L ³	Tool No.	
3.00	3.0	81.0	33.0	26.0	2XDCLM0300A	Available On Request - POA
3.10	4.0	92.0	44.0	35.0	2XDCLM0310A	
3.20					2XDCLM0320A	
3.30					2XDCLM0330A	
3.40					2XDCLM0340A	
3.50					2XDCLM0350A	
3.60					2XDCLM0360A	
3.70					2XDCLM0370A	
3.80					2XDCLM0380A	
3.90					2XDCLM0390A	
4.00	4.0	92.0	44.0	35.0	2XDCLM0400A	
4.10	5.0	100.0	45.0	36.0	2XDCLM0410A	
4.20					2XDCLM0420A	
4.30					2XDCLM0430A	
4.40					2XDCLM0440A	
4.50					2XDCLM0450A	
4.60					2XDCLM0460A	
4.70					2XDCLM0470A	
4.80					2XDCLM0480A	
4.90					2XDCLM0490A	
5.00	5.0	100.0	45.0	36.0	2XDCLM0500A	
5.10	6.0	100.0	51.0	41.0	2XDCLM0510A	
5.20					2XDCLM0520A	
5.30					2XDCLM0530A	
5.40					2XDCLM0540A	
5.50					2XDCLM0550A	
5.70					2XDCLM0570A	
5.80					2XDCLM0580A	
5.90					2XDCLM0590A	
6.00	6.0	100.0	51.0	41.0	2XDCLM0600A	
6.10	8.0	109.0	60.0	48.0	2XDCLM0610A	
6.20					2XDCLM0620A	
6.30					2XDCLM0630A	
6.40					2XDCLM0640A	
6.50					2XDCLM0650A	
6.60					2XDCLM0660A	
6.70					2XDCLM0670A	
6.80					2XDCLM0680A	
6.90					2XDCLM0690A	
7.00	8.0	109.0	60.0	48.0	2XDCLM0700A	
7.10	8.0	118.0	70.0	56.0	2XDCLM0710A	
7.20					2XDCLM0720A	
7.30					2XDCLM0730A	
7.40					2XDCLM0740A	
7.50	8.0	118.0	70.0	56.0	2XDCLM0750A	

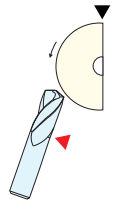
Twister® XD High Performance Drills - 7⁺xD



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Series XD CLM

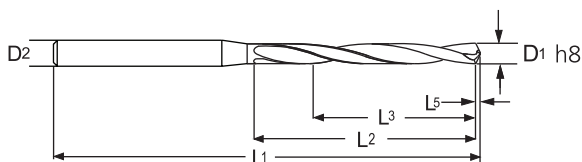
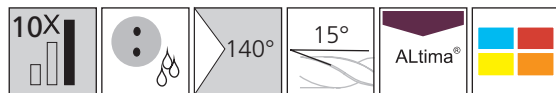
Example Ordering Code -Select series number then add tool number.
(Example 2XDCLM0850A = 8.5mm 7 x D Coolant Drill)



Drill Dimensions XD CLM					Series 2XDCLM	Regrind & Recoat
Ø D ¹	Ø D ²	L ¹	L ²	L ³	Tool No.	
7.60	8.0	118.0	70.0	56.0	2XDCLM0760A	Available On Request - POA
7.70	8.0	118.0	70.0	56.0	2XDCLM0770A	
7.80	8.0	118.0	70.0	56.0	2XDCLM0780A	
7.90					2XDCLM0790A	
8.00	8.0	118.0	70.0	56.0	2XDCLM0800A	
8.10	10.0	127.0	80.0	64.0	2XDCLM0810A	
8.20					2XDCLM0820A	
8.30					2XDCLM0830A	
8.40					2XDCLM0840A	
8.50					2XDCLM0850A	
8.60					2XDCLM0860A	
8.70					2XDCLM0870A	
8.80					2XDCLM0880A	
8.90					2XDCLM0890A	
9.00	10.0	127.0	80.0	64.0	2XDCLM0900A	
9.10	10.0	136.0	85.0	68.0	2XDCLM0910A	
9.20					2XDCLM0920A	
9.25					2XDCLM0925A	
9.30					2XDCLM0930A	
9.40					2XDCLM0940A	
9.50					2XDCLM0950A	
9.60					2XDCLM0960A	
9.70					2XDCLM0970A	
9.80					2XDCLM0980A	
9.90					2XDCLM0990A	
10.00	10.0	136.0	85.0	68.0	2XDCLM1000A	
10.10	12.0	149.0	93.0	74.0	2XDCLM1010A	
10.20					2XDCLM1020A	
10.30					2XDCLM1030A	
10.40					2XDCLM1040A	
10.50					2XDCLM1050A	
10.60					2XDCLM1060A	
10.70					2XDCLM1070A	
10.80					2XDCLM1080A	
10.90					2XDCLM1090A	
11.00	12.0	149.0	93.0	74.0	2XDCLM1100A	
11.10	12.0	155.0	102.0	82.0	2XDCLM1110A	
11.20					2XDCLM1120A	
11.30					2XDCLM1130A	
11.40					2XDCLM1140A	
11.50					2XDCLM1150A	
11.60					2XDCLM1160A	
11.70					2XDCLM1170A	
11.80					2XDCLM1180A	
11.90					2XDCLM1190A	
12.00	12.0	155.0	102.0	82.0	2XDCLM1200A	

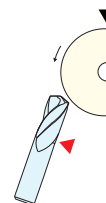
Twister® XD High Performance Drills - 10xD Micro

A.P.G. An M.A. FORD Advanced Product Group



Series MD CLM

Example Ordering Code -Select series number then add tool number.
(Example 2MDCLM0260A = 2.6mm 10 x D Coolant Drill)



Drill Dimensions MD CLM					Series 2MDCLM	Regrind & Recoat
Ø D ¹	Ø D ²	L ¹	L ²	L ³	Tool No.	
2.00	3.0	68.0	24.0	18.0	2MDCLM0200A	Available On Request - POA
2.05	3.0	74.0	28.0	21.0	2MDCLM0205A	
2.10					2MDCLM0210A	
2.15					2MDCLM0215A	
2.20					2MDCLM0220A	
2.25					2MDCLM0225A	
2.30					2MDCLM0230A	
2.35					2MDCLM0235A	
2.40					2MDCLM0240A	
2.45					2MDCLM0245A	
2.50	3.0	74.0	28.0	21.0	2MDCLM0250A	
2.55	3.0	81.0	34.0	25.5	2MDCLM0255A	
2.60					2MDCLM0260A	
2.65					2MDCLM0265A	
2.70					2MDCLM0270A	
2.75					2MDCLM0275A	
2.80					2MDCLM0280A	
2.85					2MDCLM0285A	
2.90					2MDCLM0290A	
2.95	3.0	81.0	34.0	25.5	2MDCLM0295A	



Tolerances

Drill Dia. (h8)	Tolerance
2.0 - 2.95	+0/- .014

Shank Dia. (h6)	Tolerance
3.0	+0/- .006

Machine Requirements

High Pressure Pump System (1000 psi)
Coolant filtration of 10 microns or better
Machine runout of .0004" (.01mm) Max.

Estimated Peck Depths

For hole depths up to 6x diameter No pecks
For hole depths up to 10x diameter 0-2 pecks
For hole depths up to 15x diameter 2-4 pecks

M.A. Ford® does not recommend full retraction of the body of the drill from the hole during the peck cycle. It is recommended to leave the drill point within the hole.

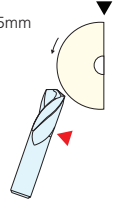
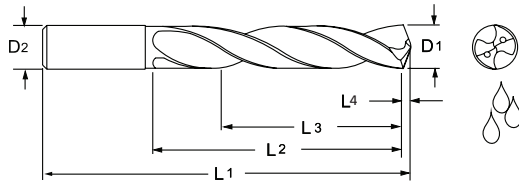
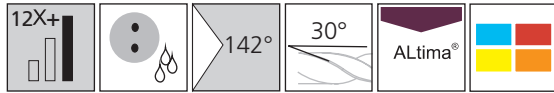
For hole depths deeper than 4x the diameter, M.A. Ford® recommends using a "soft start" program that drills to .5x diameter deep at 2/3 of the speed and feed.

Twister® XD High Performance Drills - 12⁺xD

A.P.G. An M.A.FORD Advanced Product Group

Series XD CEM

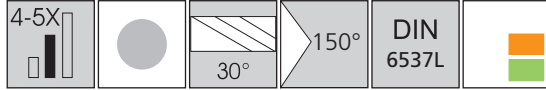
Example Ordering Code - Select series number then add tool number.
(example 2XDCEM0850A = 8.5mm 12+ x D Coolant Drill)



Drill Dimensions							Series 2XDCEM	Regrind & Recoat
Ø D ¹	Ø D ²	L ¹	L ²	L ³	L ² / D ¹ (D ¹ x Ø)	L ³ / D ¹ (D ¹ x Ø)	Tool No.	
4.00	4.0	163.0	100.0	80.0	25	20	2XDCEM0400A	Available On Request - POA
4.20	5.0	163.0	105.0	84.0	25	20	2XDCEM0420A	
4.30					24	20	2XDCEM0430A	
4.40					24	19	2XDCEM0440A	
4.60					23	18	2XDCEM0460A	
4.76					22	18	2XDCEM0476A ○	
4.80					22	18	2XDCEM0480A	
4.90					21	17	2XDCEM0490A	
5.00	5.0	163.0	105.0	84.0	21	17	2XDCEM0500A	
5.20	6.0	163.0	110.0	88.0	21	17	2XDCEM0520A	
5.40					20	16	2XDCEM0540A	
5.60					20	16	2XDCEM0560A	
5.80					19	15	2XDCEM0580A	
6.00	6.0	163.0	110.0	88.0	18	15	2XDCEM0600A	
6.20	8.0	163.0	110.0	88.0	18	14	2XDCEM0620A	
6.30					17	14	2XDCEM0630A	
6.35					17	14	2XDCEM0635A ○	
6.80					16	13	2XDCEM0680A	
7.00	8.0	163.0	110.0	88.0	16	13	2XDCEM0700A	
7.60	8.0	163.0	120.0	96.0	16	13	2XDCEM0760A	
7.80					15	12	2XDCEM0780A	
7.94					15	12	2XDCEM0794A ○	
8.00	8.0	163.0	120.0	96.0	15	12	2XDCEM0800A	
8.20	10.0	180.0	135.0	108.0	16	13	2XDCEM0820A	
8.50					16	13	2XDCEM0850A	
8.70					16	12	2XDCEM0870A	
9.00	10.0	180.0	135.0	108.0	15	12	2XDCEM0900A	
9.40	10.0	195.0	150.0	120.0	16	13	2XDCEM0940A	
9.53					16	13	2XDCEM0953A ○	
9.80					15	12	2XDCEM0980A	
10.00	10.0	195.0	150.0	120.0	15	12	2XDCEM1000A	
10.30	12.0	210.0	160.0	128.0	16	12	2XDCEM1030A	
10.50					15	12	2XDCEM1050A	
10.80					15	12	2XDCEM1080A	
11.00					15	12	2XDCEM1100A	
11.11					14	12	2XDCEM1111A ○	
11.50					14	12	2XDCEM1150A	
11.80					14	12	2XDCEM1180A	
12.00	12.0	210.0	160.0	128.0	13	12	2XDCEM1200A	
12.70	14.0	230.0	180.0	144.0	14	12	2XDCEM1270A	

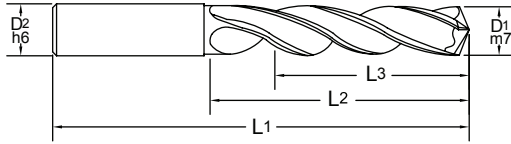
○ Non-Stocked Standard - Delivery 3-5 Days

Twister® X-AL High Performance 3 Flute - 4-5xD

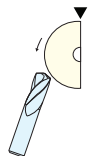
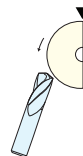
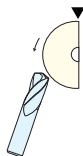


Series
229

Example Ordering Code - Select series number then add tool number.
(Example 229 0400 = 4.0mm 5 x D Drill)



Drill Dimensions					Series 229	Drill Dimensions					Series 229
Ø D ¹ (m ²)	Ø D ²	L ¹	L ²	L ³	Tool No.	Ø D ¹ (m ²)	Ø D ²	L ¹	L ²	L ³	Tool No.
2.00	2.0	38.0	16.0	12.0	229 0200	7.00	8.0	91.0	53.0	43.0	229 0700
2.30	2.3	43.0	20.0	15.0	229 0230	7.20					229 0720
2.50	2.5	43.0	20.0	15.0	229 0250	7.30					229 0730
2.90	2.9	46.0	25.0	19.0	229 0290	7.40					229 0740
3.00	6.0	66.0	28.0	23.0	229 0300	7.50					229 0750
3.10					229 0310	7.80					229 0780
3.20					229 0320	8.00	8.0	91.0	53.0	43.0	229 0800
3.30					229 0330	8.10	10.0	103.0	61.0	49.0	229 0810
3.40					229 0340	8.40					229 0840
3.50					229 0350	8.50					229 0850
3.60					229 0360	9.00					229 0900
3.70	6.0	66.0	28.0	23.0	229 0370	9.50					229 0950
3.80	6.0	74.0	36.0	29.0	229 0380	9.70					229 0970
3.90					229 0390	10.00	10.0	103.0	61.0	49.0	229 1000
4.00					229 0400	10.20	12.0	118.0	71.0	56.0	229 1020
4.10					229 0410	10.40					229 1040
4.20					229 0420	10.50					229 1050
4.40					229 0440	10.60					229 1060
4.50					229 0450	11.00					229 1100
4.60	6.0	74.0	36.0	29.0	229 0460	11.50					229 1150
4.80	6.0	82.0	44.0	35.0	229 0480	12.00	12.0	118.0	71.0	56.0	229 1200
4.90					229 0490	12.50	14.0	124.0	77.0	60.0	229 1250
5.00					229 0500	12.70					229 1270
5.20					229 0520	13.00					229 1300
5.50					229 0550	13.50					229 1350
5.60					229 0560	14.00	14.0	124.0	77.0	60.0	229 1400
6.00	6.0	82.0	44.0	35.0	229 0600	14.50	16.0	133.0	83.0	63.0	229 1450
6.20	8.0	91.0	53.0	43.0	229 0620	15.00					229 1500
6.50					229 0650	15.50					229 1550
6.70					229 0670	15.80					229 1580
6.80	8.0	91.0	53.0	43.0	229 0680	16.00	16.0	133.0	83.0	63.0	229 1600

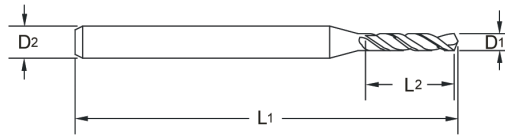
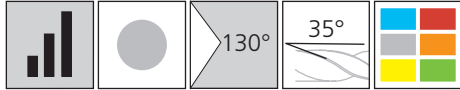


Ø D ¹	Regrind
5.00	Available On Request - POA
5.20	
5.50	
5.60	
6.00	
6.20	
6.50	
6.70	
6.80	
7.00	
7.20	
7.30	
7.40	
7.50	
7.80	
8.00	

Ø D ¹	Regrind
8.10	Available On Request - POA
8.40	
8.50	
9.00	
9.50	
9.70	
10.00	
10.20	
10.40	
10.50	
10.60	
11.00	
11.50	
12.00	
12.50	
13.00	

Ø D ¹	Regrind
13.50	Available On Request - POA
14.00	
14.50	
15.00	
15.50	
15.80	
16.00	

Twister® Micro Drill



Series

302 Uncoated

Example Ordering Code - Select series number then add tool number.
(Example 302 0100 = 1.0mm Uncoated Micro Drill)

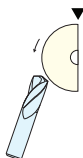
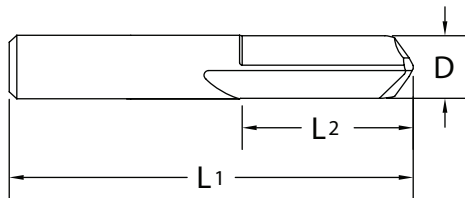
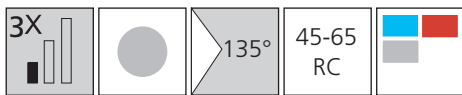
Drill Dimensions				Series 302	
Ø D ¹	Ø D ²	L ¹	L ²	Tool No	
0.10	3.175	38.1	1.7	302 0010	o
0.15			2.5	302 0015	o
0.20			3.2	302 0020	o
0.25			3.8	302 0025	o
0.30			5.0	302 0030	o
0.35			5.0	302 0035	o
0.35			6.0	302 0035-1	o
0.40			5.0	302 0040	o
0.40			6.0	302 0040-1	o
0.45			5.0	302 0045	o
0.45			6.0	302 0045-1	o
0.45			8.0	302 0045-2	o
0.50			5.0	302 0050	o
0.50			6.0	302 0050-1	o
0.50			8.0	302 0050-2	o
0.55			5.0	302 0055	o
0.55			6.0	302 0055-1	o
0.55			8.0	302 0055-2	o
0.60			5.0	302 0060	o
0.60			6.0	302 0060-1	o
0.60			8.0	302 0060-2	o
0.65			5.0	302 0065	o
0.65			6.0	302 0065-1	o
0.65			8.0	302 0065-2	o
0.70			6.0	302 0070	o
0.70			8.0	302 0070-1	o
0.70			10.2	302 0070-2	o
0.75			6.0	302 0075	o
0.75			8.0	302 0075-1	o
0.75			10.2	302 0075-2	o
0.80			6.0	302 0080	o
0.80			10.2	302 0080-1	o
0.85			6.0	302 0085	o
0.85			10.2	302 0085-1	o
0.90				302 0090	o
0.95				302 0095	o
1.00				302 0100	o
1.05				302 0105	o
1.10				302 0110	o
1.15	3.175	38.1	10.2	302 0115	o

Drill Dimensions				Series 302	
Ø D ¹	Ø D ²	L ¹	L ²	Tool No	
1.20	3.175	38.1	10.2	302 0120	o
1.25				302 0125	o
1.30				302 0130	o
1.35				302 0135	o
1.40				302 0140	o
1.45				302 0145	o
1.50				302 0150	o
1.55				302 0155	o
1.60				302 0160	o
1.65				302 0165	o
1.70				302 0170	o
1.75				302 0175	o
1.80				302 0180	o
1.85				302 0185	o
1.90				302 0190	o
1.95				302 0195	o
2.00				302 0200	o
2.05				302 0205	o
2.10				302 0210	o
2.15				302 0215	o
2.20				302 0220	o
2.25				302 0225	o
2.30				302 0230	o
2.35				302 0235	o
2.40				302 0240	o
2.45				302 0245	o
2.50				302 0250	o
2.55				302 0255	o
2.60				302 0260	o
2.65				302 0265	o
2.70				302 0270	o
2.75				302 0275	o
2.80				302 0280	o
2.85				302 0285	o
2.90				302 0290	o
2.95				302 0295	o
3.00				302 0300	o
3.05				302 0305	o
3.10				302 0310	o
3.15	3.175	38.1	10.2	302 0315	o

o Non-Stocked Standard - Delivery 3-5 Days



Twister® Hi-Roc® Drill - 3xD



Series 200

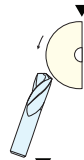
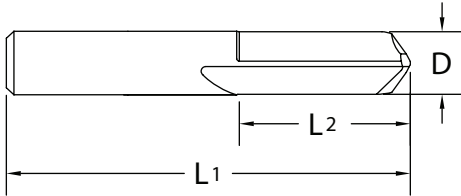
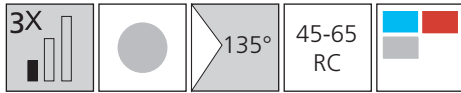
Example Ordering Code -Select series number then add tool number.
(Example 200 0400 = 4.0mm Hi Roc® Drill)



Drill Dimensions			Series 200	Regrind
Ø D	L ²	L ¹	Tool No	
0.80	5.0	38.0	200 0080	N/A
0.85	5.5		200 0085	
0.90	5.5		200 0090	
0.95	6.0		200 0095	
1.00	6.5		200 0100	
1.05			200 0105	
1.10			200 0110	
1.15	6.5		200 0115	
1.20	8.0		200 0120	
1.25			200 0125	
1.30			200 0130	
1.35			200 0135	
1.40			200 0140	
1.45			200 0145	
1.50			200 0150	
1.60	8.0		200 0160	
1.70	9.5		200 0170	
1.80			200 0180	
1.90			200 0190	
2.00	9.5		200 0200	
2.10	12.5		200 0210	
2.20			200 0220	
2.30			200 0230	
2.40			200 0240	
2.50	12.5		200 0250	
2.60	16.0		200 0260	
2.70			200 0270	
2.80			200 0280	
2.90			200 0290	
3.00			200 0300	Available On Request - POA
3.10			200 0310	
3.20			200 0320	
3.30		38.0	200 0330	
3.40		51.0	200 0340	
3.50			200 0350	
3.60			200 0360	
3.70			200 0370	
3.80			200 0380	
3.90			200 0390	
4.00			200 0400	
4.10			200 0410	
4.20			200 0420	
4.30			200 0430	
4.40			200 0440	
4.50	16.0	51.0	200 0450	

Drill Dimensions			Series 200	Regrind
Ø D	L ²	L ¹	Tool No	
4.60	16.0	51.0	200 0460	Available On Request - POA
4.70			200 0470	
4.80			200 0480	
4.90	16.0		200 0490	
5.00	19.0		200 0500	
5.10			200 0510	
5.20			200 0520	
5.30			200 0530	
5.40			200 0540	
5.50			200 0550	
5.60	19.0	51.0	200 0560	
5.70	19.0	51.0	200 0570	
5.80			200 0580	
5.90			200 0590	
6.00			200 0600	
6.10			200 0610	
6.20			200 0620	
6.30			200 0630	
6.40			200 0640	
6.50	19.0	51.0	200 0650	
6.60	19.0	64.0	200 0660	
6.70			200 0670	
6.80			200 0680	
6.90			200 0690	
7.00			200 0700	
7.10			200 0710	
7.20			200 0720	
7.30			200 0730	
7.40			200 0740	
7.50			200 0750	
7.60			200 0760	
7.70			200 0770	
7.80			200 0780	
7.90			200 0790	
8.00			200 0800	
8.10	19.0	64.0	200 0810	
8.20	25.5	64.0	200 0820	
8.30			200 0830	
8.40			200 0840	
8.50			200 0850	
8.60			200 0860	
8.70			200 0870	
8.80			200 0880	
8.90			200 0890	
9.00	25.5	64.0	200 0900	

Twister® Hi-Roc® Drill - 3xD



Series 200

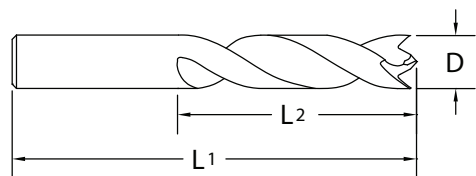
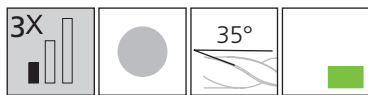
Example Ordering Code - Select series number then add tool number.
(example 200 0950 = 9.5mm Hi Roc® Drill)

Drill Dimensions			Series 200	Regrind
Ø D	L ²	L ¹	Tool No	
9.10	25.5	64.0	200 0910	Available On Request - POA
9.20			200 0920	
9.30			200 0930	
9.40			200 0940	
9.50			200 0950	
9.60	25.5	64.0	200 0960	
9.70	25.5	70.0	200 0970	
9.80			200 0980	
9.90			200 0990	
10.00			200 1000	
10.10			200 1010	
10.20			200 1020	
10.30			200 1030	
10.40			200 1040	
10.50			200 1050	
10.60			200 1060	
10.70			200 1070	
10.80			200 1080	
10.90			200 1090	
11.00			200 1100	
11.10			200 1110	
11.20	25.5	70.0	200 1120	
11.30	25.5	76.0	200 1130	

Drill Dimensions			Series 200	Regrind
Ø D	L ²	L ¹	Tool No	
11.40	25.5	76.0	200 1140	Available On Request - POA
11.50			200 1150	
11.60			200 1160	
11.70			200 1170	
11.80			200 1180	
11.90			200 1190	
12.00			200 1200	
12.50	25.5	76.0	200 1250	
13.00	28.5	89.0	200 1300	
13.50			200 1350	
14.00	28.5	89.0	200 1400	
14.50	32.0	89.0	200 1450	
15.00			200 1500	
15.50			200 1550	
16.00	32.0	89.0	200 1600	
16.50	38.0	102.0	200 1650	
17.00			200 1700	
17.50			200 1750	
18.00			200 1800	
18.50			200 1850	
19.00			200 1900	
20.00	38.0	102.0	200 2000	

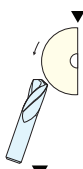


Twister® Kevlar/Composite Drill - 3xD



Series
207

Example Ordering Code - Select series number then add tool number.
(Example 207 0400 = 4.0mm Kevlar Drill)

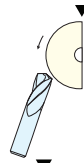
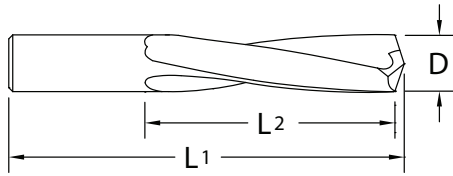
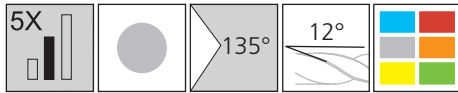


Drill Dimensions			Series 207	Regrind
Ø D	L ²	L ¹	Tool No	
2.40	12.5	44.0	207 0240	N/A
2.50		46.0	207 0250	
2.60			207 0260	
2.70	12.5	46.0	207 0270	
2.80	16.0	48.0	207 0280	
2.90			207 0290	
3.00			207 0300	
3.10			207 0310	
3.20	16.0	48.0	207 0320	
3.30	17.5	49.0	207 0330	
3.40			207 0340	
3.50			207 0350	
3.60	17.5	49.0	207 0360	
3.70	19.0	52.0	207 0370	
3.80			207 0380	
3.90	19.0	52.0	207 0390	
4.00	22.0	54.0	207 0400	
4.10			207 0410	
4.20			207 0420	
4.30	22.0	54.0	207 0430	
4.40	24.0	56.0	207 0440	
4.50			207 0450	
4.60			207 0460	
4.70	24.0	56.0	207 0470	
4.80	25.5	57.0	207 0480	
4.90			207 0490	
5.00	25.5	57.0	207 0500	

Drill Dimensions			Series 207	Regrind
Ø D	L ²	L ¹	Tool No	
5.10	25.5	57.0	207 0510	Available On Request - POA
5.20	27.0	60.0	207 0520	
5.30			207 0530	
5.40			207 0540	
5.50	27.0	60.0	207 0550	
5.60	28.5	62.0	207 0560	
5.70			207 0570	
5.80			207 0580	
5.90	28.5	62.0	207 0590	
6.00	32.0	64.0	207 0600	
6.10			207 0610	
6.20			207 0620	
6.30			207 0630	
6.40	32.0	64.0	207 0640	
6.50	33.5	67.0	207 0650	
7.00	35.0	68.0	207 0700	
7.50	35.0	70.0	207 0750	
8.00	38.0	71.0	207 0800	
8.50	39.5	75.0	207 0850	
9.00	39.5	78.0	207 0900	
9.50	41.5	79.0	207 0950	
10.00	44.5	84.0	207 1000	
10.50	46.0	86.0	207 1050	
11.00	47.5	87.0	207 1100	
11.50	51.0	92.0	207 1150	
12.00	54.0	94.0	207 1200	

