

**2014
THIRD EDITION
FULL-LINE CATALOG**



Carbide | Cobalt | Powder Metal | HSS
Endmills | Drills | Routers | Drill Mills | Specials Per Print

PRECISION CUTTING TOOLS, INC.

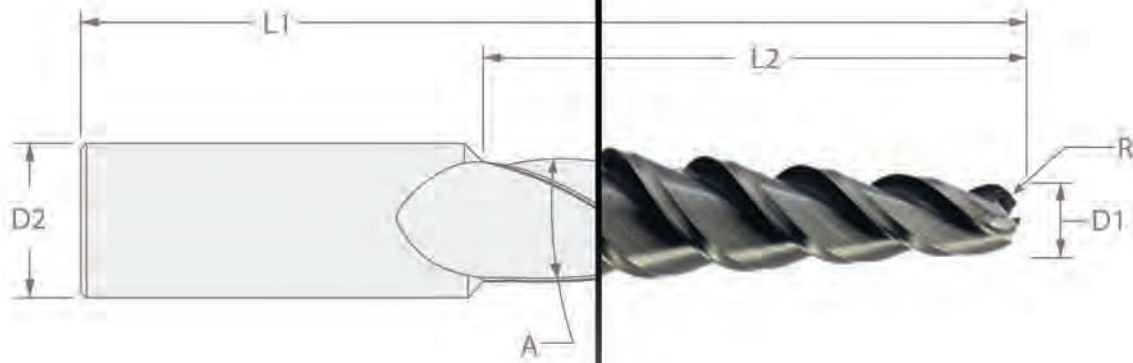


CUTTING **TOOL** **SOLUTIONS**

PCTCUTTERS.COM

Proudly Manufactured in the United States of America






E[SPECIAL]LY

Made for you


At PCT customer satisfaction is our number one priority. We understand that we serve different customers with different needs. To better serve our customers, we create Per-Print Specials upon request. **We offer a 2-3 day turnaround for the majority of our special tools.

2-3 Day Turnaround
 most specials

DRILL FORM
 REQUEST FOR QUOTATION


 PRECISION CUTTING TOOLS USA, INC.
 13701 Excelsior Drive, Santa Fe Springs, CA 90670

Please complete the information below and submit your DRILL FORM.
 If you have any questions contact one of our sales Representatives at (562) 921-7898.



Tolerances per Customer		
D1	Diameter	±
D2	Shank Diameter	±
L2	Length of Flute	±
L1	Overall Length	±
	# of Flutes	
DP	Drill Point Angle	±

*Tolerances are specified with the tolerances according to ISO standards

Material: Carbide

Coating (Please Select)
 VariMetric Eccotek Plus VariMetric Supra Z-Protect TiCN TiN

Spiral (Please Select)
 RHS LHS
 Helix Angle: _____

Coolant Fed (Please Select)
 YES NO

Quantity: _____ Price: _____ Application: _____ Delivery Time: _____

Additional Information: _____

Company: _____ Contact: _____
 Street: _____ City, State, ZIP: _____
 Telephone: _____ Fax: _____ Email: _____
 Customer Number: _____ Signature: _____ Date: _____

Submit Form: Email: sales1@pctcutters.com Fax: (562) 926-0156 Tel: (562) 921-7898

4 ways to order

- Tel. (562)921-7898
- Fax. (562)926-0156
- sales@pctcutters.com
- pctcutters.com/pct_build_tool.aspx



Visit us online to find over
 40 pre-made prints to create your SPECIAL.

Scan this code
 and get started

www.pctcutters.com/pct_build_tool.aspx

CONTENTS








CARBIDE DRILLS	Pages 18-115
EXTERNAL COOLANT CARBIDE DRILLS	18-60
INTERNAL COOLANT CARBIDE DRILLS	61-115
TECHNICAL INFORMATION	116-119
CARBIDE ENDMILLS	Pages 120-187
VARIABLE ENDMILLS	122-133
HIGH PERFORMANCE MACHINING +	134-137
HIGH PERFORMANCE ENDMILLS	138-161
STANDARD ENDMILLS	162-179
METRIC	180-187
CARBIDE ROUTERS	Pages 188-189
CARBIDE DRILL MILLS	Pages 190-193
CUTTING DATA FORMULA	Page 194
RE-SHARPENING SERVICES	Page 195
POWDER METAL COBALT HIGH SPEED ENDMILLS	Pages 196-241
POWDER METAL (PM30) ENDMILLS	196-204
POWDER METAL (PM4) ENDMILLS	206-210
COBALT (M42) ENDMILLS	212-231
HIGH SPEED STEEL (M7) ENDMILLS	232-241
ENDMILLS - TECHNICAL INFORMATION	242-243
TRACK YOUR ORDER	Page 244
MATERIAL CODE	Pages 245-246
IN-HOUSE COATING	Pages 248-249

MATERIAL CODE

P	1	Low-Carbon Steels- 1000 Series (>25 HRc)
	2	Low-Carbon Steels- 1000 Series (<25 HRc)
	3	Alloy Tool Steels- 1300,2000, 3000 (≤35HRc)
	4	Alloy Tool Steels- 1300,2000, 3000 (36-48 HRc)
	5	Ferritic, Martensitic & PH Stainless Steels- 400's,pH Types(15-5, 13-8, 17-4) (≤35HRc)
	6	Ferritic, Martensitic & PH Stainless Steels- 400's,pH Types(15-5, 13-8, 17-4)(36-48 HRc)
M	1	Austenitic Stainless Steels- Inox, 200 Series, 300 Series and 304L
	2	Austenitic Stainless Steels & Cast Stainless Steels- 310, 314, 316 (<25HRc)
	3	Duplex Steel (Austenitic & Ferritic)- 323, 329, F55, 2205
K	1	Gray Cast Iron
	2	Ductile Iron- 60-40-18, 65-45-12 (<28HRc)
	3	Ductile Iron- 32510, 35018 (<38HRc)
N	1	Wrought Aluminum Alloys
	2	Low-Silicon Aluminum Alloys Si <12.2% - 6061, 7075
	3	High-Silicon Aluminum Alloys Si >12.2% -6061, 7075
	4	Metal Matrix Composite (Glass Filament Epoxy,Fiber Glass, Graphite)
	5	Copper & Copper Alloys
	6	Carbon & Graphite Composites
S	1	Iron-Based, Heat-Resistant Alloys- Incoloy 800-802, A-286, N-155
	2	Nickel Based, Cobalt Based, Heat-Resistant Alloys- Haynes 188,Haynes 21, Hastelloy, Waspaloy, Inconel 625/718 (≤48 HRc)
	4	Titanium Alloys- Commercially Pure, 6Al-4V, Astm 1/2/3, Ti-6Al-2Sn-4Zr-2Mo (≤48 HRc)
H	1	Hardened Tool Steels- H Series(10,11,13), D Series (2,3), 4340, P20 (≤48 HRc)
	2	Hardened Tool Steels H Series(10,11,13), D Series (2,3), 4340, P20 (48-55 HRc)
	3	Hardened Tool Steels H Series(10,11,13), D Series (2,3), 4340, P20 (56-60 HRc)
	4	Hardened Tool Steels H Series(10,11,13), D Series (2,3), 4340, P20 (60-62 HRc) H Series(10,11,13), D Series (2,3), 4340, P20 (62-64 HRc)

SOLID CARBIDE DRILLS

EXTERNAL COOLANT CARBIDE DRILLS		
SX		General Purpose
TX		Multi-Purpose
AX		Aluminum
CX		Aluminum
DX		Steels
HX		Hardened Materials
SD		Spotting Drills

INTERNAL COOLANT CARBIDE DRILLS		
GXC		General Purpose
SXC		General Purpose
TXC		Multi-Purpose
AXC		Aluminum
CXC		Aluminum
HXC		Hardened Materials
PILOT DRILL		(All deep hole drills must utilize a pilot hole drill)

SOLID CARBIDE DRILLS










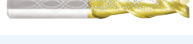









Series		Depths	Flutes	Helix	Point	Page
SX SERIES Fractional/Metric	P M K S	3xD, 5xD	2	30°	135°	20
TX SERIES Fractional/Metric	P M N S	3xD, 5xD	2	38°	140°	26
AX SERIES Fractional/Metric	K N	3xD, 5xD	2	15°	135°	32
CX SERIES Fractional/Metric	K N	3xD, 5xD	3	30°	130°	38
DX SERIES Fractional/Metric	P K	3xD, 5xD, 8xD, 12xD	2	30°	140°	44
HX SERIES Fractional/Metric	P K H	3xD, 5xD	2	30°	140°	52
SD SERIES Fractional/Metric	P M K N S	Spotting Drills	-	-	-	58

Series		Depths	Flutes	Helix	Point	Page
GXC SERIES Fractional/Metric	P M K S	3xD, 5xD, 8xD	2	30°	135°	62
SXC SERIES Fractional/Metric	P M K S	12xD, 16xD, 20xD 25xD, 30xD	2	30°	135°	70
TXC SERIES Fractional/Metric	P M N S	3xD, 5xD	2	38°	140°	80
AXC SERIES Fractional/Metric	K N	3xD, 5xD, 8xD, 12xD 16xD, 20xD, 25xD, 30xD	2	15°	135°	86
CXC SERIES Fractional/Metric	K N	3xD, 5xD	3	30°	130°	102
HXC SERIES Fractional/Metric	P K H	3xD, 5xD	2	30°	140°	108
PILOT DRILL	P M K N S	5xD	2	30°	140°	114

MATERIAL CODE

P	1	Low-Carbon Steels- 1000 Series (>25 HRc)
	2	Low-Carbon Steels- 1000 Series (<25 HRc)
	3	Alloy Tool Steels- 1300,2000, 3000 (≤35HRc)
	4	Alloy Tool Steels- 1300,2000, 3000 (36-48 HRc)
	5	Ferritic, Martensitic & PH Stainless Steels- 400's,pH Types(15-5, 13-8, 17-4) (≤35HRc)
	6	Ferritic, Martensitic & PH Stainless Steels- 400's,pH Types(15-5, 13-8, 17-4)(36-48 HRc)
M	1	Austenitic Stainless Steels- Inox, 200 Series, 300 Series and 304L
	2	Austenitic Stainless Steels & Cast Stainless Steels- 310, 314, 316 (<25HRc)
	3	Duplex Steels (Austenitic & Ferritic)- 323, 329, F55, 2205
K	1	Gray Cast Iron
	2	Ductile Iron- 60-40-18, 65-45-12 (<28HRc)
	3	Ductile Iron- 32510, 35018 (<38HRc)
N	1	Wrought Aluminum Alloys
	2	Low-Silicon Aluminum Alloys - Si <12.2% - 6061, 7075
	3	High-Silicon Aluminum Alloys - Si >12.2% -6061, 7075
	4	Metal Matrix Composite - (Glass Filament Epoxy,Fiber Glass, Graphite)
	5	Copper & Copper Alloys
	6	Carbon & Graphite Composites
S	1	Iron-Based, Heat-Resistant Alloys- Incoloy 800-802, A-286, N-155
	2	Nickel Based, Cobalt Based, Heat-Resistant Alloys- Haynes 188,Haynes 21, Hastelloy, Waspaloy, Inconel 625/718 (≤48 HRc)
	4	Titanium Alloys- Commercially Pure, 6Al-4V, Astm 1/2/3, Ti-6Al-2Sn-4Zr-2Mo (≤48 HRc)
H	1	Hardened Tool Steels- H Series(10,11,13), D Series (2,3), 4340, P20 (≤48 HRc)
	2	Hardened Tool Steels- H Series(10,11,13), D Series (2,3), 4340, P20 (48-55 HRc)
	3	Hardened Tool Steels- H Series(10,11,13), D Series (2,3), 4340, P20 (56-60 HRc)
	4	Hardened Tool Steels- H Series(10,11,13), D Series (2,3), 4340, P20 (60-62 HRc) H Series(10,11,13), D Series (2,3), 4340, P20 (62-64 HRc)

SOLID CARBIDE ENDMILLS

VARIABLE ENDMILLS		Flutes	Helix Angle
	SERIES 360 Finishing	3	-
	SERIES 451 Finishing	4	-
	SERIES 453 Roughing	4	-
	SERIES 538 Finishing	5	38°
	SERIES 558 Finishing	5	35°
	SERIES 374 Finishing	6	-
HIGH PERFORMANCE MACHINING ENDMILLS (HPM+)		Flutes	Helix Angle
	SERIES H235 Finishing	2	35°
	SERIES H337 Finishing	3	37°
HIGH PERFORMANCE ENDMILLS		Flutes	Helix Angle
	SERIES 224 Finishing	2	45°
	SERIES C224 Finishing	2	40°
	SERIES 603 Finishing	3	60°
	SERIES 314 Finishing	3	45°
	SERIES 345/W345 Finishing	3	45°
	SERIES 545 Finishing	5-7	45°
	SERIES 640 Finishing	6	40°
	SERIES 781 Finishing	7-14	45°
HIGH PERFORMANCE ROUGHING ENDMILLS		Flutes	Helix Angle
	SERIES 428 Rough & Finish	4	45°
	SERIES 429 Coarse Pitch	5-7	45°
	SERIES 430 Negative Rake	4-6	40°

Performance Level

1



Our *Elite Performance* tools are ideal for the most demanding applications. They are guaranteed to improve productivity and machining/cycle time, while still providing impressive tool life.

Performance Level	P				M	K			N	S			H		Page				
	1	2	3	4	5	6	1	2	3	1	2	3	4	5		6	1	2	3
★ ELITE									●●	●									122
★ ELITE	●●	●●	●●	●	●●	●●	●●				●	●	●●	●					124
★ ELITE	●●	●●	●●	●	●●	●●	●●				●	●	●●	●					126
★ ELITE	●	●●	●●	●●	●●	●●	●●				●	●	●●	●					128
★ ELITE	●●	●●	●●	●●	●●	●●	●●				●	●●	●●	●●	●				130
★ ELITE	●	●	●	●●	●	●	●●				●	●	●	●●	●●				132
Performance Level																			
★ ELITE									●●										136
★ ELITE									●●										137
Performance Level																			
SUPERIOR									●●	●									140
SUPERIOR									●●	●									142
SUPERIOR	●●	●			●	●	●				●●	●	●						143
SUPERIOR	●●	●●			●	●●	●				●	●	●						144
SUPERIOR							●	●	●●	●									146-149
SUPERIOR	●●	●●	●●	●							●	●	●●	●●	●				150
SUPERIOR	●●	●●	●●	●●			●	●			●	●	●●	●●	●				152
SUPERIOR	●	●●	●	●●	●●						●●	●●	●	●●	●●				154
Performance Level																			
SUPERIOR	●●	●	●●	●	●●	●●	●●				●	●	●●	●●	●●				156
SUPERIOR	●●	●	●	●	●●	●●	●●				●	●	●●	●●	●●				159
SUPERIOR	●	●	●●	●●	●●	●	●				●	●	●●	●●	●●				160

●● Highly Recommended ● Recommended ○ Not Recommended

2

 SUPERIOR

Our Superior Performance tools are ideal for challenging operations. They provide increased metal removal rates, while maintaining tool life.

3













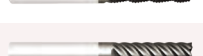
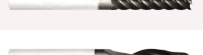







 PREMIUM

Our Premium Performance tools are ideal for standard machining. They provide impressive and reliable results at excellent value.

MATERIAL CODE

P	1	Low-Carbon Steels- 1000 Series (>25 HRc)
	2	Low-Carbon Steels- 1000 Series (<25 HRc)
	3	Alloy Tool Steels- 1300,2000, 3000 (≤35HRc)
	4	Alloy Tool Steels- 1300,2000, 3000 (36-48 HRc)
	5	Ferritic, Martensitic & PH Stainless Steels- 400's,pH Types(15-5, 13-8, 17-4) (≤35HRc)
	6	Ferritic, Martensitic & PH Stainless Steels- 400's,pH Types(15-5, 13-8, 17-4)(36-48 HRc)
M	1	Austenitic Stainless Steels- Inox, 200 Series, 300 Series and 304L
	2	Austenitic Stainless Steels & Cast Stainless Steels- 310, 314, 316 (<25HRc)
	3	Duplex Steels (Austenitic & Ferritic)- 323, 329, F55, 2205
K	1	Gray Cast Iron
	2	Ductile Iron- 60-40-18, 65-45-12 (<28HRc)
	3	Ductile Iron- 32510, 35018 (<38HRc)
N	1	Wrought Aluminum Alloys
	2	Low-Silicon Aluminum Alloys - Si <12.2% - 6061, 7075
	3	High-Silicon Aluminum Alloys - Si >12.2% -6061, 7075
	4	Metal Matrix Composite - (Glass Filament Epoxy,Fiber Glass, Graphite)
	5	Copper & Copper Alloys
	6	Carbon & Graphite Composites
S	1	Iron-Based, Heat-Resistant Alloys- Incoloy 800-802, A-286, N-155
	2	Nickel Based, Cobalt Based, Heat-Resistant Alloys- Haynes 188,Haynes 21, Hastelloy, Waspaloy, Inconel 625/718 (≤48 HRc)
	4	Titanium Alloys- Commercially Pure, 6Al-4V, Astm 1/2/3, Ti-6Al-2SN-4Zr-2Mo (≤48 HRc)
H	1	Hardened Tool Steels- H Series(10,11,13), D Series (2,3), 4340, P20 (≤48 HRc)
	2	Hardened Tool Steels- H Series(10,11,13), D Series (2,3), 4340, P20 (48-55 HRc)
	3	Hardened Tool Steels- H Series(10,11,13), D Series (2,3), 4340, P20 (56-60 HRc)
	4	Hardened Tool Steels- H Series(10,11,13), D Series (2,3), 4340, P20 (60-62 HRc) H Series(10,11,13), D Series (2,3), 4340, P20 (62-64 HRc)

SOLID CARBIDE ENDMILLS

STANDARD ENDMILLS (GENERAL PURPOSE)		Flutes	Helix Angle
	SERIES 235 Finishing	2	35°
	SERIES 337/W337 Finishing	3	37°
	SERIES 338 Coarse Pitch Rougher	3	37°
	SERIES 339 Truncated Rougher	3	37°
	SERIES 406 Finishing	4	30°
	SERIES 408 RH Cut-LH Spiral	4	30°
	SERIES 410 LH Cut-RH Spiral	4	30°
	SERIES 630 Finishing	6	30°
	SERIES 423 Fine Pitch Rougher	4	20°
Metric		Flutes	Helix Angle
	SERIES 451 Finishing	4	-
	SERIES 224 Finishing	2	45°
	SERIES 314 Finishing	3	45°
	SERIES 429 Coarse Rougher	5	45°
	SERIES 781 Finishing	6-8	50°
	SERIES 235 Finishing	2	30°
	SERIES 406 Finishing	4	30°
	SERIES 423 Fine Pitch Rougher	4	20°
CARBIDE ROUTERS		Flutes	Helix Angle
	SERIES 219 Single Flute Rougher	1	0°
	SERIES 220 2 Flute Rougher	2	0°
DRILL MILLS		Flutes	Helix Angle
	SERIES 2060 60° Drill Point	2	60°
	SERIES 2090 90° Drill Point	2	90°
	SERIES 4060 60° Drill Point	4	60°
	SERIES 4090 90° Drill Point	4	90°







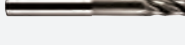
P						M			K			N						S				H			
1	2	3	4	5	6	1	2	3	1	2	3	1	2	3	4	5	6	1	2	4	1	2	3	4	




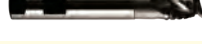

Performance Level															Page	
PREMIUM	●	●					●	●	●●	●						162
PREMIUM									●●	●						164-167
PREMIUM							●	●	●●	●						168
PREMIUM							●	●	●●	●						170
PREMIUM	●●	●●	●●	●●	●●	●●	●●	●	●	●	●●	●●	●			172
PREMIUM	●●	●●	●●	●●	●●	●●	●			●	●●	●●	●			174
PREMIUM	●●	●●	●●	●●	●●	●●	●			●	●●	●●	●			175
PREMIUM	●●	●	●	●	●●	●	●			●	●	●●				176
PREMIUM	●●	●	●	●	●	●				●	●	●				178
Performance Level															Page	
★ ELITE	●●	●●	●●	●	●●	●●	●●			●	●	●●	●			180
SUPERIOR									●●	●						181
SUPERIOR	●●	●●			●	●●	●			●	●	●				182
SUPERIOR	●●	●	●	●	●●	●●	●●			●	●	●●	●●	●●		183
SUPERIOR	●	●●	●	●●	●●					●●	●●	●	●●	●●		184
PREMIUM	●	●					●	●	●●	●						185
PREMIUM	●●	●●	●●	●●	●●	●●	●	●	●	●	●●	●●	●			186
PREMIUM	●		●		●	●				●	●●	●●				187
Performance Level															Page	
SUPERIOR									●●	●						188
SUPERIOR									●	●●						189
Performance Level															Page	
SUPERIOR	●	●	●	●	●	●	●	●	●	●	●	●	●			190
SUPERIOR	●	●	●	●	●	●	●	●	●	●	●	●	●			191
SUPERIOR	●	●	●	●	●	●	●	●	●	●	●	●	●			192
SUPERIOR	●	●	●	●	●	●	●	●	●	●	●	●	●			193



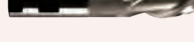





MATERIAL CODE

P	1	Low-Carbon Steels- 1000 Series (>25 HRc)
	2	Low-Carbon Steels- 1000 Series (<25 HRc)
	3	Alloy Tool Steels- 1300,2000, 3000 (≤35HRc)
	4	Alloy Tool Steels- 1300,2000, 3000 (36-48 HRc)
	5	Ferritic, Martensitic & PH Stainless Steels- 400's,pH Types(15-5, 13-8, 17-4) (≤35HRc)
	6	Ferritic, Martensitic & PH Stainless Steels- 400's,pH Types(15-5, 13-8, 17-4)(36-48 HRc)
M	1	Austenitic Stainless Steels- Inox, 200 Series, 300 Series and 304L
	2	Austenitic Stainless Steels & Cast Stainless Steels- 310, 314, 316 (<25HRc)
	3	Duplex Steel (Austenitic & Ferritic)- 323, 329, F55, 2205
K	1	Gray Cast Iron
	2	Ductile Iron- 60-40-18, 65-45-12 (<28HRc)
	3	Ductile Iron- 32510, 35018 (<38HRc)
N	1	Wrought Aluminum Alloys
	2	Low-Silicon Aluminum Alloys- Si <12.2% - 6061, 7075
	3	High-Silicon Aluminum Alloys- Si >12.2% -6061, 7075
	4	Metal Matrix Composite - (Glass Filament Epoxy,Fiber Glass, Graphite)
	5	Copper & Copper Alloys
	6	Carbon & Graphite Composites
S	1	Iron-Based, Heat-Resistant Alloys- Incoloy 800-802, A-286, N-155
	2	Nickel Based, Cobalt Based, Heat-Resistant Alloys- Haynes 188,Haynes 21, Hastelloy, Waspaloy, Inconel 625/718 (≤48 HRc)
	4	Titanium Alloys- Commercially Pure, 6Al-4V, Astm 1/2/3, Ti-6Al-2SN-4Zr-2Mo (≤48 HRc)
H	1	Hardened Tool Steels- H Series(10,11,13), D Series (2,3), 4340, P20 (≤48 HRc)
	2	Hardened Tool Steels- H Series(10,11,13), D Series (2,3), 4340, P20 (48-55 HRc)
	3	Hardened Tool Steels- H Series(10,11,13), D Series (2,3), 4340, P20 (56-60 HRc)
	4	Hardened Tool Steels- H Series(10,11,13), D Series (2,3), 4340, P20 (60-62 HRc) H Series(10,11,13), D Series (2,3), 4340, P20 (62-64 HRc)

POWDER METAL / COBALT / HSS ENDMILLS

POWDER METAL (PM30) ENDMILLS	
	4 Flute Finisher
	5,6,8 Flute Finisher / Extended Neck
	6 Flute Finisher
	8 Flute Finisher
	4,5,6,8 Flute Rougher - Coarse Pitch
	4,5,6,8 Flute Rougher - Fine Pitch
	5,6,8 Flute Rougher - Fine Pitch / Extended Neck

POWDER METAL (PM4) ENDMILLS	
	3 Flute Finisher
	3 Flute Finisher / Extended Neck
	3 Flute Truncated Rougher / Finisher
	3 Flute Truncated Rougher - Extended Neck
	3 Flute Rougher - Coarse Tooth

COBALT (M42) ENDMILLS	
	2 Flute Finisher
	2 Flute Finisher / Extended Neck
	2 Flute Finisher, Left Hand / Extended Neck
	4 Flute Finisher
	6 Flute Finisher
	8 Flute Finisher
	4 Flute Finisher
	6 Flute Finisher