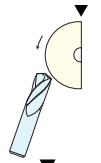


Twister® Hi-Tuff® Drill - 5xD



Series 205

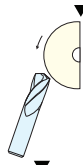
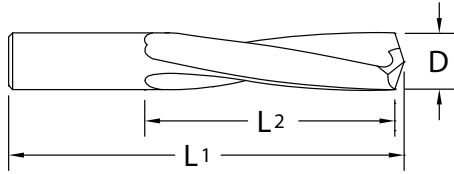
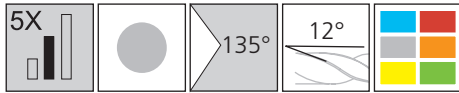
Example Ordering Code -Select series number then add tool number.
(example 205 0400 = 4.0mm Hi Tuff® Drill)



Drill Dimensions			Series 205	Regrind
Ø D	L ²	L ¹	Tool No	
0.30	5.0	38.0	205 0030	N/A
0.35			205 0035	
0.40			205 0040	
0.45	5.0		205 0045	
0.50	6.5		205 0050	
0.55			205 0055	
0.60	6.5		205 0060	
0.65	8.0		205 0065	
0.70			205 0070	
0.75	8.0		205 0075	
0.80	9.5		205 0080	
0.85	9.5		205 0085	
0.90	11.0		205 0090	
0.95	11.0		205 0095	
1.00	12.5		205 0100	
1.05			205 0105	
1.10			205 0110	
1.15			205 0115	
1.20	12.5	38.0	205 0120	
1.25	16.0	41.0	205 0125	
1.30			205 0130	
1.35			205 0135	
1.40			205 0140	
1.45			205 0145	
1.50			205 0150	
1.60	16.0	41.0	205 0160	
1.70	17.5	43.0	205 0170	
1.80			205 0180	
1.90	17.5	43.0	205 0190	
2.00	19.0	44.0	205 0200	
2.10			205 0210	
2.20			205 0220	
2.30			205 0230	
2.40	19.0	44.0	205 0240	
2.50	21.0	46.0	205 0250	
2.60	20.5		205 0260	
2.70	20.5	46.0	205 0270	
2.80	22.0	48.0	205 0280	
2.90			205 0290	
3.00			205 0300	
3.10			205 0310	
3.20	22.0	48.0	205 0320	
3.30	24.0	49.0	205 0330	
3.40			205 0340	
3.50	24.0	49.0	205 0350	

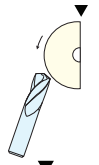
Drill Dimensions			Series 205	Regrind
Ø D	L ²	L ¹	Tool No	
3.60	24.0	49.0	205 0360	N/A
3.70	25.5	52.0	205 0370	
3.80			205 0380	
3.90	25.5	52.0	205 0390	
4.00	27.0	54.0	205 0400	
4.10			205 0410	
4.20			205 0420	
4.30	27.0	54.0	205 0430	
4.40	28.5	56.0	205 0440	
4.50			205 0450	
4.60	28.5	56.0	205 0460	
4.70	30.0	57.0	205 0470	
4.80			205 0480	
4.90			205 0490	
5.00	30.0	57.0	205 0500	
5.10	30.0	57.0	205 0510	
5.20	32.0	60.0	205 0520	
5.30			205 0530	
5.40			205 0540	
5.50	32.0	60.0	205 0550	
5.60	33.4	62.0	205 0560	
5.70			205 0570	Available On Request - POA
5.80			205 0580	
5.90	33.4	62.0	205 0590	
6.00	35.0	64.0	205 0600	
6.10			205 0610	
6.20			205 0620	
6.30			205 0630	
6.40	35.0	64.0	205 0640	
6.50	36.5	67.0	205 0650	
6.60	36.5		205 0660	
6.70	38.0	67.0	205 0670	
6.80		68.0	205 0680	
6.90			205 0690	
7.00			205 0700	
7.10			205 0710	
7.20			205 0720	
7.30	38.0	68.0	205 0730	
7.40	39.5	70.0	205 0740	
7.50			205 0750	
7.60	39.5	70.0	205 0760	
7.70	41.5	71.0	205 0770	
7.80			205 0780	
7.90			205 0790	
8.00	41.5	71.0	205 0800	

Twister® Hi-Tuff® Drill - 5xD



Series 205

Example Ordering Code -Select series number then add tool number.
(example 205 0850 = 8.5mm Hi Tuff® Drill)

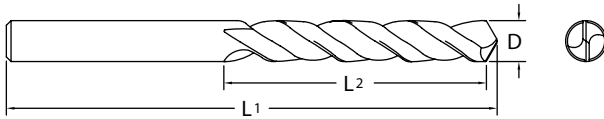
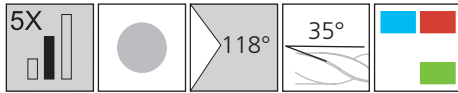


Drill Dimensions			Series 205	Regrind
Ø D	L ²	L ¹	Tool No	
8.10	43.0	75.0	205 0810	Available On Request - POA
8.20			205 0820	
8.30			205 0830	
8.40			205 0840	
8.50			205 0850	
8.60			205 0860	
8.70			205 0870	
8.80	43.0	75.0	205 0880	
8.90	44.5	78.0	205 0890	
9.00			205 0900	
9.10			205 0910	
9.20	44.5	78.0	205 0920	
9.30	46.0	79.0	205 0930	
9.40			205 0940	
9.50	46.0	79.0	205 0950	
9.60	47.5	83.0	205 0960	
9.70			205 0970	
9.80			205 0980	
9.90	47.5	83.0	205 0990	
10.00	49.0	84.0	205 1000	
10.10			205 1010	
10.20			205 1020	
10.30			205 1030	
10.40	49.0	84.0	205 1040	
10.50	51.0	86.0	205 1050	
10.60			205 1060	
10.70			205 1070	
10.80	51.0	86.0	205 1080	

Drill Dimensions			Series 205	Regrind
Ø D	L ²	L ¹	Tool No	
10.90	52.5	87.0	205 1090	Available On Request - POA
11.00	52.5	87.0	205 1100	
11.10	52.5	87.0	205 1110	
11.20	54.0	92.0	205 1120	
11.30			205 1130	
11.40			205 1140	
11.50			205 1150	
11.60			205 1160	
11.70			205 1170	
11.80			205 1180	
11.90	54.0	92.0	205 1190	
12.00	55.5	94.0	205 1200	
12.50	57.0	95.0	205 1250	
13.00	60.5	98.0	205 1300	
13.50	63.5	102.0	205 1350	
14.00	63.5	102.0	205 1400	
14.50	66.5	105.0	205 1450	
15.00	66.5	105.0	205 1500	
15.50	70.0	108.0	205 1550	
16.00	70.0	108.0	205 1600	
16.50	73.0	114.0	205 1650	
17.00	73.0	117.0	205 1700	
17.50	76.0	121.0	205 1750	
18.00	76.0	121.0	205 1800	
18.50	79.5	127.0	205 1850	
19.00	79.5	127.0	205 1900	
20.00	82.5	133.0	205 2000	



Twister® Micro Drill



Series 300 Uncoated

Example Ordering Code - Select series number then add tool number.
(Example 300 0100 = 1.0mm Uncoated Micro Drill)

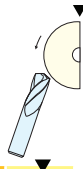
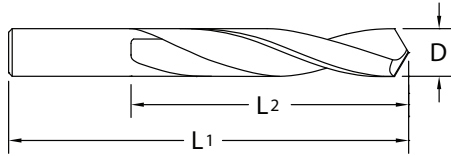
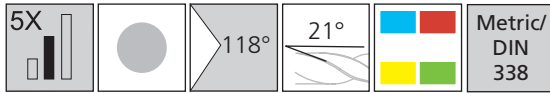
Drill Dimensions			Series 300	
Ø D	L ¹	L ²	Tool No	
0.50	38.0	9.5	300 0050	o
0.55			300 0055	o
0.60		9.5	300 0060	o
0.65		12.5	300 0065	o
0.70			300 0070	o
0.75			300 0075	o
0.80			300 0080	o
0.85		12.5	300 0085	o
0.90		16.0	300 0090	o
0.95			300 0095	o
1.00			300 0100	o
1.05			300 0105	o
1.10			300 0110	o
1.15			300 0115	o
1.20			300 0120	o
1.25			300 0125	o
1.30			300 0130	o
1.35			300 0135	o
1.40			300 0140	o
1.45			300 0145	o
1.50			300 0150	o
1.55			300 0155	o
1.60			300 0160	o
1.65			300 0165	o
1.70			300 0170	o
1.75			300 0175	o
1.80	38.0	16.0	300 0180	o

Drill Dimensions			Series 300	
Ø D	L ¹	L ²	Tool No	
1.85	38.0	16.0	300 0185	o
1.90			300 0190	o
1.95			300 0195	o
2.00			300 0200	o
2.05			300 0205	o
2.10			300 0210	o
2.15			300 0215	o
2.20			300 0220	o
2.25			300 0225	o
2.30			300 0230	o
2.35			300 0235	o
2.40			300 0240	o
2.45			300 0245	o
2.50			300 0250	o
2.55			300 0255	o
2.60			300 0260	o
2.65			300 0265	o
2.70			300 0270	o
2.75			300 0275	o
2.80			300 0280	o
2.85			300 0285	o
2.90			300 0290	o
2.95			300 0295	o
3.00			300 0300	o
3.05			300 0305	o
3.10			300 0310	o
3.15	38.0	16.0	300 0315	o



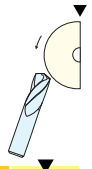
o Non-Stocked Standard - Delivery 3-5 Days

Twister® Jobbers Drill - 5xD



Series 224

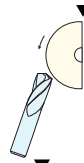
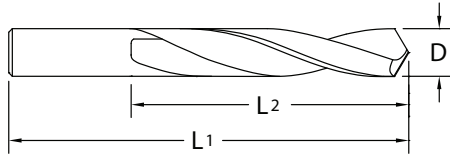
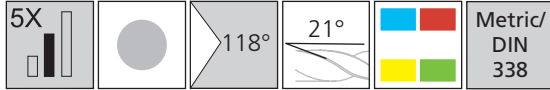
Example Ordering Code - Select series number then add tool number.
(example 224 0400 = 4.0mm Jobber Drill)



Drill Dimensions			Series 224	Regrind
Ø D	L ²	L ¹	Tool No	
0.30	3.0	26.0	224 0030	N/A
0.35	4.0		224 0035	
0.40	5.0		224 0040	
0.45	5.0		224 0045	
0.50	6.0		224 0050	
0.55	7.0		224 0055	
0.60	7.0		224 0060	
0.65	8.0	26.0	224 0065	
0.70	9.0	28.0	224 0070	
0.75	9.0	28.0	224 0075	
0.80	10.0	30.0	224 0080	
0.85	10.0	30.0	224 0085	
0.90	11.0	32.0	224 0090	
0.95	11.0	32.0	224 0095	
1.00	12.0	34.0	224 0100	
1.05	12.0	34.0	224 0105	
1.10	14.0	36.0	224 0110	
1.15	14.0	36.0	224 0115	
1.20	16.0	38.0	224 0120	
1.25			224 0125	
1.30	16.0	38.0	224 0130	N/A
1.35	18.0	40.0	224 0135	
1.40			224 0140	
1.45			224 0145	
1.50	18.0	40.0	224 0150	
1.60	20.0	43.0	224 0160	
1.70	20.0	43.0	224 0170	
1.80	22.0	46.0	224 0180	
1.90	22.0	46.0	224 0190	
2.00	24.0	49.0	224 0200	
2.10	24.0	49.0	224 0210	
2.20	27.0	53.0	224 0220	
2.30	27.0	53.0	224 0230	
2.40	30.0	57.0	224 0240	
2.50			224 0250	
2.60	30.0	57.0	224 0260	
2.70	33.0	61.0	224 0270	
2.80			224 0280	
2.90			224 0290	
3.00	33.0	61.0	224 0300	Available On Request - POA
3.10	36.0	65.0	224 0310	
3.20			224 0320	
3.30	36.0	65.0	224 0330	
3.40	39.0	70.0	224 0340	
3.50	39.0	70.0	224 0350	

Drill Dimensions			Series 224	Regrind
Ø D	L ²	L ¹	Tool No	
3.60	39.0	70.0	224 0360	N/A
3.70	39.0	70.0	224 0370	
3.80	43.0	75.0	224 0380	
3.90			224 0390	
4.00			224 0400	
4.10			224 0410	
4.20	43.0	75.0	224 0420	
4.30	47.0	80.0	224 0430	
4.40			224 0440	
4.50			224 0450	
4.60			224 0460	
4.70	47.0	80.0	224 0470	
4.80	52.0	86.0	224 0480	
4.90			224 0490	
5.00			224 0500	
5.10			224 0510	
5.20			224 0520	
5.30	52.0	86.0	224 0530	
5.40	57.0	93.0	224 0540	
5.50			224 0550	
5.60			224 0560	Available On Request - POA
5.70			224 0570	
5.80			224 0580	
5.90			224 0590	
6.00	57.0	93.0	224 0600	
6.10	63.0	101.0	224 0610	
6.20			224 0620	
6.30			224 0630	
6.40			224 0640	
6.50			224 0650	
6.60			224 0660	
6.70	63.0	101.0	224 0670	
6.80	69.0	109.0	224 0680	
6.90			224 0690	
7.00			224 0700	
7.10			224 0710	
7.20			224 0720	
7.30			224 0730	
7.40			224 0740	
7.50	69.0	109.0	224 0750	Available On Request - POA
7.60	75.0	117.0	224 0760	
7.70			224 0770	
7.80			224 0780	
7.90			224 0790	
8.00	75.0	117.0	224 0800	

Twister® Jobbers Drill - 5xD



Series 224

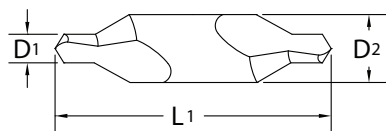
Example Ordering Code - Select series number then add tool number.
(example 224 0900 = 9.0mm Jobber Drill)

Drill Dimensions			Series 224	Regrind
Ø D	L ²	L ¹	Tool No	
8.10	75.0	117.0	224 0810	Available On Request - POA
8.20			224 0820	
8.30			224 0830	
8.40			224 0840	
8.50	75.0	117.0	224 0850	
8.60	81.0	125.0	224 0860	
8.70			224 0870	
8.80			224 0880	
8.90	81.0	125.0	224 0890	
9.00	81.0	125.0	224 0900	
9.10			224 0910	
9.20			224 0920	
9.30			224 0930	
9.40			224 0940	
9.50	81.0	125.0	224 0950	
9.60	87.0	133.0	224 0960	
9.70			224 0970	
9.80			224 0980	
9.90			224 0990	
10.00			224 1000	
10.10			224 1010	
10.20		133.0	224 1020	Available On Request - POA
10.30		133.0	224 1030	
10.40			224 1040	
10.50			224 1050	
10.60	87.0	133.0	224 1060	
10.70	94.0	142.0	224 1070	
10.80	94.0	142.0	224 1080	

Drill Dimensions			Series 224	Regrind
Ø D	L ²	L ¹	Tool No	
10.90	94.0	142.0	224 1090	Available On Request - POA
11.00			224 1100	
11.10			224 1110	
11.20			224 1120	
11.30			224 1130	
11.40			224 1140	
11.50			224 1150	
11.60			224 1160	
11.70			224 1170	
11.80	94.0	142.0	224 1180	
11.90	101.0	151.0	224 1190	
12.00			224 1200	
12.50			224 1250	
13.00	101.0	151.0	224 1300	
13.50	108.0	160.0	224 1350	
14.00	108.0	160.0	224 1400	
14.50	114.0	169.0	224 1450	
15.00	114.0	169.0	224 1500	
15.50	120.0	178.0	224 1550	
16.00	120.0	178.0	224 1600	
16.50	125.0	184.0	224 1650	
17.00	125.0	184.0	224 1700	Available On Request - POA
17.50	130.0	191.0	224 1750	
18.00	130.0	191.0	224 1800	
18.50	135.0	198.0	224 1850	
19.00	135.0	198.0	224 1900	Available On Request - POA
20.00	140.0	205.0	224 2000	



Twister® Centre Drill



Series 402

Example Ordering Code - Select series number then add tool number.
(example 402 0400 = 4.0mm Centre Drill)

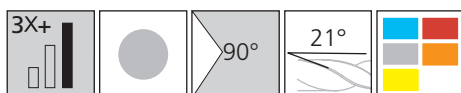


Drill Dimensions			Series 402	Regrind
Ø D ¹	Ø D ² (h9)	L ¹	Tool No	
0.50	3.15	31.5*	402 0050	Available On Request - POA
0.80	3.15	31.5*	402 0080	
1.00	3.15	31.5	402 0100	
1.25	3.15	31.5	402 0125	
1.60	4.0	35.5	402 0160	
2.00	5.0	40.0	402 0200	
2.50	6.3	45.0	402 0250	
3.15	8.0	50.0	402 0315	
4.00	10.0	56.0	402 0400	
5.00	12.5	63.0	402 0500	

* Overall Length (L¹) Not To DIN Specification

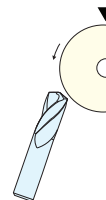


Twister® 90° NC Spot Drill



Series 404

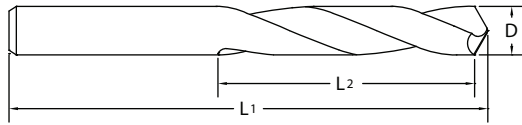
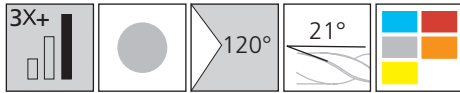
Example Ordering Code - Select series number then add tool number.
(Example 404 0600 = 6.0mm 90° Spotting Drill)



Drill Dimensions			Series 404	Regrind
Ø D	Ø D ²	L ¹	Tool No	
5.00	26.0	51.0	404 0500	Available On Request = POA
6.00	26.0	51.0	404 0600	
8.00	26.0	64.0	404 0800	
10.00	30.0	70.0	404 1000	
12.00	40.0	76.0	404 1200	

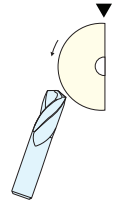


Twister® 120° NC Spot Drill



Series 403

Example Ordering Code - Select series number then add tool number.
(example 403 0600 = 6.0mm 120° Spotting Drill)



Drill Dimensions			Series 403	Regrind
Ø D	Ø D ²	L ¹	Tool No	
5.00	26.0	51.0	403 0500	Available On Request = POA
6.00	26.0	51.0	403 0600	
8.00	26.0	64.0	403 0800	
10.00	30.0	70.0	403 1000	
12.00	40.0	76.0	403 1200	



Endmills

Drills

Reamers

Countersinks

Burrs

Technical Data

Twister® Micro-Tuff™ Drill

Series 305M 305AM Recommended Cutting Data

Recommended Speeds By Material Group			Vc (m/min)	
Material Groups	Material Type		305M	305AM
			Uncoated	Altima® Micro Coated
Steels	P	Low Carbon	30 - 40	40 - 50
		Alloy Steel (≤ 35 Rc)	20 - 30	35 - 45
		Alloy Steel (36-45 Rc)	20 - 30	35 - 45
Stainless Steels	M	Free Machining	30 - 40	40 - 50
		Austenitic	20 - 30	35 - 45
		Ferritic/Martensitic	20 - 30	30 - 40
		PH Stainless	10 - 20	15 - 25
Cast Irons	K	Grey Cast Iron	30 - 40	40 - 50
		Ductile Cast Iron	30 - 40	40 - 50
Special Alloys	S	Titanium Alloys (Ti6AL4v)	10 - 20	15 - 25
		High Temp Alloys (Inconel, Nimonic, Hastelloy)	10 - 20	15 - 25
Hardened Steels	H	45 - 55 Rc Steel	5 - 15	10 - 20
Non-Ferrous	N	Aluminium Alloys (< 10% Si)	50 - 60	-
		Plastics		

RPM Formula For Metric Drills Only - $RPM = (Vc \times 318.0) \div \text{Drill } \varnothing D^1$

Recommended Feedrates By Material Group			Drill Diameter (mm)				
Material Groups	Material Type		0.5	1.0	1.5	2.0	3.0
			Feed (mm/rev)				
Steels	P	Low Carbon	0.01	0.02	0.04	0.06	0.075
		Alloy Steel (≤ 35 Rc)					
		Alloy Steel (36-45 Rc)					
Stainless Steels	M	Free Machining	0.01	0.02	0.04	0.06	0.075
		Austenitic					
		Ferritic/Martensitic					
		PH Stainless	0.005	0.01	0.02	0.03	0.035
Cast Irons	K	Grey Cast Iron	0.01	0.02	0.04	0.06	0.075
		Ductile Cast Iron					
Special Alloys	S	Titanium Alloys (Ti6AL4v)	0.01	0.02	0.04	0.06	0.075
		High Temp Alloys (Inconel, Nimonic, Hastelloy)	0.005	0.01	0.02	0.025	0.035
Hardened Steels	H	45 - 55 Rc Steel	0.005	0.01	0.02	0.025	0.035
Non-Ferrous	N	Aluminium Alloys (< 10% Si)	0.015	0.025	0.05	0.075	0.10
		Plastics					

Recommended Pecking Depths By Drill Diameter* (Ø D¹)

Diameter Ø D¹	Pecking Depth
0.50	0.5 x Ø D¹
1.00	1 x Ø D¹
1.50	1.5 x Ø D¹
2.00	2 x Ø D¹
3.00	3 x Ø D¹

* Pecking depths can vary by material type

Feedrate Formula For Metric Drills - $\text{Feed} = RPM \times \text{mm/rev}$

Technical Data

Twister® XD Spot Drill

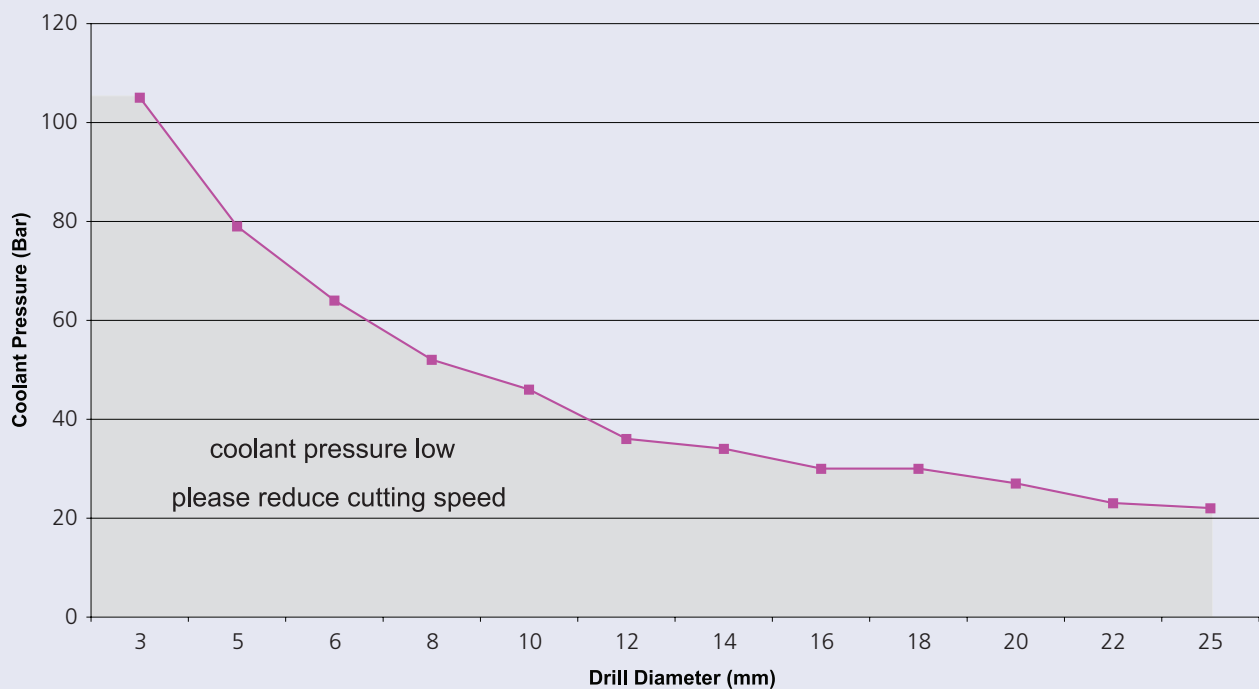
Series 200S Spot Drill Recommended Cutting Data

Materials	Vc (m/min)	Drill Diameter (mm)				
		6	8	10	12	16
		Feed (mm/rev)				
Low Carbon Steel <0.3%C	100	0.076	0.1	0.13	0.16	0.16
Medium Carbon Steel	80	0.076	0.1	0.13	0.16	0.16
Alloy Steel ≤ 35hrc	70	0.076	0.1	0.13	0.16	0.16
Alloy Steel 36- 45hrc	45	0.076	0.1	0.13	0.16	0.16
Alloy Steel 45-50hrc	40	0.076	0.1	0.13	0.16	0.16
Grey Cast Iron	110	0.076	0.1	0.13	0.16	0.16
Ductile Cast Iron	80	0.076	0.1	0.13	0.16	0.16
Austenitic Stainless	45	0.076	0.1	0.13	0.16	0.16
Ph Stainless	30	0.076	0.1	0.13	0.16	0.16
High Temp Alloys	20	0.076	0.1	0.13	0.16	0.16
Titanium Alloys	55	0.076	0.1	0.13	0.16	0.16

RPM Formula For Metric Drills Only - $RPM = (Vc \times 318.0) \div \text{Drill } \varnothing D^1$

Feedrate Formula For Metric Drills - $\text{Feed} = RPM \times \text{mm/rev}$

Recommended Minimum Coolant Pressure



Technical Data

Twister® XD High Performance Drills

Recommended Speed - XD/MD Drills

A.P.G. An M.A.FORD Advanced Product Group

Materials	Vc (m/min)					
	2XDSSM 3 X D SOLID	2XD SRM 5 X D SOLID	2XD CSM 3 X D COOLANT	2XD CRM 5 X D COOLANT	2XD CLM 7 X D COOLANT	2MD CLM 10 X D COOLANT
Low Carbon Steel <0.3%C	80-120	75-100	150-200	150-200	130-145	80-90
Medium Carbon Steel	75-100	65-90	125-175	125-175	100-130	80-90
Alloy Steel ≤ 35Hrc	60-75	50-70	75-105	75-105	70-90	80-90
Alloy Steel 36- 45Hrc	45-60	40-55	45-70	45-70	40-55	60-80
Alloy Steel 45-50Hrc	30-35	25-30	35-50	35-50	35-45	40-60
Grey Cast Iron	100-120	80-100	150-200	150-200	110-140	80-90
Ductile Cast Iron	75-90	65-80	135-150	135-150	130-145	60-80
Austenitic Stainless	30-45	25-40	80-150	80-150	45-65	60-70
Ph Stainless	20-35	15-30	50-80	50-80	30-45	40-50
High Temp Alloys	15-30	10-25	15-35	15-35	20-30	20-25
Titanium Alloys	35-45	30-40	55-70	55-70	50-65	40-50

RPM Formula For Metric Drills Only - $RPM = (Vc \times 318.0) \div \text{Drill } \varnothing D^1$