POWDER METAL / COBALT / HSS ENDMILLS

High Performance - For Titanium And Stainless Steel Alloys		Helix	Shape	Style	Page
Fractional	P M K S H	35°	Square / Ball End	Right Hand	198
Fractional	P M K S H	35°	Square / Ball End	Right Hand	199
Fractional	P M K S H	35°	Square / Ball End	Right Hand	200
Fractional	P M K S H	35°	Square / Ball End	Right Hand	201
Fractional	P M K S H	30°	Square / Ball End	Right Hand	202
Fractional	P M K S H	30°	Square / Ball End	Right Hand	203
Fractional	P M K S H	30°	Square / Ball End	Right Hand	204






















High Performance - For Aluminum Alloys / General Purpose		Helix	Shape	Style	Page
Fractional	N	37°	Square / Ball End	Right Hand	206
Fractional	N	37°	Square / Ball End	Right Hand	207
Fractional	N	37°	Square / Ball End	Right Hand	208
Fractional	N	37°	Square / Ball End	Right Hand	209
Fractional	N	37°	Square / Ball End	Right Hand	210

For General Purpose		Helix	Shape	Style	Page
Fractional	P M K S	35°	Square / Ball End	Right Hand	212
Fractional	P M K S	35°	Square / Ball End	Right Hand	213
Fractional	P M K S	35°	Square / Ball End	Left Hand	213
Fractional	P M K S	35°	Square / Ball End	Right Hand	214
Fractional	P M K S	35°	Square / Ball End	Right Hand	216
Fractional	P M K S	35°	Square / Ball End	Right Hand	217
Fractional	P M K S	35°	Square / Ball End	Left Hand	218
Fractional	P M K S	35°	Square / Ball End	Left Hand	219

MATERIAL CODE

P	1	Low-Carbon Steels- 1000 Series (>25 HRc)
	2	Low-Carbon Steels- 1000 Series (<25 HRc)
	3	Alloy Tool Steels- 1300,2000, 3000 (≤35HRc)
	4	Alloy Tool Steels- 1300,2000, 3000 (36-48 HRc)
	5	Ferritic, Martensitic & PH Stainless Steels- 400's,pH Types(15-5, 13-8, 17-4) (≤35HRc)
	6	Ferritic, Martensitic & PH Stainless Steels- 400's,pH Types(15-5, 13-8, 17-4)(36-48 HRc)
M	1	Austenitic Stainless Steels- Inox, 200 Series, 300 Series and 304L
	2	Austenitic Stainless Steels & Cast Stainless Steels- 310, 314, 316 (<25HRc)
	3	Duplex Steels (Austenitic & Ferritic)- 323, 329, F55, 2205
K	1	Gray Cast Iron
	2	Ductile Iron- 60-40-18, 65-45-12 (<28HRc)
	3	Ductile Iron- 32510, 35018 (<38HRc)
N	1	Wrought Aluminum Alloys
	2	Low-Silicon Aluminum Alloys - Si <12.2% - 6061, 7075
	3	High-Silicon Aluminum Alloys - Si >12.2% -6061, 7075
	4	Metal Matrix Composite - (Glass Filament Epoxy,Fiber Glass, Graphite)
	5	Copper & Copper Alloys
	6	Carbon & Graphite Composites
S	1	Iron-Based, Heat-Resistant Alloys- Incoloy 800-802, A-286, N-155
	2	Nickel Based, Cobalt Based, Heat-Resistant Alloys- Haynes 188,Haynes 21, Hastelloy, Waspaloy, Inconel 625/718 (≤48 HRc)
	4	Titanium Alloys- Commercially Pure, 6Al-4V, Astm 1/2/3, Ti-6Al-2Sn-4Zr-2Mo (≤48 HRc)
H	1	Hardened Tool Steels- H Series(10,11,13), D Series (2,3), 4340, P20 (≤48 HRc)
	2	Hardened Tool Steels- H Series(10,11,13), D Series (2,3), 4340, P20 (48-55 HRc)
	3	Hardened Tool Steels- H Series(10,11,13), D Series (2,3), 4340, P20 (56-60 HRc)
	4	Hardened Tool Steels- H Series(10,11,13), D Series (2,3), 4340, P20 (60-62 HRc) H Series(10,11,13), D Series (2,3), 4340, P20 (62-64 HRc)

TABLE OF CONTENTS

COBALT (M42) ENDMILLS	
	8 Flute Finisher
	4 Flute Rougher / Finisher
	6 Flute Rougher / Finisher
	4,5,6,8 Flute Rougher - Coarse Pitch
	4,5,6,8 Flute Rougher - Coarse Pitch
	4,5,6,8 Flute Rougher - Fine Pitch
	4,5,6,8 Flute Rougher - Fine Pitch
	4,6,8 Flute CurveCut Ground
	4,6,8 Flute CurveCut Milled
HIGH SPEED STEEL (M7) ENDMILLS	
	2 Flute Finisher
	2 Flute Finisher / Extended Neck
	2 Flute Finisher / Extended Neck
	2 Flute Finisher
	2 Flute Finisher
	3 Flute Finisher
	3 Flute Finisher
	3 Flute Rougher - Coarse Pitch
	3 Flute Rougher - Coarse Pitch
	4 Flute Finisher
	6 Flute Finisher
	8 Flute Finisher

For General Purpose		Helix	Shape	Style	Page
Fractional	P M K S	35°	Square / Ball End	Left Hand	219
Fractional	P M K S	35°	Square / Ball End	Right Hand	220
Fractional	P M K S	35°	Square / Ball End	Right Hand	221
Fractional	P M K S	30°	Square / Ball End	Right Hand	222
Fractional	P M K S	30°	Square / Ball End	Left Hand	224
Fractional	P M K S	30°	Square / Ball End	Right Hand	226
Fractional	P M K S	30°	Square / Ball End	Left Hand	228
Fractional	P M K S	35°	Square	Right Hand	230
Fractional	P M K S	35°	Square	Right Hand	231

For General Purpose		Helix	Shape	Style	Page
Fractional	P M K S	30°	Square / Ball End	Right Hand	232
Fractional	P M K S	30°	Square / Ball End	Right Hand	233
Fractional	P M K S	30°	Square / Ball End	Left Hand	233
Fractional	N	37°	Square / Ball End	Right Hand	234
Fractional	N	37°	Square / Ball End	Left Hand	235
Fractional	N	37°	Square / Ball End	Right Hand	236
Fractional	N	37°	Square / Ball End	Left Hand	237
Fractional	N	37°	Square / Ball End	Right Hand	238
Fractional	N	37°	Square / Ball End	Left Hand	239
Fractional	P M K S	32-1/2°	Square / Ball End	Right Hand	240
Fractional	P M K S	32-1/2°	Square / Ball End	Right Hand	240
Fractional	P M K S	32-1/2°	Square / Ball End	Right Hand	241

UNDERSTANDING OUR EDP# SYSTEM

How to read Carbide EndMill EDP#'s

Example: EDP# 0558T808062525 Dimensions: 1/2 x 1/2 x 5/8 x 2-1/2

EDP# 0558T808062525

■ **Series Name** (Based on PCT catalog series)
 ■ **Coating Code** (Based on PCT coating code chart)
 ■ **Cutting Diameter** (Based on PCT chart)
 ■ **Length of Cut** (5/8", in decimal 4 digits)
 ■ **Overall Length** (2-1/2" in 2 digits)

Additional Dimensions

Radius
.030-0558T808062525
 If the cutting tool has a radius, the radius is added in front of the part number followed by a hyphen.

Ball End
 0558T808062525B
 If the cutting tool is a ball end, there is a "B" at the end of the part number.

Left-Hand
 0558T808062525L
 If the cutting has a left-hand spiral, there is an "L" at the end of the part number.

Extended Neck EDP#
 0558T808062531
 If the cutting tool has a reach, at the end of the base part number there is a "." followed by the reach (1 single digit).
 Cutting Dia: 1/2"
 Shank Dia: 1/2"
 LOC: 5/8"
 REACH: 1-3/8"
 OAL: 3"

Cutting Diam. Code

Sizes	Decimal	Code
1/8	.1250	02
3/16	.1875	03
1/4	.2500	04
5/16	.3125	05
3/8	.3750	06
7/16	.4375	07
1/2	.5000	08
9/16	.5625	09
5/8	.6250	10
11/16	.6875	11
3/4	.7500	12
13/16	.8125	13
7/8	.8750	14
15/16	.9375	15
1	1.000	16
1-1/8	1.125	19
1-1/4	1.250	20
1-3/8	1.375	22
1-1/2	1.500	24

Coating Code

- **T0 - Uncoated**
- **T1 - TiN**
- **T2 - TiCN**
- **T4 - Exxtral Plus®** (AlTiN)
- **T5 - Variantic®** (TiAlCN)
- **T6 - Z-Power®** (ZrN)
- **T7 - Sistral®** (AlTiN nanostructured)
- **T8 - Exxtral Silver®** (AlTiCrN)
- **T9 - Varianta Supral®** (TiAlCN (ML))
- **TZ - Zirco Plus®** (ZrCN)

How to read Drill EDP#'s

Non-Coolant EDP#

AX00303175T6 Dimensions: .1250 X 1/8 X 7/8 X 2

Coolant-Hole EDP#

AXC0303175T6 Dimensions: .1250 X 6mm X 20mm X 62mm

EDP# AX00303175T6

■ **Series Name** (Based on PCT catalog series)
Ex:
 AX = Non Coolant
 AXC = Coolant Hole

■ **Coolant**
 Number "0" = Non-Coolant
 Letter "C" = Coolant Holes
 (Third digit of part number)

■ **X Diameter**
 Length X Diameter
 (2 digits)
Ex:
 3xD= 03
 16xD= 16

■ **Drill Diameter**
 Metric, drill# or decimal
Ex:
 3.175 mm = 03175
 1/8" inch = 03175

■ **Coating Code**
 (Based on PCT Coating code chart) see top

TEST PRECISION.

-4 EASY STEPS-

STEP 1

VISIT OUR WEBSITE
"WWW.PCTCUTTERS.COM"

STEP 2

SELECT THE TAB
"PRODUCTS & SERVICES"

STEP 3

CLICK ON
"GUARANTEED TEST TOOL"
& COMPLETE THE FORM

STEP 4

WAIT FOR YOUR
TEST TOOL TO ARRIVE!

- GUARANTEED -
TEST TOOL

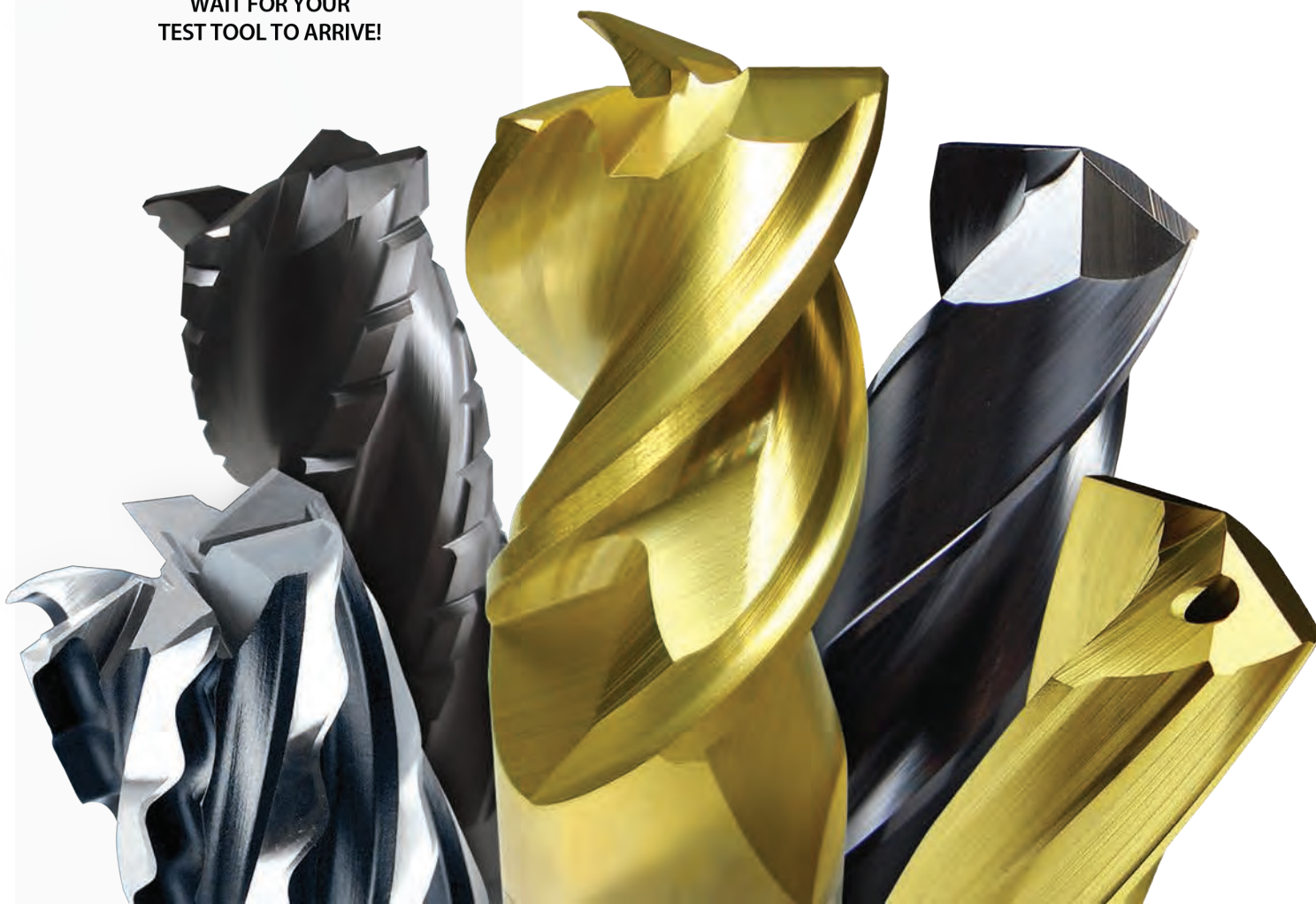
***Test our standard end mills,
drills, routers and drill mills.***

CHOOSE FROM THE FOLLOWING MATERIALS:

Carbide | Powder Metal | HSS | Cobalt

** Does Not Apply to Specials**

Our technical experts will assist you before,
during and after the testing process.





PRECISION CUTTING TOOLS, INC.

Precision Cutting Tools (PCT) is a leading cutting tool manufacturer that operates all across the United States and Mexico. With the help of our recognized distributors and sales representatives, we have successfully been able to serve the following industries: Aerospace, Automotive, Die & Mold, Oil Drilling and Medical. Furthermore, we have distinguished ourselves from our competitors, by providing our customers with German engineered and American manufactured cutting tools.

PCT's goal has always been to provide our customers with the necessary resources, so they can efficiently achieve their machining objectives including, increased productivity at reduced machining costs. In 2004, we integrated our own in-house coating facility, PCT Coating Solutions, to complement our cutting tools and simplify our customers' shopping experience. We invested heavily on quality management systems that earned our in-house coating facility ISO 9001:2008 certification. This certification assures us that our high-quality standards are continuously met.

At PCT, our customer service does not end once we ship-out our customers' tools. We feel it is our responsibility to help our customers before, during and after their transaction is completed. Our sales team has received extensive training on numerous applications including, but not limited to Aluminum, Stainless Steels, Titanium, Hardened Tool Steels, etc. They can help users select cutting tools based on their unique application and can provide technical support for maximized machining. In addition, we have several manufacturer representatives spread throughout the United States that offer one-on-one support to our geographically distant customers.

PCT offers more than just the standard tools listed in this catalog; we create specials per-print in 2-3 days. We have over 40+ pre-made prints online that are available for you to directly type-on, print and or download. If you need a tool especially made just for you, contact:

Call:
(562) 921-7898

Email:
sales@pctcutters.com

Website:
pctcutters.com

Español

Precision Cutting Tools, Inc. (PCT) es un fabricante líder de herramientas , de corte que funciona en todo Estados Unidos y México. Con la ayuda de nuestros distribuidores reconocidos y representantes de ventas, hemos podido servir con éxito las siguientes industrias: aeroespacial, automotriz, dado/ moldura, perforación petrolera y médica. Además, nos hemos distinguido de nuestros competidores, proveyendo a nuestros clientes herramientas de corte con ingeniería alemana y fabricación en los estados unidos.

El objetivo del PCT siempre ha sido proveer a nuestros clientes con los recursos necesarios, para que puedan conseguir eficazmente sus objetivos de mecanizado incluyendo, aumento de productividad con costos de mecanizado reducidos. En el año 2004, integramos nuestra propia planta interna de revestimiento, PCT Coating Solutions, para complementar nuestras herramientas de corte y simplificar la experiencia de compra de nuestros clientes. Hemos invertido fuertemente en los sistemas de manejo calidad para que nuestra instalación de recubrimiento obtuviera la certificación ISO 9001:2008. Esta certificación nos asegura que nuestras normas de alta calidad se cumplan de forma continua.

En PCT, nuestro servicio al cliente no termina una vez que enviamos las herramientas de nuestros clientes. Creemos que es nuestra responsabilidad de ayudar a nuestros clientes antes, durante y después de sus transacciones. Nuestro equipo de ventas ha recibido una amplia formación en el mecanizado de numerosas aplicaciones, incluyendo, pero no limitado a: aluminio, aceros inoxidable, titanio, aceros endurecidos, etc. Ellos pueden ayudar a los usuarios a seleccionar herramientas de corte en base a su aplicación y pueden proporcionar apoyo técnico para obtener el mecanizado máximo. Además, contamos con varios representantes de fabricantes extendidos por todo Estados Unidos, que ofrecen servicios de apoyo personalizado a nuestros clientes que están geográficamente distantes.

PCT ofrece más que sólo las herramientas estándar que figuran en este catálogo; manufacturamos especiales por plano en 2-3 días. Contamos con más de 40 planos pre- hechos en nuestra página web que están disponibles para que usted escriba, imprima o descargue. Si necesita una herramienta especial, contacto:

Llámenos:
(562) 921-7898

Correo Electrónico:
sales@pctcutters.com

Página Web:
pctcutters.com



 CANADA





NORTH AMERICA

MEXICO

Mission

Our purpose is to satisfy and fulfill the needs of our customers and employees through product innovation, a pleasant work environment and continued financial growth.

Vision

Become the leader and most preferred end mill and drill manufacturer that delivers high-quality products at competitive pricing.

Major Users



PCT does not endorse or is in affiliation with any of the logos(companies) displayed above.



PRECISION CUTTING TOOLS, INC.

CARBIDE DRILLS

External Coolant & Internal Coolant



Available from 3xD - 30xD



SXC Series p.70





**High Performance Drill
Single-Margin
Ideal for General Purpose Drilling
3xD-5xD**

Varianta® Supral Coating - Excellent for high-speed drilling operations. Ideal for dry and semi-dry machining.

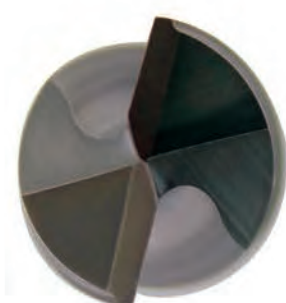
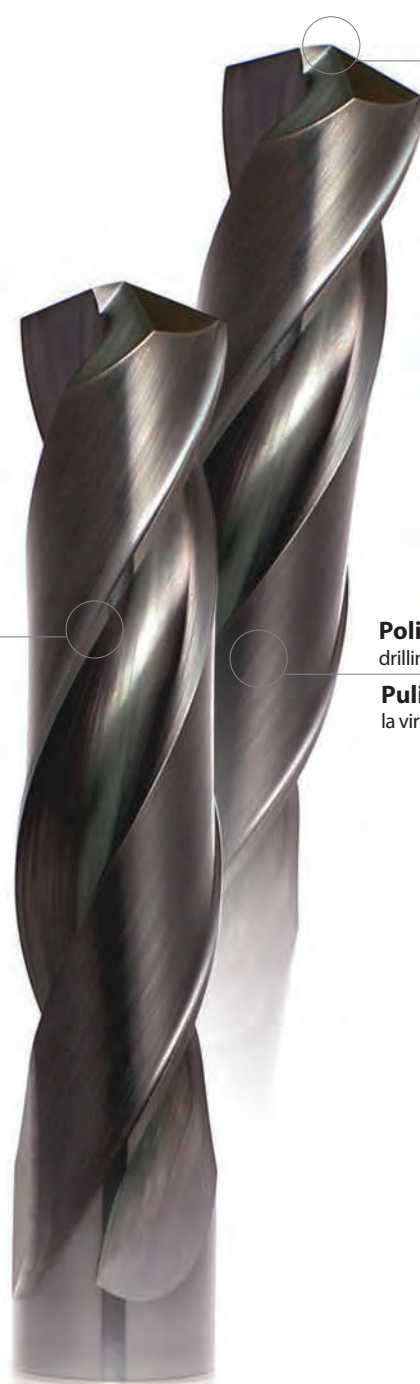
Recubrimiento Varianta® Supral - Excelente para las operaciones de perforación de alta velocidad. Ideal para el mecanizado seco y semiseco.

135° Point Geometry - Split-point geometry for superior drill penetration and accuracy.

135° Geometría de la Punta - Diseño con punto dividido para superior perforación precisión.

Polish - Chip evacuation is improved during deep hole drilling, when the flutes are polished.

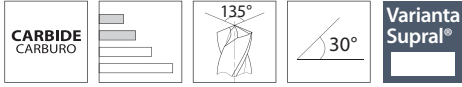
Pulido - Cuando las flautas están pulidas la evacuación de la viruta es mejorada.



Tolerance

Drill Dia (h7) Inches (in)	Drill Dia (h7) Metric (mm)
.0000-.1181: + 0/- .00039	0-3: + 0/- .010
.1182-.2362: + 0/- .00047	3.01-6: + 0/- .012
.2363-.3937: + 0/- .00059	6.01-10.0: + 0/- .015
.3938-.7087: + 0/- .00071	10.01-18.0: + 0/- .018

Shank Dia (h6) Inches (in)	Shank Dia (h6) Metric (mm)
.0000-.1181: + 0/- .00024	0-3: + 0/- .006
.1182-.2362: + 0/- .00031	3.01-6: + 0/- .008
.2363-.3937: + 0/- .00035	6.01-10.0: + 0/- .009
.3938-.7087: + 0/- .00043	10.01-18.0: + 0/- .011



Varianta Supral® provides higher cutting speeds and excellent wear resistance.

Design

Spiral-fluted, right-hand cut, with external coolant.

Coating

Varianta® Supral TiAlCN (ML)

Ideal for

general purpose drilling (Refer to page 245)

P M K S

Diseño

Flautas espirales con corte de mano derecha y refrigerante externo

Recubrimiento

Varianta® Supral TiAlCN (ML)

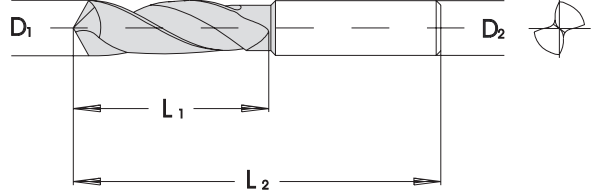
Ideal para

uso general (Consulte la página 246)

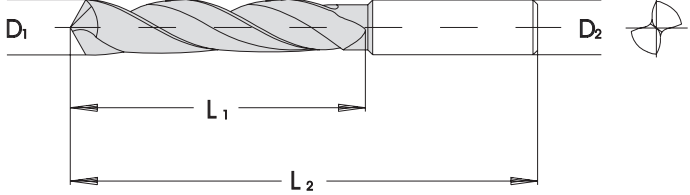
P M K S

****Left-Hand, Available Upon Request****

3xD PAGE 28



5xD PAGE 30



General Purpose Carbide Drills

Aluminum Carbide Drills

Steels Carbide Drills

Hardened Steels Carbide Drills

Spooling Carbide Drills

General Purpose Drills up to 30xD

For Aluminum up to 30xD

Drills for Steels

Pilot Drills

Solid Carbide Drills Non-Coolant

Solid Carbide Drills Internal Coolant

General Purpose Carbide Drills

Aluminum Carbide Drills

Steels Carbide Drills

Hardened Steels Carbide Drills

Spotting Carbide Drills

General Purpose Drills up to 30xD

Aluminum Drills up to 30xD

Drills for Steels

Pilot Drills

Solid Carbide Drills Non-Coolant

Solid Carbide Drills Internal Coolant

Design

Spiral-fluted, right-hand cut, with external coolant.