Series XD Drill - Recommended Feed 0.5 - 6mm diameter

Materials	Feed (mm/rev)					
	0.5	1.5	3	4	5	6
Low Carbon Steel <0.3%C	0.025-0.05	0.05-0.075	0.075-0.12	0.1-0.15	0.12-0.18	0.14-0.2
Medium Carbon Steel	0.025-0.05	0.05-0.075	0.075-0.12	0.1-0.15	0.12-0.18	0.14-0.2
Alloy Steel ≤ 35Hrc	0.025-0.05	0.05-0.075	0.075-0.12	0.1-0.15	0.12-0.18	0.14-0.2
Alloy Steel 36- 45Hrc	0.01-0.025	0.025-0.04	0.05-0.11	0.08-0.13	0.12-0.18	0.14-0.2
Alloy Steel 45-50Hrc	0.01-0.02	0.02-0.03	0.035-0.075	0.06-0.1	0.08-0.12	0.09-0.15
Grey Cast Iron	0.025-0.05	0.05-0.075	0.075-0.12	0.1-0.15	0.12-0.18	0.14-0.2
Ductile Cast Iron	0.025-0.05	0.05-0.075	0.075-0.12	0.1-0.15	0.12-0.18	0.14-0.2
Austenitic Stainless	0.025-0.05	0.05-0.075	0.075-0.12	0.1-0.15	0.12-0.18	0.14-0.2
Ph Stainless	0.01-0.03	0.025-0.05	0.05-0.085	0.06-0.09	0.07-0.11	0.08-0.12
High Temp Alloys	0.01-0.03	0.025-0.05	0.035-0.085	0.04-0.09	0.05-0.10	0.06-0.11
Titanium Alloys	0.01-0.03	0.025-0.05	0.075-0.12	0.1-0.15	0.12-0.18	0.14-0.2

Feedrate Formula For Metric Drills - $\text{Feed} = RPM \times \text{mm/rev}$

Technical Data

Twister® XD High Performance Drills

Series 2MDCL Micro Coolant Drills - Recommended Feed

A.P.G. An M.A.FORD Advanced Product Group

Materials	Feed (mm/rev)		
	Diameter		
	2	2.5	2.9
Low Carbon Steel <0.3%C	0.046	0.051	0.056
Medium Carbon Steel	0.046	0.051	0.056
Alloy Steel ≤ 35hrc	0.046	0.051	0.056
Alloy Steel 36- 45hrc	0.046	0.046	0.051
Alloy Steel 45-50hrc	0.025	0.033	0.046
Grey Cast Iron	0.046	0.051	0.056
Ductile Cast Iron	0.046	0.051	0.056
Austenitic Stainless	0.033	0.038	0.043
Ph Stainless	0.025	0.027	0.038
High Temp Alloys	0.025	0.027	0.036
Titanium Alloys	0.025	0.027	0.036

Feedrate Formula For Metric Drills - Feed = RPM x mm/rev

Series XD Drill - Recommended Feed 8 - 20mm Diameter

Materials	Feed (mm/rev)						
	8	10	12	14	16	18	20
Low Carbon Steel <0.3%C	0.16-0.24	0.18-0.27	0.2-0.3	0.22-0.35	0.25-0.36	0.28-0.38	0.3-0.4
Medium Carbon Steel	0.16-0.24	0.18-0.27	0.2-0.3	0.22-0.35	0.25-0.36	0.28-0.38	0.3-0.4
Alloy Steel ≤ 35hrc	0.16-0.24	0.18-0.27	0.2-0.3	0.22-0.35	0.25-0.36	0.28-0.38	0.3-0.4
Alloy Steel 36- 45hrc	0.16-0.24	0.18-0.27	0.2-0.3	0.22-0.35	0.25-0.36	0.28-0.38	0.3-0.4
Alloy Steel 45-50hrc	0.12-0.2	0.13-0.23	0.13-0.23	0.15-0.26	0.16-0.26	0.18-0.28	0.2-0.3
Grey Cast Iron	0.16-0.24	0.18-0.27	0.2-0.3	0.22-0.35	0.25-0.36	0.28-0.38	0.3-0.4
Ductile Cast Iron	0.16-0.24	0.18-0.27	0.2-0.3	0.22-0.35	0.25-0.36	0.28-0.38	0.3-0.4
Austenitic Stainless	0.16-0.24	0.18-0.27	0.2-0.3	0.22-0.35	0.25-0.36	0.28-0.38	0.3-0.4
Ph Stainless	0.1-0.15	0.13-0.23	0.18-0.25	0.2-0.27	0.22-0.3	0.25-0.33	0.28-0.35
High Temp Alloys	0.08-0.13	0.1-0.15	0.12-0.17	0.14-0.19	0.16-0.21	0.18-0.25	0.23-0.28
Titanium Alloys	0.16-0.24	0.18-0.27	0.2-0.3	0.22-0.35	0.25-0.36	0.28-0.38	0.3-0.4

Feedrate Formula For Metric Drills - Feed = RPM x mm/rev

Technical Data

Twister® Performance Drill

Series HPDSR - HPDCR Recommended Cutting Data

Recommended Speeds By Material Group			Vc (m/min)	
Material Groups	Material Type		HPDSR	HPDCR
			5 X D Solid	5 X D Through Coolant
Steels	P	Low Carbon	150 - 160 - 170	180 - 190 - 200
		Alloy Steel (≤ 35 Rc)	110 - 120 - 130	130 - 140 - 150
		Alloy Steel (36-45 Rc)	100 - 110 - 120	110 - 120 - 130
		Mould/Tool Steel	60 - 70 - 80	70 - 80 - 90
Stainless Steels	M	Austenitic	40 - 50 - 60	50 - 60 - 70
		Martensitic	30 - 40 - 50	40 - 50 - 60
Cast Irons	K	Grey Cast Iron	180 - 190 - 200	190 - 200 - 210
		Ductile Cast Iron	140 - 150 - 160	150 - 160 - 170

RPM Formula For Metric Drills Only - $RPM = (Vc \times 318.0) \div \text{Drill } \varnothing D^1$

Recommended Feedrates By Material Group			Drill Diameter (mm)							
Material Groups		Material Type	3.0	4.0	5.0	6.0	8.0	10.0	12.0	16.0
			Feed (mm/rev)							
Steels	P	Low Carbon	0.145	0.181	0.181	0.226	0.285	0.362	0.362	0.453
		Alloy Steel (≤ 35 Rc)								
		Alloy Steel (36-45 Rc)								
		Mould/Tool Steel	0.084	0.102	0.102	0.130	0.167	0.210	0.210	0.260
Stainless Steels	M	Austenitic	0.070	0.090	0.090	0.110	0.140	0.180	0.180	0.225
		Martensitic								
Cast Irons	K	Grey Cast Iron	0.155	0.193	0.217	0.305	0.305	0.386	0.435	0.532
		Ductile Cast Iron								

Feedrate Formula For Metric Drills - $\text{Feed} = RPM \times \text{mm/rev}$

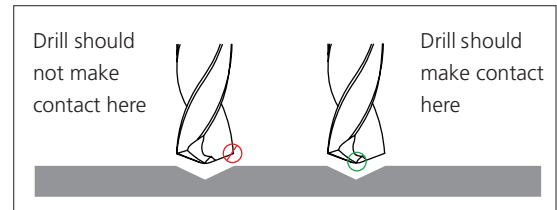
Technical Data

Twister® 2XDCEM

A.P.G. An M.A.FORD Advanced Product Group

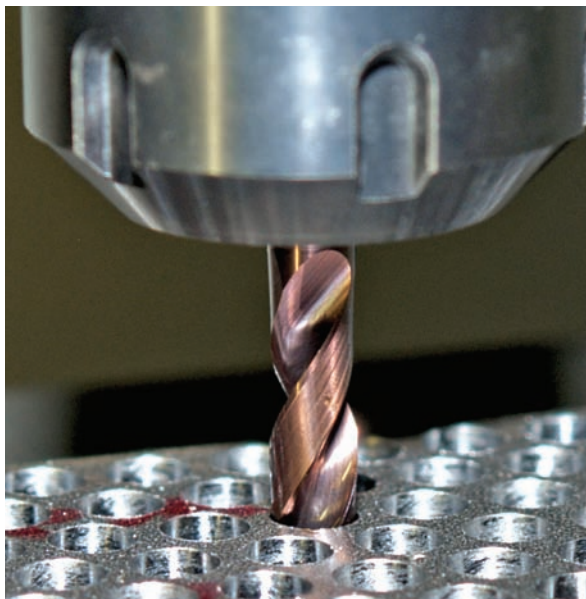
Process For Successful Deep Hole Drilling:

1. Start by producing a 1.5 x diameter to 3 x diameter pilot hole using a coolant or non-coolant pilot drill. Typically this tool will have a point angle the same as or greater than the deep hole drill. Run this drill at 100% of the final drill speed and 1/2 the normal IPM.
2. Retract and tool change to the final deep hole (2XDCE MA Ford® Series) drill.
3. Rapid to clearance plane and enter the pilot hole at 25% (don't exceed 400 to 500 RPM) of the final speed and 25 - 50 mm/min. This will help with true position by eliminating drill whip. Once into the hole, turn on the coolant and advance to the material start. At this point, you can add a dwell to clear any chips that have been left from the previous drill and let the spindle get to full speed. Increase the speed and feed to final drilling parameters.
4. Drill one shot to the final hole depth or through.
5. Should you experience any squeaking you may need to retract the drill and increase your feed. Chip packing is occurring and will need to be addressed.
6. Once through the material, it may be necessary to reduce the RPM to eliminate breakage of the drill due to drill whip. Then retract to the clearance plane.



Machine Requirements

High Pressure Pump System (70 Bar)
Machine runout of 0.008mm Max.



Due to the conditions of equipment, tool holders, and conditions beyond MA Ford's control, your results may vary.

Should your application require more in depth discussion or a special tool, please contact M.A. Ford's Application Engineering Department at +44(0) 1332 267960.

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. Technical data provided should be considered advisory only as variations may be necessary depending on the particular application.

Technical Data

Twister® XD High Performance Drills - 12⁺xD

Series 2XDCEM Recommended Cutting Data

A.P.G. An M.A.FORD Advanced Product Group

Workpiece Material Groups	Vc (m/min)	Tool Diameter (mm)								
		3	4	5	6	7	8	9	10	12
		Feed (mm/rev)								
Low Carbon Steel <0.3%C	105	0.05	0.075	0.088	0.106	0.127	0.193	0.215	0.238	0.254
Structural Steel	120	0.05	0.075	0.088	0.106	0.127	0.193	0.215	0.238	0.254
Medium Carbon Steel	80	0.05	0.075	0.088	0.106	0.127	0.193	0.215	0.238	0.254
Tool & Die Steel	80	0.05	0.075	0.088	0.106	0.127	0.193	0.215	0.238	0.254
Alloy Steel	80	0.05	0.075	0.088	0.106	0.127	0.193	0.215	0.238	0.254
Grey Cast Iron	120	0.06	0.078	0.1	0.12	0.14	0.2	0.215	0.24	0.254
Ductile Cast Iron	80	0.06	0.078	0.1	0.12	0.14	0.2	0.215	0.24	0.254
Austenitic Stainless	55	0.05	0.071	0.09	0.105	0.127	0.193	0.215	0.238	0.254
Ph Stainless	40	0.05	0.071	0.09	0.105	0.127	0.193	0.215	0.238	0.254
Martensitic Stainless	40	0.05	0.071	0.09	0.105	0.127	0.193	0.215	0.238	0.254
Ferritic Stainless	75	0.05	0.071	0.09	0.105	0.127	0.193	0.215	0.238	0.254
High Temp Alloys	20-25	0.017	0.022	0.03	0.035	0.048	0.063	0.071	0.078	0.085
Titanium Alloys	45	0.03	0.04	0.05	0.06	0.071	0.12	0.127	0.14	0.152
Hardened Steel (35-45 Hrc)	35	0.012	0.015	0.02	0.022	0.027	0.048	0.053	0.06	0.066
Hardened Steel (46-55 Hrc)	25	0.012	0.015	0.02	0.022	0.027	0.048	0.053	0.06	0.066
Non Ferrous-Al<14%Si	150	0.083	0.11	0.14	0.17	0.195	0.28	0.314	0.35	0.378
Non Ferrous-Al>14%Si	105	0.083	0.11	0.14	0.17	0.195	0.28	0.314	0.35	0.378
Non Ferrous-Brass	120	0.053	0.071	0.088	0.106	0.127	0.279	0.314	0.35	0.378
Cu/Cu Alloys/Magnesium	90	0.053	0.071	0.088	0.106	0.127	0.279	0.314	0.35	0.378

RPM Formula For Metric Drills Only - $RPM = (Vc \times 318.0) \div \text{Drill } \varnothing D^1$

Feedrate Formula For Metric Drills - $\text{Feed} = RPM \times \text{mm/rev}$

Twister® X-AL High Performance 3 Flute - 4-5xD

Series 229 Recommended Cutting Data

Workpiece Material Groups	Example Materials	Vc (m/min)	Tool Diameter (mm)					
			1.5	3	6	12	20	25
			Feed (mm/rev)					
Titanium Alloys	Ti6Al4V	30	0.013	0.05	0.11	0.15	0.2	0.25
Aluminium < 10% Si	6061/7075	215	0.08	0.20	0.31	0.45	0.61	0.76
Aluminium > 10% Si	-	155	0.05	0.08	0.15	0.25	0.31	0.35
Brass/Copper	-	120	0.05	0.08	0.15	0.25	0.31	0.35
Plastics	-	90	0.05	0.08	0.15	0.25	0.31	0.35

RPM Formula For Metric Drills Only - $RPM = (Vc \times 318.0) \div \text{Drill } \varnothing D^1$

Feedrate Formula For Metric Drills - $\text{Feed} = RPM \times \text{mm/rev}$

Technical Data

Twister® Micro Drill

Series 300 Recommended Cutting Data

Workpiece Material Groups		Examples	Vc (m/min)	Tool Diameter(mm)			
				0.5	1.0	2.0	3.0
				Feed (mm/rev)			
Steels	P	Low Carbon Steels 1018	55	.0170	.0250	.0500	.0760
		Alloy Steels (up to 35 Rc) 4140	45	.0170	.0250	.0500	.0760
Cast Irons	K	Gray Cast Iron A48 Class 20/G4000	85	.0170	.0250	.0500	.0760
		Ductile Cast Iron A536/60-40-18	55	.0170	.0250	.0500	.0760
Non-Ferrous	N	Aluminum (<10% Si) 6061-T6/7075-T6	120	.0170	.0250	.0500	.0760
		Aluminum (>10% Si) Copper/Brass	75	.0170	.0250	.0500	.0760
		Plastic	90	.0170	.0250	.0500	.0760

RPM Formula For Metric Drills Only - $RPM = (Vc \times 318.0) \div \text{Drill } \varnothing D^1$

Feedrate Formula For Metric Drills - $\text{Feed} = RPM \times \text{mm/rev}$

Series 302 Recommended Cutting Data

Workpiece Material Groups		Examples	Vc (m/min)	Tool Diameter(mm)				
				< .76	.77-.92	.93-1.02	1.03-1.30	> 1.31
				Feed (mm/rev)				
Steels	P	Low Carbon Steels 1018	90	.005-.015	0.02	0.025	0.036	0.038
		Alloy Steels (up to 35 Rc) 4140	70	.005-.015	0.02	0.025	0.036	0.038
		Alloy Steels (36-45 Rc) 4140	60	.005-.015	0.02	0.025	0.036	0.038
Austenitic	M	304/316	60	.005-.010	0.015	0.02	0.025	0.03
Stainless Steels		Free Machining	55	.005-.010	0.015	0.02	0.025	0.03
		Ferritic Martensitic	30	.005-.015	0.02	0.025	0.036	0.038
Precipitation Hardened Stainless Steels		17-4 PH	25	.005-.015	0.02	0.025	0.036	0.038
Cast Irons	K	Gray Cast Iron A48 Class 20/G4000	120	.005-.015	0.02	0.025	0.036	0.038
		Ductile Cast Iron A536/60-40-18	110	.005-.015	0.02	0.025	0.036	0.038
Special Alloys	S	Titanium 6AL-4V	20	.005-.010	0.015	0.02	0.025	0.03
		High Temp Alloys Inconel/Hastelloy/Waspelloy	15	.005-.010	0.015	0.02	0.025	0.03
Hardened Steels	H	>45 Rc A2/52100	55	.005-.015	0.02	0.025	0.036	0.038
Non-Ferrous	N	Aluminum (<10% Si)	140	.005-.015	0.02	0.025	0.036	0.038
		Aluminum (>10% Si)	100	.005-.015	0.02	0.025	0.036	0.038
		Plastics	170	.005-.015	0.02	0.025	0.036	0.038
		Composites/Fiber Reinforced Materials/ Circuit Boards	200	.013-.038	0.051	0.076	0.102	0.127

RPM Formula For Metric Drills Only - $RPM = (Vc \times 318.0) \div \text{Drill } \varnothing D^1$

Feedrate Formula For Metric Drills - $\text{Feed} = RPM \times \text{mm/rev}$

Technical Data

Twister® Hi-Roc® Drill - 3xD

Series 200 Metric Recommended Cutting Data

Workpiece Material Groups		Examples	Vc (m/min)	Tool Diameter (mm)							
				1.0	1.5	3.0	6.0	10.0	12.0	16.0	20.0
				Feed (mm/rev)							
Steels	P	Low Carbon Steels 1018	55	.0060	.0130	.0510	.1020	.1270	.1520	.1750	.2030
		Alloy Steels (up to 35 Rc) 4140	45	.0060	.0130	.0510	.1020	.1270	.1520	.1750	.2030
		Alloy Steels (36-45 Rc) 4140	30	.0060	.0127	.0500	.0760	.1010	.1520	.2030	.2250
Austenitic	M	304/316	40	.0060	.0127	.0500	.0760	.1010	.1520	.2030	.2250
Precipitation Hardened Stainless Steels	M	17-4 PH	20	.0060	.0127	.0500	.0760	.1010	.1520	.2030	.2250
Special Alloys	S	Titanium 6AL-4V	25	.0060	.0127	.0500	.0760	.1010	.1520	.2030	.2250
		High Temp Alloys Inconel/Hastelloy/Waspelloy	25	.0060	.0127	.0500	.0760	.1010	.1520	.2030	.2250
Hardened Steels	H	>45 Rc A2/52100	20	.0130	.0250	.0250	.0250	.0500	.0500	.0500	.0760
Non-Ferrous	N	Plastic	90	.0060	.0127	.0500	.0760	.1010	.1520	.2030	.2250
		Kevlar/Graphite	115	.0060	.0127	.0500	.0760	.1010	.1520	.2030	.2250
		Glass/Ceramic	25	.0130	.0250	.0250	.0250	.0500	.0500	.0500	.0760

RPM Formula For Metric Drills Only - $RPM = (Vc \times 318.0) \div \text{Drill } \varnothing D^1$

Feedrate Formula For Metric Drills - $\text{Feed} = RPM \times \text{mm/rev}$

Technical Data

Twister® Series 205 207 224 Metric

Workpiece Material Groups		Examples	Series		
			205	207	224
			Vc (m/min)		
Steels	P	Low Carbon Steels 1018	55	-	55
		Alloy Steels (up to 35 Rc) 4140	45	-	50
		Alloy Steels (36-45 Rc) 4140	35	-	45
Austenitic	M	304/316	45	-	40
Precipitation Hardened Stainless Steels	M	17-4 PH	20	-	-
Cast Irons	K	Gray Cast Iron A48 Class 20/G4000	55	-	85
		Ductile Cast Iron A536/60-40-18	55	-	55
Special Alloys	S	Titanium 6AL-4V	25	-	-
		High Temp Alloys Inconel/Hastelloy/Waspelloy	20	-	-
Hardened Steels	H	>45 Rc A2/52100	15	-	-
Non-Ferrous	N	Plastic	90	90	120
		Kevlar/Graphite	-	115	120

RPM Formula For Metric Drills Only - $RPM = (Vc \times 318.0) \div \text{Drill } \varnothing D^1$

Workpiece Material Groups		Examples	Tool Diameter (mm)								
			1.0	1.5	3.0	6.0	10.0	12.0	16.0	20.0	26.0
			Feed (mm/rev)								
Steels	P	Low Carbon Steels 1018	.0250	.0500	.0760	.1520	.2030	.2540	.2750	.3050	.3560
		Alloy Steels (up to 35 Rc) 4140	.0250	.0500	.0760	.1520	.2030	.2540	.2750	.3050	.3560
		Alloy Steels (36-45 Rc) 4140	.0250	.0500	.0760	.1520	.2030	.2540	.2750	.3050	.3560
Austenitic	M	304/316	.0250	.0500	.0760	.1520	.2030	.2540	.2750	.3050	.3560
Precipitation Hardened Stainless Steels		17-4 PH	.0060	.0127	.0500	.0760	.1010	.1520	.2030	.2250	.2540
Cast Irons	K	Gray Cast Iron A48 Class 20/G4000	.0250	.0500	.0760	.1520	.2030	.2540	.2750	.3050	.3560
		Ductile Cast Iron A536/60-40-18	.0250	.0500	.0760	.1520	.2030	.2540	.2750	.3050	.3560
Special Alloys	S	Titanium 6AL-4V	.0060	.0127	.0500	.0760	.1010	.1520	.2030	.2250	.2540
		High Temp Alloys Inconel/Hastelloy/ Waspelloy	.0060	.0127	.0500	.0760	.1010	.1520	.2030	.2250	.2540
Hardened Steels	H	>45 Rc A2/52100	.0060	.0127	.0500	.0760	.1010	.1520	.2030	.2250	.2540
Non-Ferrous	N	Plastic	.0060	.0127	.0500	.0760	.1010	.1520	.2030	.2250	.2540
		Kevlar/Graphite	.0060	.0127	.0500	.0760	.1010	.1520	.2030	.2250	.2540

Feedrate Formula For Metric Drills - $\text{Feed} = RPM \times \text{mm/rev}$

Technical Data

Twister® Series 402 403 404 Metric

Workpiece Material Groups		Examples	Vc (m/min)	Tool Diameter (mm)					
				1.0	1.5	3.0	6.0	10.0	12.0
				Feed (mm/rev)					
Steels	P	Low Carbon Steels 1018	55	.0125	.0250	.0380	.0760	.1020	.1270
		Alloy Steels (up to 35 Rc) 4140	50	.0125	.0250	.0380	.0760	.1020	.1270
		Alloy Steels (36-45 Rc) 4140	45	.0125	.0250	.0380	.0760	.1020	.1270
Stainless Steels	M	304/316	40	.0125	.0250	.0380	.0760	.1020	.1270
		17-4 PH	20	.0125	.0250	.0380	.0760	.1020	.1270
Cast Irons	K	Gray Cast Iron A48 Class 20/G4000	85	.0125	.0250	.0380	.0760	.1020	.1270
		Ductile Cast Iron A536/60-40-18	55	.0125	.0250	.0380	.0760	.1020	.1270
Special Alloys	S	Titanium 6AL-4V	25	.0125	.0250	.0380	.0760	.1020	.1270
		High Temp Alloys Inconel/Hastelloy/Waspelloy	10	.0125	.0250	.0380	.0760	.1020	.1270
Hardened Steels	H	>45 Rc A2/52100	15	.0125	.0250	.0380	.0760	.1020	.1270

RPM Formula For Metric Drills Only - $RPM = (Vc \times 318.0) \div \text{Drill } \varnothing D^1$

Feedrate Formula For Metric Drills - $\text{Feed} = RPM \times \text{mm/rev}$

TrueSize®

Carbide Reamers

In applications demanding high-precision hole tolerances, tighter diameter control and higher quality bore finishes, our TrueSize® reamers provide a highly cost-effective solution.

Our solid carbide reamers are manufactured to DIN1420 H7 standards and are available in a wide range of sizes to meet the machining needs of virtually any materials, including cast iron, aluminium, stainless steel, exotic alloys, plastics and other non-ferrous materials.

The extensive TrueSize® range of metric sizes covers diameters from 0.33mm up to 16.00mm and we currently stock more than 800 different sizes, which are available for immediate despatch to meet deadlines.