Coating

Varianta® Supral TiAlCN (ML)

Ideal for

general purpose drilling (Refer to page 245)

P M K S

Diseño

Flautas espirales con corte de mano derecha y refrigerante externo

Recubrimiento

Varianta® Supral TiAlCN (ML)

Ideal para

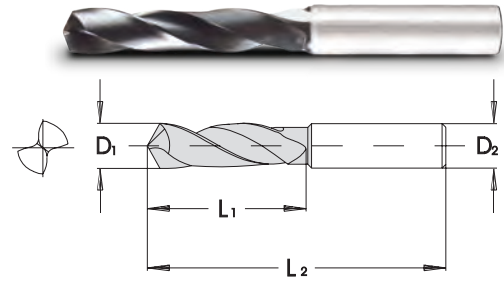
uso general (Consulte la página 246)

P M K S



Varianta Supral® provides higher cutting speeds and excellent wear resistance.

Left-Hand, Available Upon Request



D ₁	Decimal	D ₁ mm	D ₂ in	L ₁ in	L ₂ in	Part #
1/16	.0625	1.59	1/8	5/8	2	SX00306250T9
#52	.0635	1.61	1/8	11/16	2	SX00300520T9
#51	.0670	1.70	1/8	11/16	2	SX00300510T9
#50	.0700	1.78	1/8	11/16	2	SX00300500T9
#49	.0730	1.85	1/8	11/16	2	SX00300490T9
#48	.0760	1.93	1/8	11/16	2	SX00300480T9
5/64	.0781	1.98	1/8	11/16	2	SX00307810T9
#47	.0785	1.99	1/8	3/4	2	SX00300470T9
	.0787	2.00	1/8	3/4	2-1/2	SX00307870T9
#46	.0810	2.06	1/8	3/4	2-1/2	SX00300460T9
#45	.0820	2.08	1/8	3/4	2-1/2	SX00300450T9
#44	.0860	2.18	1/8	3/4	2-1/2	SX00300440T9
#43	.0890	2.26	1/8	3/4	2-1/2	SX00300430T9
#42	.0935	2.37	1/8	3/4	2-1/2	SX00300420T9
3/32	.0938	2.38	1/8	3/4	2-1/2	SX00309380T9
#41	.0960	2.44	1/8	13/16	2-1/2	SX00300410T9
#40	.0980	2.49	1/8	13/16	2-1/2	SX00300400T9
	.0984	2.50	1/8	13/16	2-1/2	SX00309840T9
#39	.0995	2.53	1/8	13/16	2-1/2	SX00300390T9
#38	.1015	2.58	1/8	13/16	2-1/2	SX00300380T9
#37	.1040	2.64	1/8	13/16	2-1/2	SX00300370T9
#36	.1065	2.71	1/8	13/16	2-1/2	SX00300360T9
7/64	.1094	2.78	1/8	13/16	2-1/2	SX00301094T9
#35	.1100	2.79	1/8	7/8	2-1/2	SX00300350T9
#34	.1110	2.82	1/8	7/8	2-1/2	SX00300340T9
#33	.1130	2.87	1/8	7/8	2-1/2	SX00300330T9
#32	.1160	2.95	1/8	7/8	2-1/2	SX00300320T9
	.1181	3.00	1/8	7/8	2-1/2	SX00303000T9
#31	.1200	3.05	1/8	7/8	2-1/2	SX00300310T9
1/8	.1250	3.17	1/8	7/8	2-1/2	SX00303175T9
#30	.1285	3.26	3/16	15/16	2-1/2	SX00300300T9
#29	.1360	3.45	3/16	15/16	2-1/2	SX00300290T9
	.1378	3.50	3/16	15/16	2-1/2	SX00303500T9
#28	.1405	3.57	3/16	15/16	2-1/2	SX00300280T9
9/64	.1406	3.57	3/16	1	2-1/2	SX00303570T9
#27	.1440	3.66	3/16	1	2-1/2	SX00300270T9

D ₁	Decimal	D ₁ mm	D ₂ in	L ₁ in	L ₂ in	Part #
#26	.1470	3.73	3/16	1	2-1/2	SX00300260T9
#25	.1495	3.80	3/16	1	2-1/2	SX00300250T9
#24	.1520	3.86	3/16	1	2-1/2	SX00300240T9
#23	.1540	3.91	3/16	1	2-1/2	SX00300230T9
5/32	.1562	3.97	3/16	1	2-1/2	SX00303970T9
#22	.1570	3.99	3/16	1-1/16	2-1/2	SX00300220T9
	.1575	4.00	3/16	1-1/16	2-1/2	SX00304000T9
#21	.1590	4.04	3/16	1-1/16	2-1/2	SX00300210T9
#20	.1610	4.09	3/16	1-1/16	2-1/2	SX00300200T9
	.1654	4.20	3/16	1-1/16	2-1/2	SX00304200T9
#19	.1660	4.22	3/16	1-1/16	2-1/2	SX00300190T9
#18	.1695	4.30	3/16	1-1/16	2-1/2	SX00300180T9
11/64	.1719	4.37	3/16	1-1/16	2-1/2	SX00304370T9
#17	.1730	4.39	3/16	1-1/8	3	SX00300170T9
#16	.1770	4.49	3/16	1-1/8	3	SX00300160T9
	.1772	4.50	3/16	1-1/8	3	SX00304500T9
#15	.1800	4.57	3/16	1-1/8	3	SX00300150T9
#14	.1820	4.62	3/16	1-1/8	3	SX00300140T9
#13	.1850	4.70	3/16	1-1/8	3	SX00300130T9
3/16	.1875	4.76	3/16	1-1/8	3	SX00304760T9
#12	.1890	4.80	1/4	1-3/16	3	SX00300120T9
#11	.1910	4.85	1/4	1-3/16	3	SX00300110T9
#10	.1935	4.91	1/4	1-3/16	3	SX00300100T9
#9	.1960	4.98	1/4	1-3/16	3	SX00300090T9
	.1969	5.00	1/4	1-3/16	3	SX00305000T9
#8	.1990	5.05	1/4	1-3/16	3	SX00300080T9
	.2008	5.10	1/4	1-3/16	3	SX00305100T9
#7	.2010	5.10	1/4	1-3/16	3	SX00300070T9
13/64	.2031	5.16	1/4	1-3/16	3	SX00305160T9
#6	.2040	5.18	1/4	1-1/4	3	SX00300060T9
#5	.2055	5.22	1/4	1-1/4	3	SX00300050T9
#4	.2090	5.31	1/4	1-1/4	3	SX00300040T9
#3	.2130	5.41	1/4	1-1/4	3	SX00300030T9
	.2165	5.50	1/4	1-1/4	3	SX00302165T9
7/32	.2188	5.56	1/4	1-1/4	3	SX00305560T9
#2	.2210	5.61	1/4	1-5/16	3	SX00300020T9

Other Dimensions are Available Upon Request

General Purpose
Carbide Drills

Aluminum
Carbide Drills

Steels
Carbide Drills

Hardened Steels
Carbide Drills

Spotting
Carbide Drills

General Purpose
Drills up to 30xD

Aluminum Drills
up to 30xD

Drills for Steels

Pilot Drills

Solid Carbide Drills Non-Coolant

Solid Carbide Drills Internal Coolant

D ₁	Decimal	D ₁ mm	D ₂ in	L ₁ in	L ₂ in	Part #
#1	.2280	5.79	1/4	1-5/16	3	SX00300010T9
A	.2340	5.94	1/4	1-5/16	3	SX003000A0T9
15/64	.2344	5.95	1/4	1-5/16	3	SX00305950T9
	.2362	6.00	1/4	1-3/8	3	SX00306000T9
B	.2380	6.04	1/4	1-3/8	3	SX003000B0T9
C	.2420	6.15	1/4	1-3/8	3	SX003000C0T9
D	.2460	6.25	1/4	1-3/8	3	SX003000D0T9
1/4 / E	.2500	6.35	1/4	1-3/8	3	SX00306350T9
	.2559	6.50	5/16	1-7/16	3	SX00306500T9
F	.2570	6.53	5/16	1-7/16	3	SX003000F0T9
G	.2610	6.63	5/16	1-7/16	3	SX003000G0T9
17/64	.2656	6.75	5/16	1-7/16	3	SX00306750T9
H	.2660	6.76	5/16	1-1/2	3	SX003000H0T9
I	.2720	6.91	5/16	1-1/2	3	SX003000I0T9
	.2756	7.00	5/16	1-1/2	3	SX00307000T9
J	.2770	7.03	5/16	1-1/2	3	SX003000J0T9
K	.2810	7.14	5/16	1-1/2	3	SX003000K0T9
9/32	.2812	7.14	5/16	1-1/2	3	SX00307140T9
L	.2900	7.37	5/16	1-9/16	4	SX003000L0T9
M	.2950	7.49	5/16	1-9/16	4	SX003000M0T9
	.2953	7.50	5/16	1-9/16	4	SX00307500T9
19/64	.2969	7.54	5/16	1-9/16	4	SX00307540T9
N	.3020	7.67	5/16	1-5/8	4	SX003000N0T9
5/16	.3125	7.94	5/16	1-5/8	4	SX00307940T9
	.3150	8.00	3/8	1-11/16	4	SX00308000T9
O	.3160	8.03	3/8	1-11/16	4	SX003000O0T9
P	.3230	8.20	3/8	1-11/16	4	SX003000P0T9
21/64	.3281	8.33	3/8	1-11/16	4	SX00308330T9
Q	.3320	8.43	3/8	1-11/16	4	SX003000Q0T9
	.3346	8.50	3/8	1-11/16	4	SX00308500T9

D ₁	Decimal	D ₁ mm	D ₂ in	L ₁ in	L ₂ in	Part #
R	.3390	8.61	3/8	1-11/16	4	SX003000R0T9
11/32	.3438	8.73	3/8	1-11/16	4	SX00308730T9
S	.3480	8.84	3/8	1-3/4	4	SX003000S0T9
	.3543	9.00	3/8	1-3/4	4	SX00309000T9
T	.3580	9.09	3/8	1-3/4	4	SX003000T0T9
23/64	.3594	9.13	3/8	1-3/4	4	SX00309130T9
U	.3680	9.35	3/8	1-13/16	4	SX003000U0T9
	.3740	9.50	3/8	1-13/16	4	SX00309500T9
3/8	.3750	9.52	3/8	1-13/16	4	SX00309520T9
V	.3770	9.57	7/16	1-7/8	4	SX003000V0T9
W	.3860	9.80	7/16	1-7/8	4	SX003000W0T9
25/64	.3906	9.92	7/16	1-7/8	4	SX00309920T9
	.3937	10.00	7/16	1-15/16	4	SX00310000T9
X	.3970	10.08	7/16	1-15/16	4	SX003000X0T9
Y	.4040	10.26	7/16	1-15/16	4	SX003000Y0T9
13/32	.4062	10.32	7/16	1-15/16	4	SX00310320T9
Z	.4130	10.49	7/16	2	4	SX003000Z0T9
	.4134	10.50	7/16	2	4	SX00310500T9
27/64	.4219	10.72	7/16	2	4	SX00310720T9
	.4252	10.80	7/16	2	4	SX00310800T9
	.4331	11.00	7/16	2-1/16	4	SX00311000T9
7/16	.4375	11.11	7/16	2-1/16	4	SX00304375T9
	.4528	11.50	1/2	2-1/8	4	SX00311500T9
29/64	.4531	11.51	1/2	2-1/8	4	SX00311510T9
15/32	.4688	11.91	1/2	2-1/8	4	SX00311910T9
	.4724	12.00	1/2	2-3/16	4	SX00312000T9
31/64	.4844	12.30	1/2	2-3/16	4	SX00312300T9
	.4921	12.50	1/2	2-3/16	4	SX00312500T9
1/2	.5000	12.70	1/2	2-1/4	4	SX00312700T9

Other Dimensions are Available Upon Request

Tolerance

Drill Dia (h7) Inches (in)	Drill Dia (h7) Metric (mm)	Shank Dia (h6) Inches (in)	Shank Dia (h6) Metric (mm)
.0000-.1181: + 0/- .00039	0-3: + 0/- .010	.0000-.1181: + 0/- .00024	0-3: + 0/- .006
.1182-.2362: + 0/- .00047	3.01-6: + 0/- .012	.1182-.2362: + 0/- .00031	3.01-6: + 0/- .008
.2363-.3937: + 0/- .00059	6.01-10.0: + 0/- .015	.2363-.3937: + 0/- .00035	6.01-10.0: + 0/- .009
.3938-.7087: + 0/- .00071	10.01-18.0: + 0/- .018	.3938-.7087: + 0/- .00043	10.01-18.0: + 0/- .011

General Purpose Carbide Drills

Aluminum Carbide Drills

Steels Carbide Drills

Hardened Steels Carbide Drills

Spotting Carbide Drills

General Purpose Drills up to 30xD

Aluminum Drills up to 30xD

Drills for Steels

Pilot Drills

Design

Spiral-fluted, right-hand cut, with external coolant.

Coating

Varianta® Supral TiAlCN (ML)

Ideal for

general purpose drilling (Refer to page 245)

P M K S

Diseño

Flautas espirales con corte de mano derecha y refrigerante externo.

Recubrimiento

Varianta® Supral TiAlCN (ML)

Ideal para

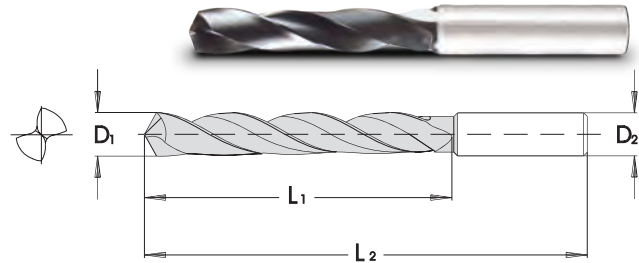
uso general (Consulte la página 246)

P M K S



Varianta Supral® provides higher cutting speeds and excellent wear resistance.

Left-Hand, Available Upon Request



D ₁	Decimal	D ₁ mm	D ₂ in	L ₁ in	L ₂ in	Part #
1/16	.0625	1.59	1/8	3/4	2-1/2	SX00506250T9
#52	.0635	1.61	1/8	3/4	2-1/2	SX00500520T9
#51	.0670	1.70	1/8	3/4	2-1/2	SX00500510T9
#50	.0700	1.78	1/8	7/8	2-1/2	SX00500500T9
#49	.0730	1.85	1/8	7/8	2-1/2	SX00500490T9
#48	.0760	1.93	1/8	7/8	2-1/2	SX00500480T9
5/64	.0781	1.98	1/8	7/8	2-1/2	SX00507810T9
#47	.0785	1.99	1/8	7/8	2-1/2	SX00500470T9
	.0787	2.00	1/8	7/8	2-1/2	SX00507870T9
#46	.0810	2.06	1/8	7/8	2-1/2	SX00500460T9
#45	.0820	2.08	1/8	7/8	2-1/2	SX00500450T9
#44	.0860	2.18	1/8	1	2-1/2	SX00500440T9
#43	.0890	2.26	1/8	1	2-1/2	SX00500430T9
#42	.0935	2.37	1/8	1	2-1/2	SX00500420T9
3/32	.0938	2.38	1/8	1	2-1/2	SX00509380T9
#41	.0960	2.44	1/8	1	2-1/2	SX00500410T9
#40	.0980	2.49	1/8	1	2-1/2	SX00500400T9
	.0984	2.50	1/8	1-1/4	3	SX00509840T9
#39	.0995	2.53	1/8	1-1/4	3	SX00500390T9
#38	.1015	2.58	1/8	1-1/4	3	SX00500380T9
#37	.1040	2.64	1/8	1-1/4	3	SX00500370T9
#36	.1065	2.71	1/8	1-1/4	3	SX00500360T9
7/64	.1094	2.78	1/8	1-1/4	3	SX00501094T9
#35	.1100	2.79	1/8	1-1/4	3	SX00500350T9
#34	.1110	2.82	1/8	1-1/4	3	SX00500340T9
#33	.1130	2.87	1/8	1-1/4	3	SX00500330T9
#32	.1160	2.95	1/8	1-1/4	3	SX00500320T9
	.1181	3.00	1/8	1-1/4	3	SX00503000T9
#31	.1200	3.05	1/8	1-1/4	3	SX00500310T9
1/8	.1250	3.17	1/8	1-1/4	3	SX00503175T9
#30	.1285	3.26	3/16	1-1/4	3	SX00500300T9
#29	.1360	3.45	3/16	1-3/8	3	SX00500290T9
	.1378	3.50	3/16	1-3/8	3	SX00503500T9
#28	.1405	3.57	3/16	1-3/8	3	SX00500280T9
9/64	.1406	3.57	3/16	1-3/8	3	SX00503570T9
#27	.1440	3.66	3/16	1-3/8	3	SX00500270T9

D ₁	Decimal	D ₁ mm	D ₂ in	L ₁ in	L ₂ in	Part #
#26	.1470	3.73	3/16	1-3/8	3	SX00500260T9
#25	.1495	3.80	3/16	1-3/8	3	SX00500250T9
#24	.1520	3.86	3/16	1-3/8	3	SX00500240T9
#23	.1540	3.91	3/16	1-3/8	3	SX00500230T9
5/32	.1562	3.97	3/16	1-3/8	3	SX00503970T9
#22	.1570	3.99	3/16	1-3/8	3	SX00500220T9
	.1575	4.00	3/16	1-3/8	3	SX00504000T9
#21	.1590	4.04	3/16	1-3/8	3	SX00500210T9
#20	.1610	4.09	3/16	1-3/8	3	SX00500200T9
#19	.1660	4.22	3/16	1-5/8	4	SX00500190T9
#18	.1695	4.30	3/16	1-5/8	4	SX00500180T9
11/64	.1719	4.37	3/16	1-5/8	4	SX00504370T9
#17	.1730	4.39	3/16	1-5/8	4	SX00500170T9
#16	.1770	4.49	3/16	1-5/8	4	SX00500160T9
	.1772	4.50	3/16	1-5/8	4	SX00504500T9
#15	.1800	4.57	3/16	1-5/8	4	SX00500150T9
#14	.1820	4.62	3/16	1-5/8	4	SX00500140T9
#13	.1850	4.70	3/16	1-5/8	4	SX00500130T9
3/16	.1875	4.76	3/16	1-5/8	4	SX00504760T9
#12	.1890	4.80	1/4	1-5/8	4	SX00500120T9
#11	.1910	4.85	1/4	1-5/8	4	SX00500110T9
#10	.1935	4.91	1/4	1-5/8	4	SX00500100T9
#9	.1960	4.98	1/4	1-3/4	4	SX00500090T9
	.1969	5.00	1/4	1-1/2	4	SX00505000T9
#8	.1990	5.05	1/4	1-1/2	4	SX00500080T9
#7	.2010	5.10	1/4	1-3/4	4	SX00500070T9
13/64	.2031	5.16	1/4	1-3/4	4	SX00505160T9
#6	.2040	5.18	1/4	1-3/4	4	SX00500060T9
#5	.2055	5.22	1/4	1-3/4	4	SX00500050T9
#4	.2090	5.31	1/4	1-3/4	4	SX00500040T9
#3	.2130	5.41	1/4	1-3/4	4	SX00500030T9
	.2165	5.50	1/4	1-3/4	4	SX00502165T9
7/32	.2188	5.56	1/4	1-3/4	4	SX00505560T9
#2	.2210	5.61	1/4	1-3/4	4	SX00500020T9
#1	.2280	5.79	1/4	1-3/4	4	SX00500010T9
A	.2340	5.94	1/4	2	4	SX005000A0T9

Other Dimensions are Available Upon Request

General Purpose Carbide Drills

Aluminum Carbide Drills

Steels Carbide Drills

Hardened Steels Carbide Drills

Spotting Carbide Drills

General Purpose Drills up to 30xD

Aluminum Drills up to 30xD

Drills for Steels

Pilot Drills

D ₁	Decimal	D ₁ mm	D ₂ in	L ₁ in	L ₂ in	Part #
15/64	.2344	5.95	1/4	2	4	SX00505950T9
	.2362	6.00	1/4	2	4	SX00506000T9
B	.2380	6.04	1/4	2	4	SX005000B0T9
C	.2420	6.15	1/4	2	4	SX005000C0T9
D	.2460	6.25	1/4	2	4	SX005000D0T9
1/4 / E	.2500	6.35	1/4	2	4	SX00506350T9
	.2559	6.50	5/16	2	4	SX00506500T9
F	.2570	6.53	5/16	2	4	SX005000F0T9
G	.2610	6.63	5/16	2-1/8	4	SX005000G0T9
17/64	.2656	6.75	5/16	2-1/8	4	SX00506750T9
H	.2660	6.76	5/16	2-1/8	4	SX005000H0T9
I	.2720	6.91	5/16	2-1/8	4	SX005000I0T9
	.2756	7.00	5/16	2-1/8	4	SX00507000T9
J	.2770	7.03	5/16	2-1/8	4	SX005000J0T9
K	.2810	7.14	5/16	2-1/8	4	SX005000K0T9
9/32	.2812	7.14	5/16	2-1/8	4	SX00507140T9
L	.2900	7.37	5/16	2-1/8	4	SX005000L0T9
M	.2950	7.49	5/16	2-3/8	4	SX005000M0T9
	.2953	7.50	5/16	2-3/8	4	SX00507500T9
19/64	.2969	7.54	5/16	2-3/8	4	SX00507540T9
N	.3020	7.67	5/16	2-3/8	4	SX005000N0T9
5/16	.3125	7.94	5/16	2-3/8	4	SX00507940T9
	.3150	8.00	3/8	2-3/8	4	SX00508000T9
O	.3160	8.03	3/8	2-3/8	4	SX005000O0T9
P	.3230	8.20	3/8	2-3/8	4	SX005000P0T9
21/64	.3281	8.33	3/8	2-1/2	5	SX00508330T9
Q	.3320	8.43	3/8	2-1/2	5	SX005000Q0T9
	.3346	8.50	3/8	2-1/2	5	SX00508500T9
R	.3390	8.61	3/8	2-1/2	5	SX005000R0T9
11/32	.3438	8.73	3/8	2-1/2	5	SX00508730T9
S	.3480	8.84	3/8	2-1/2	5	SX005000S0T9
	.3543	9.00	3/8	2-1/2	5	SX00509000T9
T	.3580	9.09	3/8	2-3/4	5	SX005000T0T9
23/64	.3594	9.13	3/8	2-3/4	5	SX00509130T9
U	.3680	9.35	3/8	2-3/4	5	SX005000U0T9
	.3740	9.50	3/8	2-3/4	5	SX00509500T9

D ₁	Decimal	D ₁ mm	D ₂ in	L ₁ in	L ₂ in	Part #
3/8	.3750	9.52	3/8	2-3/4	5	SX00509520T9
V	.3770	9.57	7/16	2-3/4	5	SX005000V0T9
W	.3860	9.80	7/16	2-7/8	5	SX005000W0T9
25/64	.3906	9.92	7/16	2-7/8	5	SX00509920T9
	.3937	10.00	7/16	2-7/8	5	SX00510000T9
X	.3970	10.08	7/16	2-7/8	5	SX005000X0T9
Y	.4040	10.26	7/16	2-7/8	5	SX005000Y0T9
13/32	.4062	10.32	7/16	2-7/8	5	SX00510320T9
Z	.4130	10.49	7/16	2-7/8	5	SX005000Z0T9
	.4134	10.50	7/16	2-7/8	5	SX00510500T9
27/64	.4219	10.72	7/16	2-7/8	5	SX00510720T9
	.4252	10.80	7/16	2-7/8	5	SX00510800T9
	.4331	11.00	7/16	2-7/8	5	SX00511000T9
7/16	.4375	11.11	7/16	2-7/8	5	SX00504375T9
	.4528	11.50	1/2	3	5	SX00511500T9
29/64	.4531	11.51	1/2	3	5	SX00511510T9
15/32	.4688	11.91	1/2	3	5	SX00511910T9
	.4724	12.00	1/2	3	5	SX00512000T9
31/64	.4844	12.30	1/2	3	5	SX00512300T9
	.4921	12.50	1/2	3	5	SX00512500T9
1/2	.5000	12.70	1/2	3	5	SX00512700T9
	.5118	13.00	9/16	3	5	SX00513000T9
33/64	.5156	13.10	9/16	3-1/4	5	SX00513100T9
17/32	.5312	13.49	9/16	3-1/4	5	SX00513490T9
	.5315	13.50	9/16	3-1/4	5	SX00513500T9
35/64	.5469	13.89	9/16	3-1/4	5	SX00513890T9
	.5512	14.00	9/16	3-1/4	5	SX00514000T9
9/16	.5625	14.29	9/16	3-1/4	5	SX00514290T9
	.5709	14.50	5/8	3-1/4	5	SX00514500T9
37/64	.5781	14.68	5/8	3-1/2	6	SX00514680T9
	.5906	15.00	5/8	3-1/2	6	SX00515000T9
19/32	.5938	15.08	5/8	3-1/2	6	SX00515080T9
39/64	.6094	15.48	5/8	3-1/2	6	SX00515480T9
	.6102	15.50	5/8	3-1/2	6	SX00515500T9
5/8	.6250	15.87	5/8	3-1/2	6	SX00515870T9
	.6299	16.00	3/4	3-1/2	6	SX00516000T9

Other Dimensions are Available Upon Request

Tolerance

Drill Dia (h7) Inches (in)	Drill Dia (h7) Metric (mm)	Shank Dia (h6) Inches (in)	Shank Dia (h6) Metric (mm)
.0000-.1181: + 0/--.00039	0-3: + 0/--.010	.0000-.1181: + 0/--.00024	0-3: + 0/--.006
.1182-.2362: + 0/--.00047	3.01-6: + 0/--.012	.1182-.2362: + 0/--.00031	3.01-6: + 0/--.008
.2363-.3937: + 0/--.00059	6.01-10.0: + 0/--.015	.2363-.3937: + 0/--.00035	6.01-10.0: + 0/--.009
.3938-.7087: + 0/--.00071	10.01-18.0: + 0/--.018	.3938-.7087: + 0/--.00043	10.01-18.0: + 0/--.011



**High Performance Drill
Single-Margin
Ideal for Multi-Purpose Drilling
3xD-5xD**

140° Point Geometry - Designed for low-cutting force and small chip evacuation.