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VHM
Tool Material

45°
Lead Chamfer

DIN 1420 H7
DIN Specs

RHC
Right Hand Cutting

P01
Technical Information

Workpiece Material Group

Steel

Cast Iron

Hardened Steels (35-65Rc)

Special Alloys

Stainless Steels

Non-Ferrous

TrueSize® Solid Carbide Reamers

Recommended Stock Allowance For Truesize® Solid Carbide Metric Reamers

Workpiece Material Group	Material Type	Reamer Diameter (mm)										
		0.35	1.00	2.00	3.00	4.00	5.00	6.00	8.00	10.00	12.00	16.00
		Drill Diameter (mm)										
		0.30	0.90	1.80	2.70	3.70	4.70	5.70	7.60	9.60	11.60	15.50
		Stock Allowance (mm)										
P	Low Carbon	0.03	0.09	0.17	0.24	0.26	0.27	0.28	0.31	0.33	0.35	0.41
	Medium Carbon	0.03	0.08	0.15	0.21	0.23	0.24	0.25	0.28	0.31	0.32	0.38
	Tool Steel	0.03	0.08	0.15	0.21	0.23	0.24	0.25	0.28	0.31	0.32	0.38
M	Stainless	0.03	0.08	0.15	0.21	0.23	0.24	0.25	0.28	0.31	0.32	0.38
S	High Temp Alloys	0.03	0.07	0.14	0.20	0.21	0.22	0.23	0.24	0.26	0.29	0.33
	Titanium Alloys	0.03	0.09	0.17	0.24	0.26	0.27	0.28	0.31	0.33	0.35	0.41
K	Grey Cast Iron	0.03	0.09	0.17	0.24	0.26	0.27	0.28	0.31	0.33	0.35	0.41
	Ductile Cast Iron	0.03	0.09	0.17	0.24	0.26	0.27	0.28	0.31	0.33	0.35	0.41
H	Hardened Steel	0.02	0.06	0.12	0.17	0.19	0.19	0.20	0.23	0.26	0.27	0.33
N	Aluminium Alloys	0.04	0.09	0.19	0.27	0.29	0.29	0.30	0.32	0.34	0.37	0.41
	Copper & Hard Bronze	0.04	0.09	0.19	0.27	0.29	0.29	0.30	0.33	0.36	0.38	0.43
	Brass & Soft Bronze	0.04	0.09	0.19	0.27	0.29	0.29	0.30	0.32	0.34	0.37	0.41

Dowel Pin Chart - Metric Dowels

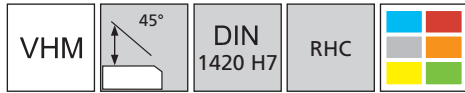
Dowel Pin	Tight - Press Fit	Reamer	Tight - Press Fit 0.013	Reamer	Loose - Press Fit	Reamer	Tight - Slip Fit	Reamer	Loose - Slip Fit	Reamer
Size (mm)	0.013	Tool No.	DP (2)	Tool No.	DP (2)	Tool No.	Reamer Ø	Tool No.	OS	Tool No.
2.0	1.95	27207670	1.98	27207810	1.99	27207850	2.01	27207900	2.02	27207950
3.0	2.95	27211610	2.98	27211750	3.00	27211800	3.01	27211850	3.02	27211900
4.0	3.95	27215550	3.99	27215700	4.00	27215750	4.01	27215800	4.03	27215850
5.0	4.95	27219490	4.99	27219650	5.00	27219690	5.02	27219750	5.03	27219800
6.0	5.95	27223430	5.98	27223550	5.99	27223600	6.01	27223650	6.02	27223700
8.0	7.95	27231300	7.98	27231400	8.00	27231500	8.00	27231500	8.03	27231600
10.0	9.96	27239200	9.98	27239300	10.00	27239370	10.01	27239400	10.03	27239500
12.0	11.96	27247100	11.99	27247200	12.00	27247240	12.01	27247300	12.01	27247300

Truesize® Reamer Tolerance - DIN 1420 H7

Dowels are to nominal size +0.0025 / -0.0025mm

ISO 9001:2008 Certified

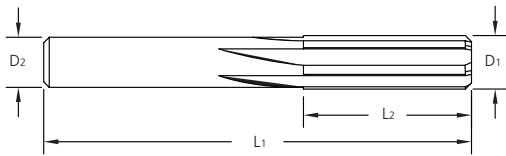
TrueSize® Straight Flute Carbide Reamers



DIN 1420 H7

D ¹ (mm)	Tolerance (mm)
≤ 3.00	+ 0.004 / + 0.008
> 3.00 - 6.00	+ 0.005 / + 0.010
> 6.00 - 10.00	+ 0.006 / + 0.012
> 10.00 - 16.00	+ 0.008 / + 0.015

Series
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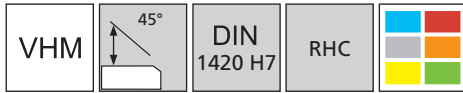
Tool Dimensions					Tool No.
Ø D ¹	Ø D ²	L ²	L ¹	Z	
0.330	0.33	5.0	38.0	4	27201300
0.343	0.34	5.0	38.0	4	27201350
0.351	0.35	5.0	38.0	4	27201380
0.356	0.36	5.0	38.0	4	27201400
0.368	0.37	5.0	38.0	4	27201450
0.381	0.38	5.0	38.0	4	27201500
0.394	0.39	5.0	38.0	4	27201550
0.400	0.40	5.0	38.0	4	27201570
0.406	0.41	5.0	38.0	4	27201600
0.419	0.42	5.0	38.0	4	27201650
0.432	0.43	5.0	38.0	4	27201700
0.445	0.45	5.0	38.0	4	27201750
0.450	0.45	5.0	38.0	4	27201770
0.457	0.46	5.0	38.0	4	27201800
0.470	0.47	5.0	38.0	4	27201850
0.483	0.48	5.0	38.0	4	27201900
0.495	0.49	5.0	38.0	4	27201950
0.500	0.50	5.0	38.0	4	27201970
0.508	0.51	5.0	38.0	4	27202000
0.521	0.52	6.5	38.0	4	27202050
0.533	0.53	6.5	38.0	4	27202100
0.546	0.55	6.5	38.0	4	27202150
0.551	0.55	6.5	38.0	4	27202170
0.559	0.56	6.5	38.0	4	27202200
0.572	0.57	6.5	38.0	4	27202250
0.584	0.58	6.5	38.0	4	27202300
0.597	0.59	6.5	38.0	4	27202350
0.600	0.60	6.5	38.0	4	27202360
0.610	0.61	6.5	38.0	4	27202400
0.622	0.62	6.5	38.0	4	27202450
0.635	0.64	6.5	38.0	4	27202500
0.648	0.65	6.5	38.0	4	27202550
0.650	0.65	6.5	38.0	4	27202560
0.660	0.66	6.5	38.0	4	27202600
0.673	0.67	6.5	38.0	4	27202650
0.686	0.69	6.5	38.0	4	27202700
0.700	0.70	6.5	38.0	4	27202750
0.711	0.71	6.5	38.0	4	27202800
0.724	0.72	6.5	38.0	4	27202850
0.737	0.73	6.5	38.0	4	27202900
0.742	0.74	6.5	38.0	4	27202920
0.750	0.75	6.5	38.0	4	27202951
0.762	0.76	6.5	38.0	4	27203000
0.775	0.78	6.5	38.0	4	27203050
0.787	0.79	6.5	38.0	4	27203100
0.792	0.79	6.5	38.0	4	27203120
0.800	0.80	6.5	38.0	4	27203150

Tool Dimensions					Tool No.
Ø D ¹	Ø D ²	L ²	L ¹	Z	
0.813	0.81	6.5	38.0	4	27203200
0.826	0.83	6.5	38.0	4	27203250
0.838	0.84	6.5	38.0	4	27203300
0.850	0.85	6.5	38.0	4	27203350
0.864	0.86	6.5	38.0	4	27203400
0.876	0.88	6.5	38.0	4	27203450
0.889	0.89	6.5	38.0	4	27203500
0.900	0.90	6.5	38.0	4	27203540
0.914	0.91	6.5	38.0	4	27203600
0.927	0.93	6.5	38.0	4	27203650
0.940	0.94	6.5	38.0	4	27203700
0.950	0.95	6.5	38.0	4	27203740
0.965	0.97	6.5	38.0	4	27203800
0.978	0.98	6.5	38.0	4	27203850
0.991	0.99	6.5	38.0	4	27203900
1.000	1.00	6.5	38.0	4	27203940
1.016	1.02	6.5	38.0	4	27204000
1.029	1.03	9.5	38.0	4	27204050
1.041	1.04	9.5	38.0	4	27204100
1.049	1.05	9.5	38.0	4	27204130
1.054	1.06	9.5	38.0	4	27204150
1.067	1.07	9.5	38.0	4	27204200
1.080	1.08	9.5	38.0	4	27204250
1.092	1.09	9.5	38.0	4	27204300
1.100	1.10	9.5	38.0	4	27204330
1.105	1.09	9.5	38.0	4	27204350
1.118	1.09	9.5	38.0	4	27204400
1.130	1.09	9.5	38.0	4	27204450
1.143	1.09	9.5	38.0	4	27204500
1.148	1.09	9.5	38.0	4	27204520
1.156	1.09	9.5	38.0	4	27204550
1.168	1.09	9.5	38.0	4	27204600
1.181	1.09	9.5	38.0	4	27204650
1.189	1.09	9.5	38.0	4	27204680
1.194	1.09	9.5	38.0	4	27204700
1.200	1.09	9.5	38.0	4	27204720
1.207	1.09	9.5	38.0	4	27204750
1.219	1.09	9.5	38.0	4	27204800
1.232	1.09	9.5	38.0	4	27204850
1.245	1.09	9.5	38.0	4	27204900
1.250	1.09	9.5	38.0	4	27204920
1.257	1.09	9.5	38.0	4	27204950
1.270	1.09	9.5	38.0	4	27205000
1.283	1.09	9.5	38.0	4	27205050
1.295	1.09	9.5	38.0	4	27205100
1.298	1.09	9.5	38.0	4	27205110
1.308	1.09	9.5	38.0	4	27205150



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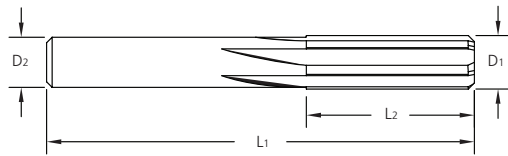
TrueSize® Straight Flute Carbide Reamers



DIN 1420 H7

D ¹ (mm)	Tolerance (mm)
≤ 3.00	+ 0.004 / + 0.008
> 3.00 - 6.00	+ 0.005 / + 0.010
> 6.00 - 10.00	+ 0.006 / + 0.012
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Series
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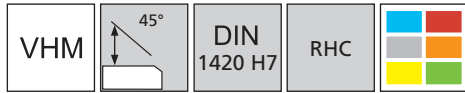


Tool Dimensions					Tool No.
Ø D ¹	Ø D ²	L ²	L ¹	Z	
1.321	1.17	9.5	38.0	4	27205200
1.334	1.17	9.5	38.0	4	27205250
1.346	1.17	9.5	38.0	4	27205300
1.349	1.17	9.5	38.0	4	27205310
1.359	1.17	9.5	38.0	4	27205350
1.372	1.17	9.5	38.0	4	27205400
1.384	1.17	9.5	38.0	4	27205450
1.397	1.17	9.5	38.0	4	27205500
1.400	1.17	9.5	38.0	4	27205510
1.410	1.17	9.5	38.0	4	27205550
1.422	1.17	9.5	38.0	4	27205600
1.435	1.17	9.5	38.0	4	27205650
1.448	1.17	9.5	38.0	4	27205700
1.450	1.17	9.5	38.0	4	27205710
1.461	1.17	9.5	38.0	4	27205750
1.473	1.17	9.5	38.0	4	27205800
1.486	1.17	9.5	38.0	4	27205850
1.500	1.17	9.5	38.0	4	27205901
1.511	1.47	9.5	38.0	4	27205950
1.524	1.47	9.5	38.0	4	27206000
1.537	1.47	9.5	38.0	4	27206050
1.550	1.47	9.5	38.0	4	27206101
1.562	1.47	9.5	38.0	4	27206150
1.575	1.47	9.5	38.0	4	27206200
1.588	1.47	9.5	38.0	4	27206250
1.600	1.47	9.5	38.0	4	27206300
1.613	1.47	9.5	38.0	4	27206350
1.626	1.47	9.5	38.0	4	27206400
1.638	1.47	9.5	38.0	4	27206450
1.650	1.47	9.5	38.0	4	27206500
1.664	1.47	9.5	38.0	4	27206550
1.676	1.47	9.5	38.0	4	27206600
1.689	1.65	12.5	44.0	4	27206650
1.700	1.65	12.5	44.0	4	27206690
1.715	1.65	12.5	44.0	4	27206750
1.727	1.65	12.5	44.0	4	27206800
1.740	1.65	12.5	44.0	4	27206850
1.750	1.65	12.5	44.0	4	27206890
1.753	1.65	12.5	44.0	4	27206900
1.765	1.65	12.5	44.0	4	27206950
1.778	1.65	12.5	44.0	4	27207000
1.791	1.65	12.5	44.0	4	27207050
1.798	1.65	12.5	44.0	4	27207080
1.803	1.65	12.5	44.0	4	27207100
1.816	1.65	12.5	44.0	4	27207150
1.829	1.65	12.5	44.0	4	27207200
1.842	1.65	12.5	44.0	4	27207250

Tool Dimensions					Tool No.
Ø D ¹	Ø D ²	L ²	L ¹	Z	
1.850	1.65	12.5	44.0	4	27207280
1.854	1.65	12.5	44.0	4	27207300
1.867	1.65	12.5	44.0	4	27207350
1.880	1.65	12.5	44.0	4	27207400
1.892	1.85	12.5	44.0	4	27207450
1.900	1.85	12.5	44.0	4	27207480
1.905	1.85	12.5	44.0	4	27207500
1.918	1.85	12.5	44.0	4	27207550
1.930	1.85	12.5	44.0	4	27207600
1.943	1.85	12.5	44.0	4	27207650
1.948	1.85	12.5	44.0	4	27207670
1.956	1.85	12.5	44.0	4	27207700
1.969	1.85	12.5	44.0	4	27207750
1.981	1.85	12.5	44.0	4	27207800
1.984	1.85	12.5	44.0	4	27207810
1.994	1.85	12.5	44.0	4	27207850
2.000	1.85	12.5	44.0	4	27207870
2.007	1.85	12.5	44.0	4	27207900
2.019	1.85	12.5	44.0	4	27207950
2.032	1.85	12.5	44.0	4	27208000
2.045	1.85	12.5	44.0	4	27208050
2.050	1.85	12.5	44.0	4	27208070
2.057	1.85	12.5	44.0	4	27208100
2.070	2.03	12.5	51.0	4	27208150
2.083	2.03	12.5	51.0	4	27208200
2.096	2.03	12.5	51.0	4	27208250
2.101	2.03	12.5	51.0	4	27208270
2.108	2.03	12.5	51.0	4	27208300
2.121	2.03	12.5	51.0	4	27208350
2.134	2.03	12.5	51.0	4	27208400
2.146	2.03	12.5	51.0	4	27208450
2.149	2.03	12.5	51.0	4	27208460
2.159	2.03	12.5	51.0	4	27208500
2.172	2.03	12.5	51.0	4	27208550
2.184	2.03	12.5	51.0	4	27208600
2.197	2.03	12.5	51.0	4	27208650
2.200	2.03	12.5	51.0	4	27208660
2.210	2.03	12.5	51.0	4	27208700
2.223	2.03	12.5	51.0	4	27208750
2.235	2.03	12.5	51.0	4	27208800
2.248	2.03	12.5	51.0	4	27208850
2.250	2.03	12.5	51.0	4	27208860
2.261	2.03	12.5	51.0	4	27208900
2.273	2.24	12.5	51.0	4	27208950
2.286	2.24	12.5	51.0	4	27209000
2.300	2.24	12.5	51.0	4	27209050
2.311	2.24	12.5	51.0	4	27209100



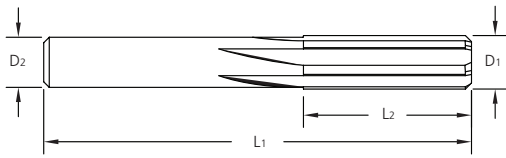
TrueSize® Straight Flute Carbide Reamers



DIN 1420 H7

D ¹ (mm)	Tolerance (mm)
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Series
272



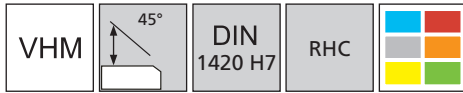
Tool Dimensions					Tool No.
Ø D ¹	Ø D ²	L ²	L ¹	Z	
2.324	2.24	12.5	51.0	4	27209150
2.337	2.24	12.5	51.0	4	27209200
2.350	2.24	12.5	51.0	4	27209251
2.362	2.24	12.5	51.0	4	27209300
2.375	2.24	12.5	51.0	4	27209350
2.380	2.24	12.5	51.0	4	27209370
2.388	2.24	12.5	51.0	4	27209400
2.400	2.24	12.5	51.0	4	27209450
2.413	2.24	12.5	51.0	4	27209500
2.426	2.24	12.5	51.0	4	27209550
2.438	2.24	12.5	51.0	4	27209600
2.451	2.24	12.5	51.0	4	27209650
2.464	2.24	12.5	51.0	4	27209700
2.477	2.44	16.0	57.0	4	27209750
2.489	2.44	16.0	57.0	4	27209800
2.500	2.44	16.0	57.0	4	27209840
2.515	2.44	16.0	57.0	4	27209900
2.527	2.44	16.0	57.0	4	27209950
2.540	2.44	16.0	57.0	4	27210000
2.550	2.44	16.0	57.0	4	27210040
2.565	2.44	16.0	57.0	4	27210100
2.578	2.44	16.0	57.0	4	27210150
2.591	2.44	16.0	57.0	4	27210200
2.601	2.44	16.0	57.0	4	27210240
2.616	2.44	16.0	57.0	4	27210300
2.629	2.44	16.0	57.0	4	27210350
2.642	2.44	16.0	57.0	4	27210400
2.649	2.44	16.0	57.0	4	27210430
2.667	2.44	16.0	57.0	4	27210500
2.680	2.64	16.0	57.0	4	27210550
2.692	2.64	16.0	57.0	4	27210600
2.700	2.64	16.0	57.0	4	27210630
2.705	2.64	16.0	57.0	4	27210650
2.718	2.64	16.0	57.0	4	27210700
2.731	2.64	16.0	57.0	4	27210750
2.743	2.64	16.0	57.0	4	27210800
2.751	2.64	16.0	57.0	4	27210830
2.756	2.64	16.0	57.0	4	27210850
2.769	2.64	16.0	57.0	4	27210900
2.779	2.64	16.0	57.0	4	27210940
2.781	2.64	16.0	57.0	4	27210950
2.794	2.64	16.0	57.0	4	27211000
2.800	2.64	16.0	57.0	4	27211020
2.807	2.64	16.0	57.0	4	27211050
2.819	2.64	16.0	57.0	4	27211100
2.832	2.64	16.0	57.0	4	27211150
2.845	2.64	16.0	57.0	4	27211200

Tool Dimensions					Tool No.
Ø D ¹	Ø D ²	L ²	L ¹	Z	
2.850	2.64	16.0	57.0	4	27211220
2.858	2.64	16.0	57.0	4	27211250
2.870	2.64	16.0	57.0	4	27211300
2.883	2.84	16.0	57.0	4	27211350
2.896	2.84	16.0	57.0	4	27211400
2.900	2.84	16.0	57.0	4	27211420
2.908	2.84	16.0	57.0	4	27211450
2.921	2.84	16.0	57.0	4	27211500
2.934	2.84	16.0	57.0	4	27211550
2.946	2.84	16.0	57.0	4	27211600
2.949	2.84	16.0	57.0	4	27211610
2.959	2.84	16.0	57.0	4	27211650
2.972	2.84	16.0	57.0	4	27211700
2.985	2.84	16.0	57.0	4	27211750
3.000	2.84	16.0	57.0	4	27211810
3.010	2.84	16.0	57.0	4	27211850
3.023	2.84	16.0	57.0	4	27211900
3.035	2.84	16.0	57.0	4	27211950
3.048	2.84	16.0	57.0	4	27212000
3.051	2.84	16.0	57.0	4	27212010
3.061	2.84	16.0	57.0	4	27212050
3.073	2.84	16.0	57.0	4	27212100
3.086	3.05	16.0	57.0	4	27212150
3.099	3.05	16.0	57.0	4	27212200
3.112	3.05	16.0	57.0	4	27212250
3.124	3.05	16.0	57.0	4	27212300
3.137	3.05	16.0	57.0	4	27212350
3.150	3.05	16.0	57.0	4	27212401
3.162	3.05	16.0	57.0	4	27212450
3.170	3.05	16.0	57.0	4	27212480
3.175	3.05	16.0	57.0	4	27212500
3.188	3.05	16.0	57.0	4	27212550
3.200	3.05	16.0	57.0	4	27212600
3.213	3.05	16.0	57.0	4	27212650
3.226	3.05	16.0	57.0	4	27212700
3.239	3.05	16.0	57.0	4	27212750
3.251	3.05	16.0	57.0	4	27212800
3.264	3.23	19.0	63.0	4	27212850
3.277	3.23	19.0	63.0	4	27212900
3.289	3.23	19.0	63.0	4	27212950
3.300	3.23	19.0	63.0	4	27212990
3.315	3.23	19.0	63.0	4	27213050
3.327	3.23	19.0	63.0	4	27213100
3.340	3.23	19.0	63.0	4	27213150
3.350	3.23	19.0	63.0	4	27213190
3.366	3.23	19.0	63.0	4	27213250
3.378	3.23	19.0	63.0	4	27213300



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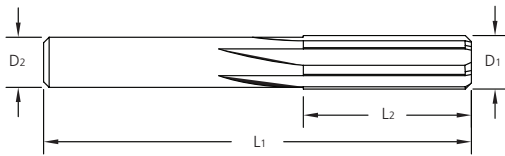
TrueSize® Straight Flute Carbide Reamers



DIN 1420 H7

D ¹ (mm)	Tolerance (mm)
≤ 3.00	+ 0.004 / + 0.008
> 3.00 - 6.00	+ 0.005 / + 0.010
> 6.00 - 10.00	+ 0.006 / + 0.012
> 10.00 - 16.00	+ 0.008 / + 0.015

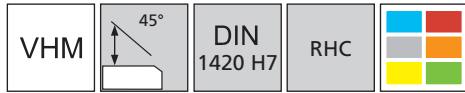
Series
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Tool Dimensions					Tool No.
Ø D ¹	Ø D ²	L ²	L ¹	Z	
3.391	3.23	19.0	63.0	4	27213350
3.401	3.23	19.0	63.0	4	27213390
3.416	3.23	19.0	63.0	4	27213450
3.429	3.23	19.0	63.0	4	27213500
3.442	3.23	19.0	63.0	4	27213550
3.449	3.23	19.0	63.0	4	27213580
3.454	3.23	19.0	63.0	4	27213600
3.467	3.43	19.0	63.0	4	27213650
3.480	3.43	19.0	63.0	4	27213700
3.493	3.43	19.0	63.0	4	27213750
3.500	3.43	19.0	63.0	4	27213780
3.505	3.43	19.0	63.0	4	27213800
3.518	3.43	19.0	63.0	4	27213850
3.531	3.43	19.0	63.0	4	27213900
3.543	3.43	19.0	63.0	4	27213950
3.551	3.43	19.0	63.0	4	27213980
3.556	3.43	19.0	63.0	4	27214000
3.571	3.43	19.0	63.0	4	27214060
3.581	3.43	19.0	63.0	4	27214100
3.594	3.43	19.0	63.0	4	27214150
3.599	3.43	19.0	63.0	4	27214170
3.607	3.43	19.0	63.0	4	27214200
3.620	3.43	19.0	63.0	4	27214250
3.632	3.43	19.0	63.0	4	27214300
3.645	3.43	19.0	63.0	4	27214350
3.650	3.43	19.0	63.0	4	27214370
3.658	3.43	19.0	63.0	4	27214400
3.670	3.63	19.0	63.0	4	27214450
3.683	3.63	19.0	63.0	4	27214500
3.696	3.63	19.0	63.0	4	27214550
3.701	3.63	19.0	63.0	4	27214570
3.708	3.63	19.0	63.0	4	27214600
3.721	3.63	19.0	63.0	4	27214650
3.734	3.63	19.0	63.0	4	27214700
3.747	3.63	19.0	63.0	4	27214750
3.750	3.63	19.0	63.0	4	27214760
3.759	3.63	19.0	63.0	4	27214800
3.772	3.63	19.0	63.0	4	27214850
3.785	3.63	19.0	63.0	4	27214900
3.800	3.63	19.0	63.0	4	27214960
3.810	3.63	19.0	63.0	4	27215000
3.823	3.63	19.0	63.0	4	27215050
3.835	3.63	19.0	63.0	4	27215100
3.851	3.63	19.0	63.0	4	27215160
3.861	3.63	19.0	63.0	4	27215200
3.874	3.84	19.0	63.0	4	27215250
3.886	3.84	19.0	63.0	4	27215300

Tool Dimensions					Tool No.
Ø D ¹	Ø D ²	L ²	L ¹	Z	
3.900	3.84	19.0	63.0	4	27215351
3.912	3.84	19.0	63.0	4	27215400
3.924	3.84	19.0	63.0	4	27215450
3.937	3.84	19.0	63.0	4	27215500
3.950	3.84	19.0	63.0	4	27215550
3.962	3.84	19.0	63.0	4	27215600
3.967	3.84	19.0	63.0	4	27215620
3.975	3.84	19.0	63.0	4	27215650
3.988	3.84	19.0	63.0	4	27215700
4.000	3.84	19.0	63.0	4	27215750
4.013	3.84	19.0	63.0	4	27215800
4.026	3.84	19.0	63.0	4	27215850
4.039	3.84	19.0	63.0	4	27215900
4.049	4.01	22.0	70.0	4	27215940
4.064	4.01	22.0	70.0	4	27216000
4.077	4.01	22.0	70.0	4	27216050
4.089	4.01	22.0	70.0	4	27216100
4.100	4.01	22.0	70.0	4	27216140
4.115	4.01	22.0	70.0	4	27216200
4.128	4.01	22.0	70.0	4	27216250
4.140	4.01	22.0	70.0	4	27216300
4.150	4.01	22.0	70.0	4	27216340
4.166	4.01	22.0	70.0	4	27216400
4.178	4.01	22.0	70.0	4	27216450
4.191	4.01	22.0	70.0	4	27216500
4.201	4.01	22.0	70.0	4	27216540
4.216	4.01	22.0	70.0	4	27216600
4.229	4.01	22.0	70.0	4	27216650
4.242	4.01	22.0	70.0	4	27216700
4.249	4.22	22.0	70.0	4	27216730
4.267	4.22	22.0	70.0	4	27216800
4.280	4.22	22.0	70.0	4	27216850
4.293	4.22	22.0	70.0	4	27216900
4.300	4.22	22.0	70.0	4	27216930
4.305	4.22	22.0	70.0	4	27216950
4.318	4.22	22.0	70.0	4	27217000
4.331	4.22	22.0	70.0	4	27217050
4.343	4.22	22.0	70.0	4	27217100
4.351	4.22	22.0	70.0	4	27217130
4.356	4.22	22.0	70.0	4	27217150
4.366	4.22	22.0	70.0	4	27217190
4.369	4.22	22.0	70.0	4	27217200
4.382	4.22	22.0	70.0	4	27217250
4.394	4.22	22.0	70.0	4	27217300
4.399	4.22	22.0	70.0	4	27217320
4.407	4.22	22.0	70.0	4	27217350
4.420	4.22	22.0	70.0	4	27217400

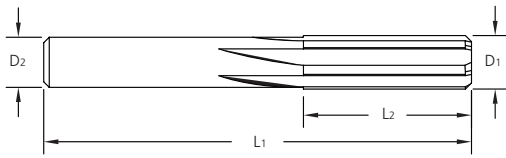
TrueSize® Straight Flute Carbide Reamers



DIN 1420 H7

D ¹ (mm)	Tolerance (mm)
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Series
272



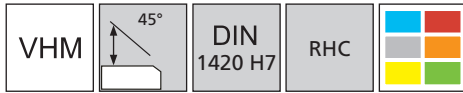
Tool Dimensions					Tool No.
Ø D ¹	Ø D ²	L ²	L ¹	Z	
4.432	4.22	22.0	70.0	4	27217450
4.445	4.22	22.0	70.0	4	27217500
4.450	4.42	22.0	70.0	4	27217520
4.458	4.42	22.0	70.0	4	27217550
4.470	4.42	22.0	70.0	4	27217600
4.483	4.42	22.0	70.0	4	27217650
4.496	4.42	22.0	70.0	4	27217700
4.501	4.42	22.0	70.0	4	27217720
4.509	4.42	22.0	70.0	4	27217750
4.521	4.42	22.0	70.0	4	27217800
4.534	4.42	22.0	70.0	4	27217850
4.547	4.42	22.0	70.0	4	27217900
4.549	4.42	22.0	70.0	4	27217910
4.559	4.42	22.0	70.0	4	27217950
4.572	4.42	22.0	70.0	4	27218000
4.585	4.42	22.0	70.0	4	27218050
4.597	4.42	22.0	70.0	4	27218100
4.600	4.42	22.0	70.0	4	27218110
4.610	4.42	22.0	70.0	4	27218150
4.623	4.42	22.0	70.0	4	27218200
4.636	4.42	22.0	70.0	4	27218250
4.648	4.42	22.0	70.0	4	27218300
4.651	4.62	22.0	70.0	4	27218310
4.661	4.62	22.0	70.0	4	27218350
4.674	4.62	22.0	70.0	4	27218400
4.686	4.62	22.0	70.0	4	27218450
4.700	4.62	22.0	70.0	4	27218500
4.712	4.62	22.0	70.0	4	27218550
4.724	4.62	22.0	70.0	4	27218600
4.737	4.62	22.0	70.0	4	27218650
4.750	4.62	22.0	70.0	4	27218701
4.760	4.62	22.0	70.0	4	27218740
4.775	4.62	22.0	70.0	4	27218800
4.788	4.62	22.0	70.0	4	27218850
4.798	4.62	22.0	70.0	4	27218890
4.800	4.62	22.0	70.0	4	27218900
4.813	4.62	22.0	70.0	4	27218950
4.826	4.62	22.0	70.0	4	27219000
4.839	4.62	22.0	70.0	4	27219050
4.849	4.62	22.0	70.0	4	27219090
4.864	4.83	25.0	76.0	4	27219150
4.877	4.83	25.0	76.0	4	27219200
4.890	4.83	25.0	76.0	4	27219250
4.900	4.83	25.0	76.0	4	27219290
4.915	4.83	25.0	76.0	4	27219350
4.928	4.83	25.0	76.0	4	27219400
4.940	4.83	25.0	76.0	4	27219450