140° Geometría de la Punta - Diseñado para fuerza moderada y evacuación de la viruta pequeña.

Varianta® Supral Coating - Excellent for high-speed drilling operations. Ideal for dry and semi-dry machining.

Recubrimiento Varianta® Supral - Excelente para las operaciones de perforación de alta velocidad. Ideal para el mecanizado seco y semiseco.

Polish - Chip evacuation is improved during deep hole drilling, when the flutes are polished.

Pulido - Cuando las flautas están pulidas la evacuación de la viruta es mejorada.



Tolerance

Drill Dia (h7) Inches (in)	Drill Dia (h7) Metric (mm)
.0000-.1181: + 0/- .00039	0-3: + 0/- .010
.1182-.2362: + 0/- .00047	3.01-6: + 0/- .012
.2363-.3937: + 0/- .00059	6.01-10.0: + 0/- .015
.3938-.7087: + 0/- .00071	10.01-18.0: + 0/- .018

Shank Dia (h6) Inches (in)	Shank Dia (h6) Metric (mm)
.0000-.1181: + 0/- .00024	0-3: + 0/- .006
.1182-.2362: + 0/- .00031	3.01-6: + 0/- .008
.2363-.3937: + 0/- .00035	6.01-10.0: + 0/- .009
.3938-.7087: + 0/- .00043	10.01-18.0: + 0/- .011



Varianta Supral® provides higher cutting speeds and excellent wear resistance.

Design

Spiral- fluted, right hand cut, with external coolant and a cylindrical shank.

Coating

Varianta® Supral TiAlCN (ML)

Ideal for

multi-purpose drilling (Refer to page 245)

P M N S

Diseño

Flautas espirales con corte de mano derecha, refrigerante externo y un zanco cilíndrico.

Recubrimiento

Varianta® Supral TiAlCN (ML)

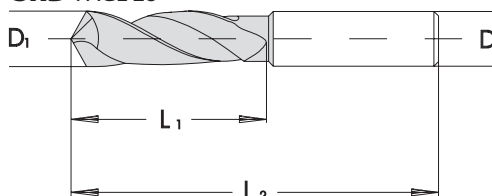
Ideal para

usos múltiples (Consulte la página 246)

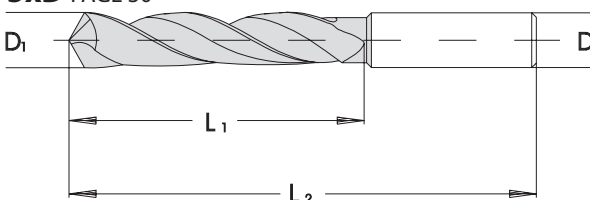
P M N S

****Left-Hand, Available Upon Request****

3xD PAGE 28



5xD PAGE 30



General Purpose Carbide Drills

Aluminum Carbide Drills

Steels Carbide Drills

Hardened Steels Carbide Drills

Spotting Carbide Drills

General Purpose Drills up to 30xD

Aluminum Drills up to 30xD

Drills for Steels

Pilot Drills

Solid Carbide Drills Non-Coolant

Solid Carbide Drills Internal Coolant

General Purpose Carbide Drills

Aluminum Carbide Drills

Steels Carbide Drills

Hardened Steels Carbide Drills

Spotting Carbide Drills

General Purpose Drills up to 30xD

Aluminum Drills up to 30xD

Drills for Steels

Pilot Drills

Design

Spiral-fluted, right-hand cut, with external coolant and a cylindrical shank.

Coating

Varianta® Supral TiAlCN (ML)

Ideal for

multi-purpose drilling (Refer to page 245)

P M N S

Diseño

Flautas espirales con corte de mano derecha, refrigerante externo y un zanco cilíndrico.

Recubrimiento

Varianta® Supral TiAlCN (ML)

Ideal para

usos múltiples (Consulte la página 246)

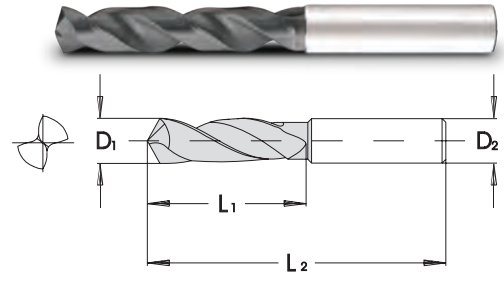
P M N S



Varianta Supral® provides higher cutting speeds and excellent wear resistance.

Speeds & Feeds Refer to Page 29.

****Left-Hand, Available Upon Request****



D ₁	Decimal	D ₁ mm	D ₂ in	L ₁ in	L ₂ in	Part #
1/16	.0625	1.59	1/8	5/8	2	TX00306250T9
#52	.0635	1.61	1/8	11/16	2	TX00300520T9
#51	.0670	1.70	1/8	11/16	2	TX00300510T9
#50	.0700	1.78	1/8	11/16	2	TX00300500T9
#49	.0730	1.85	1/8	11/16	2	TX00300490T9
#48	.0760	1.93	1/8	11/16	2	TX00300480T9
5/64	.0781	1.98	1/8	11/16	2	TX00307810T9
#47	.0785	1.99	1/8	3/4	2-1/2	TX00300470T9
	.0787	2.00	1/8	3/4	2-1/2	TX00307870T9
#46	.0810	2.06	1/8	3/4	2-1/2	TX00300460T9
#45	.0820	2.08	1/8	3/4	2-1/2	TX00300450T9
#44	.0860	2.18	1/8	3/4	2-1/2	TX00300440T9
#43	.0890	2.26	1/8	3/4	2-1/2	TX00300430T9
#42	.0935	2.37	1/8	3/4	2-1/2	TX00300420T9
3/32	.0938	2.38	1/8	3/4	2-1/2	TX00309380T9
#41	.0960	2.44	1/8	13/16	2-1/2	TX00300410T9
#40	.0980	2.49	1/8	13/16	2-1/2	TX00300400T9
	.0984	2.50	1/8	13/16	2-1/2	TX00309840T9
#39	.0995	2.53	1/8	13/16	2-1/2	TX00300390T9
#38	.1015	2.58	1/8	13/16	2-1/2	TX00300380T9
#37	.1040	2.64	1/8	13/16	2-1/2	TX00300370T9
#36	.1065	2.71	1/8	13/16	2-1/2	TX00300360T9
7/64	.1094	2.78	1/8	13/16	2-1/2	TX00301094T9
#35	.1100	2.79	1/8	7/8	2-1/2	TX00300350T9
#34	.1110	2.82	1/8	7/8	2-1/2	TX00300340T9
#33	.1130	2.87	1/8	7/8	2-1/2	TX00300330T9
#32	.1160	2.95	1/8	7/8	2-1/2	TX00300320T9
	.1181	3.00	1/8	7/8	2-1/2	TX00303000T9
#31	.1200	3.05	1/8	7/8	2-1/2	TX00300310T9
1/8	.1250	3.17	1/8	7/8	2-1/2	TX00303175T9
#30	.1285	3.26	3/16	15/16	2-1/2	TX00300300T9
#29	.1360	3.45	3/16	15/16	2-1/2	TX00300290T9
	.1378	3.50	3/16	15/16	2-1/2	TX00303500T9
#28	.1405	3.57	3/16	15/16	2-1/2	TX00300280T9
9/64	.1406	3.57	3/16	1	2-1/2	TX00303570T9
#27	.1440	3.66	3/16	1	2-1/2	TX00300270T9

D ₁	Decimal	D ₁ mm	D ₂ in	L ₁ in	L ₂ in	Part #
#26	.1470	3.73	3/16	1	2-1/2	TX00300260T9
#25	.1495	3.80	3/16	1	2-1/2	TX00300250T9
#24	.1520	3.86	3/16	1	2-1/2	TX00300240T9
#23	.1540	3.91	3/16	1	2-1/2	TX00300230T9
5/32	.1562	3.97	3/16	1	2-1/2	TX00303970T9
#22	.1570	3.99	3/16	1-1/16	2-1/2	TX00300220T9
	.1575	4.00	3/16	1-1/16	2-1/2	TX00304000T9
#21	.1590	4.04	3/16	1-1/16	2-1/2	TX00300210T9
#20	.1610	4.09	3/16	1-1/16	2-1/2	TX00300200T9
	.1654	4.20	3/16	1-1/16	2-1/2	TX00304200T9
#19	.1660	4.22	3/16	1-1/16	2-1/2	TX00300190T9
#18	.1695	4.30	3/16	1-1/16	2-1/2	TX00300180T9
11/64	.1719	4.37	3/16	1-1/16	2-1/2	TX00304370T9
#17	.1730	4.39	3/16	1-1/8	3	TX00300170T9
#16	.1770	4.49	3/16	1-1/8	3	TX00300160T9
	.1772	4.50	3/16	1-1/8	3	TX00304500T9
#15	.1800	4.57	3/16	1-1/8	3	TX00300150T9
#14	.1820	4.62	3/16	1-1/8	3	TX00300140T9
#13	.1850	4.70	3/16	1-1/8	3	TX00300130T9
3/16	.1875	4.76	3/16	1-1/8	3	TX00304760T9
#12	.1890	4.80	1/4	1-3/16	3	TX00300120T9
#11	.1910	4.85	1/4	1-3/16	3	TX00300110T9
#10	.1935	4.91	1/4	1-3/16	3	TX00300100T9
#9	.1960	4.98	1/4	1-3/16	3	TX00300090T9
	.1969	5.00	1/4	1-3/16	3	TX00305000T9
#8	.1990	5.05	1/4	1-3/16	3	TX00300080T9
	.2008	5.10	1/4	1-3/16	3	TX00305100T9
#7	.2010	5.10	1/4	1-3/16	3	TX00300070T9
13/64	.2031	5.16	1/4	1-3/16	3	TX00305160T9
#6	.2040	5.18	1/4	1-1/4	3	TX00300060T9
#5	.2055	5.22	1/4	1-1/4	3	TX00300050T9
#4	.2090	5.31	1/4	1-1/4	3	TX00300040T9
#3	.2130	5.41	1/4	1-1/4	3	TX00300030T9
	.2165	5.50	1/4	1-1/4	3	TX00302165T9
7/32	.2188	5.56	1/4	1-1/4	3	TX00305560T9
#2	.2210	5.61	1/4	1-5/16	3	TX00300020T9

****Other Dimensions are Available Upon Request****

Tolerance

Drill Dia (h7) Inches (in)	Drill Dia (h7) Metric (mm)	Shank Dia (h6) Inches (in)	Shank Dia (h6) Metric (mm)
.0000-.1181: + 0/-0.0039	0-3: + 0/-0.10	.0000-.1181: + 0/-0.0024	0-3: + 0/-0.006
.1182-.2362: + 0/-0.0047	3.01-6: + 0/-0.12	.1182-.2362: + 0/-0.0031	3.01-6: + 0/-0.008
.2363-.3937: + 0/-0.0059	6.01-10.0: + 0/-0.15	.2363-.3937: + 0/-0.0035	6.01-10.0: + 0/-0.009
.3938-.7087: + 0/-0.0071	10.01-18.0: + 0/-0.18	.3938-.7087: + 0/-0.0043	10.01-18.0: + 0/-0.11

D ₁	Decimal	D ₁ mm	D ₂ in	L ₁ in	L ₂ in	Part #
#1	.2280	5.79	1/4	1-5/16	3	TX00300010T9
A	.2340	5.94	1/4	1-5/16	3	TX003000A0T9
15/64	.2344	5.95	1/4	1-5/16	3	TX00305950T9
	.2362	6.00	1/4	1-3/8	3	TX00306000T9
B	.2380	6.04	1/4	1-3/8	3	TX003000B0T9
C	.2420	6.15	1/4	1-3/8	3	TX003000C0T9
D	.2460	6.25	1/4	1-3/8	3	TX003000D0T9
1/4 / E	.2500	6.35	1/4	1-3/8	3	TX00306350T9
	.2559	6.50	5/16	1-7/16	3	TX00306500T9
F	.2570	6.53	5/16	1-7/16	3	TX003000F0T9
G	.2610	6.63	5/16	1-7/16	3	TX003000G0T9
17/64	.2656	6.75	5/16	1-7/16	3	TX00306750T9
H	.2660	6.76	5/16	1-1/2	3	TX003000H0T9
I	.2720	6.91	5/16	1-1/2	3	TX003000I0T9
	.2756	7.00	5/16	1-1/2	3	TX00307000T9
J	.2770	7.03	5/16	1-1/2	3	TX003000J0T9
K	.2810	7.14	5/16	1-1/2	3	TX003000K0T9
9/32	.2812	7.14	5/16	1-1/2	3	TX00307140T9
L	.2900	7.37	5/16	1-9/16	4	TX003000L0T9
M	.2950	7.49	5/16	1-9/16	4	TX003000M0T9
	.2953	7.50	5/16	1-9/16	4	TX00307500T9
19/64	.2969	7.54	5/16	1-9/16	4	TX00307540T9
N	.3020	7.67	5/16	1-5/8	4	TX003000N0T9
5/16	.3125	7.94	5/16	1-5/8	4	TX00307940T9
	.3150	8.00	3/8	1-11/16	4	TX00308000T9
O	.3160	8.03	3/8	1-11/16	4	TX003000O0T9
P	.3230	8.20	3/8	1-11/16	4	TX003000P0T9
21/64	.3281	8.33	3/8	1-11/16	4	TX00308330T9
Q	.3320	8.43	3/8	1-11/16	4	TX003000Q0T9
	.3346	8.50	3/8	1-11/16	4	TX00308500T9

D ₁	Decimal	D ₁ mm	D ₂ in	L ₁ in	L ₂ in	Part #
R	.3390	8.61	3/8	1-11/16	4	TX003000R0T9
11/32	.3438	8.73	3/8	1-11/16	4	TX00308730T9
S	.3480	8.84	3/8	1-3/4	4	TX003000S0T9
	.3543	9.00	3/8	1-3/4	4	TX00309000T9
T	.3580	9.09	3/8	1-3/4	4	TX003000T0T9
23/64	.3594	9.13	3/8	1-3/4	4	TX00309130T9
U	.3680	9.35	3/8	1-13/16	4	TX003000U0T9
	.3740	9.50	3/8	1-13/16	4	TX00309500T9
3/8	.3750	9.52	3/8	1-13/16	4	TX00309520T9
V	.3770	9.57	7/16	1-7/8	4	TX003000V0T9
W	.3860	9.80	7/16	1-7/8	4	TX003000W0T9
25/64	.3906	9.92	7/16	1-7/8	4	TX00309920T9
	.3937	10.00	7/16	1-15/16	4	TX00310000T9
X	.3970	10.08	7/16	1-15/16	4	TX003000X0T9
Y	.4040	10.26	7/16	1-15/16	4	TX003000Y0T9
13/32	.4062	10.32	7/16	1-15/16	4	TX00310320T9
Z	.4130	10.49	7/16	2	4	TX003000Z0T9
	.4134	10.50	7/16	2	4	TX00310500T9
27/64	.4219	10.72	7/16	2	4	TX00310720T9
	.4252	10.80	7/16	2	4	TX00310800T9
	.4331	11.00	7/16	2-1/16	4	TX00311000T9
7/16	.4375	11.11	7/16	2-1/16	4	TX00304375T9
	.4528	11.50	1/2	2-1/8	4	TX00311500T9
29/64	.4531	11.51	1/2	2-1/8	4	TX00311510T9
15/32	.4688	11.91	1/2	2-1/8	4	TX00311910T9
	.4724	12.00	1/2	2-3/16	4	TX00312000T9
31/64	.4844	12.30	1/2	2-3/16	4	TX00312300T9
	.4921	12.50	1/2	2-3/16	4	TX00312500T9
1/2	.5000	12.70	1/2	2-1/4	4	TX00312700T9

Other Dimensions are Available Upon Request

TX 3xD Speeds and Feeds METRIC		Vc m/min (Cutting speed)	D1mm	F[mm/u] Feed Per Revolution				
Material	> 3.00 ≤ 5.00			> 5.00 ≤ 8.00	> 8.00 ≤ 12.00	> 12.00 ≤ 16.00	> 16.00 ≤ 20.00	
			Dec. Inch.	.1181- .1969	.1970- .3150	.3151- .4724	.4725- .6299	.4726- .7874
P1	Low - Carbon Steel - 1000 Series (> 25 HRC)	65		.14	.20	.275	.35	.45
P3	Alloy Tool Steels - 1300, 2000, 3000 (≤ 35HRC)	60		.14	.20	.28	.35	.45
M2	Austenitic Stainless Steel & Cast Stainless Steel- 310, 314, 316 (< 25 HRC)	60		.08	.12	.15	.20	.25
N2	Low-Silicon Aluminum Alloys Si < 12.2%- 6061,7075	132		.14	.20	.275	.35	.45
S2	Nickel Based, cobalt Based, Heat Resistant Alloys- Haynes 188, Haynes 21, Hastelloy, Waspalloy, Inconel 625/718 (≤48hRc)	34		.04	.08	.12	.16	.20

Note: These are only recommended starting figures that depend on conditions such as machine and material rigidity, type of coating if any, etc. TESTING IS RECOMMENDED

TX 3xD Speeds and Feeds INCHES		SFM(Vc) Surface Feet Per Minute	D1mm	IPR=Inches Per Revolution				
Material	> 3.00 ≤ 5.00			> 5.00 ≤ 8.00	> 8.00 ≤ 12.00	> 12.00 ≤ 16.00	> 16.00 ≤ 20.00	
			Dec. Inch.	.1181- .1969	.1970- .3150	.3151- .4724	.4725- .6299	.4726- .7874
P1	Low - Carbon Steel - 1000 Series (> 25 HRC)	213.3		0.005	0.007	0.010	0.013	0.017
P3	Alloy Tool Steels - 1300, 2000, 3000 (≤ 35HRC)	196.9		0.005	0.007	0.010	0.013	0.017
M2	Austenitic Stainless Steel & Cast Stainless Steel- 310, 314, 316 (< 25 HRC)	196.9		0.003	0.004	0.005	0.007	0.009
N2	Low-Silicon Aluminum Alloys Si < 12.2%- 6061,7075	433.1		0.005	0.007	0.010	0.013	0.017
S2	Nickel Based, cobalt Based, Heat Resistant Alloys- Haynes 188, Haynes 21, Hastelloy, Waspalloy, Inconel 625/718 (≤48hRc)	111.6		0.001	0.003	0.004	0.006	0.007

Note: These are only recommended starting figures that depend on conditions such as machine and material rigidity, type of coating if any, etc. TESTING IS RECOMMENDED

General Purpose Carbide Drills

Aluminum Carbide Drills

Steels Carbide Drills

Hardened Steels Carbide Drills

Spotting Carbide Drills

General Purpose Drills up to 30xD

Aluminum Drills up to 30xD

Drills for Steels

Pilot Drills

Design

Spiral-fluted, right-hand cut, with external coolant and a cylindrical shank.

Coating

Varianta® Supral TiAlCN (ML)

Ideal for

multi-purpose drilling (Refer to page 245)

P M N S

Diseño

Flautas Espirales con corte de mano derecha, refrigerante externo y un zanco cilíndrico.

Recubrimiento

Varianta® Supral TiAlCN (ML)

Ideal para

usos múltiples (Consulte la página 246)

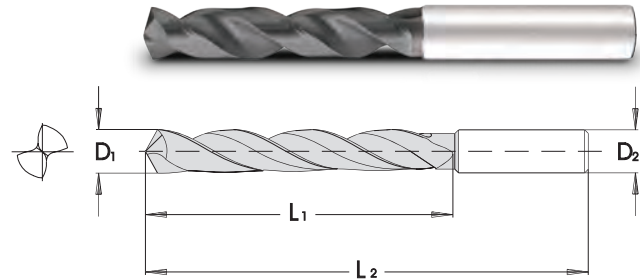
P M N S



Varianta Supral® provides higher cutting speeds and excellent wear resistance.

Speeds & Feeds Refer to Page 31.