Tool Dimensions					Tool No.
Ø D ¹	Ø D ²	L ²	L ¹	Z	
4.950	4.83	25.0	76.0	4	27219490
4.966	4.83	25.0	76.0	4	27219550
4.978	4.83	25.0	76.0	4	27219600
4.991	4.83	25.0	76.0	4	27219650
5.001	4.83	25.0	76.0	4	27219690
5.017	4.83	25.0	76.0	4	27219750
5.029	4.83	25.0	76.0	4	27219800
5.042	4.83	25.0	76.0	4	27219850
5.050	4.83	25.0	76.0	4	27219880
5.067	5.03	25.0	76.0	4	27219950
5.080	5.03	25.0	76.0	4	27220000
5.093	5.03	25.0	76.0	4	27220050
5.100	5.03	25.0	76.0	4	27220080
5.105	5.03	25.0	76.0	4	27220100
5.118	5.03	25.0	76.0	4	27220150
5.131	5.03	25.0	76.0	4	27220200
5.144	5.03	25.0	76.0	4	27220250
5.151	5.03	25.0	76.0	4	27220280
5.159	5.03	25.0	76.0	4	27220310
5.169	5.03	25.0	76.0	4	27220350
5.182	5.03	25.0	76.0	4	27220400
5.194	5.03	25.0	76.0	4	27220450
5.199	5.03	25.0	76.0	4	27220470
5.207	5.03	25.0	76.0	4	27220500
5.220	5.03	25.0	76.0	4	27220550
5.232	5.03	25.0	76.0	4	27220600
5.245	5.21	25.0	76.0	4	27220650
5.250	5.21	25.0	76.0	4	27220670
5.258	5.21	25.0	76.0	4	27220700
5.271	5.21	25.0	76.0	4	27220750
5.283	5.21	25.0	76.0	4	27220800
5.296	5.21	25.0	76.0	4	27220850
5.301	5.21	25.0	76.0	4	27220870
5.309	5.21	25.0	76.0	4	27220900
5.321	5.21	25.0	76.0	4	27220950
5.334	5.21	25.0	76.0	4	27221000
5.347	5.21	25.0	76.0	4	27221050
5.349	5.21	25.0	76.0	4	27221060
5.359	5.21	25.0	76.0	4	27221100
5.372	5.21	25.0	76.0	4	27221150
5.385	5.21	25.0	76.0	4	27221200
5.398	5.21	25.0	76.0	4	27221250
5.400	5.21	25.0	76.0	4	27221260
5.410	5.21	25.0	76.0	4	27221300
5.423	5.21	25.0	76.0	4	27221350
5.436	5.21	25.0	76.0	4	27221400
5.448	5.21	25.0	76.0	4	27221450



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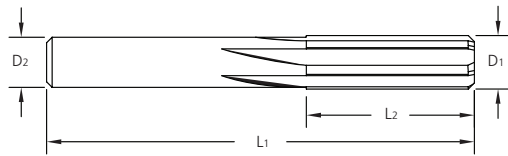
TrueSize® Straight Flute Carbide Reamers



DIN 1420 H7

D ¹ (mm)	Tolerance (mm)
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Series
272

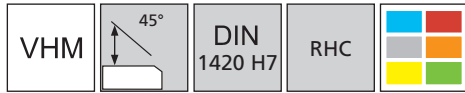


Tool Dimensions					Tool No.
Ø D ¹	Ø D ²	L ²	L ¹	Z	
5.451	5.41	25.0	76.0	4	27221460
5.461	5.41	25.0	76.0	4	27221500
5.474	5.41	25.0	76.0	4	27221550
5.486	5.41	25.0	76.0	4	27221600
5.500	5.41	25.0	76.0	4	27221651
5.512	5.41	25.0	76.0	4	27221700
5.525	5.41	25.0	76.0	4	27221750
5.537	5.41	25.0	76.0	4	27221800
5.550	5.41	25.0	76.0	4	27221851
5.563	5.41	25.0	76.0	4	27221900
5.575	5.41	25.0	76.0	4	27221950
5.588	5.41	25.0	76.0	4	27222000
5.601	5.41	25.0	76.0	4	27222050
5.613	5.41	25.0	76.0	4	27222100
5.626	5.41	25.0	76.0	4	27222150
5.639	5.41	25.0	76.0	4	27222200
5.649	5.61	25.0	76.0	4	27222240
5.652	5.61	25.0	76.0	4	27222250
5.664	5.61	25.0	76.0	4	27222300
5.677	5.61	25.0	76.0	4	27222350
5.690	5.61	25.0	76.0	4	27222400
5.700	5.61	25.0	76.0	4	27222440
5.715	5.61	25.0	76.0	4	27222500
5.728	5.61	25.0	76.0	4	27222550
5.740	5.61	25.0	76.0	4	27222600
5.751	5.61	25.0	76.0	4	27222640
5.766	5.61	25.0	76.0	4	27222700
5.779	5.61	25.0	76.0	4	27222750
5.791	5.61	25.0	76.0	4	27222800
5.799	5.61	25.0	76.0	4	27222830
5.804	5.61	25.0	76.0	4	27222850
5.817	5.61	25.0	76.0	4	27222900
5.829	5.61	25.0	76.0	4	27222950
5.842	5.61	25.0	76.0	4	27223000
5.850	5.82	25.0	76.0	4	27223030
5.855	5.82	25.0	76.0	4	27223050
5.867	5.82	25.0	76.0	4	27223100
5.880	5.82	25.0	76.0	4	27223150
5.893	5.82	25.0	76.0	4	27223200
5.900	5.82	25.0	76.0	4	27223230
5.906	5.82	25.0	76.0	4	27223250
5.918	5.82	25.0	76.0	4	27223300
5.931	5.82	25.0	76.0	4	27223350
5.944	5.82	25.0	76.0	4	27223400
5.951	5.82	25.0	76.0	4	27223430
5.956	5.82	25.0	76.0	4	27223450
5.969	5.82	25.0	76.0	4	27223500

Tool Dimensions					Tool No.
Ø D ¹	Ø D ²	L ²	L ¹	Z	
5.982	5.82	25.0	76.0	4	27223550
5.994	5.82	25.0	76.0	4	27223600
5.999	5.82	25.0	76.0	4	27223620
6.007	5.82	25.0	76.0	4	27223650
6.020	5.82	25.0	76.0	4	27223700
6.033	5.99	25.0	76.0	4	27223750
6.045	5.99	25.0	76.0	4	27223800
6.050	5.99	25.0	76.0	4	27223820
6.058	5.99	25.0	76.0	4	27223850
6.071	5.99	25.0	76.0	4	27223900
6.083	5.99	25.0	76.0	4	27223950
6.096	5.99	25.0	76.0	4	27224000
6.101	5.99	25.0	76.0	4	27224020
6.109	5.99	25.0	76.0	4	27224050
6.121	5.99	25.0	76.0	4	27224100
6.134	5.99	25.0	76.0	4	27224150
6.149	5.99	25.0	76.0	4	27224210
6.160	5.99	25.0	76.0	4	27224250
6.172	5.99	25.0	76.0	4	27224300
6.185	5.99	25.0	76.0	4	27224350
6.200	5.99	25.0	76.0	4	27224410
6.210	5.99	25.0	76.0	4	27224450
6.223	5.99	25.0	76.0	4	27224500
6.236	6.20	25.0	76.0	4	27224550
6.251	6.20	25.0	76.0	4	27224610
6.261	6.20	25.0	76.0	4	27224650
6.274	6.20	25.0	76.0	4	27224700
6.287	6.20	25.0	76.0	4	27224750
6.300	6.20	25.0	76.0	4	27224801
6.312	6.20	25.0	76.0	4	27224850
6.325	6.20	25.0	76.0	4	27224900
6.337	6.20	25.0	76.0	4	27224950
6.345	6.20	25.0	76.0	4	27224980
6.350	6.20	25.0	76.0	4	27225001
6.363	6.20	25.0	76.0	4	27225050
6.375	6.20	25.0	76.0	4	27225100
6.388	6.20	25.0	76.0	4	27225150
6.398	6.20	25.0	76.0	4	27225190
6.401	6.20	25.0	76.0	4	27225200
6.414	6.20	25.0	76.0	4	27225250
6.426	6.20	25.0	76.0	4	27225300
6.449	6.40	28.0	83.0	6	27225390
6.477	6.40	28.0	83.0	6	27225500
6.500	6.40	28.0	83.0	6	27225590
6.528	6.40	28.0	83.0	6	27225700
6.553	6.40	28.0	83.0	6	27225800
6.579	6.40	28.0	83.0	6	27225900



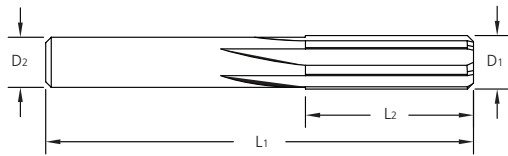
TrueSize® Straight Flute Carbide Reamers



DIN 1420 H7

D ¹ (mm)	Tolerance (mm)
≤ 3.00	+ 0.004 / + 0.008
> 3.00 - 6.00	+ 0.005 / + 0.010
> 6.00 - 10.00	+ 0.006 / + 0.012
> 10.00 - 16.00	+ 0.008 / + 0.015

Series
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Tool Dimensions					Tool No.
Ø D ¹	Ø D ²	L ²	L ¹	Z	
6.604	6.40	28.0	83.0	6	27226000
6.629	6.40	28.0	83.0	6	27226100
6.655	6.40	28.0	83.0	6	27226200
6.680	6.40	28.0	83.0	6	27226300
6.706	6.40	28.0	83.0	6	27226400
6.731	6.40	28.0	83.0	6	27226500
6.746	6.40	28.0	83.0	6	27226560
6.756	6.40	28.0	83.0	6	27226600
6.782	6.40	28.0	83.0	6	27226700
6.807	6.40	28.0	83.0	6	27226800
6.833	6.40	28.0	83.0	6	27226900
6.858	6.40	28.0	83.0	6	27227000
6.883	6.40	28.0	83.0	6	27227100
6.909	6.86	28.0	83.0	6	27227200
6.934	6.86	28.0	83.0	6	27227300
6.960	6.86	28.0	83.0	6	27227400
6.985	6.86	28.0	83.0	6	27227500
7.000	6.86	28.0	83.0	6	27227560
7.010	6.86	28.0	83.0	6	27227600
7.036	6.86	28.0	83.0	6	27227700
7.061	6.86	28.0	83.0	6	27227800
7.087	6.86	28.0	83.0	6	27227900
7.112	6.86	28.0	83.0	6	27228000
7.137	6.86	28.0	83.0	6	27228100
7.142	6.86	28.0	83.0	6	27228120
7.163	6.86	28.0	83.0	6	27228200
7.188	6.86	28.0	83.0	6	27228300
7.214	6.86	28.0	83.0	6	27228400
7.239	6.86	28.0	83.0	6	27228500
7.264	6.86	28.0	83.0	6	27228600
7.290	7.24	28.0	83.0	6	27228700
7.315	7.24	28.0	83.0	6	27228800
7.341	7.24	28.0	83.0	6	27228900
7.366	7.24	28.0	83.0	6	27229000
7.391	7.24	28.0	83.0	6	27229100
7.417	7.24	28.0	83.0	6	27229200
7.442	7.24	28.0	83.0	6	27229300
7.468	7.24	28.0	83.0	6	27229400
7.493	7.24	28.0	83.0	6	27229500
7.501	7.24	28.0	83.0	6	27229530
7.518	7.24	28.0	83.0	6	27229600
7.539	7.24	28.0	83.0	6	27229680
7.544	7.24	28.0	83.0	6	27229700
7.569	7.24	28.0	83.0	6	27229800
7.595	7.24	28.0	83.0	6	27229900
7.620	7.24	28.0	83.0	6	27230000
7.645	7.24	28.0	83.0	6	27230100

Tool Dimensions					Tool No.
Ø D ¹	Ø D ²	L ²	L ¹	Z	
7.671	7.24	28.0	83.0	6	27230200
7.696	7.65	28.0	83.0	6	27230300
7.722	7.65	28.0	83.0	6	27230400
7.747	7.65	28.0	83.0	6	27230500
7.772	7.65	28.0	83.0	6	27230600
7.798	7.65	28.0	83.0	6	27230700
7.823	7.65	28.0	83.0	6	27230800
7.849	7.65	28.0	83.0	6	27230900
7.874	7.65	28.0	83.0	6	27231000
7.887	7.65	28.0	83.0	6	27231050
7.899	7.65	28.0	83.0	6	27231100
7.912	7.65	28.0	83.0	6	27231150
7.925	7.65	28.0	83.0	6	27231200
7.932	7.65	28.0	83.0	6	27231230
7.938	7.65	28.0	83.0	6	27231250
7.950	7.65	28.0	83.0	6	27231300
7.963	7.65	28.0	83.0	6	27231350
7.976	7.65	28.0	83.0	6	27231400
8.000	7.65	28.0	83.0	6	27231500
8.026	7.65	28.0	83.0	6	27231600
8.052	7.65	28.0	83.0	6	27231700
8.077	7.65	28.0	83.0	6	27231800
8.103	8.05	32.0	89.0	6	27231900
8.128	8.05	32.0	89.0	6	27232000
8.153	8.05	32.0	89.0	6	27232100
8.179	8.05	32.0	89.0	6	27232200
8.204	8.05	32.0	89.0	6	27232300
8.230	8.05	32.0	89.0	6	27232400
8.255	8.05	32.0	89.0	6	27232500
8.280	8.05	32.0	89.0	6	27232600
8.306	8.05	32.0	89.0	6	27232700
8.331	8.05	32.0	89.0	6	27232800
8.357	8.05	32.0	89.0	6	27232900
8.382	8.05	32.0	89.0	6	27233000
8.407	8.05	32.0	89.0	6	27233100
8.433	8.05	32.0	89.0	6	27233200
8.458	8.05	32.0	89.0	6	27233300
8.484	8.43	32.0	89.0	6	27233400
8.499	8.43	32.0	89.0	6	27233460
8.509	8.43	32.0	89.0	6	27233500
8.534	8.43	32.0	89.0	6	27233600
8.560	8.43	32.0	89.0	6	27233700
8.585	8.43	32.0	89.0	6	27233800
8.611	8.43	32.0	89.0	6	27233900
8.636	8.43	32.0	89.0	6	27234000
8.661	8.43	32.0	89.0	6	27234100
8.687	8.43	32.0	89.0	6	27234200



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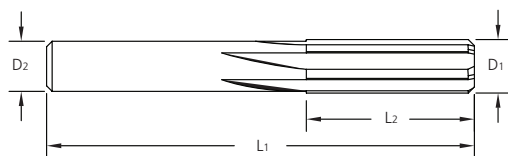
TrueSize® Straight Flute Carbide Reamers



DIN 1420 H7

D ¹ (mm)	Tolerance (mm)
≤ 3.00	+ 0.004 / + 0.008
> 3.00 - 6.00	+ 0.005 / + 0.010
> 6.00 - 10.00	+ 0.006 / + 0.012
> 10.00 - 16.00	+ 0.008 / + 0.015

Series
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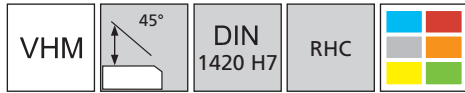


Tool Dimensions					Tool No.
Ø D ¹	Ø D ²	L ²	L ¹	Z	
8.712	8.43	32.0	89.0	6	27234300
8.730	8.43	32.0	89.0	6	27234370
8.738	8.43	32.0	89.0	6	27234400
8.763	8.43	32.0	89.0	6	27234500
8.788	8.43	32.0	89.0	6	27234600
8.814	8.43	32.0	89.0	6	27234700
8.839	8.43	32.0	89.0	6	27234800
8.865	8.43	32.0	89.0	6	27234900
8.890	8.84	32.0	89.0	6	27235000
8.915	8.84	32.0	89.0	6	27235100
8.941	8.84	32.0	89.0	6	27235200
8.966	8.84	32.0	89.0	6	27235300
8.992	8.84	32.0	89.0	6	27235400
8.999	8.84	32.0	89.0	6	27235430
9.017	8.84	32.0	89.0	6	27235500
9.042	8.84	32.0	89.0	6	27235600
9.068	8.84	32.0	89.0	6	27235700
9.093	8.84	32.0	89.0	6	27235800
9.119	8.84	32.0	89.0	6	27235900
9.129	8.84	32.0	89.0	6	27235940
9.144	8.84	32.0	89.0	6	27236000
9.169	8.84	32.0	89.0	6	27236100
9.195	8.84	32.0	89.0	6	27236200
9.220	8.84	32.0	89.0	6	27236300
9.246	8.84	32.0	89.0	6	27236400
9.271	9.22	32.0	89.0	6	27236500
9.296	9.22	32.0	89.0	6	27236600
9.322	9.22	32.0	89.0	6	27236700
9.347	9.22	32.0	89.0	6	27236800
9.373	9.22	32.0	89.0	6	27236900
9.398	9.22	32.0	89.0	6	27237000
9.423	9.22	32.0	89.0	6	27237100
9.449	9.22	32.0	89.0	6	27237200
9.474	9.22	32.0	89.0	6	27237300
9.500	9.22	32.0	89.0	6	27237400
9.512	9.22	32.0	89.0	6	27237450
9.520	9.22	32.0	89.0	6	27237480
9.525	9.22	32.0	89.0	6	27237500
9.550	9.22	32.0	89.0	6	27237600
9.576	9.22	32.0	89.0	6	27237700
9.601	9.22	32.0	89.0	6	27237800
9.627	9.22	32.0	89.0	6	27237900
9.652	9.22	32.0	89.0	6	27238000
9.677	9.22	32.0	89.0	6	27238100
9.703	9.22	32.0	89.0	6	27238200
9.728	9.22	32.0	89.0	6	27238300
9.754	9.22	32.0	89.0	6	27238400

Tool Dimensions					Tool No.
Ø D ¹	Ø D ²	L ²	L ¹	Z	
9.779	9.22	32.0	89.0	6	27238500
9.804	9.22	32.0	89.0	6	27238600
9.830	9.65	32.0	89.0	6	27238700
9.855	9.65	32.0	89.0	6	27238800
9.881	9.65	32.0	89.0	6	27238900
9.906	9.65	32.0	89.0	6	27239000
9.921	9.65	32.0	89.0	6	27239060
9.931	9.65	32.0	89.0	6	27239100
9.957	9.65	32.0	89.0	6	27239200
9.982	9.65	32.0	89.0	6	27239300
10.000	9.65	32.0	89.0	6	27239370
10.008	9.65	32.0	89.0	6	27239400
10.033	9.65	32.0	89.0	6	27239500
10.058	9.65	32.0	89.0	6	27239600
10.084	9.65	32.0	89.0	6	27239700
10.109	9.65	32.0	89.0	6	27239800
10.135	9.65	32.0	89.0	6	27239900
10.160	9.65	32.0	89.0	6	27240000
10.185	9.65	32.0	89.0	6	27240100
10.211	9.65	32.0	89.0	6	27240200
10.236	9.65	32.0	89.0	6	27240300
10.262	9.65	32.0	89.0	6	27240400
10.287	9.65	32.0	89.0	6	27240500
10.312	9.65	32.0	89.0	6	27240600
10.317	9.65	32.0	89.0	6	27240620
10.338	9.65	32.0	89.0	6	27240700
10.363	9.65	32.0	89.0	6	27240800
10.389	9.65	32.0	89.0	6	27240900
10.414	9.65	32.0	89.0	6	27241000
10.439	9.65	32.0	89.0	6	27241100
10.465	9.65	32.0	89.0	6	27241200
10.490	9.65	32.0	89.0	6	27241300
10.500	9.65	32.0	89.0	6	27241340
10.516	9.65	32.0	89.0	6	27241400
10.541	9.65	32.0	89.0	6	27241500
10.566	10.41	35.0	95.0	6	27241600
10.592	10.41	35.0	95.0	6	27241700
10.617	10.41	35.0	95.0	6	27241800
10.643	10.41	35.0	95.0	6	27241900
10.668	10.41	35.0	95.0	6	27242000
10.693	10.41	35.0	95.0	6	27242100
10.719	10.41	35.0	95.0	6	27242200
10.744	10.41	35.0	95.0	6	27242300
10.770	10.41	35.0	95.0	6	27242400
10.795	10.41	35.0	95.0	6	27242500
10.820	10.41	35.0	95.0	6	27242600
10.846	10.41	35.0	95.0	6	27242700



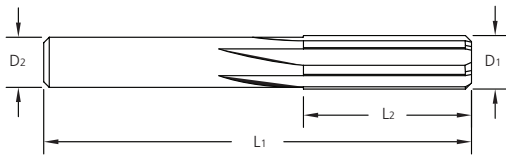
TrueSize® Straight Flute Carbide Reamers



DIN 1420 H7

D ¹ (mm)	Tolerance (mm)
≤ 3.00	+ 0.004 / + 0.008
> 3.00 - 6.00	+ 0.005 / + 0.010
> 6.00 - 10.00	+ 0.006 / + 0.012
> 10.00 - 16.00	+ 0.008 / + 0.015

Series
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Tool Dimensions					Tool No.
Ø D ¹	Ø D ²	L ²	L ¹	Z	
10.871	10.41	35.0	95.0	6	27242800
10.897	10.41	35.0	95.0	6	27242900
10.922	10.41	35.0	95.0	6	27243000
10.947	10.41	35.0	95.0	6	27243100
10.973	10.41	35.0	95.0	6	27243200
11.000	10.41	35.0	95.0	6	27243310
11.024	10.41	35.0	95.0	6	27243400
11.049	10.41	35.0	95.0	6	27243500
11.074	10.41	35.0	95.0	6	27243600
11.100	10.41	35.0	95.0	6	27243700
11.110	10.41	35.0	95.0	6	27243740
11.125	10.41	35.0	95.0	6	27243800
11.138	10.41	35.0	95.0	6	27243850
11.151	10.41	35.0	95.0	6	27243900
11.176	10.41	35.0	95.0	6	27244000
11.201	10.41	35.0	95.0	6	27244100
11.227	10.41	35.0	95.0	6	27244200
11.252	10.41	35.0	95.0	6	27244300
11.278	10.41	35.0	95.0	6	27244400
11.303	10.41	35.0	95.0	6	27244500
11.328	11.18	35.0	95.0	6	27244600
11.354	11.18	35.0	95.0	6	27244700
11.379	11.18	35.0	95.0	6	27244800
11.405	11.18	35.0	95.0	6	27244900
11.430	11.18	35.0	95.0	6	27245000
11.455	11.18	35.0	95.0	6	27245100
11.481	11.18	35.0	95.0	6	27245200
11.499	11.18	35.0	95.0	6	27245270
11.509	11.18	35.0	95.0	6	27245310
11.532	11.18	35.0	95.0	6	27245400
11.557	11.18	35.0	95.0	6	27245500
11.582	11.18	35.0	95.0	6	27245600
11.608	11.18	35.0	95.0	6	27245700
11.633	11.18	35.0	95.0	6	27245800
11.659	11.18	35.0	95.0	6	27245900
11.684	11.18	35.0	95.0	6	27246000
11.709	11.18	35.0	95.0	6	27246100
11.735	11.18	35.0	95.0	6	27246200
11.760	11.18	35.0	95.0	6	27246300
11.786	11.18	35.0	95.0	6	27246400
11.811	11.18	35.0	95.0	6	27246500
11.836	11.18	35.0	95.0	6	27246600
11.862	11.18	35.0	95.0	6	27246700
11.887	11.18	35.0	95.0	6	27246800
11.908	11.18	35.0	95.0	6	27246880
11.913	11.18	35.0	95.0	6	27246900
11.938	11.18	35.0	95.0	6	27247000

Tool Dimensions					Tool No.
Ø D ¹	Ø D ²	L ²	L ¹	Z	
11.963	11.18	35.0	95.0	6	27247100
11.989	11.18	35.0	95.0	6	27247200
11.999	11.18	35.0	95.0	6	27247240
12.014	11.18	35.0	95.0	6	27247300
12.040	11.18	35.0	95.0	6	27247400
12.065	11.18	35.0	95.0	6	27247500
12.090	11.94	38.0	102.0	6	27247600
12.116	11.94	38.0	102.0	6	27247700
12.141	11.94	38.0	102.0	6	27247800
12.167	11.94	38.0	102.0	6	27247900
12.192	11.94	38.0	102.0	6	27248000
12.217	11.94	38.0	102.0	6	27248100
12.243	11.94	38.0	102.0	6	27248200
12.268	11.94	38.0	102.0	6	27248300
12.294	11.94	38.0	102.0	6	27248400
12.304	11.94	38.0	102.0	6	27248440
12.319	11.94	38.0	102.0	6	27248500
12.344	11.94	38.0	102.0	6	27248600
12.370	11.94	38.0	102.0	6	27248700
12.395	11.94	38.0	102.0	6	27248800
12.421	11.94	38.0	102.0	6	27248900
12.446	11.94	38.0	102.0	6	27249000
12.471	11.94	38.0	102.0	6	27249100
12.497	11.94	38.0	102.0	6	27249200
12.522	11.94	38.0	102.0	6	27249300
12.548	11.94	38.0	102.0	6	27249400
12.573	11.94	38.0	102.0	6	27249500
12.598	11.94	38.0	102.0	6	27249600
12.624	11.94	38.0	102.0	6	27249700
12.649	11.94	38.0	102.0	6	27249800
12.675	11.94	38.0	102.0	6	27249900
12.687	11.94	38.0	102.0	6	27249950
12.697	11.94	38.0	102.0	6	27249990
12.700	11.94	38.0	102.0	6	27250000
12.725	11.94	38.0	102.0	6	27250100
13.000	12.83	38.0	102.0	6	27251180
13.096	12.83	38.0	102.0	6	27251560
13.492	12.83	38.0	102.0	6	27253120
13.891	13.59	38.0	102.0	6	27254690
14.000	13.59	38.0	102.0	6	27255120
14.288	13.59	38.0	102.0	6	27256250
14.684	14.35	44.0	102.0	6	27257810
14.999	14.35	44.0	102.0	6	27259050
15.083	14.35	44.0	102.0	6	27259380
15.479	15.11	44.0	102.0	6	27260940
15.875	15.11	44.0	102.0	6	27262500
15.999	15.11	44.0	102.0	6	27262990



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Technical & Application Data

TrueSize® Solid Carbide Reamers

Workpiece Material Group		Material Type	Vc (m/min)	Feed Type (Refer To Chart)
Steels	P	Low Carbon	60 - 90	M - H
		Medium Carbon	40 - 60	M
		Alloy Steels	20 - 40	L
		Mould/Tool Steel	20 - 40	L
Stainless Steels	M	Free Machining	45 - 75	M
		Austenitic	45 - 75	M
		Ferritic	25 - 40	M
		Martensitic	25 - 40	M
		PH Stainless	20 - 30	L - M
Special Alloys	S	High Temp Alloys (Ni)	40 - 70	L
		High Temp Alloys (Co)	30 - 45	L
		Titanium Alloys	35 - 50	L - M
Cast Irons	K	Grey Cast Iron	25 - 45	L - M
		Ductile Cast Iron	40 - 60	M
		Malleable Iron	40 - 60	M
Hardened Steels	H	< 25 HRc	60 - 90	M - H
		25 - 32 HRc	40 - 60	M
		32 - 43 HRc	15 - 40	L
		43 - 52 HRc	10 - 15	L
		> 52 HRc	5 - 10	L
Non Ferrous	N	Aluminium Alloys	150 - 300	M - H
		Copper & Hard Bronze	30 - 45	L
		Brass & Soft Bronze	50 - 80	M

$$\text{RPM} = \text{Vc (m/min)} \times 318.0 \div \text{Reamer } \varnothing$$

Series 272 - Recommended Feedrate Data

Nominal Reamer Diameter $\varnothing D^1$	Feed (mm/rev)		
	L	M	H
0.3mm - 1.6mm	0.01 - 0.03	0.02 - 0.05	0.03 - 0.08
1.6mm - 3.0mm	0.03 - 0.05	0.05 - 0.10	0.08 - 0.15
3.0mm - 6.0mm	0.05 - 0.10	0.10 - 0.15	0.15 - 0.25
6.0mm - 12.0mm	0.10 - 0.15	0.15 - 0.25	0.25 - 0.35
12.0mm - 16.0mm	0.15 - 0.25	0.25 - 0.50	0.35 - 0.75

Feedrate Formula For Metric Reamers - Feed = RPM x mm/rev

TrueSize® Reamer Tolerances

Tool Dimensions	Diameter (mm)	Tolerance (mm)
D ¹	0.330 - 16.000	DIN 1420 H7 (See Below)
D ²	0.330 - 16.000	+ 0.00 / - 0.03
L ¹	0.330 - 16.000	+ /- 1.5
L ²	0.330 - 16.000	+ /- 1.5

Countersinks

M.A. Ford offers one of the most comprehensive ranges of solid carbide and HSS countersinks available to ensure that whatever your countersink application, we have the perfect solution.