****Left-Hand, Available Upon Request****



D ₁	Decimal	D ₁ mm	D ₂ in	L ₁ in	L ₂ in	Part #
1/16	.0625	1.59	1/8	3/4	2-1/2	TX00506250T9
#52	.0635	1.61	1/8	3/4	2-1/2	TX00500520T9
#51	.0670	1.70	1/8	3/4	2-1/2	TX00500510T9
#50	.0700	1.78	1/8	7/8	2-1/2	TX00500500T9
#49	.0730	1.85	1/8	7/8	2-1/2	TX00500490T9
#48	.0760	1.93	1/8	7/8	2-1/2	TX00500480T9
5/64	.0781	1.98	1/8	7/8	2-1/2	TX00507810T9
#47	.0785	1.99	1/8	7/8	2-1/2	TX00500470T9
	.0787	2.00	1/8	7/8	2-1/2	TX00507870T9
#46	.0810	2.06	1/8	7/8	2-1/2	TX00500460T9
#45	.0820	2.08	1/8	7/8	2-1/2	TX00500450T9
#44	.0860	2.18	1/8	1	2-1/2	TX00500440T9
#43	.0890	2.26	1/8	1	2-1/2	TX00500430T9
#42	.0935	2.37	1/8	1	2-1/2	TX00500420T9
3/32	.0938	2.38	1/8	1	2-1/2	TX00509380T9
#41	.0960	2.44	1/8	1	2-1/2	TX00500410T9
#40	.0980	2.49	1/8	1	2-1/2	TX00500400T9
	.0984	2.50	1/8	1-1/4	3	TX00509840T9
#39	.0995	2.53	1/8	1-1/4	3	TX00500390T9
#38	.1015	2.58	1/8	1-1/4	3	TX00500380T9
#37	.1040	2.64	1/8	1-1/4	3	TX00500370T9
#36	.1065	2.71	1/8	1-1/4	3	TX00500360T9
7/64	.1094	2.78	1/8	1-1/4	3	TX00501094T9
#35	.1100	2.79	1/8	1-1/4	3	TX00500350T9
#34	.1110	2.82	1/8	1-1/4	3	TX00500340T9
#33	.1130	2.87	1/8	1-1/4	3	TX00500330T9
#32	.1160	2.95	1/8	1-1/4	3	TX00500320T9
	.1181	3.00	1/8	1-1/4	3	TX00503000T9
#31	.1200	3.05	1/8	1-1/4	3	TX00500310T9
1/8	.1250	3.17	1/8	1-1/4	3	TX00503175T9
#30	.1285	3.26	3/16	1-1/4	3	TX00500300T9
#29	.1360	3.45	3/16	1-3/8	3	TX00500290T9
	.1378	3.50	3/16	1-3/8	3	TX00503500T9
#28	.1405	3.57	3/16	1-3/8	3	TX00500280T9
9/64	.1406	3.57	3/16	1-3/8	3	TX00503570T9
#27	.1440	3.66	3/16	1-3/8	3	TX00500270T9

D ₁	Decimal	D ₁ mm	D ₂ in	L ₁ in	L ₂ in	Part #
#26	.1470	3.73	3/16	1-3/8	3	TX00500260T9
#25	.1495	3.80	3/16	1-3/8	3	TX00500250T9
#24	.1520	3.86	3/16	1-3/8	3	TX00500240T9
#23	.1540	3.91	3/16	1-3/8	3	TX00500230T9
5/32	.1562	3.97	3/16	1-3/8	3	TX00503970T9
#22	.1570	3.99	3/16	1-3/8	3	TX00500220T9
	.1575	4.00	3/16	1-3/8	3	TX00504000T9
#21	.1590	4.04	3/16	1-3/8	3	TX00500210T9
#20	.1610	4.09	3/16	1-3/8	3	TX00500200T9
#19	.1660	4.22	3/16	1-5/8	3	TX00500190T9
#18	.1695	4.30	3/16	1-5/8	3	TX00500180T9
11/64	.1719	4.37	3/16	1-5/8	3	TX00504370T9
#17	.1730	4.39	3/16	1-5/8	3	TX00500170T9
#16	.1770	4.49	3/16	1-5/8	3	TX00500160T9
	.1772	4.50	3/16	1-5/8	3	TX00504500T9
#15	.1800	4.57	3/16	1-5/8	3	TX00500150T9
#14	.1820	4.62	3/16	1-5/8	3	TX00500140T9
#13	.1850	4.70	3/16	1-5/8	3	TX00500130T9
3/16	.1875	4.76	3/16	1-5/8	3	TX00504760T9
#12	.1890	4.80	1/4	1-5/8	3	TX00500120T9
#11	.1910	4.85	1/4	1-5/8	3	TX00500110T9
#10	.1935	4.91	1/4	1-5/8	3	TX00500100T9
#9	.1960	4.98	1/4	1-3/4	3	TX00500090T9
	.1969	5.00	1/4	1-3/4	3	TX00505000T9
#8	.1990	5.05	1/4	1-3/4	3	TX00500080T9
#7	.2010	5.10	1/4	1-3/4	3	TX00500070T9
13/64	.2031	5.16	1/4	1-3/4	3	TX00505160T9
#6	.2040	5.18	1/4	1-3/4	3	TX00500060T9
#5	.2055	5.22	1/4	1-3/4	3	TX00500050T9
#4	.2090	5.31	1/4	1-3/4	3	TX00500040T9
#3	.2130	5.41	1/4	1-3/4	3	TX00500030T9
	.2165	5.50	1/4	1-3/4	3	TX00502165T9
7/32	.2188	5.56	1/4	1-3/4	3	TX00505560T9
#2	.2210	5.61	1/4	1-3/4	3	TX00500020T9
#1	.2280	5.79	1/4	1-3/4	3	TX00500010T9
A	.2340	5.94	1/4	2	4	TX005000A0T9

****Other Dimensions are Available Upon Request****

Tolerance

Drill Dia (h7) Inches (in)	Drill Dia (h7) Metric (mm)	Shank Dia (h6) Inches (in)	Shank Dia (h6) Metric (mm)
.0000-.1181: + 0/--.00039	0-3: + 0/--.010	.0000-.1181: + 0/--.00024	0-3: + 0/--.006
.1182-.2362: + 0/--.00047	3.01-6: + 0/--.012	.1182-.2362: + 0/--.00031	3.01-6: + 0/--.008
.2363-.3937: + 0/--.00059	6.01-10.0: + 0/--.015	.2363-.3937: + 0/--.00035	6.01-10.0: + 0/--.009
.3938-.7087: + 0/--.00071	10.01-18.0: + 0/--.018	.3938-.7087: + 0/--.00043	10.01-18.0: + 0/--.011

D ₁	Decimal	D ₁ mm	D ₂ in	L ₁ in	L ₂ in	Part #
15/64	.2344	5.95	1/4	2	4	TX0050950T9
	.2362	6.00	1/4	2	4	TX00506000T9
B	.2380	6.04	1/4	2	4	TX005000B0T9
C	.2420	6.15	1/4	2	4	TX005000C0T9
D	.2460	6.25	1/4	2	4	TX005000D0T9
1/4 / E	.2500	6.35	1/4	2	4	TX00506350T9
	.2559	6.50	5/16	2	4	TX00506500T9
F	.2570	6.53	5/16	2	4	TX005000F0T9
G	.2610	6.63	5/16	2-1/8	4	TX005000G0T9
17/64	.2656	6.75	5/16	2-1/8	4	TX00506750T9
H	.2660	6.76	5/16	2-1/8	4	TX005000H0T9
I	.2720	6.91	5/16	2-1/8	4	TX005000I0T9
	.2756	7.00	5/16	2-1/8	4	TX00507000T9
J	.2770	7.03	5/16	2-1/8	4	TX005000J0T9
K	.2810	7.14	5/16	2-1/8	4	TX005000K0T9
9/32	.2812	7.14	5/16	2-1/8	4	TX00507140T9
L	.2900	7.37	5/16	2-1/8	4	TX005000L0T9
M	.2950	7.49	5/16	2-3/8	4	TX005000M0T9
	.2953	7.50	5/16	2-3/8	4	TX00507500T9
19/64	.2969	7.54	5/16	2-3/8	4	TX00507540T9
N	.3020	7.67	5/16	2-3/8	4	TX005000N0T9
5/16	.3125	7.94	5/16	2-3/8	4	TX00507940T9
	.3150	8.00	3/8	2-3/8	4	TX00508000T9
O	.3160	8.03	3/8	2-3/8	4	TX005000O0T9
P	.3230	8.20	3/8	2-3/8	4	TX005000P0T9
21/64	.3281	8.33	3/8	2-1/2	5	TX00508330T9
Q	.3320	8.43	3/8	2-1/2	5	TX005000Q0T9
	.3346	8.50	3/8	2-1/2	5	TX00508500T9
R	.3390	8.61	3/8	2-1/2	5	TX005000R0T9
11/32	.3438	8.73	3/8	2-1/2	5	TX00508730T9
S	.3480	8.84	3/8	2-1/2	5	TX005000S0T9
	.3543	9.00	3/8	2-1/2	5	TX00509000T9
T	.3580	9.09	3/8	2-3/4	5	TX005000T0T9
23/64	.3594	9.13	3/8	2-3/4	5	TX00509130T9
U	.3680	9.35	3/8	2-3/4	5	TX005000U0T9
	.3740	9.50	3/8	2-3/4	5	TX00509500T9

D ₁	Decimal	D ₁ mm	D ₂ in	L ₁ in	L ₂ in	Part #
3/8	.3750	9.52	3/8	2-3/4	4	TX00509520T9
V	.3770	9.57	7/16	2-3/4	5	TX005000V0T9
W	.3860	9.80	7/16	2-7/8	5	TX005000W0T9
25/64	.3906	9.92	7/16	2-7/8	5	TX00509920T9
	.3937	10.00	7/16	2-7/8	5	TX00510000T9
X	.3970	10.08	7/16	2-7/8	5	TX005000X0T9
Y	.4040	10.26	7/16	2-7/8	5	TX005000Y0T9
13/32	.4062	10.32	7/16	2-7/8	5	TX00510320T9
Z	.4130	10.49	7/16	2-7/8	5	TX005000Z0T9
	.4134	10.50	7/16	2-7/8	5	TX00510500T9
27/64	.4219	10.72	7/16	2-7/8	5	TX00510720T9
	.4252	10.80	7/16	2-7/8	5	TX00510800T9
	.4331	11.00	7/16	2-7/8	5	TX00511000T9
7/16	.4375	11.11	7/16	2-7/8	5	TX00504375T9
	.4528	11.50	1/2	3	5	TX00511500T9
29/64	.4531	11.51	1/2	3	5	TX00511510T9
15/32	.4688	11.91	1/2	3	5	TX00511910T9
	.4724	12.00	1/2	3	5	TX00512000T9
31/64	.4844	12.30	1/2	3	5	TX00512300T9
	.4921	12.50	1/2	3	5	TX00512500T9
1/2	.5000	12.70	1/2	3	5	TX00512700T9
	.5118	13.00	9/16	3	5	TX00513000T9
33/64	.5156	13.10	9/16	3-1/4	5	TX00513100T9
17/32	.5312	13.49	9/16	3-1/4	5	TX00513490T9
	.5315	13.50	9/16	3-1/4	5	TX00513500T9
35/64	.5469	13.89	9/16	3-1/4	5	TX00513890T9
	.5512	14.00	9/16	3-1/4	5	TX00514000T9
9/16	.5625	14.29	9/16	3-1/4	5	TX00514290T9
	.5709	14.50	5/8	3-1/4	5	TX00514500T9
37/64	.5781	14.68	5/8	3-1/2	6	TX00514680T9
	.5906	15.00	5/8	3-1/2	6	TX00515000T9
19/32	.5938	15.08	5/8	3-1/2	6	TX00515080T9
39/64	.6094	15.48	5/8	3-1/2	6	TX00515480T9
	.6102	15.50	5/8	3-1/2	6	TX00515500T9
5/8	.6250	15.87	5/8	3-1/2	6	TX00515870T9
	.6299	16.00	3/4	3-1/2	6	TX00516000T9

Other Dimensions are Available Upon Request

TX 5xD Speeds and Feeds METRIC		Vc m/min (Cutting speed)	D1mm	F[mm/u] Feed Per Revolution				
Material	Dec. Inch.			> 3.00 ≤ 5.00	> 5.00 ≤ 8.00	> 8.00 ≤ 12.00	> 12.00 ≤ 16.00	> 16.00 ≤ 20.00
P1 Low - Carbon Steel - 1000 Series (> 25 HRC)		60		.14	.20	.275	.35	.45
P3 Alloy Tool Steels - 1300, 2000, 3000 (≤ 35HRC)		55		.14	.20	.28	.35	.45
M2 Austenitic Stainless Steel & Cast Stainless Steel- 310, 314, 316 (< 25 HRC)		55		.08	.12	.15	.20	.25
N2 Low-Silicon Aluminum Alloys Si < 12.2%- 6061,7075		127		.14	.20	.275	.35	.45
S2 Nickel Based, cobalt Based, Heat Resistant Alloys- Haynes 188, Haynes 21, Hastelloy, Waspalloy, Inconel 625/718 (≤48hRc)		29		.04	.08	.12	.16	.20

Note: These are only recommended starting figures that depend on conditions such as machine and material rigidity, type of coating if any, etc. TESTING IS RECOMMENDED

TX 5xD Speeds and Feeds INCHES		SFM(Vc) Surface Feet Per Minute	D1mm	IPR=Inches Per Revolution				
Material	Dec. Inch.			> 3.00 ≤ 5.00	> 5.00 ≤ 8.00	> 8.00 ≤ 12.00	> 12.00 ≤ 16.00	> 16.00 ≤ 20.00
P1 Low - Carbon Steel - 1000 Series (> 25 HRC)		195.4		0.005	0.007	0.010	0.013	0.017
P3 Alloy Tool Steels - 1300, 2000, 3000 (≤ 35HRC)		181.3		0.005	0.007	0.010	0.013	0.017
M2 Austenitic Stainless Steel & Cast Stainless Steel- 310, 314, 316 (< 25 HRC)		181.3		0.003	0.004	0.005	0.007	0.009
N2 Low-Silicon Aluminum Alloys Si < 12.2%- 6061,7075		418.3		0.005	0.007	0.010	0.013	0.017
S2 Nickel Based, cobalt Based, Heat Resistant Alloys- Haynes 188, Haynes 21, Hastelloy, Waspalloy, Inconel 625/718 (≤48hRc)		97.5		0.001	0.003	0.004	0.006	0.007

Note: These are only recommended starting figures that depend on conditions such as machine and material rigidity, type of coating if any, etc. TESTING IS RECOMMENDED

General Purpose Carbide Drills
Aluminum Carbide Drills
Steels Carbide Drills
Hardened Steels Carbide Drills
Spotting Carbide Drills
General Purpose Drills up to 30xD
Aluminum Drills up to 30xD
Drills for Steels
Pilot Drills



**High-Performance Drill
Triple-Margin
Ideal for Aluminum & Cast Materials
3xD-5xD**

Triple Margin Design - When drilling, the triple margin improves stability, accuracy and surface finish.

Triple Diseño Margen - Cuando se perfora, el margen triple mejora la estabilidad, precisión y acabado superficial.

Z-Power Coating - Reduces friction between the chip and tool, preventing chip clogging. In addition, the coating reduces heat and abrasion wear.

Z-Power Recubrimiento - Reduce la fricción entre la viruta y la herramienta, previniendo el atasco de viruta. Además, el recubrimiento reduce la temperatura y abrasión.

135° Point Geometry - Split-point geometry for superior drill penetration and accuracy. It has a self-centering point with high penetration capabilities.

135° Geometría de la Punta - Diseño con punto dividido para superior perforación y precisión. Tiene un punto autocentrante con alto poder de penetración.

Polish - Chip evacuation is improved during deep hole drilling, when the flutes are polished.

Pulido - Cuando las flautas están pulidas la evacuación de la viruta es mejorada.



Tolerance

Drill Dia (h7) Inches (in)	Drill Dia (h7) Metric (mm)
.0000-.1181: + 0/-0.0039	0-3: + 0/-0.10
.1182-.2362: + 0/-0.0047	3.01-6: + 0/-0.12
.2363-.3937: + 0/-0.0059	6.01-10.0: + 0/-0.15
.3938-.7087: + 0/-0.0071	10.01-18.0: + 0/-0.18

Shank Dia (h6) Inches (in)	Shank Dia (h6) Metric (mm)
.0000-.1181: + 0/-0.0024	0-3: + 0/-0.06
.1182-.2362: + 0/-0.0031	3.01-6: + 0/-0.08
.2363-.3937: + 0/-0.0035	6.01-10.0: + 0/-0.09
.3938-.7087: + 0/-0.0043	10.01-18.0: + 0/-0.11



Z-Power® has excellent corrosion and adhesion resistant properties.

Design

Long spiral-fluted, triple-margin, right-hand cut and external coolant.

Coating

Z-Power (ZrN)

Ideal for

aluminum, cast materials and non-ferrous materials (Refer to page 245)



Diseño

Flautas largas espirales, margen, triple con corte de mano derecha y refrigerante externo.

Recubrimiento

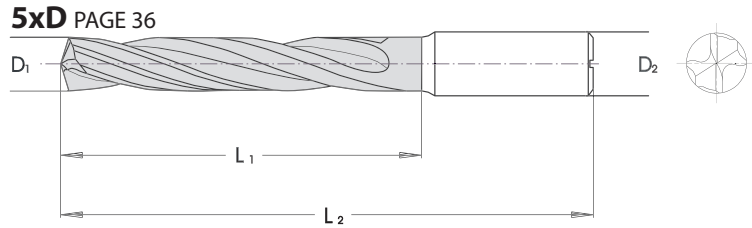
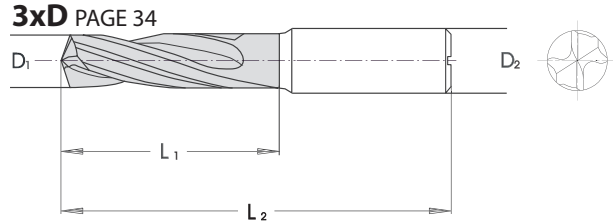
Z-Power (ZrN)

Ideal para

aluminio, materiales de fundición y materiales no ferrosos (Consulte la página 246)



Left-Hand, Available Upon Request



General Purpose
Carbide Drills

Aluminum
Carbide Drills

Steels
Carbide Drills

Hardened Steels
Carbide Drills

Spotting
Carbide Drills

General Purpose
Drills up to 30xD

Aluminum Drills
up to 30xD

Drills for Steels

Pilot Drills

Solid Carbide Drills Non-Coolant

Solid Carbide Drills Internal Coolant

General Purpose Carbide Drills
Aluminum Carbide Drills
Steels Carbide Drills
Hardened Steels Carbide Drills
Spotting Carbide Drills
General Purpose Drills up to 30xD
Aluminum Drills up to 30xD
Drills for Steels
Pilot Drills

Design

Long spiral - fluted, triple - margin, right-hand cut and external coolant.

Coating

Z-Power (ZrN)

Ideal for

aluminum, cast materials and non-ferrous materials (Refer to page 245)



Diseño

Flautas largas espirales, margen con corte de mano derecha y refrigerante externo.

Recubrimiento

Z-Power (ZrN)

Ideal para

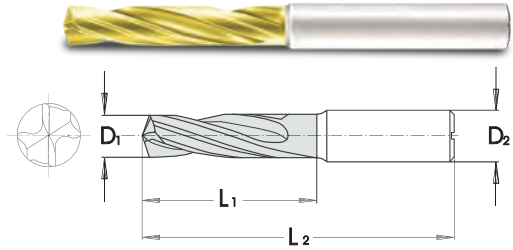
aluminio, materiales de fundición y materiales no ferrosos (Consulte la página 246)



Z-Power® has excellent corrosion and adhesion resistant properties.

Speeds & Feeds Refer to Page 35.

Left-Hand, Available Upon Request



D ₁	Decimal	D ₁ mm	D ₂ in	L ₁ in	L ₂ in	Part #
1/16	.0625	1.59	1/8	5/8	2	AX00306250T6
#52	.0635	1.61	1/8	11/16	2	AX00300520T6
#51	.0670	1.70	1/8	11/16	2	AX00300510T6
#50	.0700	1.78	1/8	11/16	2	AX00300500T6
#49	.0730	1.85	1/8	11/16	2	AX00300490T6
#48	.0760	1.93	1/8	11/16	2	AX00300480T6
5/64	.0781	1.98	1/8	11/16	2	AX00307810T6
#47	.0785	1.99	1/8	3/4	2-1/2	AX00300470T6
	.0787	2.00	1/8	3/4	2-1/2	AX00307870T6
#46	.0810	2.06	1/8	3/4	2-1/2	AX00300460T6
#45	.0820	2.08	1/8	3/4	2-1/2	AX00300450T6
#44	.0860	2.18	1/8	3/4	2-1/2	AX00300440T6
#43	.0890	2.26	1/8	3/4	2-1/2	AX00300430T6
#42	.0935	2.37	1/8	3/4	2-1/2	AX00300420T6
3/32	.0938	2.38	1/8	3/4	2-1/2	AX00309380T6
#41	.0960	2.44	1/8	13/16	2-1/2	AX00300410T6
#40	.0980	2.49	1/8	13/16	2-1/2	AX00300400T6
	.0984	2.50	1/8	13/16	2-1/2	AX00309840T6
#39	.0995	2.53	1/8	13/16	2-1/2	AX00300390T6
#38	.1015	2.58	1/8	13/16	2-1/2	AX00300380T6
#37	.1040	2.64	1/8	13/16	2-1/2	AX00300370T6
#36	.1065	2.71	1/8	13/16	2-1/2	AX00300360T6
7/64	.1094	2.78	1/8	13/16	2-1/2	AX00301094T6
#35	.1100	2.79	1/8	7/8	2-1/2	AX00300350T6
#34	.1110	2.82	1/8	7/8	2-1/2	AX00300340T6
#33	.1130	2.87	1/8	7/8	2-1/2	AX00300330T6
#32	.1160	2.95	1/8	7/8	2-1/2	AX00300320T6
	.1181	3.00	1/8	7/8	2-1/2	AX00303000T6
#31	.1200	3.05	1/8	7/8	2-1/2	AX00300310T6
1/8	.1250	3.17	1/8	7/8	2-1/2	AX00303175T6
#30	.1285	3.26	3/16	15/16	2-1/2	AX00300300T6
#29	.1360	3.45	3/16	15/16	2-1/2	AX00300290T6
	.1378	3.50	3/16	15/16	2-1/2	AX00303500T6
#28	.1405	3.57	3/16	15/16	2-1/2	AX00300280T6
9/64	.1406	3.57	3/16	1	2-1/2	AX00303570T6
#27	.1440	3.66	3/16	1	2-1/2	AX00300270T6

D ₁	Decimal	D ₁ mm	D ₂ in	L ₁ in	L ₂ in	Part #
#26	.1470	3.73	3/16	1	2-1/2	AX00300260T6
#25	.1495	3.80	3/16	1	2-1/2	AX00300250T6
#24	.1520	3.86	3/16	1	2-1/2	AX00300240T6
#23	.1540	3.91	3/16	1	2-1/2	AX00300230T6
5/32	.1562	3.97	3/16	1	2-1/2	AX00303970T6
#22	.1570	3.99	3/16	1-1/16	2-1/2	AX00300220T6
	.1575	4.00	3/16	1-1/16	2-1/2	AX00304000T6
#21	.1590	4.04	3/16	1-1/16	2-1/2	AX00300210T6
#20	.1610	4.09	3/16	1-1/16	2-1/2	AX00300200T6
	.1654	4.20	3/16	1-1/16	2-1/2	AX00304200T6
#19	.1660	4.22	3/16	1-1/16	2-1/2	AX00300190T6
#18	.1695	4.30	3/16	1-1/16	2-1/2	AX00300180T6
11/64	.1719	4.37	3/16	1-1/16	2-1/2	AX00304370T6
#17	.1730	4.39	3/16	1-1/8	3	AX00300170T6
#16	.1770	4.49	3/16	1-1/8	3	AX00300160T6
	.1772	4.50	3/16	1-1/8	3	AX00304500T6
#15	.1800	4.57	3/16	1-1/8	3	AX00300150T6
#14	.1820	4.62	3/16	1-1/8	3	AX00300140T6
#13	.1850	4.70	3/16	1-1/8	3	AX00300130T6
3/16	.1875	4.76	3/16	1-1/8	3	AX00304760T6
#12	.1890	4.80	1/4	1-3/16	3	AX00300120T6
#11	.1910	4.85	1/4	1-3/16	3	AX00300110T6
#10	.1935	4.91	1/4	1-3/16	3	AX00300100T6
#9	.1960	4.98	1/4	1-3/16	3	AX00300090T6
	.1969	5.00	1/4	1-3/16	3	AX00305000T6
#8	.1990	5.05	1/4	1-3/16	3	AX00300080T6
	.2008	5.10	1/4	1-3/16	3	AX00305100T6
#7	.2010	5.10	1/4	1-3/16	3	AX00300070T6
13/64	.2031	5.16	1/4	1-3/16	3	AX00305160T6
#6	.2040	5.18	1/4	1-1/4	3	AX00300060T6
#5	.2055	5.22	1/4	1-1/4	3	AX00300050T6
#4	.2090	5.31	1/4	1-1/4	3	AX00300040T6
#3	.2130	5.41	1/4	1-1/4	3	AX00300030T6
	.2165	5.50	1/4	1-1/4	3	AX00302165T6
7/32	.2188	5.56	1/4	1-1/4	3	AX00305560T6
#2	.2210	5.61	1/4	1-5/16	3	AX00300020T6

Other Dimensions are Available Upon Request

Tolerance

Drill Dia (h7) Inches (in) .0000-.1181: +0/-.00039 .1182-.2362: +0/-.00047 .2363-.3937: +0/-.00059 .3938-.7087: +0/-.00071	Drill Dia (h7) Metric (mm) 0-3: +0/-.010 3.01-6: +0/-.012 6.01-10.0: +0/-.015 10.01-18.0: +0/-.018	Shank Dia (h6) Inches (in) .0000-.1181: +0/-.00024 .1182-.2362: +0/-.00031 .2363-.3937: +0/-.00035 .3938-.7087: +0/-.00043	Shank Dia (h6) Metric (mm) 0-3: +0/-.006 3.01-6: +0/-.008 6.01-10.0: +0/-.009 10.01-18.0: +0/-.011
--	--	--	--

D ₁	Decimal	D ₁ mm	D ₂ in	L ₁ in	L ₂ in	Part #
#1	.2280	5.79	1/4	1-5/16	3	AX00300010T6
A	.2340	5.94	1/4	1-5/16	3	AX003000A0T6
15/64	.2344	5.95	1/4	1-5/16	3	AX00305950T6
	.2362	6.00	1/4	1-3/8	3	AX00306000T6
B	.2380	6.04	1/4	1-3/8	3	AX003000B0T6
C	.2420	6.15	1/4	1-3/8	3	AX003000C0T6
D	.2460	6.25	1/4	1-3/8	3	AX003000D0T6
1/4 / E	.2500	6.35	1/4	1-3/8	3	AX00306350T6
	.2559	6.50	5/16	1-7/16	3	AX00306500T6
F	.2570	6.53	5/16	1-7/16	3	AX003000F0T6
G	.2610	6.63	5/16	1-7/16	3	AX003000G0T6
17/64	.2656	6.75	5/16	1-7/16	3	AX00306750T6
H	.2660	6.76	5/16	1-1/2	3	AX003000H0T6
I	.2720	6.91	5/16	1-1/2	3	AX003000I0T6
	.2756	7.00	5/16	1-1/2	3	AX00307000T6
J	.2770	7.03	5/16	1-1/2	3	AX003000J0T6
K	.2810	7.14	5/16	1-1/2	3	AX003000K0T6
9/32	.2812	7.14	5/16	1-1/2	3	AX00307140T6
L	.2900	7.37	5/16	1-9/16	4	AX003000L0T6
M	.2950	7.49	5/16	1-9/16	4	AX003000M0T6
	.2953	7.50	5/16	1-9/16	4	AX00307500T6
19/64	.2969	7.54	5/16	1-9/16	4	AX00307540T6
N	.3020	7.67	5/16	1-5/8	4	AX003000N0T6
5/16	.3125	7.94	5/16	1-5/8	4	AX00307940T6
	.3150	8.00	3/8	1-11/16	3	AX00308000T6
O	.3160	8.03	3/8	1-11/16	3	AX003000O0T6
P	.3230	8.20	3/8	1-11/16	3	AX003000P0T6
21/64	.3281	8.33	3/8	1-11/16	3	AX00308330T6
Q	.3320	8.43	3/8	1-11/16	3	AX003000Q0T6
	.3346	8.50	3/8	1-11/16	3	AX00308500T6

D ₁	Decimal	D ₁ mm	D ₂ in	L ₁ in	L ₂ in	Part #
R	.3390	8.61	3/8	1-11/16	4	AX003000R0T6
11/32	.3438	8.73	3/8	1-11/16	4	AX00308730T6
S	.3480	8.84	3/8	1-3/4	4	AX003000S0T6
	.3543	9.00	3/8	1-3/4	4	AX00309000T6
T	.3580	9.09	3/8	1-3/4	4	AX003000T0T6
23/64	.3594	9.13	3/8	1-3/4	4	AX00309130T6
U	.3680	9.35	3/8	1-13/16	4	AX003000U0T6
	.3740	9.50	3/8	1-13/16	4	AX00309500T6
3/8	.3750	9.52	3/8	1-13/16	4	AX00309520T6
V	.3770	9.57	7/16	1-7/8	4	AX003000V0T6
W	.3860	9.80	7/16	1-7/8	4	AX003000W0T6
25/64	.3906	9.92	7/16	1-7/8	4	AX00309920T6
	.3937	10.00	7/16	1-15/16	4	AX00310000T6
X	.3970	10.08	7/16	1-15/16	4	AX003000X0T6
Y	.4040	10.26	7/16	1-15/16	4	AX003000Y0T6
13/32	.4062	10.32	7/16	1-15/16	4	AX00310320T6
Z	.4130	10.49	7/16	2	4	AX003000Z0T6
	.4134	10.50	7/16	2	4	AX00310500T6
27/64	.4219	10.72	7/16	2	4	AX00310720T6
	.4252	10.80	7/16	2	4	AX00310800T6
	.4331	11.00	7/16	2-1/16	4	AX00311000T6
7/16	.4375	11.11	7/16	2-1/16	4	AX00304375T6
	.4528	11.50	1/2	2-1/8	4	AX00311500T6
29/64	.4531	11.51	1/2	2-1/8	4	AX00311510T6
15/32	.4688	11.91	1/2	2-1/8	4	AX00311910T6
	.4724	12.00	1/2	2-3/16	4	AX00312000T6
31/64	.4844	12.30	1/2	2-3/16	4	AX00312300T6
	.4921	12.50	1/2	2-3/16	4	AX00312500T6
1/2	.5000	12.70	1/2	2-1/4	4	AX00312700T6

Other Dimensions are Available Upon Request

AX 3xD Speeds and Feeds METRIC		Vc m/min (Cutting speed)	D1mm Dec. Inch.	F[mm/u] Feed Per Revolution				
Material	> 3.00 ≤ 5.00			> 5.00 ≤ 8.00	> 8.00 ≤ 12.00	> 12.00 ≤ 16.00	> 16.00 ≤ 20.00	
N1 Wrought Aluminum Alloys	326		.1181- .1969	.1970- .3150	.3151- .4724	.4725- .6299	.4726- .7874	
N2 Low-Silicon Aluminum Alloys Si <12.2% - 6061, 7075	326							
N3 High-Silicon Aluminum Alloys Si >12.2% - 6061, 7075	317							
N5 Copper & Copper Alloys	156							

Note: These are only recommended starting figures that depend on conditions such as machine and material rigidity, type of coating if any, etc. TESTING IS RECOMMENDED

AX 3xD Speeds and Feeds INCHES		SFM(Vc) Surface Feet Per Minute	D1mm Dec. Inch.	IPR=Inches Per Revolution				
Material	> 3.00 ≤ 5.00			> 5.00 ≤ 8.00	> 8.00 ≤ 12.00	> 12.00 ≤ 16.00	> 16.00 ≤ 20.00	
N1 Wrought Aluminum Alloys	1069.6		0.012	0.015	0.019	0.023	0.025	
N2 Low-Silicon Aluminum Alloys Si <12.2% - 6061, 7075	1069.6							
N3 High-Silicon Aluminum Alloys Si >12.2% - 6061, 7075	1040.1							
N5 Copper & Copper Alloys	511.8							

Note: These are only recommended starting figures that depend on conditions such as machine and material rigidity, type of coating if any, etc. TESTING IS RECOMMENDED

General Purpose Carbide Drills
Aluminum Carbide Drills
Steels Carbide Drills
Hardened Steels Carbide Drills
Spotting Carbide Drills
General Purpose Drills up to 30xD
Aluminum Drills up to 30xD
Drills for Steels
Pilot Drills

Design

Long spiral - fluted, triple - margin, right-hand cut and external coolant.

Coating

Z-Power (ZrN)

Ideal for

aluminum, cast materials and non-ferrous materials (Refer to page 245)



Diseño

Flautas largas espirales, margen con corte de mano derecha y refrigerante externo.

Recubrimiento

Z-Power (ZrN)

Ideal para

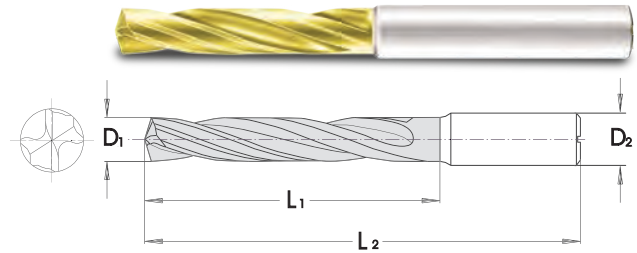
aluminio, materiales de fundición y materiales no ferrosos (Consulte la página 246)



Z-Power® has excellent corrosion and adhesion resistant properties.

Speeds & Feeds Refer to Page 37.

Left-Hand, Available Upon Request



D ₁	Decimal	D ₁ mm	D ₂ in	L ₁ in	L ₂ in	Part #
1/16	.0625	1.59	1/8	3/4	2-1/2	AX00506250T6
#52	.0635	1.61	1/8	3/4	2-1/2	AX00500520T6
#51	.0670	1.70	1/8	3/4	2-1/2	AX00500510T6
#50	.0700	1.78	1/8	7/8	2-1/2	AX00500500T6
#49	.0730	1.85	1/8	7/8	2-1/2	AX00500490T6
#48	.0760	1.93	1/8	7/8	2-1/2	AX00500480T6
5/64	.0781	1.98	1/8	7/8	2-1/2	AX00500470T6
#47	.0785	1.99	1/8	7/8	2-1/2	AX00500470T6
	.0787	2.00	1/8	7/8	2-1/2	AX00507870T6
#46	.0810	2.06	1/8	7/8	2-1/2	AX00500460T6
#45	.0820	2.08	1/8	7/8	2-1/2	AX00500450T6
#44	.0860	2.18	1/8	1	2-1/2	AX00500440T6
#43	.0890	2.26	1/8	1	2-1/2	AX00500430T6
#42	.0935	2.37	1/8	1	2-1/2	AX00500420T6
3/32	.0938	2.38	1/8	1	2-1/2	AX00509380T6
#41	.0960	2.44	1/8	1	3	AX00500410T6
#40	.0980	2.49	1/8	1	3	AX00500400T6
	.0984	2.50	1/8	1-1/4	3	AX00509840T6
#39	.0995	2.53	1/8	1-1/4	3	AX00500390T6
#38	.1015	2.58	1/8	1-1/4	3	AX00500380T6
#37	.1040	2.64	1/8	1-1/4	3	AX00500370T6
#36	.1065	2.71	1/8	1-1/4	3	AX00500360T6
7/64	.1094	2.78	1/8	1-1/4	3	AX00501094T6
#35	.1100	2.79	1/8	1-1/4	3	AX00500350T6
#34	.1110	2.82	1/8	1-1/4	3	AX00500340T6
#33	.1130	2.87	1/8	1-1/4	3	AX00500330T6
#32	.1160	2.95	1/8	1-1/4	3	AX00500320T6
	.1181	3.00	1/8	1-1/4	3	AX00503000T6
#31	.1200	3.05	1/8	1-1/4	3	AX00500310T6
1/8	.1250	3.17	1/8	1-1/4	3	AX00503175T6
#30	.1285	3.26	3/16	1-1/4	3	AX00500300T6
#29	.1360	3.45	3/16	1-3/8	3	AX00500290T6
	.1378	3.50	3/16	1-3/8	3	AX00503500T6
#28	.1405	3.57	3/16	1-3/8	3	AX00500280T6
9/64	.1406	3.57	3/16	1-3/8	3	AX00503570T6
#27	.1440	3.66	3/16	1-3/8	3	AX00500270T6

D ₁	Decimal	D ₁ mm	D ₂ in	L ₁ in	L ₂ in	Part #
#26	.1470	3.73	3/16	1-3/8	3	AX00500260T6
#25	.1495	3.80	3/16	1-3/8	3	AX00500250T6
#24	.1520	3.86	3/16	1-3/8	3	AX00500240T6
#23	.1540	3.91	3/16	1-3/8	3	AX00500230T6
5/32	.1562	3.97	3/16	1-3/8	3	AX00503970T6
#22	.1570	3.99	3/16	1-3/8	3	AX00500220T6
	.1575	4.00	3/16	1-3/8	3	AX00504000T6
#21	.1590	4.04	3/16	1-3/8	3	AX00500210T6
#20	.1610	4.09	3/16	1-3/8	3	AX00500200T6
#19	.1660	4.22	3/16	1-5/8	3	AX00500190T6
#18	.1695	4.30	3/16	1-5/8	3	AX00500180T6
11/64	.1719	4.37	3/16	1-5/8	3	AX00504370T6
#17	.1730	4.39	3/16	1-5/8	3	AX00500170T6
#16	.1770	4.49	3/16	1-5/8	3	AX00500160T6
	.1772	4.50	3/16	1-5/8	3	AX00504500T6
#15	.1800	4.57	3/16	1-5/8	3	AX00500150T6
#14	.1820	4.62	3/16	1-5/8	3	AX00500140T6
#13	.1850	4.70	3/16	1-5/8	3	AX00500130T6
3/16	.1875	4.76	3/16	1-5/8	3	AX00504760T6
#12	.1890	4.80	1/4	1-5/8	3	AX00500120T6
#11	.1910	4.85	1/4	1-5/8	3	AX00500110T6
#10	.1935	4.91	1/4	1-5/8	3	AX00500100T6
#9	.1960	4.98	1/4	1-3/4	3	AX00500090T6
	.1969	5.00	1/4	1-3/4	3	AX00505000T6
#8	.1990	5.05	1/4	1-3/4	3	AX00500080T6
#7	.2010	5.10	1/4	1-3/4	3	AX00500070T6
13/64	.2031	5.16	1/4	1-3/4	3	AX00505160T6
#6	.2040	5.18	1/4	1-3/4	3	AX00500060T6
#5	.2055	5.22	1/4	1-3/4	3	AX00500050T6
#4	.2090	5.31	1/4	1-3/4	3	AX00500040T6
#3	.2130	5.41	1/4	1-3/4	3	AX00500030T6
	.2165	5.50	1/4	1-3/4	3	AX00502165T6
7/32	.2188	5.56	1/4	1-3/4	3	AX00505560T6
#2	.2210	5.61	1/4	1-3/4	3	AX00500020T6
#1	.2280	5.79	1/4	1-3/4	3	AX00500010T6
A	.2340	5.94	1/4	2	4	AX005000A0T6

Other Dimensions are Available Upon Request

Tolerance

Drill Dia (h7) Inches (in)	Drill Dia (h7) Metric (mm)	Shank Dia (h6) Inches (in)	Shank Dia (h6) Metric (mm)
.0000-.1181: +0/-0.00039	0-3: +0/-0.010	.0000-.1181: +0/-0.00024	0-3: +0/-0.006
.1182-.2362: +0/-0.00047	3.01-6: +0/-0.012	.1182-.2362: +0/-0.00031	3.01-6: +0/-0.008
.2363-.3937: +0/-0.00059	6.01-10.0: +0/-0.015	.2363-.3937: +0/-0.00035	6.01-10.0: +0/-0.009
.3938-.7087: +0/-0.00071	10.01-18.0: +0/-0.018	.3938-.7087: +0/-0.00043	10.01-18.0: +0/-0.011

General Purpose
Carbide Drills

Aluminum
Carbide Drills

Steels
Carbide Drills

Hardened Steels
Carbide Drills

Spotting
Carbide Drills

General Purpose
Drills up to 30xD

Aluminum Drills
up to 30xD

Drills for Steels

Pilot Drills

Solid Carbide Drills Non-Coolant

Solid Carbide Drills Internal Coolant

D ₁	Decimal	D ₁ mm	D ₂ in	L ₁ in	L ₂ in	Part #
15/64	.2344	5.95	1/4	2	4	AX00505950T6
	.2362	6.00	1/4	2	4	AX00506000T6
B	.2380	6.04	1/4	2	4	AX005000B0T6
C	.2420	6.15	1/4	2	4	AX005000C0T6
D	.2460	6.25	1/4	2	4	AX005000D0T6
1/4 / E	.2500	6.35	1/4	2	4	AX00506350T6
	.2559	6.50	5/16	2	4	AX00506500T6
F	.2570	6.53	5/16	2	4	AX005000F0T6
G	.2610	6.63	5/16	2-1/8	4	AX005000G0T6
17/64	.2656	6.75	5/16	2-1/8	4	AX00506750T6
H	.2660	6.76	5/16	2-1/8	4	AX005000H0T6
I	.2720	6.91	5/16	2-1/8	4	AX005000I0T6
	.2756	7.00	5/16	2-1/8	4	AX00507000T6
J	.2770	7.03	5/16	2-1/8	4	AX005000J0T6
K	.2810	7.14	5/16	2-1/8	4	AX005000K0T6
9/32	.2812	7.14	5/16	2-1/8	4	AX00507140T6
L	.2900	7.37	5/16	2-1/8	4	AX005000L0T6
M	.2950	7.49	5/16	2-3/8	4	AX005000M0T6
	.2953	7.50	5/16	2-3/8	4	AX00507500T6
19/64	.2969	7.54	5/16	2-3/8	4	AX00507540T6
N	.3020	7.67	5/16	2-3/8	4	AX005000N0T6
5/16	.3125	7.94	5/16	2-3/8	4	AX00507940T6
	.3150	8.00	3/8	2-3/8	4	AX00508000T6
O	.3160	8.03	3/8	2-3/8	4	AX005000O0T6
P	.3230	8.20	3/8	2-3/8	4	AX005000P0T6
21/64	.3281	8.33	3/8	2-1/2	5	AX00508330T6
Q	.3320	8.43	3/8	2-1/2	5	AX005000Q0T6
	.3346	8.50	3/8	2-1/2	5	AX00508500T6
R	.3390	8.61	3/8	2-1/2	5	AX005000R0T6
11/32	.3438	8.73	3/8	2-1/2	5	AX00508730T6
S	.3480	8.84	3/8	2-1/2	5	AX005000S0T6
	.3543	9.00	3/8	2-1/2	5	AX00509000T6
T	.3580	9.09	3/8	2-3/4	5	AX005000T0T6
23/64	.3594	9.13	3/8	2-3/4	5	AX00509130T6
U	.3680	9.35	3/8	2-3/4	5	AX005000U0T6
	.3740	9.50	3/8	2-3/4	5	AX00509500T6

D ₁	Decimal	D ₁ mm	D ₂ in	L ₁ in	L ₂ in	Part #
3/8	.3750	9.52	3/8	2-3/4	5	AX00509520T6
V	.3770	9.57	7/16	2-3/4	5	AX005000V0T6
W	.3860	9.80	7/16	2-7/8	5	AX005000W0T6
25/64	.3906	9.92	7/16	2-7/8	5	AX00509920T6
	.3937	10.00	7/16	2-7/8	5	AX00510000T6
X	.3970	10.08	7/16	2-7/8	5	AX005000X0T6
Y	.4040	10.26	7/16	2-7/8	5	AX005000Y0T6
13/32	.4062	10.32	7/16	2-7/8	5	AX00510320T6
Z	.4130	10.49	7/16	2-7/8	5	AX005000Z0T6
	.4134	10.50	7/16	2-7/8	5	AX00510500T6
27/64	.4219	10.72	7/16	2-7/8	5	AX00510720T6
	.4252	10.80	7/16	2-7/8	5	AX00510800T6
	.4331	11.00	7/16	2-7/8	5	AX00511000T6
7/16	.4375	11.11	7/16	2-7/8	5	AX00504375T6
	.4528	11.50	1/2	3	5	AX00511500T6
29/64	.4531	11.51	1/2	3	5	AX00511510T6
15/32	.4688	11.91	1/2	3	5	AX00511910T6
	.4724	12.00	1/2	3	5	AX00512000T6
31/64	.4844	12.30	1/2	3	5	AX00512300T6
	.4921	12.50	1/2	3	5	AX00512500T6
1/2	.5000	12.70	1/2	3	5	AX00512700T6
	.5118	13.00	9/16	3-1/4	5	AX00513000T6
33/64	.5156	13.10	9/16	3-1/4	5	AX00513100T6
17/32	.5312	13.49	9/16	3-1/4	5	AX00513490T6
	.5315	13.50	9/16	3-1/4	5	AX00513500T6
35/64	.5469	13.89	9/16	3-1/4	5	AX00513890T6
	.5512	14.00	9/16	3-1/4	5	AX00514000T6
9/16	.5625	14.29	9/16	3-1/4	5	AX00514290T6
	.5709	14.50	5/8	3-1/4	5	AX00514500T6
37/64	.5781	14.68	5/8	3-1/2	6	AX00514680T6
	.5906	15.00	5/8	3-1/2	6	AX00515000T6
19/32	.5938	15.08	5/8	3-1/2	6	AX00515080T6
39/64	.6094	15.48	5/8	3-1/2	6	AX00515480T6
	.6102	15.50	5/8	3-1/2	6	AX00515500T6
5/8	.6250	15.87	5/8	3-1/2	6	AX00515870T6
	.6299	16.00	3/4	3-1/2	6	AX00516000T6

Other Dimensions are Available Upon Request

Left-Hand, Available Upon Request

AX 5xD Speeds and Feeds METRIC		Vc m/min (Cutting speed)	D1mm	F[mm/u] Feed Per Revolution				
Material	Dec. Inch.			> 3.00 ≤ 5.00	> 5.00 ≤ 8.00	> 8.00 ≤ 12.00	> 12.00 ≤ 16.00	> 16.00 ≤ 20.00
N1 Wrought Aluminum Alloys		306		.1181- .1969	.1970- .3150	.3151- .4724	.4725- .6299	.4726- .7874
N2 Low-Silicon Aluminum Alloys Si <12.2% - 6061, 7075		306			.30	.40	.50	.60
N3 High-Silicon Aluminum Alloys Si >12.2% - 6061, 7075		297			.30	.40	.50	.60
N5 Copper & Copper Alloys		136			.23	.30	.38	.45

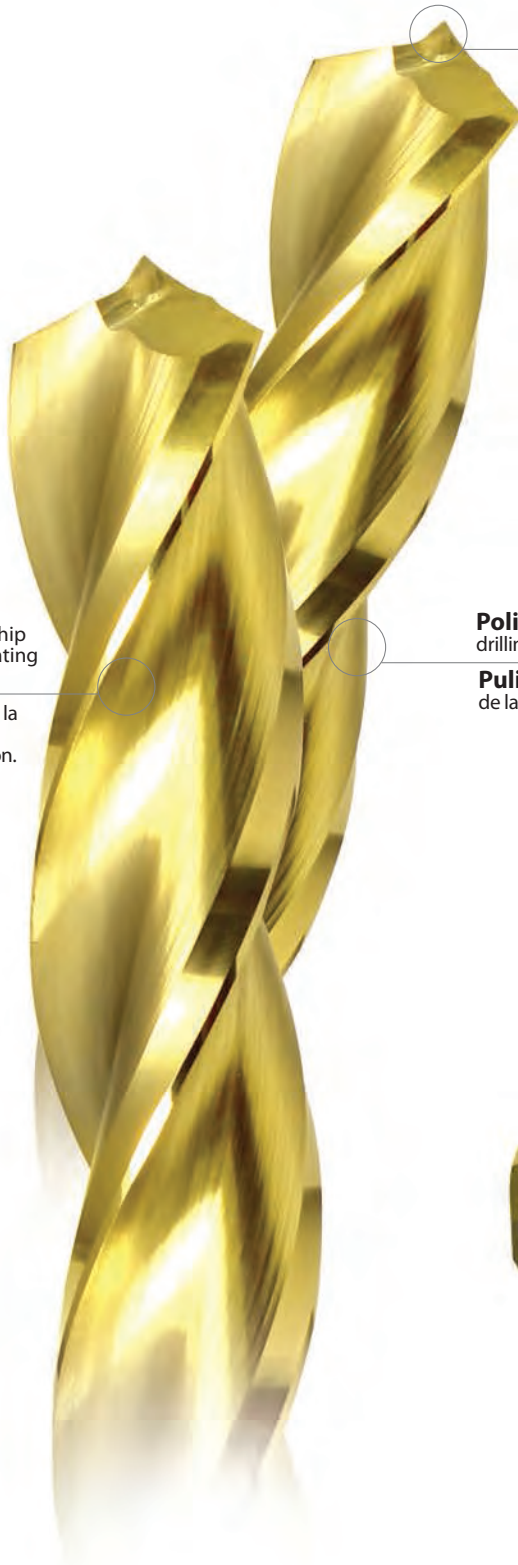
Note: These are only recommended starting figures that depend on conditions such as machine and material rigidity, type of coating if any, etc. TESTING IS RECOMMENDED

AX 5xD Speeds and Feeds INCHES		SFM(Vc) Surface Feet Per Minute	D1mm	IPR=Inches Per Revolution				
Material	Dec. Inch.			> 3.00 ≤ 5.00	> 5.00 ≤ 8.00	> 8.00 ≤ 12.00	> 12.00 ≤ 16.00	> 16.00 ≤ 20.00
N1 Wrought Aluminum Alloys		1004		0.012	0.015	0.019	0.023	0.025
N2 Low-Silicon Aluminum Alloys Si <12.2% - 6061, 7075		1004		0.013	0.017	0.022	0.025	0.027
N3 High-Silicon Aluminum Alloys Si >12.2% - 6061, 7075		976		0.011	0.015	0.019	0.023	0.025
N5 Copper & Copper Alloys		446		0.009	0.011	0.015	0.015	0.021

Note: These are only recommended starting figures that depend on conditions such as machine and material rigidity, type of coating if any, etc. TESTING IS RECOMMENDED



**High-Performance Drill
Single-Margin
Ideal for Aluminum & Cast Materials
3xD-5xD**



130° Point Geometry -Ideal for faster drilling and high feed rates.

130° Geometría de la Punta - Ideal para perforaciones rápidas y altas velocidades de avance.

Z-Power Coating - Reduces friction between the chip and tool, preventing chip clogging. In addition, the coating reduces heat and abrasion wear.

Z-Power Recubrimiento - Reduce la fricción entre la viruta y la herramienta, previniendo el atasco de viruta. Además el recubrimiento reduce la temperatura y abrasión.

Polish- Chip evacuation is improved during deep hole drilling, when the flutes are polished.

Pulido - Cuando las flautas están pulidas la evacuación de la viruta es mejorada.



Tolerance

Drill Dia (h7) Inches (in)	Drill Dia (h7) Metric (mm)
.0000-.1181: + 0/--.00039	0-3: + 0/--.010
.1182-.2362: + 0/--.00047	3.01-6: + 0/--.012
.2363-.3937: + 0/--.00059	6.01-10.0: + 0/--.015
.3938-.7087: + 0/--.00071	10.01-18.0: + 0/--.018

Shank Dia (h6) Inches (in)	Shank Dia (h6) Metric (mm)
.0000-.1181: + 0/--.00024	0-3: + 0/--.006
.1182-.2362: + 0/--.00031	3.01-6: + 0/--.008
.2363-.3937: + 0/--.00035	6.01-10.0: + 0/--.009
.3938-.7087: + 0/--.00043	10.01-18.0: + 0/--.011



Z-Power® has excellent corrosion and adhesion resistant properties.

Design

Spiral- fluted, right-hand cut, with external coolant and a cylindrical shank.