The original M.A. Ford single flute Uniflute® countersink is unrivalled for economical, chatter free machining and is available in both carbide and HSS options with a choice of angles from 60° to 120° and diameters ranging from 3mm to 75mm.

For higher feed rates, multiple flute tools are also available in our range. Multiple flute countersinks not only allow the use of increased feed rates but also reduces chip loads and removes vibration and chatter. Whichever you select for your specific needs, you'll find unparalleled quality in manufacturing and materials with HSS and carbide countersinks.



Tool Material



Coatings



Number of Flutes



Included Angle



DIN Specs



Technical Information



Workpiece Material Group

Steel

Cast Iron

Hardened Steels (35-65HRC)

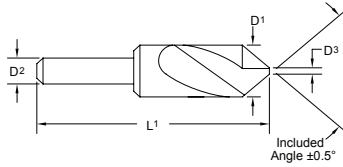
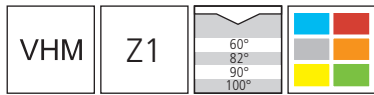
Special Alloys

Stainless Steels

Non-Ferrous

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Uniflute® Carbide Countersink - Single Flute

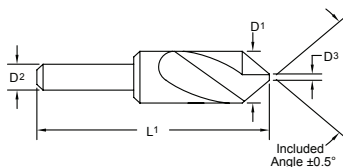
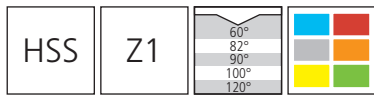


Series
60 Uncoated

Tool Dimensions				60°	82°	90°	100°
D1	D2	D3 (Max)	L1	Tool No.	Tool No.	Tool No.	Tool No.
1/8" 3.2mm	1/8" 3.2mm	0.030" 0.8mm	1-1/2" 38.1mm	60012501	60012502	60012503	60012504
3/16" 4.8mm	3/16" 4.8mm	0.045" 1.1mm	1-1/2" 38.1mm	60018701	60018702	60018703	60018704
1/4" 6.4mm	1/4" 6.4mm	0.045" 1.1mm	2" 50.8mm	60025001	60025002	60025003	60025004
3/8" 9.5mm	1/4" 6.4mm	0.06" 1.5mm	2" 50.8mm	60037501	60037502	60037503	60037504
1/2" 12.7mm	1/4" 6.4mm	0.06" 1.5mm	2-3/8" 60.3mm	60050001	60050002	60050003	60050004
3/4" 19.0mm	1/2" 12.7mm	0.120" 3.1mm	3" 76.2mm	60075001	60075002	60075003	60075004
1" 25.4mm	1/2" 12.7mm	0.120" 3.1mm	3" 76.2mm	60100001	60100002	60100003	60100004



Uniflute® HSS Countersink - Single Flute

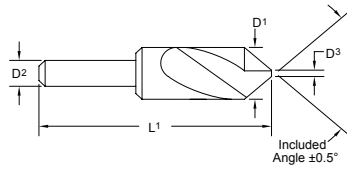
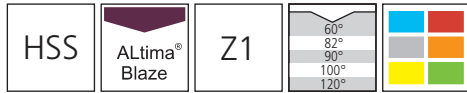


Series
61 Steam Treated

Tool Dimensions				60°	82°	90°	100°	120°
D1	D2	D3 (Max)	L1	Tool No.	Tool No.	Tool No.	Tool No.	Tool No.
1/8" 3.2mm	1/8" 3.2mm	0.030" 0.8mm	1-1/2" 38.1mm	61012501	61012502	61012503	61012504	61012506
3/16" 4.8mm	3/16" 4.8mm	0.045" 1.1mm	1-1/2" 38.1mm	61018701	61018702	61018703	61018704	61018706
1/4" 6.4mm	1/4" 6.4mm	0.045" 1.1mm	2" 50.8mm	61025001	61025002	61025003	61025004	61025006
3/8" 9.5mm	1/4" 6.4mm	0.060" 1.5mm	2" 50.8mm	61037501	61037502	61037503	61037504	61037506
1/2" 12.7mm	1/4" 6.4mm	0.060" 1.5mm	2" 50.8mm	61050001	61050002	61050003	61050004	61050006
5/8" 15.9mm	1/4" 6.4mm	0.060" 1.5mm	2" 50.8mm	61062501	61062502	61062503	61062504	61062506
3/4" 19.0mm	1/2" 12.7mm	0.120" 3.1mm	2-3/4" 69.9mm	61075001	61075002	61075003	61075004	61075006
1" 25.4mm	1/2" 12.7mm	0.120" 3.1mm	2-3/4" 69.9mm	61100001	61100002	61100003	61100004	61100006
1-1/4" 31.8mm	1/2" 12.7mm	0.120" 3.1mm	3" 76.2mm	61125001	61125002	61125003	-	-
1-1/2" 38.1mm	3/4" 19.0mm	1/4" 6.4mm	3-1/2" 88.9mm	61150001	61150002	61150003	-	-
2" 50.8mm	3/4" 19.0mm	1/2" 12.7mm	3-3/4" 95.3mm	61200001	61200002	61200003	-	-
2-1/2" 63.5mm	3/4" 19.0mm	3/4" 19.0mm	5" 127.0mm	61250001	61250002	61250003	-	-
3" 76.2mm	3/4" 19.0mm	1" 25.4mm	5-1/4" 133.4mm	61300001	61300002	61300003	-	-



Uniflute® HSS Countersink - Single Flute



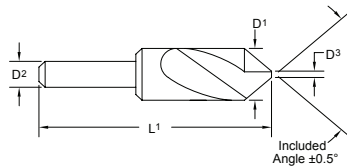
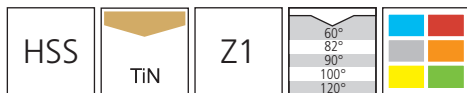
Series

61B ALtima® Blaze Coated

Tool Dimensions				60°	82°	90°	100°	120°
D1	D2	D3 (Max)	L1	Tool No.	Tool No.	Tool No.	Tool No.	Tool No.
1/8" 3.2mm	1/8" 3.2mm	0.030" 0.8mm	1-1/2" 38.1mm	61B012501	61B012502	61B012503	61B012504	61B012506
3/16" 4.8mm	3/16" 4.8mm	0.045" 1.1mm	1-1/2" 38.1mm	61B018701	61B018702	61B018703	61B018704	61B018706
1/4" 6.4mm	1/4" 6.4mm	0.045" 1.1mm	2" 50.8mm	61B025001	61B025002	61B025003	61B025004	61B025006
3/8" 9.5mm	1/4" 6.4mm	0.060" 1.5mm	2" 50.8mm	61B037501	61B037502	61B037503	61B037504	61B037506
1/2" 12.7mm	1/4" 6.4mm	0.060" 1.5mm	2" 50.8mm	61B050001	61B050002	61B050003	61B050004	61B050006
5/8" 15.9mm	1/4" 6.4mm	0.060" 1.5mm	2" 50.8mm	61B062501	61B062502	61B062503	61B062504	61B062506
3/4" 19.0mm	1/2" 12.7mm	0.120" 3.1mm	2-3/4" 69.9mm	61B075001	61B075002	61B075003	61B075004	61B075006
1" 25.4mm	1/2" 12.7mm	0.120" 3.1mm	2-3/4" 69.9mm	61B100001	61B100002	61B100003	61B100004	61B100006



Uniflute® HSS Countersink - Single Flute



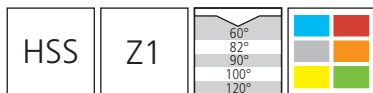
Series

61T TiN Coated

Tool Dimensions				60°	82°	90°	100°	120°
D1	D2	D3 (Max)	L1	Tool No.	Tool No.	Tool No.	Tool No.	Tool No.
1/8" 3.2mm	1/8" 3.2mm	0.030" 0.8mm	1-1/2" 38.1mm	61T012501	61T012502	61T012503	61T012504	61T012506
3/16" 4.8mm	3/16" 4.8mm	0.045" 1.1mm	1-1/2" 38.1mm	61T018701	61T018702	61T018703	61T018704	61T018706
1/4" 6.4mm	1/4" 6.4mm	0.045" 1.1mm	2" 50.8mm	61T025001	61T025002	61T025003	61T025004	61T025006
3/8" 9.5mm	1/4" 6.4mm	0.060" 1.5mm	2" 50.8mm	61T037501	61T037502	61T037503	61T037504	61T037506
1/2" 12.7mm	1/4" 6.4mm	0.060" 1.5mm	2" 50.8mm	61T050001	61T050002	61T050003	61T050004	61T050006
5/8" 15.9mm	1/4" 6.4mm	0.060" 1.5mm	2" 50.8mm	61T062501	61T062502	61T062503	61T062504	61T062506
3/4" 19.0mm	1/2" 12.7mm	0.120" 3.1mm	2-3/4" 69.9mm	61T075001	61T075002	61T075003	61T075004	61T075006
1" 25.4mm	1/2" 12.7mm	0.120" 3.1mm	2-3/4" 69.9mm	61T100001	61T100002	61T100003	61T100004	61T100006



Uniflute® HSS Countersink Sets - Single Flute



Series
61 Steam Treated



4pc Set - Series 61

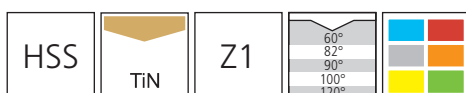
Set Includes - 1/4" (6.4mm), 1/2" (12.7mm), 3/4" (19.0mm) & 1" (25.4mm)

Set No.	Angle
64100001	60°
64100002	82°
64100003	90°
64100004	100°
64100006	120°

7pc Set - Series 61

Set Includes - 3/16" (4.8mm), 1/4" (6.4mm), 3/8" (9.5mm), 1/2" (12.7mm), 5/8" (15.9mm), 3/4" (19.0mm) & 1" (25.4mm)

Set No.	Angle
64100071	60°
64100072	82°
64100073	90°
64100074	100°
64100076	120°



Series
61T TiN Coated

4pc Set - Series 61T

Set Includes - 1/4" (6.4mm), 1/2" (12.7mm), 3/4" (19.0mm), 1" (25.4mm)

Set No.	Angle
64T100001	60°
64T100002	82°
64T100003	90°

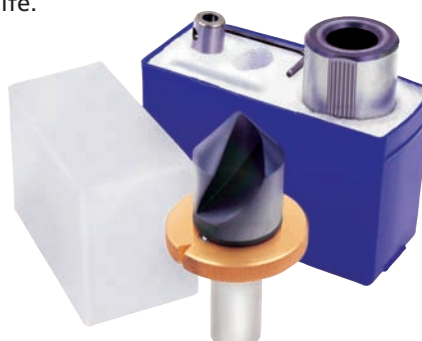


Uniflute® Resharpener Fixture

Series
65

The Unicam Resharpener Fixture is designed to sharpen Uniflute® countersinks. The unique cam relief is quickly and easily reground on worn tools, greatly extending tool life.

- Can be used on a tool and cutter grinder, surface grinder or a pedestal grinder.
- Resharpens tools with 1/4", 1/2" or 3/4" shanks
- Packaged in plastic case.
- Includes detailed instructions on set-up and operation.
- Not recommended for 2-1/2" or 3" tools.

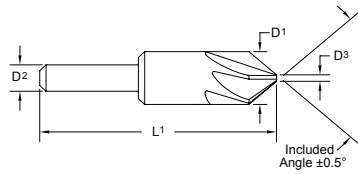


Resharpener Fixture

Part No.

65000000

Vibration Free Carbide Countersink - 6 Flute

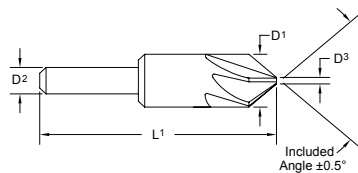
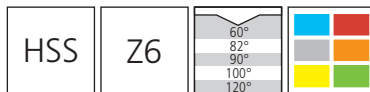


Series
78 Uncoated

Tool Dimensions				60°	82°	90°	100°	120°
D ¹	D ²	D ³ (Max)	L ¹	Tool No.	Tool No.	Tool No.	Tool No.	Tool No.
1/8"	1/8"	0.030"	1-1/2"	78012501	78012502	78012503	78012504	78012506
3.2mm	3.2mm	0.8mm	38.1mm					
3/16"	3/16"	0.045"	1-1/2"	78018701	78018702	78018703	78018704	78018706
4.8mm	4.8mm	1.1mm	38.1mm					
1/4"	1/4"	0.060"	2"	78025001	78025002	78025003	78025004	78025006
6.4mm	6.4mm	1.5mm	50.8mm					
3/8"	1/4"	0.090"	2"	78037501	78037502	78037503	78037504	78037506
9.5mm	6.4mm	2.3mm	50.8mm					
1/2"	3/8"	0.150"	2-1/8"	78050001	78050002	78050003	78050004	78050006
12.7mm	9.5mm	3.8mm	54.0mm					
5/8"	3/8"	0.180"	2-3/8"	78062501	78062502	78062503	78062504	78062506
15.9mm	9.5mm	4.6mm	60.3mm					
3/4"	1/2"	0.210"	2-3/4"	78075001	78075002	78075003	78075004	78075006
19.0mm	12.7mm	5.3mm	69.9mm					
1"	1/2"	1/4"	2-3/4"	78100001	78100002	78100003	78100004	78100006
25.4mm	12.7mm	6.4mm	69.9mm					
1-1/4"	1/2"	0.370"	3"	78125001	78125002	78125003	-	-
31.8mm	12.7mm	9.4mm	76.2mm					
1-1/2"	3/4"	0.430"	3-1/2"	78150001	78150002	78150003	-	-
38.1mm	19.0mm	10.9mm	88.9mm					



Vibration Free HSS Countersink - 6 Flute

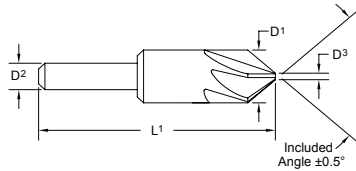
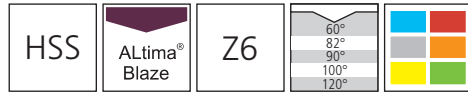


Series
79 Treated

Tool Dimensions				60°	82°	90°	100°	120°
D ¹	D ²	D ³ (Max)	L ¹	Tool No.	Tool No.	Tool No.	Tool No.	Tool No.
1/8"	1/8"	0.030"	1-1/2"	79012501	79012502	79012503	79012504	79012506
3.2mm	3.2mm	0.8mm	38.1mm					
3/16"	3/16"	0.045"	1-1/2"	79018701	79018702	79018703	79018704	79018706
4.8mm	4.8mm	1.1mm	38.1mm					
1/4"	1/4"	0.060"	2"	79025001	79025002	79025003	79025004	79025006
6.4mm	6.4mm	1.5mm	50.8mm					
5/16"	1/4"	0.080"	2"	79031201	79031202	79031203	79031204	79031206
7.9mm	6.4mm	2.0mm	50.8mm					
3/8"	1/4"	0.090"	2"	79037501	79037502	79037503	79037504	79037506
9.5mm	6.4mm	2.3mm	50.8mm					
1/2"	3/8"	0.150"	2"	79050001	79050002	79050003	79050004	79050006
12.7mm	9.5mm	3.8mm	50.8mm					
5/8"	3/8"	0.180"	2-1/4"	79062501	79062502	79062503	79062504	79062506
15.9mm	9.5mm	4.6mm	57.1mm					
3/4"	1/2"	0.210"	2-3/4"	79075001	79075002	79075003	79075004	79075006
19.0mm	12.7mm	5.3mm	69.9mm					
7/8"	1/2"	0.230"	2-3/4"	79087501	79087502	79087503	79087504	79087506
22.2mm	12.7mm	5.8mm	69.9mm					
1"	1/2"	1/4"	2-3/4"	79100001	79100002	79100003	79100004	79100006
25.4mm	12.7mm	6.4mm	69.9mm					
1-1/4"	1/2"	0.370"	3"	79125001	79125002	79125003	79125004	79125006
31.8mm	12.7mm	9.4mm	76.2mm					
1-1/2"	3/4"	0.430"	3-1/2"	79150001	79150002	79150003	79150004	79150006
38.1mm	19.0mm	10.9mm	88.9mm					
2"	3/4"	0.620"	3-3/4"	79200001	79200002	79200003	79200004	79200006
50.8mm	19.0mm	15.7mm	95.2mm					
2-1/2"	3/4"	3/4"	5"	79250001	79250002	79250003	-	-
63.5mm	19.0mm	19.0mm	127.0mm					
3"	3/4"	1"	5-1/4"	79300001	79300002	79300003	-	-
76.2mm	19.0mm	25.4mm	133.4mm					



Vibration Free HSS Countersink - 6 Flute



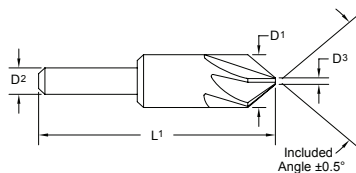
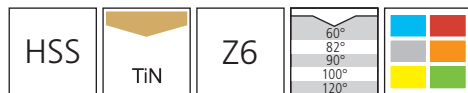
Series

79B ALtima® Blaze Coated

Tool Dimensions				60°	82°	90°	100°	120°
D ¹	D ²	D ³ (Max)	L ¹	Tool No.	Tool No.	Tool No.	Tool No.	Tool No.
1/8" 3.2mm	1/8" 3.2mm	0.030" 0.8mm	1-1/2" 38.1mm	79B012501	79B012502	79B012503	79B012504	79B012506
3/16" 4.8mm	3/16" 4.8mm	0.045" 1.1mm	1-1/2" 38.1mm	79B018701	79B018702	79B018703	79B018704	79B018706
1/4" 6.4mm	1/4" 6.4mm	0.060" 1.5mm	2" 50.8mm	79B025001	79B025002	79B025003	79B025004	79B025006
3/8" 9.5mm	1/4" 6.4mm	0.090" 2.3mm	2" 50.8mm	79B037501	79B037502	79B037503	79B037504	79B037506
1/2" 12.7mm	3/8" 9.5mm	0.150" 3.8mm	2" 50.8mm	79B050001	79B050002	79B050003	79B050004	79B050006
5/8" 15.9mm	3/8" 9.5mm	0.180" 4.6mm	2-1/4" 57.1mm	79B062501	79B062502	79B062503	79B062504	79B062506
3/4" 19.0mm	1/2" 12.7mm	0.210" 5.3mm	2-3/4" 69.9mm	79B075001	79B075002	79B075003	79B075004	79B075006
1" 25.4mm	1/2" 12.7mm	1/4" 6.4mm	2-3/4" 69.9mm	79B100001	79B100002	79B100003	79B100004	79B100006



Vibration Free HSS Countersink - 6 Flute



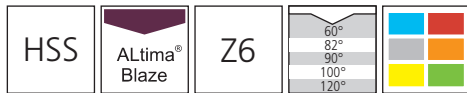
Series

79T TiN Coated

Tool Dimensions				60°	82°	90°	100°	120°
D ¹	D ²	D ³ (Max)	L ¹	Tool No.	Tool No.	Tool No.	Tool No.	Tool No.
1/8" 3.2mm	1/8" 3.2mm	0.030" 0.8mm	1-1/2" 38.1mm	79T012501	79T012502	79T012503	79T012504	79T012506
3/16" 4.8mm	3/16" 4.8mm	0.045" 1.1mm	1-1/2" 38.1mm	79T018701	79T018702	79T018703	79T018704	79T018706
1/4" 6.4mm	1/4" 6.4mm	0.060" 1.5mm	2" 50.8mm	79T025001	79T025002	79T025003	79T025004	79T025006
3/8" 9.5mm	1/4" 6.4mm	0.090" 2.3mm	2" 50.8mm	79T037501	79T037502	79T037503	79T037504	79T037506
1/2" 12.7mm	3/8" 9.5mm	0.150" 3.8mm	2" 50.8mm	79T050001	79T050002	79T050003	79T050004	79T050006
5/8" 15.9mm	3/8" 9.5mm	0.180" 4.6mm	2-1/4" 57.1mm	79T062501	79T062502	79T062503	79T062504	79T062506
3/4" 19.0mm	1/2" 12.7mm	0.210" 5.3mm	2-3/4" 69.9mm	79T075001	79T075002	79T075003	79T075004	79T075006
1" 25.4mm	1/2" 12.7mm	1/4" 6.4mm	2-3/4" 69.9mm	79T100001	79T100002	79T100003	79T100004	79T100006



Vibration Free HSS Countersink - 6 Flute Sets



Series

79 Steam Treated



4pc Set - Series 79

Set Includes - 1/4" (6.4mm), 1/2" (12.7mm)
3/4" (19.0mm), 1" (25.4mm)

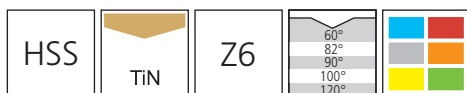
Set No.	Angle
79000011	60°
79000012	82°
79000013	90°
79000014	100°

7pc Set - Series 79

Set Includes - 1/4" (6.4mm), 5/16" (7.9mm), 3/8" (9.5mm)
1/2" (12.7mm), 5/8" (15.9mm), 3/4" (19.0mm), 1" (25.4mm)

Set No.	Angle
79000001	60°
79000002	82°
79000003	90°
79000004	100°

Vibration Free HSS Countersink - 6 Flute Set



Series

79T TiN Coated

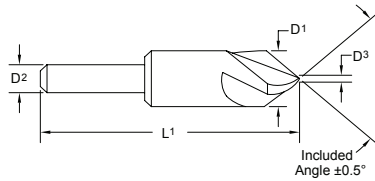
4pc Set - Series 79T

Set Includes - 1/4" (6.4mm), 1/2" (12.7mm)
3/4" (19.0mm), 1" (25.4mm)

Set No.	Angle
79T000011	60°
79T000012	82°
79T000013	90°



HSS Aircraft Countersink - 3 Flute

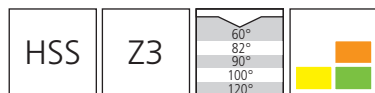


Series
92 Bright Finish

Tool Dimensions				60°	82°	90°	100°	120°
D1	D2	D3 (Max)	L1	Tool No.	Tool No.	Tool No.	Tool No.	Tool No.
1/4" 6.4mm	1/4" 6.4mm	0.070" 1.8mm	1-1/4" 31.8mm	92025001	92025002	92025003	92025004	92025006
3/8" 9.5mm	1/4" 6.4mm	0.110" 2.8mm	1-5/8" 41.3mm	92037501	92037502	92037503	92037504	92037506
1/2" 12.7mm	1/4" 6.4mm	0.150" 3.8mm	2" 50.8mm	92050001	92050002	92050003	92050004	92050006
5/8" 15.9mm	1/4" 6.4mm	0.190" 4.8mm	2-1/4" 57.1mm	92062501	92062502	92062503	92062504	92062506
3/4" 19.0mm	1/2" 12.7mm	0.230" 5.8mm	3" 76.2mm	92075001	92075002	92075003	92075004	92075006
7/8" 22.2mm	1/2" 12.7mm	0.260" 6.6mm	3" 76.2mm	92087501	92087502	92087503	92087504	92087506
1" 25.4mm	1/2" 12.7mm	0.300" 7.6mm	3-1/4" 82.5mm	92100001	92100002	92100003	92100004	92100006
1-1/8" 28.6mm	1/2" 12.7mm	0.340" 8.6mm	3-1/4" 82.5mm	92112501	92112502	92112503	92112504	92112506
1-1/4" 31.8mm	5/8" 15.9mm	0.380" 9.6mm	3-1/2" 88.9mm	92125001	92125002	92125003	92125004	92125006
1-1/2" 38.1mm	3/4" 19.0mm	0.450" 11.4mm	3-7/8" 98.4mm	92150001	92150002	92150003	92150004	92150006
2" 50.8mm	3/4" 19.0mm	0.600" 15.2mm	4-1/4" 107.9mm	92200001	92200002	92200003	92200004	92200006



HSS Aircraft Countersink Set - 3 Flute

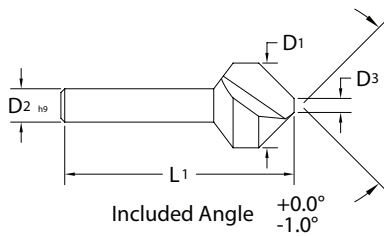
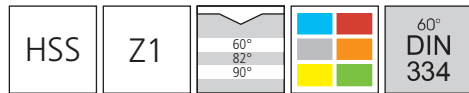


Series
92 Bright Finish

5pc Set - Series 92	
Set Includes - 1/4"(6.4mm), 3/8"(9.5mm), 1/2"(12.7mm), 5/8"(15.9mm) & 3/4"(19.0mm)	
Set No.	Angle
92000011	60°
92000012	82°
92000013	90°
92000014	100°
92000016	120°



HSS Countersink - Single Flute



Series

880, 882 & 883
Bright Finish

Tool Dimensions					60°	82°	90°
D ¹	D ²	D ³ (Max)	L ¹	Fastner Size	Tool No.	Tool No.	Tool No.
4.3	4.0	1.3	40.0	M2	-	-	883 0430
5.0	4.0	1.5	40.0	M2.5	-	-	883 0500
6.0	5.0	1.5	45.0	M3	-	-	883 0600
6.3	5.0	1.5	45.0	M3	880 0630	882 0630	883 0630
7.0	6.0	1.8	50.0	M3.5	-	-	883 0700
8.0	6.0	2.0	50.0	M4	880 0800	-	883 0800
8.3	6.0	2.0	50.0	M4	-	882 0830	883 0830
10.0	6.0	2.5	50.0	M5	-	-	883 1000
10.4	6.0	2.5	50.0	M5	-	882 1040	883 1040
11.5	8.0	2.8	56.0	M6	-	-	883 1150
12.4	8.0	2.8	56.0	M6	-	882 1240	883 1240
12.5	8.0	3.2	56.0	M6	880 1250	-	-
15.0	10.0	3.2	60.0	M8	-	-	883 1500
16.0	10.0	4.0	63.0	M8	880 1600	-	-
16.5	10.0	3.2	60.0	M8	-	882 1650	883 1650
19.0	10.0	3.5	63.0	M10	-	-	883 1900
20.0	10.0	5.0	67.0	M10	880 2000	-	-
20.5	10.0	3.5	63.0	M10	-	882 2050	883 2050
23.0	10.0	3.8	67.0	M12	-	-	883 2300
25.0	10.0	3.8	67.0	M12	-	882 2500	883 2500
25.0	10.0	6.3	71.0	M12	880 2500	-	-
31.0	12.0	4.2	71.0	M16	-	-	883 3100



Endmills

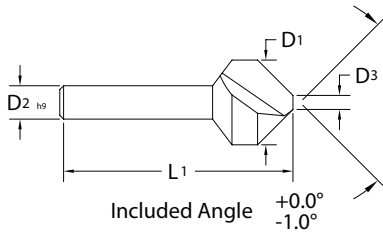
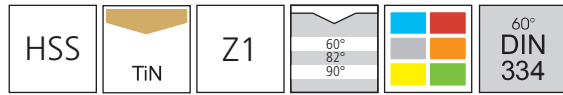
Drills

Reamers

Countersinks

Burrs

HSS Countersink - Single Flute



Series

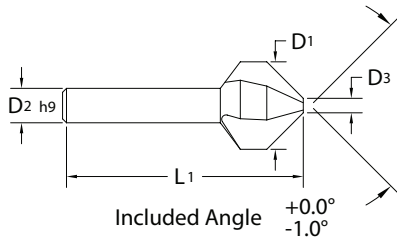
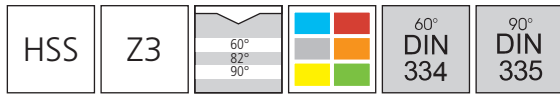
880T, 882T & 883T

TiN Coated

Tool Dimensions					60°	82°	90°
D ¹	D ²	D ³ (Max)	L ¹	Fastner Size	Tool No.	Tool No.	Tool No.
4.3	4.0	1.3	40.0	M2	-	-	883 0430T
5.0	4.0	1.5	40.0	M2.5	-	-	883 0500T
6.0	5.0	1.5	45.0	M3	-	-	883 0600T
6.3	5.0	1.5	45.0	M3	880 0630T	882 0630T	883 0630T
7.0	6.0	1.8	50.0	M3.5	-	-	883 0700T
8.0	6.0	2.0	50.0	M4	880 0800T	-	883 0800T
8.3	6.0	2.0	50.0	M4	-	882 0830T	883 0830T
10.0	6.0	2.5	50.0	M5	-	-	883 1000T
10.4	6.0	2.5	50.0	M5	-	882 1040T	883 1040T
11.5	8.0	2.8	56.0	M6	-	-	883 1150T
12.4	8.0	2.8	56.0	M6	-	882 1240T	883 1240T
12.5	8.0	3.2	56.0	M6	880 1250T	-	-
15.0	10.0	3.2	60.0	M8	-	-	883 1500T
16.0	10.0	4.0	63.0	M8	880 1600T	-	-
16.5	10.0	3.2	60.0	M8	-	882 1650T	883 1650T
19.0	10.0	3.5	63.0	M10	-	-	883 1900T
20.0	10.0	5.0	67.0	M10	880 2000T	-	-
20.5	10.0	3.5	63.0	M10	-	882 2050T	883 2050T
23.0	10.0	3.8	67.0	M12	-	-	883 2300T
25.0	10.0	3.8	67.0	M12	-	882 2500T	883 2500T
25.0	10.0	6.3	71.0	M12	880 2500T	-	-
31.0	12.0	4.2	71.0	M16	-	-	883 3100T



HSS Countersink - 3 Flute



Series

890, 892 & 893
Bright Finish

Tool Dimensions					60°	82°	90°
D ¹	D ²	D ³ (Max)	L ¹	Fastner Size	Tool No.	Tool No.	Tool No.
4.3	4.0	1.3	40.0	M2	-	-	893 0430
5.0	4.0	1.5	40.0	M2.5	-	-	893 0500
6.0	5.0	1.5	45.0	M3	-	-	893 0600
6.3	5.0	1.5	45.0	M3	890 0630	892 0630	893 0630
7.0	6.0	1.8	50.0	M3.5	-	-	893 0700
8.0	6.0	2.0	50.0	M4	890 0800	-	893 0800
8.3	6.0	2.0	50.0	M4	-	892 0830	893 0830
10.0	6.0	2.5	50.0	M5	-	-	893 1000
10.4	6.0	2.5	50.0	M5	-	892 1040	893 1040
11.5	8.0	2.8	56.0	M6	-	-	893 1150
12.4	8.0	2.8	56.0	M6	-	892 1240	893 1240
12.5	8.0	3.2	56.0	M6	890 1250	-	-
15.0	10.0	3.2	60.0	M8	-	-	893 1500
16.0	10.0	4.0	63.0	M8	890 1600	-	-
16.5	10.0	3.2	60.0	M8	-	892 1650	893 1650
19.0	10.0	3.5	63.0	M10	-	-	893 1900
20.0	10.0	5.0	67.0	M10	890 2000	-	-
20.5	10.0	3.5	63.0	M10	-	892 2050	893 2050
23.0	10.0	3.8	67.0	M12	-	-	893 2300
25.0	10.0	3.8	67.0	M12	-	892 2500	893 2500
25.0	10.0	6.3	71.0	M12	890 2500	-	-
31.0	12.0	4.2	71.0	M16	-	-	893 3100



P86

Endmills

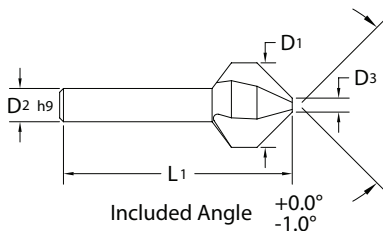
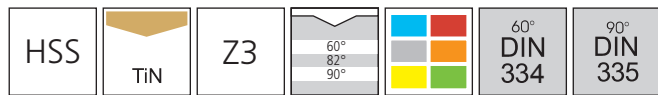
Drills

Reamers

Countersinks

Burrs

HSS Countersink - 3 Flute

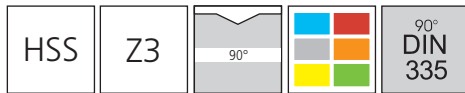


Series
890T, 892T & 893T
TiN Coated

Tool Dimensions					60°	82°	90°
D ¹	D ²	D ³ (Max)	L ¹	Fastner Size	Tool No.	Tool No.	Tool No.
4.3	4.0	1.3	40.0	M2	-	-	893 0430T
5.0	4.0	1.5	40.0	M2.5	-	-	893 0500T
6.0	5.0	1.5	45.0	M3	-	-	893 0600T
6.3	5.0	1.5	45.0	M3	890 0630T	892 0630T	893 0630T
7.0	6.0	1.8	50.0	M3.5	-	-	893 0700T
8.0	6.0	2.0	50.0	M4	890 0800T	-	893 0800T
8.3	6.0	2.0	50.0	M4	-	892 0830T	893 0830T
10.0	6.0	2.5	50.0	M5	-	-	893 1000T
10.4	6.0	2.5	50.0	M5	-	892 1040T	893 1040T
11.5	8.0	2.8	56.0	M6	-	-	893 1150T
12.4	8.0	2.8	56.0	M6	-	892 1240T	893 1240T
12.5	8.0	3.2	56.0	M6	890 1250T	-	-
15.0	10.0	3.2	60.0	M8	-	-	893 1500T
16.0	10.0	4.0	63.0	M8	890 1600T	-	-
16.5	10.0	3.2	60.0	M8	-	892 1650T	893 1650T
19.0	10.0	3.5	63.0	M10	-	-	893 1900T
20.0	10.0	5.0	67.0	M10	890 2000T	-	-
20.5	10.0	3.5	63.0	M10	-	892 2050T	893 2050T
23.0	10.0	3.8	67.0	M12	-	-	893 2300T
25.0	10.0	3.8	67.0	M12	-	892 2500T	893 2500T
25.0	10.0	6.3	71.0	M12	890 2500T	-	-
31.0	12.0	4.2	71.0	M16	-	-	893 3100T



HSS Countersink Set - 3 Flute



Series

893 Bright Finish

6pc Set - Series 893

Set Includes - 6.3mm, 8.3mm, 10.4mm
12.4mm, 16.5mm & 20.5mm

Set No.	Angle
893 6PC 90 DEG	90°



HSS Countersink Set - 3 Flute



Series

893T TiN Coated

6pc Set - Series 893T

Set Includes - 6.3mm, 8.3mm, 10.4mm
12.4mm, 16.5mm & 20.5mm

Set No.	Angle
893T 6PC 90 DEG	90°



Endmills

Drills

Reamers

Countersinks

Burrs

Technical & Application Data

HSS & Carbide Countersinks

Uniflute® Countersink Feed Rates

Uniflute® countersinks are designed with cam relief, therefore feed rates should not exceed 0.125mm per revolution on larger diameter holes. Reduced feeds are recommended for smaller diameter holes. A controlled feed results in vibration-free finishes associated with Uniflute® countersinks.

Multiple Flute Countersink Feed Rates

Multiple flute countersinks are designed for increased feed rates. Because there is more than one cutting edge, tooth loads are not excessive so vibration can be controlled, allowing higher feedrates.

Speeds

To determine optimum speed, start at the lower end of the cutting speed range shown in the chart below, increasing the speed until performance is maximized. When a countersink is operated at excessive RPM, vibration may result and the cutting edges can overheat and become prematurely worn.

Workpiece Material Group		Material Type	Vc (m/min)			
			HSS	HSS TiN Coated	HSS ALtima® Blaze Coated	Carbide
Steels	P	Low Carbon	25 - 30	30 - 40	40 - 50	40 - 50
		Medium Carbon	20 - 25	25 - 30	35 - 40	35 - 45
		Alloy Steels	15 - 20	20 - 25	25 - 30	20 - 30
Stainless Steels	M	Free Machining	10 - 25	10 - 30	15 - 40	25 - 40
		Difficult Stainless	5 - 10	5 - 20	10 - 25	15 - 25
Special Alloys	S	High Temperature Alloys	5 - 8	5 - 10	5 - 10	8 - 15
		Titanium Alloys	15 - 20	20 - 25	25 - 30	20 - 30
Cast Irons	K	Cast Iron	15 - 30	20 - 40	25 - 50	30 - 55
		Malleable Iron	25 - 30	30 - 35	40 - 45	30 - 45
Hardened Steels	H	45 - 50 HRC	5 - 10	5 - 10	8 - 10	8 - 15
		50 - 55 HRC	2 - 5	3 - 5	5 - 10	5 - 10
Non Ferrous	N	Aluminium Alloys	45 - 75	60 - 100	75 - 120	90 - 150
		Brass / Bronze	25 - 40	30 - 50	35 - 60	45 - 80

Conversion Formula

$$\text{RPM} = \text{Vc (m/min)} \times 318.0 \div \text{Countersink } \varnothing *$$

* Countersink $\varnothing$ Must Be Calculated in mm
(When making the calculation, use the diameter on the countersink where the cutting is actually taking place)

Technical & Application Data

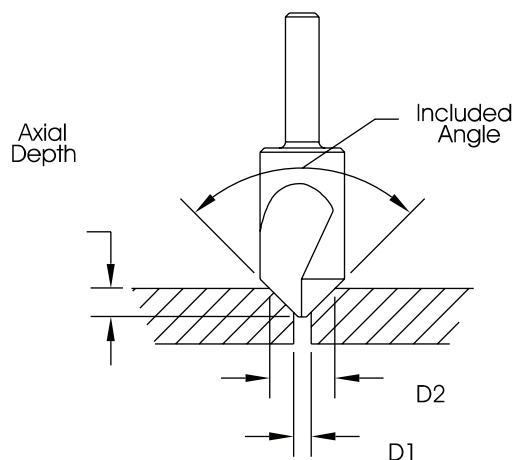
HSS & Carbide Countersinks

Minimum Body Diameter for 90° Flat Head Cap Screws (mm)

Cap Screw Size (mm)	Countersink Diameter (mm)
M3	7.0
M4	10.0
M5	12.0
M6	14.0
M8	19.0
M10	23.0
M12	31.0

Size Diameter Gain for every 0.025mm of Axial Depth in to a Pre-Drilled Hole

Included Angle	Axial Depth (mm)	Diameter Gain (mm)
30°	0.025	0.0127
45°	0.025	0.0203
60°	0.025	0.0254
82°	0.025	0.0432
90°	0.025	0.0508
100°	0.025	0.0711
120°	0.025	0.0864



$$\text{DIAMETER GAIN} = D2 - D1$$

Technical & Application Data

HSS & Carbide Countersinks

All M.A. Ford HSS countersinks are heat treated in an electronically controlled vacuum furnace. This assures precise hardening and eliminates the possibility of decarburization. All heat treating is done in our own facilities for maximum control and assurance of desired hardness and toughness.

Most M.A. Ford HSS countersinks receive an additional heat treat process known as the Steam Homogeneous Process. This process is like a final tempering, relieving internal grinding stresses. The result is a much tougher cutting edge that stays sharper, longer. Additionally, the Steam Homogeneous Process provides a tough, hard, porous oxide film on the tool that is sufficient enough to retain cutting oil, further reducing frictional heat and extending tool life.

Coated Countersinks



ALtima® Blaze



TiN coating

Coating Properties

	TiN	ALtima® Blaze
Micro Hardness (HV)	2300	3200
Max. Working Temperature	600° C 1112° F	1100° C 2012° F
Friction Coefficient	0.40	0.35

ALtima® Blaze

features high temperature hardness and oxidation resistance that provides extreme wear resistance under all machining conditions.

TiN

provides a higher surface hardness and increased lubricity over an uncoated tool.

Edgehog®

Carbide Burrs

For aggressive cutting action, smooth operation and long tool life, M.A. Ford Edgehog® carbide burrs are by far the most effective solution for even the most demanding de-burring and pre-finishing applications.

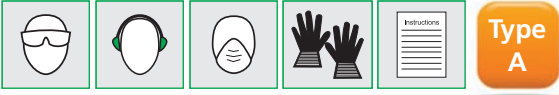
All of our solid tungsten carbide rotary burrs are manufactured to the most exacting tolerances so that they run smoother and providing a highly efficient cutting operation producing a better quality finish than is possible with alternative burr tooling, such as hand ground burrs.

There are well over 160 different tool shapes and sizes available in our Edgehog range of precision metric burrs range, including cylindrical, conical, ball and countersink styles to meet virtually every application.



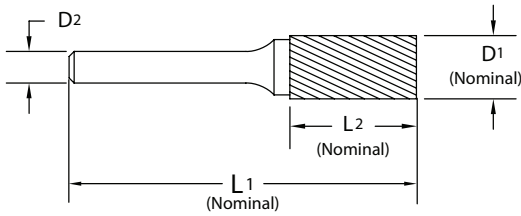
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Edgehog® Carbide Burrs Series SM	101
Edgehog® Carbide Burrs Series SN	102
Technical Information	103 - 104

Edgehog® Carbide Burrs



Cylinder

Series
SA



3mm Shank Burrs (Standard Length)

Tool Dimensions							
D ¹	D ²	L ²	L ¹	Standard Cut Tool No.	Alt Diamond Tool No.	Fine Cut Tool No.	Shear Cut Tool No.
1.6	3.0	6.0	38.0	SA-41M	SA-41M-D	SA-41M-F	-
2.4	3.0	11.1	38.0	SA-42M	SA-42M-D	SA-42M-F	-
3.0	3.0	14.3	38.0	SA-43M	SA-43M-D	SA-43M-F	-
4.0	3.0	12.7	38.0	SA-52M	SA-52M-D	SA-52M-F	-
4.8	3.0	12.7	38.0	SA-53M	SA-53M-D	SA-53M-F	-
6.4	3.0	12.7	51.0	SA-51M	SA-51M-D	SA-51M-F	-

6mm Shank Burrs (Standard Length)

Tool Dimensions							
D ¹	D ²	L ²	L ¹	Standard Cut Tool No.	Alt Diamond Tool No.	Fine Cut Tool No.	Shear Cut Tool No.
3.0	6.0	12.7	50.0	SA-11M	SA-11M-D	-	-
4.0	6.0	16.0	50.0	SA-13M	-	-	-
4.8	6.0	16.0	50.0	-	SA-14M-D	-	-
6.0	6.0	16.0	50.0	SA-1M	SA-1M-D	SA-1M-F	-
8.0	6.0	19.0	64.0	SA-2M	SA-2M-D	-	-
9.5	6.0	19.0	64.0	SA-3M	SA-3M-D	SA-3M-F	SA-3NFM
10.0	6.0	20.0	65.0	SA-3MZ	SA-3MZ-D	SA-3MZ-F	-
11.0	6.0	25.0	70.0	SA-4M	SA-4M-D	-	-
12.0	6.0	25.0	70.0	SA-5MZ	SA-5MZ-D	-	-
12.7	6.0	25.0	70.0	SA-5M	SA-5M-D	SA-5M-F	SA-5NFM
16.0	6.0	25.0	70.0	SA-6M	SA-6M-D	SA-6M-F	SA-6NFM
19.0	6.0	12.7	58.0	SA-15M	-	-	-
19.0	6.0	25.0	70.0	SA-7M	SA-7M-D	SA-7M-F	-
25.0	6.0	25.0	70.0	SA-9M	SA-9M-D	SA-9M-F	-



3mm Shank Burrs (Extended Length)

Tool Dimensions							
D ¹	D ²	L ²	L ¹	Standard Cut Tool No.	Alt Diamond Tool No.	Fine Cut Tool No.	Shear Cut Tool No.
3.0	3.0	14.3	76.0	SA-43L76M	SA-43L76M-D	-	-



Note: Burrs 12.0mm and above are available with an 8.0mm shank on request as a non-stock standard.

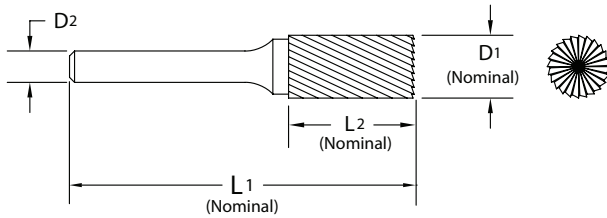
Edgehog® Carbide Burrs



Type B

Cylinder - With End Cut

Series
SB



3mm Shank Burrs (Standard Length)

Tool Dimensions							
D ¹	D ²	L ²	L ¹	Standard Cut Tool No.	Alt Diamond Tool No.	Fine Cut Tool No.	Shear Cut Tool No.
6.4	3.0	4.8	43.0	SB-51M	SB-51M-D	SB-51M-F	-

6mm Shank Burrs (Standard Length)

Tool Dimensions							
D ¹	D ²	L ²	L ¹	Standard Cut Tool No.	Alt Diamond Tool No.	Fine Cut Tool No.	Shear Cut Tool No.
3.0	6.0	12.7	50.0	SB-11M	SB-11M-D	-	-
4.0	6.0	16.0	50.0	SB-13M	SB-13M-D	-	-
4.8	6.0	16.0	50.0	-	SB-14M-D	-	-
6.0	6.0	16.0	50.0	SB-1M	SB-1M-D	SB-1M-F	-
8.0	6.0	19.0	64.0	SB-2M	SB-2M-D	SB-2M-F	-
9.5	6.0	19.0	64.0	SB-3M	SB-3M-D	SB-3M-F	SB-3NFM
10.0	6.0	20.0	65.0	SB-3MZ	SB-3MZ-D	SB-3MZ-F	-
11.0	6.0	25.0	70.0	SB-4M	SB-4M-D	-	-
12.0	6.0	25.0	70.0	SB-5MZ	SB-5MZ-D	SB-5MZ-F	-
12.7	6.0	25.0	70.0	SB-5M	SB-5M-D	-	SB-5NFM
16.0	6.0	25.0	70.0	SB-6M	SB-6M-D	-	-
19.0	6.0	19.0	64.0	-	SB-16M-D	-	-
19.0	6.0	25.0	70.0	-	SB-7M-D	SB-7M-F	-
25.0	6.0	25.0	70.0	SB-9M	SB-9M-D	-	-



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Note: Burrs 12.0mm and above are available with an 8.0mm shank on request as a non-stock standard.

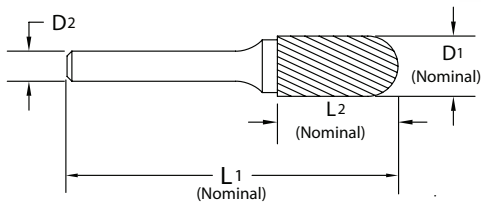
Edgehog® Carbide Burrs



Type
C

Ball Nosed Cylinder

Series
SC



3mm Shank Burrs (Standard Length)

Tool Dimensions							
D ¹	D ²	L ²	L ¹	Standard Cut Tool No.	Alt Diamond Tool No.	Fine Cut Tool No.	Shear Cut Tool No.
2.4	3.0	3.0	38.0	SC-41M	SC-41M-D	SC-41M-F	-
3.0	3.0	3.0	38.0	SC-42M	SC-42M-D	SC-42M-F	-
4.0	3.0	3.0	38.0	SC-52M	SC-52M-D	SC-52M-F	-
4.8	3.0	3.0	38.0	SC-53M	SC-53M-D	SC-53M-F	-
6.4	3.0	3.0	51.0	SC-51M	SC-51M-D	SC-51M-F	-

6mm Shank Burrs (Standard Length)

Tool Dimensions							
D ¹	D ²	L ²	L ¹	Standard Cut Tool No.	Alt Diamond Tool No.	Fine Cut Tool No.	Shear Cut Tool No.
3.0	6.0	12.7	50.0	-	SC-11M-D	-	-
4.0	6.0	16.0	50.0	SC-13M	SC-13M-D	-	-
4.8	6.0	16.0	50.0	SC-14M	SC-14M-D	-	-
6.0	6.0	16.0	50.0	SC-1M	SC-1M-D	SC-1M-F	-
8.0	6.0	19.0	64.0	SC-2M	SC-2M-D	SC-2M-F	-
9.5	6.0	19.0	64.0	SC-3M	SC-3M-D	SC-3M-F	SC-3NFM
10.0	6.0	20.0	65.0	SC-3MZ	SC-3MZ-D	SC-3MZ-F	-
11.0	6.0	25.0	70.0	SC-4M	SC-4M-D	-	-
12.0	6.0	25.0	70.0	SC-5MZ	SC-5MZ-D	SC-5MZ-F	-
12.7	6.0	25.0	70.0	SC-5M	SC-5M-D	SC-5M-F	SC-5NFM
16.0	6.0	25.0	70.0	SC-6M	SC-6M-D	SC-6M-F	SC-6NFM
19.0	6.0	25.0	70.0	SC-7M	SC-7M-D	-	-
25.0	6.0	25.0	70.0	SC-9M	SC-9M-D	-	-

3mm Shank Burrs (Extended Length)

Tool Dimensions							
D ¹	D ²	L ²	L ¹	Standard Cut Tool No.	Alt Diamond Tool No.	Fine Cut Tool No.	Shear Cut Tool No.
3.0	3.0	14.3	76.0	SC-42L76M	SC-42L76M-D	-	-

6mm Shank Burrs (Extended Length)

Tool Dimensions							
D ¹	D ²	L ²	L ¹	Standard Cut Tool No.	Alt Diamond Tool No.	Fine Cut Tool No.	Shear Cut Tool No.
6.0	6.0	16.0	166.0	SC-1L6M	-	-	-
9.5	6.0	19.0	169.0	SC-3L6M	-	-	-
12.7	6.0	25.0	175.0	SC-5L6M	SC-5L6M-D	SC-5L6M-F	-

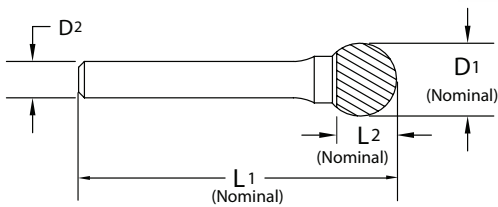
Note: Burrs 12.0mm and above are available with an 8.0mm shank on request as a non-stock standard.

Edgehog® Carbide Burrs



Ball

Series
SD



3mm Shank Burrs (Standard Length)

Tool Dimensions							
D ¹	D ²	L ²	L ¹	Standard Cut Tool No.	Alt Diamond Tool No.	Fine Cut Tool No.	Shear Cut Tool No.
2.4	3.0	2.0	38.0	SD-41M	SD-41M-D	SD-41M-F	-
3.0	3.0	2.8	38.0	SD-42M	SD-42M-D	SD-42M-F	-
4.8	3.0	4.0	38.0	SD-53M	SD-53M-D	SD-53M-F	-
6.4	3.0	5.6	44.0	SD-51M	SD-51M-D	SD-51M-F	-

6mm Shank Burrs (Standard Length)

Tool Dimensions							
D ¹	D ²	L ²	L ¹	Standard Cut Tool No.	Alt Diamond Tool No.	Fine Cut Tool No.	Shear Cut Tool No.
3.0	6.0	2.8	50.0	SD-11M	SD-11M-D	-	-
4.8	6.0	4.0	50.0	SD-14M	SD-14M-D	SD-14M-F	-
6.0	6.0	5.0	50.0	SD-1M	SD-1M-D	SD-1M-F	-
8.0	6.0	6.0	51.0	SD-2M	SD-2M-D	-	-
9.5	6.0	7.0	53.0	SD-3M	SD-3M-D	SD-3M-F	SD-3NFM
10.0	6.0	7.0	54.0	SD-3MZ	SD-3MZ-D	SD-3MZ-F	-
11.0	6.0	8.0	54.0	SD-4M	SD-4M-D	SD-4M-F	-
12.0	6.0	9.5	56.0	SD-5MZ	-	-	-
12.7	6.0	10.0	56.0	SD-5M	SD-5M-D	SD-5M-F	SD-5NFM
16.0	6.0	13.0	59.0	SD-6M	SD-6M-D	SD-6M-F	SD-6NFM
19.0	6.0	16.0	62.0	SD-7M	SD-7M-D	-	-
25.0	6.0	21.0	68.0	SD-9M	SD-9M-D	-	-

3mm Shank Burrs (Extended Length)

Tool Dimensions							
D ¹	D ²	L ²	L ¹	Standard Cut Tool No.	Alt Diamond Tool No.	Fine Cut Tool No.	Shear Cut Tool No.
3.0	3.0	2.8	76.0	SD-42L76M	SD-42L76M-D	-	-

6mm Shank Burrs (Extended Length)

Tool Dimensions							
D ¹	D ²	L ²	L ¹	Standard Cut Tool No.	Alt Diamond Tool No.	Fine Cut Tool No.	Shear Cut Tool No.
6.0	6.0	5.0	155.0	-	SD-1L6M-D	-	-
8.0	6.0	6.0	159.0	-	SD-2L6M-D	-	-
9.5	6.0	7.0	161.0	SD-3L6M	SD-3L6M-D	SD-3L6M-F	-
12.7	6.0	10.0	164.0	SD-5L6M	SD-5L6M-D	SD-5L6M-F	-



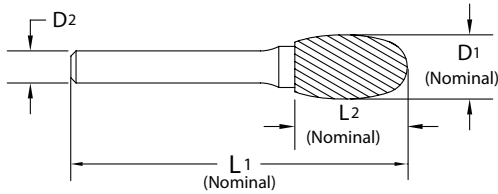
Note: Burrs 12.0mm and above are available with an 8.0mm shank on request as a non-stock standard.