Coating

Z-Power (ZrN)

Ideal for

aluminum, cast materials and non-ferrous materials (Refer to page 245)



Diseño

Flautas espirales con corte de mano derecha, refrigerante externo y un zanco cilíndrico.

Recubrimiento

Z-Power (ZrN)

Ideal para

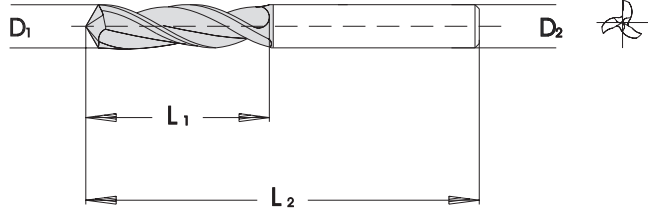
aluminio, materiales de fundición y materiales no ferrosos (Consulte la página 246)



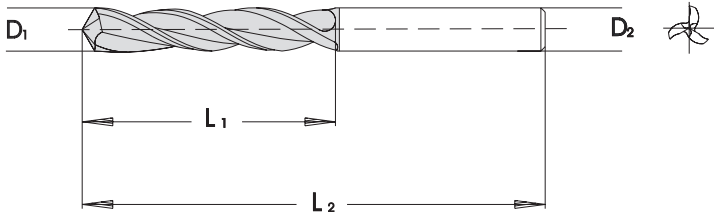
Speeds & Feeds Refer to Page 41 & 43.

****Left-Hand, Available Upon Request****

3xD PAGE 40



5xD PAGE 42



General Purpose
Carbide Drills

Aluminum
Carbide Drills

Steels
Carbide Drills

Hardened Steels
Carbide Drills

Spotting
Carbide Drills

General Purpose
Drills up to 30xD

Aluminum Drills
up to 30xD

Drills for Steels

Pilot Drills

Solid Carbide Drills Non-Coolant

Solid Carbide Drills Internal Coolant

General Purpose Carbide Drills
Aluminum Carbide Drills
Steels Carbide Drills
Hardened Steels Carbide Drills
Spotting Carbide Drills
General Purpose Drills up to 30xD
Aluminum Drills up to 30xD
Drills for Steels
Pilot Drills

Design

Spiral-fluted, right-hand cut, with external coolant coolant and a cylindrical shank.

Coating

Z-Power (ZrN)

Ideal for

aluminum, cast materials and non-ferrous materials (Refer to page 245)



Diseño

Flautas espirales con corte de mano derecha, refrigerante externo y un zanco cilíndrico.

Recubrimiento

Z-Power (ZrN)

Ideal para

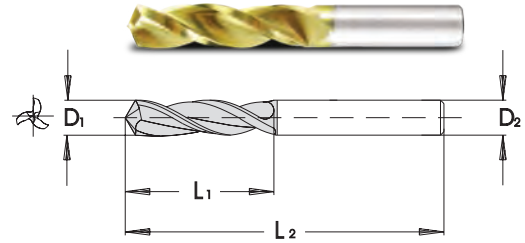
aluminio, materiales de fundición y materiales no ferrosos (Consulte la página 246)



Z-Power® has excellent corrosion and adhesion resistant properties.

Speeds & Feeds Refer to Page 41.

Left-Hand, Available Upon Request



D ₁	Decimal	D ₁ mm	D ₂ in	L ₁ in	L ₂ in	Part #
1/16	.0625	1.59	1/8	5/8	2	CX00306250T6
#52	.0635	1.61	1/8	11/16	2	CX00300520T6
#51	.0670	1.70	1/8	11/16	2	CX00300510T6
#50	.0700	1.78	1/8	11/16	2	CX00300500T6
#49	.0730	1.85	1/8	11/16	2	CX00300490T6
#48	.0760	1.93	1/8	11/16	2	CX00300480T6
5/64	.0781	1.98	1/8	11/16	2	CX00307810T6
#47	.0785	1.99	1/8	3/4	2-1/2	CX00300470T6
	.0787	2.00	1/8	3/4	2-1/2	CX00307870T6
#46	.0810	2.06	1/8	3/4	2-1/2	CX00300460T6
#45	.0820	2.08	1/8	3/4	2-1/2	CX00300450T6
#44	.0860	2.18	1/8	3/4	2-1/2	CX00300440T6
#43	.0890	2.26	1/8	3/4	2-1/2	CX00300430T6
#42	.0935	2.37	1/8	3/4	2-1/2	CX00300420T6
3/32	.0938	2.38	1/8	3/4	2-1/2	CX00309380T6
#41	.0960	2.44	1/8	13/16	2-1/2	CX00300410T6
#40	.0980	2.49	1/8	13/16	2-1/2	CX00300400T6
	.0984	2.50	1/8	13/16	2-1/2	CX00309840T6
#39	.0995	2.53	1/8	13/16	2-1/2	CX00300390T6
#38	.1015	2.58	1/8	13/16	2-1/2	CX00300380T6
#37	.1040	2.64	1/8	13/16	2-1/2	CX00300370T6
#36	.1065	2.71	1/8	13/16	2-1/2	CX00300360T6
7/64	.1094	2.78	1/8	13/16	2-1/2	CX00301094T6
#35	.1100	2.79	1/8	7/8	2-1/2	CX00300350T6
#34	.1110	2.82	1/8	7/8	2-1/2	CX00300340T6
#33	.1130	2.87	1/8	7/8	2-1/2	CX00300330T6
#32	.1160	2.95	1/8	7/8	2-1/2	CX00300320T6
	.1181	3.00	1/8	7/8	2-1/2	CX00303000T6
#31	.1200	3.05	1/8	7/8	2-1/2	CX00300310T6
1/8	.1250	3.17	1/8	7/8	2-1/2	CX00303175T6
#30	.1285	3.26	3/16	15/16	2-1/2	CX00300300T6
#29	.1360	3.45	3/16	15/16	2-1/2	CX00300290T6
	.1378	3.50	3/16	15/16	2-1/2	CX00303500T6
#28	.1405	3.57	3/16	15/16	2-1/2	CX00300280T6
9/64	.1406	3.57	3/16	1	2-1/2	CX00303570T6
#27	.1440	3.66	3/16	1	2-1/2	CX00300270T6

D ₁	Decimal	D ₁ mm	D ₂ in	L ₁ in	L ₂ in	Part #
#26	.1470	3.73	3/16	1	2-1/2	CX00300260T6
#25	.1495	3.80	3/16	1	2-1/2	CX00300250T6
#24	.1520	3.86	3/16	1	2-1/2	CX00300240T6
#23	.1540	3.91	3/16	1	2-1/2	CX00300230T6
5/32	.1562	3.97	3/16	1	2-1/2	CX00303970T6
#22	.1570	3.99	3/16	1-1/16	2-1/2	CX00300220T6
	.1575	4.00	3/16	1-1/16	2-1/2	CX00304000T6
#21	.1590	4.04	3/16	1-1/16	2-1/2	CX00300210T6
#20	.1610	4.09	3/16	1-1/16	2-1/2	CX00300200T6
	.1654	4.20	3/16	1-1/16	2-1/2	CX00304200T6
#19	.1660	4.22	3/16	1-1/16	2-1/2	CX00300190T6
#18	.1695	4.30	3/16	1-1/16	2-1/2	CX00300180T6
11/64	.1719	4.37	3/16	1-1/16	2-1/2	CX00304370T6
#17	.1730	4.39	3/16	1-1/8	3-1/2	CX00300170T6
#16	.1770	4.49	3/16	1-1/8	3-1/2	CX00300160T6
	.1772	4.50	3/16	1-1/8	3-1/2	CX00304500T6
#15	.1800	4.57	3/16	1-1/8	3-1/2	CX00300150T6
#14	.1820	4.62	3/16	1-1/8	3-1/2	CX00300140T6
#13	.1850	4.70	3/16	1-1/8	3-1/2	CX00300130T6
3/16	.1875	4.76	3/16	1-1/8	3-1/2	CX00304760T6
#12	.1890	4.80	1/4	1-3/16	3-1/2	CX00300120T6
#11	.1910	4.85	1/4	1-3/16	3-1/2	CX00300110T6
#10	.1935	4.91	1/4	1-3/16	3-1/2	CX00300100T6
#9	.1960	4.98	1/4	1-3/16	3-1/2	CX00300090T6
	.1969	5.00	1/4	1-3/16	3-1/2	CX00305000T6
#8	.1990	5.05	1/4	1-3/16	3-1/2	CX00300080T6
	.2008	5.10	1/4	1-3/16	3-1/2	CX00305100T6
#7	.2010	5.10	1/4	1-3/16	3-1/2	CX00300070T6
13/64	.2031	5.16	1/4	1-3/16	3-1/2	CX00305160T6
#6	.2040	5.18	1/4	1-1/4	3-1/2	CX00300060T6
#5	.2055	5.22	1/4	1-1/4	3-1/2	CX00300050T6
#4	.2090	5.31	1/4	1-1/4	3-1/2	CX00300040T6
#3	.2130	5.41	1/4	1-1/4	3-1/2	CX00300030T6
	.2165	5.50	1/4	1-1/4	3-1/2	CX00302165T6
7/32	.2188	5.56	1/4	1-1/4	3-1/2	CX00305560T6
#2	.2210	5.61	1/4	1-5/16	3-1/2	CX00300020T6

Other Dimensions are Available Upon Request

Tolerance

Drill Dia (h7) Inches (in)	Drill Dia (h7) Metric (mm)	Shank Dia (h6) Inches (in)	Shank Dia (h6) Metric (mm)
.0000-.1181: +0/-0.00039	0-3: +0/-0.010	.0000-.1181: +0/-0.00024	0-3: +0/-0.006
.1182-.2362: +0/-0.00047	3.01-6: +0/-0.012	.1182-.2362: +0/-0.00031	3.01-6: +0/-0.008
.2363-.3937: +0/-0.00059	6.01-10.0: +0/-0.015	.2363-.3937: +0/-0.00035	6.01-10.0: +0/-0.009
.3938-.7087: +0/-0.00071	10.01-18.0: +0/-0.018	.3938-.7087: +0/-0.00043	10.01-18.0: +0/-0.011

General Purpose
Carbide Drills

Aluminum
Carbide Drills

Steels
Carbide Drills

Hardened Steels
Carbide Drills

Spotting
Carbide Drills

Solid Carbide Drills Non-Coolant

General Purpose
Drills up to 30xD

Aluminum Drills
up to 30xD

Drills for Steels

Pilot Drills

Solid Carbide Drills Internal Coolant

D ₁	Decimal	D ₁ mm	D ₂ in	L ₁ in	L ₂ in	Part #
#1	.2280	5.79	1/4	1-5/16	3-1/2	CX00300010T6
A	.2340	5.94	1/4	1-5/16	3-1/2	CX003000A0T6
15/64	.2344	5.95	1/4	1-5/16	3-1/2	CX00305950T6
	.2362	6.00	1/4	1-3/8	3-1/2	CX00306000T6
B	.2380	6.04	1/4	1-3/8	3-1/2	CX003000B0T6
C	.2420	6.15	1/4	1-3/8	3-1/2	CX003000C0T6
D	.2460	6.25	1/4	1-3/8	3-1/2	CX003000D0T6
1/4 / E	.2500	6.35	1/4	1-3/8	3-1/2	CX00306350T6
	.2559	6.50	5/16	1-7/16	3	CX00306500T6
F	.2570	6.53	5/16	1-7/16	3	CX003000F0T6
G	.2610	6.63	5/16	1-7/16	3	CX003000G0T6
17/64	.2656	6.75	5/16	1-7/16	3	CX00306750T6
H	.2660	6.76	5/16	1-1/2	3	CX003000H0T6
I	.2720	6.91	5/16	1-1/2	3	CX003000I0T6
	.2756	7.00	5/16	1-1/2	3	CX00307000T6
J	.2770	7.03	5/16	1-1/2	3	CX003000J0T6
K	.2810	7.14	5/16	1-1/2	3	CX003000K0T6
9/32	.2812	7.14	5/16	1-1/2	3	CX00307140T6
L	.2900	7.37	5/16	1-9/16	4	CX003000L0T6
M	.2950	7.49	5/16	1-9/16	4	CX003000M0T6
	.2953	7.50	5/16	1-9/16	4	CX00307500T6
19/64	.2969	7.54	5/16	1-9/16	4	CX00307540T6
N	.3020	7.67	5/16	1-5/8	4	CX003000N0T6
5/16	.3125	7.94	5/16	1-5/8	4	CX00307940T6
	.3150	8.00	3/8	1-11/16	4	CX00308000T6
O	.3160	8.03	3/8	1-11/16	4	CX003000O0T6
P	.3230	8.20	3/8	1-11/16	4	CX003000P0T6
21/64	.3281	8.33	3/8	1-11/16	4	CX00308330T6
Q	.3320	8.43	3/8	1-11/16	4	CX003000Q0T6
	.3346	8.50	3/8	1-11/16	4	CX00308500T6

D ₁	Decimal	D ₁ mm	D ₂ in	L ₁ in	L ₂ in	Part #
R	.3390	8.61	3/8	1-11/16	4	CX003000R0T6
11/32	.3438	8.73	3/8	1-11/16	4	CX00308730T6
S	.3480	8.84	3/8	1-3/4	4	CX003000S0T6
	.3543	9.00	3/8	1-3/4	4	CX00309000T6
T	.3580	9.09	3/8	1-3/4	4	CX003000T0T6
23/64	.3594	9.13	3/8	1-3/4	4	CX00309130T6
U	.3680	9.35	3/8	1-13/16	4	CX003000U0T6
	.3740	9.50	3/8	1-13/16	4	CX00309500T6
3/8	.3750	9.52	3/8	1-13/16	4	CX00309520T6
V	.3770	9.57	7/16	1-7/8	4	CX003000V0T6
W	.3860	9.80	7/16	1-7/8	4	CX003000W0T6
25/64	.3906	9.92	7/16	1-7/8	4	CX00309920T6
	.3937	10.00	7/16	1-15/16	4	CX00310000T6
X	.3970	10.08	7/16	1-15/16	4	CX003000X0T6
Y	.4040	10.26	7/16	1-15/16	4	CX003000Y0T6
13/32	.4062	10.32	7/16	1-15/16	4	CX00310320T6
Z	.4130	10.49	7/16	2	4	CX003000Z0T6
	.4134	10.50	7/16	2	4	CX00310500T6
27/64	.4219	10.72	7/16	2	4	CX00310720T6
	.4252	10.80	7/16	2	4	CX00310800T6
	.4331	11.00	7/16	2-1/16	4	CX00311000T6
7/16	.4375	11.11	7/16	2-1/16	4	CX00304375T6
	.4528	11.50	1/2	2-1/8	4	CX00311500T6
29/64	.4531	11.51	1/2	2-1/8	4	CX00311510T6
15/32	.4688	11.91	1/2	2-1/8	4	CX00311910T6
	.4724	12.00	1/2	2-3/16	4	CX00312000T6
31/64	.4844	12.30	1/2	2-3/16	4	CX00312300T6
	.4921	12.50	1/2	2-3/16	4	CX00312500T6
1/2	.5000	12.70	1/2	2-1/4	4	CX00312700T6

Other Dimensions are Available Upon Request

CX 3xD Speeds and Feeds METRIC		Vc m/min (Cutting speed)	D1mm Dec. Inch.	F[mm/u] Feed Per Revolution				
Material				> 3.00 ≤ 5.00	> 5.00 ≤ 8.00	> 8.00 ≤ 12.00	> 12.00 ≤ 16.00	> 16.00 ≤ 20.00
K1	Gray Cast Iron	70		.14	.20	.275	.35	.45
N1	Wrought Aluminum Alloys	180		.14	.20	.275	.35	.45
N2	Low-Silicon Aluminum Alloys Si <12.2% - 6061, 7075	140		.14	.20	.275	.35	.45
N3	High-Silicon Aluminum Alloys Si >12.2% - 6061, 7075	110		.14	.20	.275	.35	.45
N5	Copper & Copper Alloys	140		.10	.15	.20	.26	.33

Note: These are only recommended starting figures that depend on conditions such as machine and material rigidity, type of coating if any, etc. TESTING IS RECOMMENDED

CX 3xD Speeds and Feeds INCHES		SFM(Vc) Surface Feet Per Minute	D1mm Dec. Inch.	IPR=Inches Per Revolution				
Material				> 3.00 ≤ 5.00	> 5.00 ≤ 8.00	> 8.00 ≤ 12.00	> 12.00 ≤ 16.00	> 16.00 ≤ 20.00
K1	Gray Cast Iron	229.7		0.005	0.007	0.010	0.013	0.017
N1	Wrought Aluminum Alloys	590.6		0.005	0.007	0.010	0.013	0.017
N2	Low-Silicon Aluminum Alloys Si <12.2% - 6061, 7075	459.3		0.005	0.007	0.010	0.013	0.017
N3	High-Silicon Aluminum Alloys Si >12.2% - 6061, 7075	360.9		0.005	0.007	0.010	0.013	0.017
N5	Copper & Copper Alloys	459.3		0.003	0.005	0.007	0.010	0.012

Note: These are only recommended starting figures that depend on conditions such as machine and material rigidity, type of coating if any, etc. TESTING IS RECOMMENDED

General Purpose Carbide Drills
Aluminum Carbide Drills
Steels Carbide Drills
Hardened Steels Carbide Drills
Spotting Carbide Drills
General Purpose Drills up to 30xD
Aluminum Drills up to 30xD
Drills for Steels
Pilot Drills

Design

Spiral-fluted, right-hand cut, with external coolant and a cylindrical shank.

Coating

Z-Power (ZrN)

Ideal for

aluminum, cast materials and non-ferrous materials (Refer to page 245)



Diseño

Flautas espirales con corte de mano derecha, refrigerante externo y un zanco cilíndrico.

Recubrimiento

Z-Power (ZrN)

Ideal para

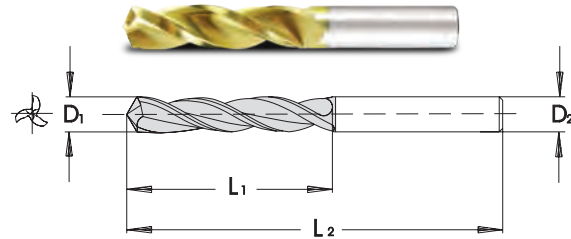
aluminio, materiales de fundición y materiales no ferrosos (Consulte la página 246)



Z-Power® has excellent corrosion and adhesion resistant properties.

Speeds & Feeds Refer to Page 43.

****Left-Hand, Available Upon Request****



D ₁	Decimal	D ₁ mm	D ₂ in	L ₁ in	L ₂ in	Part #
1/16	.0625	1.59	1/8	3/4	2-1/2	CX00506250T6
#52	.0635	1.61	1/8	3/4	2-1/2	CX00500520T6
#51	.0670	1.70	1/8	3/4	2-1/2	CX00500510T6
#50	.0700	1.78	1/8	7/8	2-1/2	CX00500500T6
#49	.0730	1.85	1/8	7/8	2-1/2	CX00500490T6
#48	.0760	1.93	1/8	7/8	2-1/2	CX00500480T6
5/64	.0781	1.98	1/8	7/8	2-1/2	CX005007810T6
#47	.0785	1.99	1/8	7/8	2-1/2	CX00500470T6
	.0787	2.00	1/8	7/8	2-1/2	CX00507870T6
#46	.0810	2.06	1/8	7/8	2-1/2	CX00500460T6
#45	.0820	2.08	1/8	7/8	2-1/2	CX00500450T6
#44	.0860	2.18	1/8	1	2-1/2	CX00500440T6
#43	.0890	2.26	1/8	1	2-1/2	CX00500430T6
#42	.0935	2.37	1/8	1	2-1/2	CX00500420T6
3/32	.0938	2.38	1/8	1	2-1/2	CX00509380T6
#41	.0960	2.44	1/8	1	3	CX00500410T6
#40	.0980	2.49	1/8	1	3	CX00500400T6
	.0984	2.50	1/8	1	3	CX00509840T6
#39	.0995	2.53	1/8	1-1/4	3	CX00500390T6
#38	.1015	2.58	1/8	1-1/4	3	CX00500380T6
#37	.1040	2.64	1/8	1-1/4	3	CX00500370T6
#36	.1065	2.71	1/8	1-1/4	3	CX00500360T6
7/64	.1094	2.78	1/8	1-1/4	3	CX00501094T6
#35	.1100	2.79	1/8	1-1/4	3	CX00500350T6
#34	.1110	2.82	1/8	1-1/4	3	CX00500340T6
#33	.1130	2.87	1/8	1-1/4	3	CX00500330T6
#32	.1160	2.95	1/8	1-1/4	3	CX00500320T6
	.1181	3.00	1/8	1-1/4	3	CX00503000T6
#31	.1200	3.05	1/8	1-1/4	3	CX00500310T6
1/8	.1250	3.17	1/8	1-1/4	3	CX00503175T6
#30	.1285	3.26	3/16	1-3/8	3	CX00500300T6
#29	.1360	3.45	3/16	1-3/8	3	CX00500290T6
	.1378	3.50	3/16	1-3/8	3	CX00503500T6
#28	.1405	3.57	3/16	1-3/8	3	CX00500280T6
9/64	.1406	3.57	3/16	1-3/8	3	CX00503570T6
#27	.1440	3.66	3/16	1-3/8	3	CX00500270T6

D ₁	Decimal	D ₁ mm	D ₂ in	L ₁ in	L ₂ in	Part #
#26	.1470	3.73	3/16	1-3/8	3	CX00500260T6
#25	.1495	3.80	3/16	1-3/8	3	CX00500250T6
#24	.1520	3.86	3/16	1-3/8	3	CX00500240T6
#23	.1540	3.91	3/16	1-3/8	3	CX00500230T6
5/32	.1562	3.97	3/16	1-3/8	3	CX00503970T6
#22	.1570	3.99	3/16	1-3/8	3	CX00500220T6
	.1575	4.00	3/16	1-3/8	3	CX00504000T6
#21	.1590	4.04	3/16	1-3/8	3	CX00500210T6
#20	.1610	4.09	3/16	1-3/8	3	CX00500200T6
#19	.1660	4.22	3/16	1-5/8	3	CX00500190T6
#18	.1695	4.30	3/16	1-5/8	3	CX00500180T6
11/64	.1719	4.37	3/16	1-5/8	3	CX00504370T6
#17	.1730	4.39	3/16	1-5/8	3	CX00500170T6
#16	.1770	4.49	3/16	1-5/8	3	CX00500160T6
	.1772	4.50	3/16	1-5/8	3	CX00504500T6
#15	.1800	4.57	3/16	1-5/8	3	CX00500150T6
#14	.1820	4.62	3/16	1-5/8	3	CX00500140T6
#13	.1850	4.70	3/16	1-5/8	3	CX00500130T6
3/16	.1875	4.76	3/16	1-5/8	3	CX00504760T6
#12	.1890	4.80	1/4	1-5/8	3	CX00500120T6
#11	.1910	4.85	1/4	1-5/8	3	CX00500110T6
#10	.1935	4.91	1/4	1-5/8	3	CX00500100T6
#9	.1960	4.98	1/4	1-3/4	3	CX00500090T6
	.1969	5.00	1/4	1-3/4	3	CX00505000T6
#8	.1990	5.05	1/4	1-3/4	3	CX00500080T6
#7	.2010	5.10	1/4	1-3/4	3	CX00500070T6
13/64	.2031	5.16	1/4	1-3/4	3	CX00505160T6
#6	.2040	5.18	1/4	1-3/4	3	CX00500060T6
#5	.2055	5.22	1/4	1-3/4	3	CX00500050T6
#4	.2090	5.31	1/4	1-3/4	3	CX00500040T6
#3	.2130	5.41	1/4	1-3/4	3	CX00500030T6
	.2165	5.50	1/4	1-3/4	3	CX00502165T6
7/32	.2188	5.56	1/4	1-3/4	3	CX00505560T6
#2	.2210	5.61	1/4	1-3/4	3	CX00500020T6
#1	.2280	5.79	1/4	1-3/4	3	CX00500010T6
A	.2340	5.94	1/4	2	4	CX005000A0T6

****Other Dimensions are Available Upon Request****

Tolerance

Drill Dia (h7) Inches (in) .0000-.1181: + 0/- .00039 .1182-.2362: + 0/- .00047 .2363-.3937: + 0/- .00059 .3938-.7087: + 0/- .00071	Drill Dia (h7) Metric (mm) 0-3: + 0/- .010 3.01-6: + 0/- .012 6.01-10.0: + 0/- .015 10.01-18.0: + 0/- .018	Shank Dia (h6) Inches (in) .0000-.1181: + 0/- .00024 .1182-.2362: + 0/- .00031 .2363-.3937: + 0/- .00035 .3938-.7087: + 0/- .00043	Shank Dia (h6) Metric (mm) 0-3: + 0/- .006 3.01-6: + 0/- .008 6.01-10.0: + 0/- .009 10.01-18.0: + 0/- .011
--	--	--	--