Edgehog® Carbide Burrs



Oval

Series
SE



3mm Shank Burrs (Standard Length)

Tool Dimensions							
D ¹	D ²	L ²	L ¹	Standard Cut Tool No.	Alt Diamond Tool No.	Fine Cut Tool No.	Shear Cut Tool No.
3.0	3.0	5.6	38.0	SE-41M	SE-41M-D	SE-41M-F	-
4.8	3.0	7.0	38.0	SE-53M	SE-53M-D	-	-
6.4	3.0	9.5	48.0	SE-51M	SE-51M-D	SE-51M-F	-

6mm Shank Burrs (Standard Length)

Tool Dimensions							
D ¹	D ²	L ²	L ¹	Standard Cut Tool No.	Alt Diamond Tool No.	Fine Cut Tool No.	Shear Cut Tool No.
6.0	6.0	9.5	50.0	SE-1M	SE-1M-D	-	-
8.0	6.0	16.0	60.0	-	SE-2M-D	-	-
9.5	6.0	16.0	60.0	SE-3M	SE-3M-D	SE-3M-F	SE-3NFM
12.7	6.0	22.0	67.0	SE-5M	SE-5M-D	SE-5M-F	SE-5NFM
16.0	6.0	25.0	70.0	SE-6M	SE-6M-D	-	SE-6NFM
19.0	6.0	25.0	70.0	SE-7M	SE-7M-D	-	-

3mm Shank Burrs (Extended Length)

Tool Dimensions							
D ¹	D ²	L ²	L ¹	Standard Cut Tool No.	Alt Diamond Tool No.	Fine Cut Tool No.	Shear Cut Tool No.
3.0	3.0	5.6	76.0	SE-41L76M	-	-	-

6mm Shank Burrs (Extended Length)

Tool Dimensions							
D ¹	D ²	L ²	L ¹	Standard Cut Tool No.	Alt Diamond Tool No.	Fine Cut Tool No.	Shear Cut Tool No.
9.5	6.0	16.0	166.0	SE-3L6M	SE-3L6M-D	-	-
12.7	6.0	22.0	172.0	SE-5L6M	SE-5L6M-D	-	-

Note: Burrs 12.0mm and above are available with an 8.0mm shank on request as a non-stock standard.

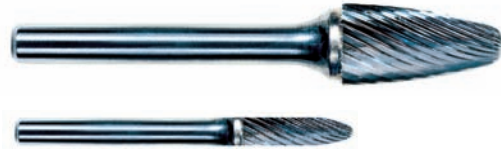
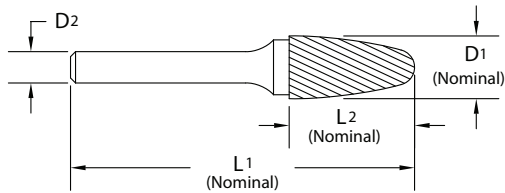
Edgehog® Carbide Burrs



Type
F

Ball Nosed Tree

Series
SF



3mm Shank Burrs (Standard Length)

Tool Dimensions							
D ¹	D ²	L ²	L ¹	Standard Cut Tool No.	Alt Diamond Tool No.	Fine Cut Tool No.	Shear Cut Tool No.
3.0	3.0	6.0	38.0	SF-41M	SF-41M-D	SF-41M-F	-
3.0	3.0	12.7	38.0	SF-42M	SF-42M-D	SF-42M-F	-
4.8	3.0	12.7	38.0	SF-53M	SF-53M-D	SF-53M-F	-
6.4	3.0	12.7	51.0	SF-51M	SF-51M-D	SF-51M-F	-

6mm Shank Burrs (Standard Length)

Tool Dimensions							
D ¹	D ²	L ²	L ¹	Standard Cut Tool No.	Alt Diamond Tool No.	Fine Cut Tool No.	Shear Cut Tool No.
3.0	6.0	12.7	50.0	SF-11M	SF-11M-D	SF-11M-F	-
6.0	6.0	16.0	50.0	SF-1M	SF-1M-D	SF-1M-F	-
9.5	6.0	19.0	64.0	SF-3M	SF-3M-D	-	SF-3NFM
11.0	6.0	25.0	70.0	SF-4M	SF-4M-D	-	-
12.0	6.0	25.0	70.0	SF-5MZ	SF-5MZ-D	SF-5MZ-F	-
12.7	6.0	19.0	64.0	SF-13M	SF-13M-D	SF-13M-F	-
12.7	6.0	25.0	70.0	SF-5M	SF-5M-D	SF-5M-F	SF-5NFM
16.0	6.0	25.0	70.0	SF-6M	SF-6M-D	SF-6M-F	SF-6NFM
19.0	6.0	25.0	70.0	SF-7M	SF-7M-D	SF-7M-F	-
19.0	6.0	31.0	76.0	SF-14M	SF-14M-D	-	-

3mm Shank Burrs (Extended Length)

Tool Dimensions							
D ¹	D ²	L ²	L ¹	Standard Cut Tool No.	Alt Diamond Tool No.	Fine Cut Tool No.	Shear Cut Tool No.
3.0	3.0	12.7	76.0	SF-42L76M	SF-42L76M-D	-	-

6mm Shank Burrs (Extended Length)

Tool Dimensions							
D ¹	D ²	L ²	L ¹	Standard Cut Tool No.	Alt Diamond Tool No.	Fine Cut Tool No.	Shear Cut Tool No.
6.0	6.0	16.0	166.0	SF-1L6M	SF-1L6M-D	SF-1L6M-F	-
9.5	6.0	19.0	169.0	SF-3L6M	SF-3L6M-D	-	-
12.7	6.0	25.0	175.0	SF-5L6M	SF-5L6M-D	-	-

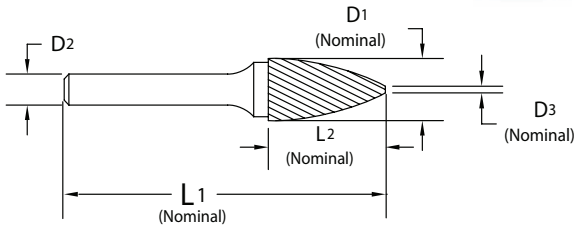
Note: Burrs 12.0mm and above are available with an 8.0mm shank on request as a non-stock standard.

Edgehog® Carbide Burrs



Tree

Series
SG



3mm Shank Burrs (Standard Length)

Tool Dimensions								
D ¹	D ²	L ²	L ¹	D ³	Standard Cut Tool No.	Alt Diamond Tool No.	Fine Cut Tool No.	Shear Cut Tool No.
3.0	3.0	6.0	38.0	0.46	SG-41M	SG-41M-D	SG-41M-F	-
3.0	3.0	8.0	38.0	0.46	SG-42M	SG-42M-D	SG-42M-F	-
3.0	3.0	9.5	38.0	0.46	SG-43M	SG-43M-D	SG-43M-F	-
4.8	3.0	12.7	38.0	0.64	SG-53M	SG-53M-D	SG-53M-F	-
6.4	3.0	12.7	51.0	0.76	SG-51M	SG-51M-D	SG-51M-F	-

6mm Shank Burrs (Standard Length)

Tool Dimensions								
D ¹	D ²	L ²	L ¹	D ³	Standard Cut Tool No.	Alt Diamond Tool No.	Fine Cut Tool No.	Shear Cut Tool No.
6.0	6.0	16.0	50.0	0.76	SG-1M	SG-1M-D	SG-1M-F	-
8.0	6.0	19.0	64.0	1.02	SG-2M	SG-2M-D	SG-2M-F	-
9.5	6.0	19.0	64.0	1.02	SG-3M	SG-3M-D	SG-3M-F	-
10.0	6.0	20.0	65.0	1.14	SG-3MZ	SG-3MZ-D	SG-3MZ-F	-
12.0	6.0	25.0	70.0	1.27	SG-5MZ	SG-5MZ-D	SG-5MZ-F	-
12.7	6.0	19.0	64.0	1.27	SG-13M	SG-13M-D	SG-13M-F	-
12.7	6.0	25.0	70.0	1.27	SG-5M	SG-5M-D	SG-5M-F	-
16.0	6.0	25.0	70.0	1.27	SG-6M	SG-6M-D	SG-6M-F	-
19.0	6.0	25.0	70.0	1.27	SG-7M	SG-7M-D	SG-7M-F	-
19.0	6.0	38.0	84.0	1.78	SG-15M	SG-15M-D	SG-15M-F	-



3mm Shank Burrs (Extended Length)

Tool Dimensions								
D ¹	D ²	L ²	L ¹	D ³	Standard Cut Tool No.	Alt Diamond Tool No.	Fine Cut Tool No.	Shear Cut Tool No.
3.0	3.0	8.0	76.0	0.46	SG-42L76M	SG-42L76M-D	-	-
3.0	3.0	9.5	76.0	0.46	SG-43L76M	SG-43L76M-D	-	-



6mm Shank Burrs (Extended Length)

Tool Dimensions								
D ¹	D ²	L ²	L ¹	D ³	Standard Cut Tool No.	Alt Diamond Tool No.	Fine Cut Tool No.	Shear Cut Tool No.
6.0	6.0	16.0	166.0	0.76	SG-1L6M	SG-1L6M-D	SG-1L6M-F	-
9.5	6.0	19.0	169.0	1.02	-	SG-3L6M-D	SG-3L6M-F	-
12.7	6.0	25.0	175.0	1.27	-	SG-5L6M-D	SG-5L6M-F	-

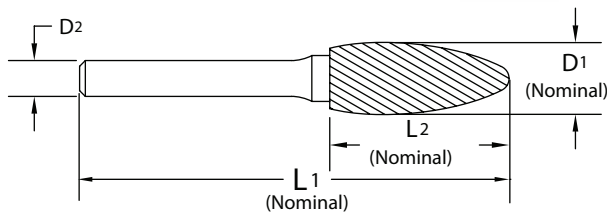
Note: Burrs 12.0mm and above are available with an 8.0mm shank on request as a non-stock standard.

Edgehog® Carbide Burrs



Flame

Series
SH



3mm Shank Burrs (Standard Length)

Tool Dimensions							
D ¹	D ²	L ²	L ¹	Standard Cut Tool No.	Alt Diamond Tool No.	Fine Cut Tool No.	Shear Cut Tool No.
3.0	3.0	6.0	38.0	SH-41M	SH-41M-D	SH-41M-F	-
4.8	3.0	9.5	38.0	SH-53M	SH-53M-D	SH-53M-F	-

6mm Shank Burrs (Standard Length)

Tool Dimensions							
D ¹	D ²	L ²	L ¹	Standard Cut Tool No.	Alt Diamond Tool No.	Fine Cut Tool No.	Shear Cut Tool No.
6.0	6.0	16.0	50.0	SH-1M	SH-1M-D	SH-1M-F	-
8.0	6.0	19.0	64.0	SH-2M	SH-2M-D	SH-2M-F	-
12.7	6.0	31.0	76.0	SH-5M	SH-5M-D	SH-5M-F	-
16.0	6.0	36.0	81.0	SH-6M	SH-6M-D	SH-6M-F	-
19.0	6.0	41.0	86.0	SH-7M	SH-7M-D	SH-7M-F	-

3mm Shank Burrs (Extended Length)

Tool Dimensions							
D ¹	D ²	L ²	L ¹	Standard Cut Tool No.	Alt Diamond Tool No.	Fine Cut Tool No.	Shear Cut Tool No.
3.0	3.0	6.0	76.0	SH-41L76M	SH-41L76M-D	-	-

6mm Shank Burrs (Extended Length)

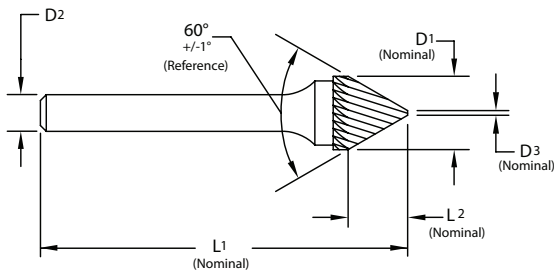
Tool Dimensions							
D ¹	D ²	L ²	L ¹	Standard Cut Tool No.	Alt Diamond Tool No.	Fine Cut Tool No.	Shear Cut Tool No.
8.0	6.0	19.0	169.0	SH-2L6M	SH-2L6M-D	SH-2L6M-F	-
12.7	6.0	31.0	181.0	SH-5L6M	SH-5L6M-D	SH-5L6M-F	-

Edgehog® Carbide Burrs



Countersink 60°

Series
SJ



3mm Shank Burrs (Standard Length)

Tool Dimensions							
D ¹	D ²	L ²	L ¹	Standard Cut Tool No.	Alt Diamond Tool No.	Fine Cut Tool No.	Shear Cut Tool No.
3.0	3.0	2.4	38.0	SJ-42M	SJ-42M-D	SJ-42M-F	-
3.0	3.0	2.4	38.0	-	SJ-82M-D*	-	-

* SJ-82M-D is double ended

6mm Shank Burrs (Standard Length)

Tool Dimensions							
D ¹	D ²	L ²	L ¹	Standard Cut Tool No.	Alt Diamond Tool No.	Fine Cut Tool No.	Shear Cut Tool No.
6.0	6.0	4.8	50.0	SJ-1M	SJ-1M-D	-	-
9.5	6.0	8.0	55.0	SJ-3M	SJ-3M-D	-	-
12.7	6.0	11.0	58.0	SJ-5M	SJ-5M-D	-	-
16.0	6.0	12.7	62.0	SJ-6M	SJ-6M-D	-	-
19.0	6.0	14.0	64.0	SJ-7M	SJ-7M-D	-	-
25.0	6.0	21.0	70.0	SJ-9M	SJ-9M-D	-	-



Note: Burrs 12.0mm and above are available with an 8.0mm shank on request as a non-stock standard.

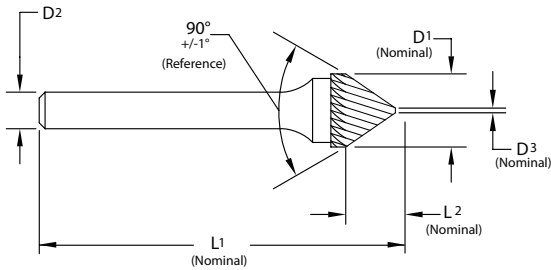
Edgehog® Carbide Burrs



Type
K

Countersink 90°

Series
SK



3mm Shank Burrs (Standard Length)

Tool Dimensions							
D ¹	D ²	L ²	L ¹	Standard Cut Tool No.	Alt Diamond Tool No.	Fine Cut Tool No.	Shear Cut Tool No.
3.0	3.0	1.6	38.0	SK-42M	SK-42M-D	-	-
3.0	3.0	1.6	38.0	SK-82M*	SK-82M-D*	-	-

* SK-82M is double ended

6mm Shank Burrs (Standard Length)

Tool Dimensions							
D ¹	D ²	L ²	L ¹	Standard Cut Tool No.	Alt Diamond Tool No.	Fine Cut Tool No.	Shear Cut Tool No.
6.0	6.0	3.0	50.0	SK-1M	SK-1M-D	-	-
9.5	6.0	4.8	52.0	SK-3M	SK-3M-D	-	-
12.7	6.0	6.4	53.0	SK-5M	SK-5M-D	-	-
16.0	6.0	8.0	56.0	SK-6M	SK-6M-D	-	-
19.0	6.0	9.5	58.0	SK-7M	SK-7M-D	-	-
25.0	6.0	12.7	61.0	SK-9M	SK-9M-D	-	-



Note: Burrs 12.0mm and above are available with an 8.0mm shank on request as a non-stock standard.

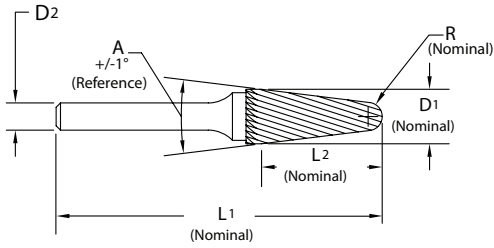
Edgehog® Carbide Burrs



Type
L

Ball Nosed Cone

Series
SL



3mm Shank Burrs (Standard Length)

Tool Dimensions								
D ¹	D ²	L ²	L ¹	A°	Standard Cut Tool No.	Alt Diamond Tool No.	Fine Cut Tool No.	Shear Cut Tool No.
3.0	3.0	9.5	38.0	8°	SL-41M	SL-41M-D	SL-41M-F	-
3.0	3.0	12.7	38.0	8°	SL-42M	SL-42M-D	SL-42M-F	-
4.8	3.0	12.7	38.0	14°	SL-53M	SL-53M-D	SL-53M-F	-

6mm Shank Burrs (Standard Length)

Tool Dimensions								
D ¹	D ²	L ²	L ¹	A°	Standard Cut Tool No.	Alt Diamond Tool No.	Fine Cut Tool No.	Shear Cut Tool No.
6.0	6.0	16.0	50.0	14°	SL-1M	SL-1M-D	SL-1M-F	-
8.0	6.0	24.0	71.0	14°	SL-2M	SL-2M-D	SL-2M-F	-
9.5	6.0	28.0	75.0	14°	SL-3M	SL-3M-D	SL-3M-F	SL-3NFM
12.7	6.0	30.0	76.0	14°	SL-4M	SL-4M-D	SL-4M-F	SL-4NFM
16.0	6.0	33.0	80.0	14°	-	SL-6M-D	SL-6M-F	SL-6NFM
19.0	6.0	39.0	86.0	14°	SL-7M	SL-7M-D	SL-7M-F	-



3mm Shank Burrs (Extended Length)

Tool Dimensions								
D ¹	D ²	L ²	L ¹	A°	Standard Cut Tool No.	Alt Diamond Tool No.	Fine Cut Tool No.	Shear Cut Tool No.
3.0	3.0	12.7	76.0	8°	SL-42L76M	SL-42L76M-D	-	-



6mm Shank Burrs (Extended Length)

Tool Dimensions								
D ¹	D ²	L ²	L ¹	A°	Standard Cut Tool No.	Alt Diamond Tool No.	Fine Cut Tool No.	Shear Cut Tool No.
8.0	6.0	24.0	176.0	14°	-	-	SL-2L6M-F	-
9.5	6.0	28.0	180.0	14°	SL-3L6M	SL-3L6M-D	SL-3L6M-F	-
12.7	6.0	30.0	182.0	14°	SL-4L6M	SL-4L6M-D	SL-4L6M-F	-

Note: Burrs 12.0mm and above are available with an 8.0mm shank on request as a non-stock standard.

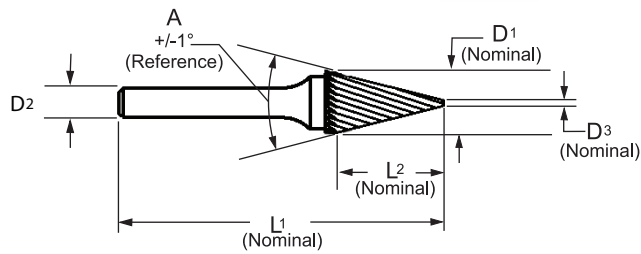
Edgehog® Carbide Burrs



Type
M

Cone

Series
SM



3mm Shank Burrs (Standard Length)

Tool Dimensions									
D ¹	D ²	L ²	L ¹	A°	D ³	Standard Cut Tool No.	Alt Diamond Tool No.	Fine Cut Tool No.	Shear Cut Tool No.
3.0	3.0	4.8	38.0	32°	0.46	SM-45M	SM-45M-D	SM-45M-F	-
3.0	3.0	9.5	38.0	12°	1.09	SM-41M	SM-41M-D	SM-41M-F	-
3.0	3.0	11.1	38.0	14°	0.36	SM-42M	SM-42M-D	SM-42M-F	-
3.0	3.0	16.0	38.0	7°	1.14	SM-43M	SM-43M-D	SM-43M-F	-
4.8	3.0	12.7	38.0	16°	0.97	SM-53M	SM-53M-D	SM-53M-F	-
6.4	3.0	12.7	54.0	22°	1.32	SM-51M	SM-51M-D	SM-51M-F	-

6mm Shank Burrs (Standard Length)

Tool Dimensions									
D ¹	D ²	L ²	L ¹	A°	D ³	Standard Cut Tool No.	Alt Diamond Tool No.	Fine Cut Tool No.	Shear Cut Tool No.
6.0	6.0	12.7	50.0	22°	1.17	SM-1M	SM-1M-D	SM-1M-F	-
6.0	6.0	19.0	50.0	14°	1.42	SM-2M	SM-2M-D	SM-2M-F	-
6.0	6.0	25.0	50.0	10°	1.65	SM-3M	SM-3M-D	SM-3M-F	-
9.5	6.0	16.0	63.0	28°	1.32	SM-4M	SM-4M-D	SM-4M-F	-
12.7	6.0	22.0	69.0	28°	1.32	SM-5M	SM-5M-D	SM-5M-F	-
16.0	6.0	25.0	72.0	31°	1.52	SM-6M	SM-6M-D	SM-6M-F	-



3mm Shank Burrs (Extended Length)

Tool Dimensions									
D ¹	D ²	L ²	L ¹	A°	D ³	Standard Cut Tool No.	Alt Diamond Tool No.	Fine Cut Tool No.	Shear Cut Tool No.
3.0	3.0	11.0	76.0	14°	0.36	SM-42L76M	SM-42L76M-D	-	-



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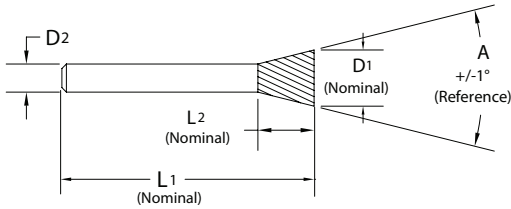
Note: Burrs 12.0mm and above are available with an 8.0mm shank on request as a non-stock standard.

Edgehog® Carbide Burrs



Inverted Cone

Series
SN



3mm Shank Burrs (Standard Length)

Tool Dimensions								
D ¹	D ²	L ²	L ¹	A°	Standard Cut Tool No.	Alt Diamond Tool No.	Fine Cut Tool No.	Shear Cut Tool No.
2.4	3.0	3.0	38.0	10°	SN-41M	SN-41M-D	SN-41M-F	-
3.0	3.0	4.8	38.0	10°	SN-42M	SN-42M-D	SN-42M-F	-
4.8	3.0	6.4	38.0	10°	SN-53M	SN-53M-D	SN-53M-F	-
6.4	3.0	6.4	44.0	10°	SN-51M	SN-51M-D	SN-51M-F	-

6mm Shank Burrs (Standard Length)

Tool Dimensions								
D ¹	D ²	L ²	L ¹	A°	Standard Cut Tool No.	Alt Diamond Tool No.	Fine Cut Tool No.	Shear Cut Tool No.
6.0	6.0	8.0	50.0	10°	-	SN-1M-D	SN-1M-F	-
9.5	6.0	9.5	55.0	13°	SN-2M	SN-2M-D	SN-2M-F	-
12.7	6.0	12.7	58.0	28°	SN-4M	SN-4M-D	SN-4M-F	-
16.0	6.0	19.0	64.0	18°	SN-6M	SN-6M-D	SN-6M-F	-
19.0	6.0	16.0	61.0	30°	-	SN-7M-D	SN-7M-F	-



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Note: Burrs 12.0mm and above are available with an 8.0mm shank on request as a non-stock standard.

Technical Data

Carbide Burrs

Burr Fluting Chart

Number Of Flutes (± 10%)			
Burr Ø	Standard Cut	Fine Cut	Shear Cut
1.6	10	12	-
2.0	10	12	-
2.4	12	16	-
3.0	12	20	-
4.0	14	24	-
4.8	15	24	-
6.0	16	25	-
8.0	18	30	-
9.5	20	30	6
11.0	22	30	-
12.7	24	35	8*
16.0	26	40	8**
19.0	30	40	-
25.0	35	45	-

* Except SL-4NFM - 6 Flutes

** Except SD-6NFM, SE-6NFM and SF-6NFM - 10 Flutes.

Alternate Diamond Grind - LH Fluting 40% of RH Fluting
Diamond Grind - LH Fluting 80% of RH Fluting.

Recommended Operating Speeds

Burr Diameter Ø mm	Operating Speed RPM	
	From	To
3.0	45,000	90,000
6.0	23,000	45,000
9.5	19,000	30,000
12.7	15,000	22,000
16.0	12,000	18,000
19.0	7,500	15,000

The speed guidelines above are general recommendations.
Speeds may require adjusting based on material and application.

Burr Application By Material

Material	Standard Cut	Alt Diamond Cut	Fine Cut	Shear Cut
Aluminium	•	•	-	•
Brass, Bronze, Copper	•	•	-	-
Carbon	•	-	-	-
Cast Iron	•	-	-	-
Fibreglass	•	-	-	-
Hard Rubber	•	-	-	•
Magnesium	-	-	-	•
Masonite	•	-	-	•
Plastics	•	-	-	•
Steels - 40-60HRc	•	•	•	-
Steels, Alloy Steels	•	•	-	-
Nickel/Chrome Steels	•	•	-	-
Stainless Steels	•	•	•	-
Steel Weldments	•	•	-	-
Titanium	•	•	-	-
Wood	-	-	-	•
Zinc	-	-	-	•

Technical & Application Data

Carbide Burrs

Problems and Solutions

Possible Causes

Problem		Excessive Force	Shank Friction With Workpiece	Worn Burr	Incorrect Collet Location	Worn Grinder Bearings	Poor Shank Straightness	Unstable Workpiece	Working in Soft Materials	Cutting Abrasive Material	Low Setup Rigidity
	Broken Brazed Joint	•	•	•	-	-	-	-	-	-	-
	Poor Burr Control	-	-	-	•	•	•	•	-	-	•
	Flutes Clogging	-	-	-	-	-	-	-	•	-	-
	Excessive Vibration	-	-	-	•	•	•	•	-	-	•
	Poor Finish	-	-	-	•	•	•	•	•	-	•
	Poor Tool Life	-	•	-	•	•	•	•	-	•	•

Possible Causes

Problem		Reduce Cutting Pressure	Ensure Shank / Workpiece Clearance	Replace Worn Burr	Check Burr Location & Replace Collet if Necessary	Check & Replace Grinder Bearings if Necessary	Check Shank Straightness - Replace Burr if Necessary	Improve Workpiece Stability	Use a Coarser Cut Burr
	Broken Brazed Joint	•	•	•	-	-	-	-	-
	Poor Burr Control	-	-	-	•	•	•	•	-
	Flutes Clogging	-	-	-	-	-	-	-	•
	Excessive Vibration	-	-	-	•	•	•	•	-
	Poor Finish	-	-	-	•	•	•	•	-
	Poor Tool Life	-	•	-	•	•	•	-	-

Possible Causes

Problem		Use Lubricant or Anti-Sticking Agent	Increase RPM	Reduce RPM	Make Lighter Cuts	Change to a Finer Cut Burr	Faster Feed	Slower Feed
	Broken Brazed Joint	-	-	-	-	-	-	-
	Poor Burr Control	-	-	-	-	-	-	-
	Flutes Clogging	•	•	•	•	-	-	-
	Excessive Vibration	-	•	•	-	-	•	•
	Poor Finish	-	•	•	-	•	•	•
	Poor Tool Life	•	-	•	-	•	•	•



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