General Purpose
Carbide Drills

Aluminum
Carbide Drills

Steels
Carbide Drills

Hardened Steels
Carbide Drills

Spotting
Carbide Drills

General Purpose
Drills up to 30xD

Aluminum Drills
up to 30xD

Drills for Steels

Pilot Drills

Solid Carbide Drills Non-Coolant

Solid Carbide Drills Internal Coolant

D ₁	Decimal	D ₁ mm	D ₂ in	L ₁ in	L ₂ in	Part #
15/64	.2344	5.95	1/4	2	4	CX0050950T6
	.2362	6.00	1/4	2	4	CX00506000T6
B	.2380	6.04	1/4	2	4	CX005000B0T6
C	.2420	6.15	1/4	2	4	CX005000C0T6
D	.2460	6.25	1/4	2	4	CX005000D0T6
1/4 / E	.2500	6.35	1/4	2	4	CX00506350T6
	.2559	6.50	5/16	2	4	CX00506500T6
F	.2570	6.53	5/16	2	4	CX005000F0T6
G	.2610	6.63	5/16	2-1/8	4	CX005000G0T6
17/64	.2656	6.75	5/16	2-1/8	4	CX00506750T6
H	.2660	6.76	5/16	2-1/8	4	CX005000H0T6
I	.2720	6.91	5/16	2-1/8	4	CX005000I0T6
	.2756	7.00	5/16	2-1/8	4	CX00507000T6
J	.2770	7.03	5/16	2-1/8	4	CX005000J0T6
K	.2810	7.14	5/16	2-1/8	4	CX005000K0T6
9/32	.2812	7.14	5/16	2-1/8	4	CX00507140T6
L	.2900	7.37	5/16	2-1/8	4	CX005000L0T6
M	.2950	7.49	5/16	2-3/8	4	CX005000M0T6
	.2953	7.50	5/16	2-3/8	4	CX00507500T6
19/64	.2969	7.54	5/16	2-3/8	4	CX00507540T6
N	.3020	7.67	5/16	2-3/8	4	CX005000N0T6
5/16	.3125	7.94	5/16	2-3/8	4	CX00507940T6
	.3150	8.00	3/8	2-3/8	4	CX00508000T6
O	.3160	8.03	3/8	2-3/8	4	CX005000O0T6
P	.3230	8.20	3/8	2-3/8	4	CX005000P0T6
21/64	.3281	8.33	3/8	2-1/2	5	CX00508330T6
Q	.3320	8.43	3/8	2-1/2	5	CX005000Q0T6
	.3346	8.50	3/8	2-1/2	5	CX00508500T6
R	.3390	8.61	3/8	2-1/2	5	CX005000R0T6
11/32	.3438	8.73	3/8	2-1/2	5	CX00508730T6
S	.3480	8.84	3/8	2-1/2	5	CX005000S0T6
	.3543	9.00	3/8	2-1/4	5	CX00509000T6
T	.3580	9.09	3/8	2-3/4	5	CX005000T0T6
23/64	.3594	9.13	3/8	2-3/4	5	CX00509130T6
U	.3680	9.35	3/8	2-3/4	5	CX005000U0T6
	.3740	9.50	3/8	2-3/4	5	CX00509500T6

D ₁	Decimal	D ₁ mm	D ₂ in	L ₁ in	L ₂ in	Part #
3/8	.3750	9.52	3/8	2-3/4	5	CX00509520T6
V	.3770	9.57	7/16	2-3/4	5	CX005000V0T6
W	.3860	9.80	7/16	2-7/8	5	CX005000W0T6
25/64	.3906	9.92	7/16	2-7/8	5	CX00509920T6
	.3937	10.00	7/16	2-7/8	5	CX00510000T6
X	.3970	10.08	7/16	2-7/8	5	CX005000X0T6
Y	.4040	10.26	7/16	2-7/8	5	CX005000Y0T6
13/32	.4062	10.32	7/16	2-7/8	5	CX00510320T6
Z	.4130	10.49	7/16	2-7/8	5	CX005000Z0T6
	.4134	10.50	7/16	2-7/8	5	CX00510500T6
27/64	.4219	10.72	7/16	2-7/8	5	CX00510720T6
	.4252	10.80	7/16	2-7/8	5	CX00510800T6
	.4331	11.00	7/16	2-7/8	5	CX00511000T6
7/16	.4375	11.11	7/16	2-7/8	5	CX00504375T6
	.4528	11.50	1/2	3	5	CX00511500T6
29/64	.4531	11.51	1/2	3	5	CX00511510T6
15/32	.4688	11.91	1/2	3	5	CX00511910T6
	.4724	12.00	1/2	3	5	CX00512000T6
31/64	.4844	12.30	1/2	3	5	CX00512300T6
	.4921	12.50	1/2	3	5	CX00512500T6
1/2	.5000	12.70	1/2	3	5	CX00512700T6
	.5118	13.00	9/16	3-1/4	5	CX00513000T6
33/64	.5156	13.10	9/16	3-1/4	5	CX00513100T6
17/32	.5312	13.49	9/16	3-1/4	5	CX00513490T6
	.5315	13.50	9/16	3-1/4	5	CX00513500T6
35/64	.5469	13.89	9/16	3-1/4	5	CX00513890T6
	.5512	14.00	9/16	3-1/4	5	CX00514000T6
9/16	.5625	14.29	9/16	3-1/4	5	CX00514290T6
	.5709	14.50	5/8	3-1/4	5	CX00514500T6
37/64	.5781	14.68	5/8	3-1/2	6	CX00514680T6
	.5906	15.00	5/8	3-1/2	6	CX00515000T6
19/32	.5938	15.08	5/8	3-1/2	6	CX00515080T6
39/64	.6094	15.48	5/8	3-1/2	6	CX00515480T6
	.6102	15.50	5/8	3-1/2	6	CX00515500T6
5/8	.6250	15.87	5/8	3-1/2	6	CX00515870T6
	.6299	16.00	3/4	3-1/2	6	CX00516000T6

Other Dimensions are Available Upon Request

CX		F[mm/u] Feed Per Revolution						
5xD Speeds and Feeds		Vc m/min (Cutting speed)	D1mm	> 3.00	> 5.00	> 8.00	> 12.00	> 16.00
METRIC				≤ 5.00	≤ 8.00	≤ 12.00	≤ 16.00	≤ 20.00
Material		Dec. Inch.	.1181-1969	.1970-.3150	.3151-.4724	.4725-.6299	.4726-.7874	
K1	Gray Cast Iron	59	.14	.20	.275	.35	.45	
N1	Wrought Aluminum Alloys	153	.14	.20	.275	.35	.45	
N2	Low-Silicon Aluminum Alloys Si <12.2% - 6061, 7075	119	.14	.20	.275	.35	.45	
N3	High-Silicon Aluminum Alloys Si>12.2% - 6061, 7075	93	.14	.20	.275	.35	.45	
N5	Copper & Copper Alloys	119	.10	.15	.20	.26	.33	

Note: These are only recommended starting figures that depend on conditions such as machine and material rigidity, type of coating if any, etc. TESTING IS RECOMMENDED

CX		IPR=Inches Per Revolution						
5xD Speeds and Feeds		SFM(Vc) Surface Feet Per Minute	D1mm	> 3.00	> 5.00	> 8.00	> 12.00	> 16.00
INCHES				≤ 5.00	≤ 8.00	≤ 12.00	≤ 16.00	≤ 20.00
Material		Dec. Inch.	.1181-1969	.1970-.3150	.3151-.4724	.4725-.6299	.4726-.7874	
K1	Gray Cast Iron	195	0.005	0.007	0.010	0.013	0.017	
N1	Wrought Aluminum Alloys	502	0.005	0.007	0.010	0.013	0.017	
N2	Low-Silicon Aluminum Alloys Si <12.2% - 6061, 7075	390	0.005	0.007	0.010	0.013	0.017	
N3	High-Silicon Aluminum Alloys Si>12.2% - 6061, 7075	307	0.005	0.007	0.010	0.013	0.017	
N5	Copper & Copper Alloys	390	0.003	0.005	0.007	0.010	0.012	

Note: These are only recommended starting figures that depend on conditions such as machine and material rigidity, type of coating if any, etc. TESTING IS RECOMMENDED



**High-Performance Drill
Double-Margin
Ideal for Steels & Cast Materials
3xD-12xD**



140° Point Geometry - Designed with four margins to increase precision and accuracy when drilling.

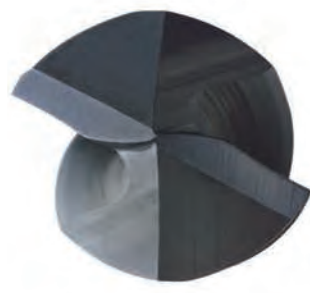
140° Geometría de la Punta - Diseñado con cuatro márgenes para aumentar la precisión y la exactitud de la perforación.

Polish - Chip evacuation is improved during deep hole drilling, when the flutes are polished.

Pulido - Cuando las flautas están pulidas la evacuación de la viruta es mejorada.

Varianta® Supral Coating - Excellent for high-speed drilling operations. Ideal for dry and semi-dry machining.

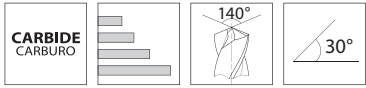
Recubrimiento Varianta® Supral - Excelente para las operaciones de perforación de alta velocidad. Ideal para el mecanizado seco y semiseco.



Tolerance

Drill Dia (h7) Inches (in)	Drill Dia (h7) Metric (mm)
.0000-.1181: + 0/- .00039	0-3: + 0/- .010
.1182-.2362: + 0/- .00047	3.01-6: + 0/- .012
.2363-.3937: + 0/- .00059	6.01-10.0: + 0/- .015
.3938-.7087: + 0/- .00071	10.01-18.0: + 0/- .018

Shank Dia (h6) Inches (in)	Shank Dia (h6) Metric (mm)
.0000-.1181: + 0/- .00024	0-3: + 0/- .006
.1182-.2362: + 0/- .00031	3.01-6: + 0/- .008
.2363-.3937: + 0/- .00035	6.01-10.0: + 0/- .009
.3938-.7087: + 0/- .00043	10.01-18.0: + 0/- .011



Varianta Supral® provides higher cutting speeds and excellent wear resistance.

Design

Spiral-fluted, right-hand cut, with external coolant and a cylindrical shank.

Coating

Varianta® Supral TiAlCN (ML)

Ideal for

steels and cast materials (Refer to page 245)



Diseño

Flautas espirales con corte de mano derecha, refrigerante externo y un zanco cilíndrico.

Recubrimiento

Varianta® Supral TiAlCN (ML)

Ideal para

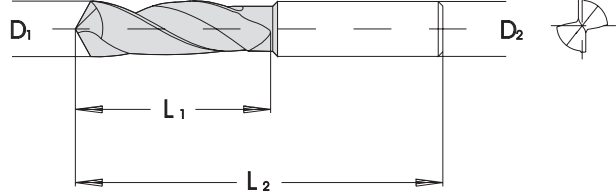
aceros y materiales de fundición (Consulte la página 246)



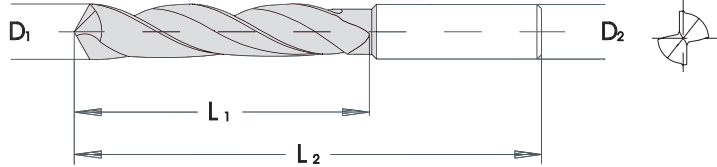
Speeds & Feeds Refer to Page 47,49,50 & 51.

****Left-Hand, Available Upon Request****

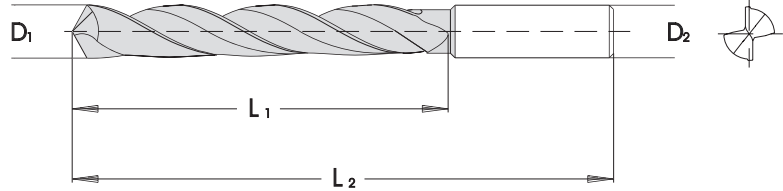
3xD PAGE 46



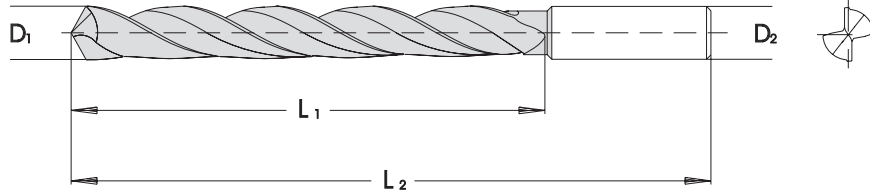
5xD PAGE 48



8xD PAGE 50



12xD PAGE 51



General Purpose
Carbide Drills

Aluminum
Carbide Drills

Steels
Carbide Drills

Hardened Steels
Carbide Drills

Spotting
Carbide Drills

General Purpose
Drills up to 30xD

Aluminum Drills
up to 30xD

Drills for Steels

Pilot Drills

Solid Carbide Drills Non-Coolant

Solid Carbide Drills Internal Coolant

General Purpose
Carbide Drills

Aluminum
Carbide Drills

Steels
Carbide Drills

Hardened Steels
Carbide Drills

Spotting
Carbide Drills

General Purpose
Drills up to 30xD

Aluminum Drills
up to 30xD

Drills for Steels

Pilot Drills

Design

Spiral-fluted, right-hand cut, with external coolant and a cylindrical shank.

Coating

Varianta® Supral TiAlCN (ML)

Ideal for

steels and cast materials
(Refer to page 245)



Speeds & Feeds Refer to Page 47.

****Left-Hand, Available Upon Request****

Diseño

Flautas espirales con corte de mano derecha, refrigerante externo y un zanco cilíndrico.

Recubrimiento

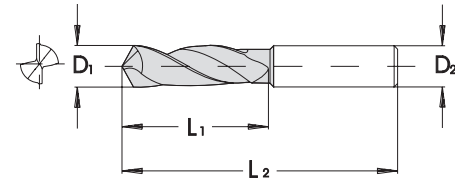
Varianta® Supral TiAlCN (ML)

Ideal para

aceros y materiales de fundición
(Consulte la página 246)



Varianta Supral® provides higher cutting speeds and excellent wear resistance.



D ₁	Decimal	D ₁ mm	D ₂ in	L ₁ in	L ₂ in	Part #
1/16	.0625	1.59	1/8	5/8	2	DX00306250T9
#52	.0635	1.61	1/8	11/16	2	DX00300520T9
#51	.0670	1.70	1/8	11/16	2	DX00300510T9
#50	.0700	1.78	1/8	11/16	2	DX00300500T9
#49	.0730	1.85	1/8	11/16	2	DX00300490T9
#48	.0760	1.93	1/8	11/16	2	DX00300480T9
5/64	.0781	1.98	1/8	11/16	2	DX00307810T9
#47	.0785	1.99	1/8	3/4	2-1/2	DX00300470T9
	.0787	2.00	1/8	3/4	2-1/2	DX00307870T9
#46	.0810	2.06	1/8	3/4	2-1/2	DX00300460T9
#45	.0820	2.08	1/8	3/4	2-1/2	DX00300450T9
#44	.0860	2.18	1/8	3/4	2-1/2	DX00300440T9
#43	.0890	2.26	1/8	3/4	2-1/2	DX00300430T9
#42	.0935	2.37	1/8	3/4	2-1/2	DX00300420T9
3/32	.0938	2.38	1/8	3/4	2-1/2	DX00309380T9
#41	.0960	2.44	1/8	13/16	2-1/2	DX00300410T9
#40	.0980	2.49	1/8	13/16	2-1/2	DX00300400T9
	.0984	2.50	1/8	13/16	2-1/2	DX00309840T9
#39	.0995	2.53	1/8	13/16	2-1/2	DX00300390T9
#38	.1015	2.58	1/8	13/16	2-1/2	DX00300380T9
#37	.1040	2.64	1/8	13/16	2-1/2	DX00300370T9
#36	.1065	2.71	1/8	13/16	2-1/2	DX00300360T9
7/64	.1094	2.78	1/8	13/16	2-1/2	DX00301094T9
#35	.1100	2.79	1/8	7/8	2-1/2	DX00300350T9
#34	.1110	2.82	1/8	7/8	2-1/2	DX00300340T9
#33	.1130	2.87	1/8	7/8	2-1/2	DX00300330T9
#32	.1160	2.95	1/8	7/8	2-1/2	DX00300320T9
	.1181	3.00	1/8	7/8	2-1/2	DX00303000T9
#31	.1200	3.05	1/8	7/8	2-1/2	DX00300310T9
1/8	.1250	3.17	1/8	7/8	2-1/2	DX00303175T9
#30	.1285	3.26	3/16	15/16	2-1/2	DX00300300T9
#29	.1360	3.45	3/16	15/16	2-1/2	DX00300290T9
	.1378	3.50	3/16	15/16	2-1/2	DX00303500T9
#28	.1405	3.57	3/16	15/16	2-1/2	DX00300280T9
9/64	.1406	3.57	3/16	1	2-1/2	DX00303570T9
#27	.1440	3.66	3/16	1	2-1/2	DX00300270T9

D ₁	Decimal	D ₁ mm	D ₂ in	L ₁ in	L ₂ in	Part #
#26	.1470	3.73	3/16	1	2-1/2	DX00300260T9
#25	.1495	3.80	3/16	1	2-1/2	DX00300250T9
#24	.1520	3.86	3/16	1	2-1/2	DX00300240T9
#23	.1540	3.91	3/16	1	2-1/2	DX00300230T9
5/32	.1562	3.97	3/16	1	2-1/2	DX00303970T9
#22	.1570	3.99	3/16	1-1/16	2-1/2	DX00300220T9
	.1575	4.00	3/16	1-1/16	2-1/2	DX00304000T9
#21	.1590	4.04	3/16	1-1/16	2-1/2	DX00300210T9
#20	.1610	4.09	3/16	1-1/16	2-1/2	DX00300200T9
	.1654	4.20	3/16	1-1/16	2-1/2	DX00304200T9
#19	.1660	4.22	3/16	1-1/16	2-1/2	DX00300190T9
#18	.1695	4.30	3/16	1-1/16	2-1/2	DX00300180T9
11/64	.1719	4.37	3/16	1-1/16	2-1/2	DX00304370T9
#17	.1730	4.39	3/16	1-1/8	3	DX00300170T9
#16	.1770	4.49	3/16	1-1/8	3	DX00300160T9
	.1772	4.50	3/16	1-1/8	3	DX00304500T9
#15	.1800	4.57	3/16	1-1/8	3	DX00300150T9
#14	.1820	4.62	3/16	1-1/8	3	DX00300140T9
#13	.1850	4.70	3/16	1-1/8	3	DX00300130T9
3/16	.1875	4.76	3/16	1-1/8	3	DX00304760T9
#12	.1890	4.80	1/4	1-3/16	3	DX00300120T9
#11	.1910	4.85	1/4	1-3/16	3	DX00300110T9
#10	.1935	4.91	1/4	1-3/16	3	DX00300100T9
#9	.1960	4.98	1/4	1-3/16	3	DX00300090T9
	.1969	5.00	1/4	1-3/16	3	DX00305000T9
#8	.1990	5.05	1/4	1-3/16	3	DX00300080T9
	.2008	5.10	1/4	1-3/16	3	DX00305100T9
#7	.2010	5.10	1/4	1-3/16	3	DX00300070T9
13/64	.2031	5.16	1/4	1-3/16	3	DX00305160T9
#6	.2040	5.18	1/4	1-1/4	3	DX00300060T9
#5	.2055	5.22	1/4	1-1/4	3	DX00300050T9
#4	.2090	5.31	1/4	1-1/4	3	DX00300040T9
#3	.2130	5.41	1/4	1-1/4	3	DX00300030T9
	.2165	5.50	1/4	1-1/4	3	DX00302165T9
7/32	.2188	5.56	1/4	1-1/4	3	DX00305560T9
#2	.2210	5.61	1/4	1-5/16	3	DX00300020T9

****Other Dimensions are Available Upon Request****

D ₁	Decimal	D ₁ mm	D ₂ in	L ₁ in	L ₂ in	Part #
#1	.2280	5.79	1/4	1-5/16	3	DX00300010T9
A	.2340	5.94	1/4	1-5/16	3	DX003000A0T9
15/64	.2344	5.95	1/4	1-5/16	3	DX00305950T9
	.2362	6.00	1/4	1-3/8	3	DX00306000T9
B	.2380	6.04	1/4	1-3/8	3	DX003000B0T9
C	.2420	6.15	1/4	1-3/8	3	DX003000C0T9
D	.2460	6.25	1/4	1-3/8	3	DX003000D0T9
1/4 / E	.2500	6.35	1/4	1-3/8	3	DX00306350T9
	.2559	6.50	5/16	1-7/16	3	DX00306500T9
F	.2570	6.53	5/16	1-7/16	3	DX003000F0T9
G	.2610	6.63	5/16	1-7/16	3	DX003000G0T9
17/64	.2656	6.75	5/16	1-7/16	3	DX00306750T9
H	.2660	6.76	5/16	1-1/2	3	DX003000H0T9
I	.2720	6.91	5/16	1-1/2	3	DX003000I0T9
	.2756	7.00	5/16	1-1/2	3	DX00307000T9
J	.2770	7.03	5/16	1-1/2	3	DX003000J0T9
K	.2810	7.14	5/16	1-1/2	3	DX003000K0T9
9/32	.2812	7.14	5/16	1-1/2	3	DX00307140T9
L	.2900	7.37	5/16	1-9/16	4	DX003000L0T9
M	.2950	7.49	5/16	1-9/16	4	DX003000M0T9
	.2953	7.50	5/16	1-9/16	4	DX00307500T9
19/64	.2969	7.54	5/16	1-9/16	4	DX00307540T9
N	.3020	7.67	5/16	1-5/8	4	DX003000N0T9
5/16	.3125	7.94	5/16	1-5/8	4	DX00307940T9
	.3150	8.00	3/8	1-11/16	4	DX00308000T9
O	.3160	8.03	3/8	1-11/16	4	DX003000O0T9
P	.3230	8.20	3/8	1-11/16	4	DX003000P0T9
21/64	.3281	8.33	3/8	1-11/16	4	DX00308330T9
Q	.3320	8.43	3/8	1-11/16	4	DX003000Q0T9
	.3346	8.50	3/8	1-11/16	4	DX00308500T9

D ₁	Decimal	D ₁ mm	D ₂ in	L ₁ in	L ₂ in	Part #
R	.3390	8.61	3/8	1-11/16	4	DX003000R0T9
11/32	.3438	8.73	3/8	1-11/16	4	DX00308730T9
S	.3480	8.84	3/8	1-3/4	4	DX003000S0T9
	.3543	9.00	3/8	1-3/4	4	DX00309000T9
T	.3580	9.09	3/8	1-3/4	4	DX003000T0T9
23/64	.3594	9.13	3/8	1-3/4	4	DX00309130T9
U	.3680	9.35	3/8	1-13/16	4	DX003000U0T9
	.3740	9.50	3/8	1-13/16	4	DX00309500T9
3/8	.3750	9.52	3/8	1-13/16	4	DX00309520T9
V	.3770	9.57	7/16	1-7/8	4	DX003000V0T9
W	.3860	9.80	7/16	1-7/8	4	DX003000W0T9
25/64	.3906	9.92	7/16	1-7/8	4	DX00309920T9
	.3937	10.00	7/16	1-15/16	4	DX00310000T9
X	.3970	10.08	7/16	1-15/16	4	DX003000X0T9
Y	.4040	10.26	7/16	1-15/16	4	DX003000Y0T9
13/32	.4062	10.32	7/16	1-15/16	4	DX00310320T9
Z	.4130	10.49	7/16	2	4	DX003000Z0T9
	.4134	10.50	7/16	2	4	DX00310500T9
27/64	.4219	10.72	7/16	2	4	DX00310720T9
	.4252	10.80	7/16	2	4	DX00310800T9
	.4331	11.00	7/16	2-1/16	4	DX00311000T9
7/16	.4375	11.11	7/16	2-1/16	4	DX00304375T9
	.4528	11.50	1/2	2-1/8	4	DX00311500T9
29/64	.4531	11.51	1/2	2-1/8	4	DX00311510T9
15/32	.4688	11.91	1/2	2-1/8	4	DX00311910T9
	.4724	12.00	1/2	2-3/16	4	DX00312000T9
31/64	.4844	12.30	1/2	2-3/16	4	DX00312300T9
	.4921	12.50	1/2	2-3/16	4	DX00312500T9
1/2	.5000	12.70	1/2	2-1/4	4	DX00312700T9

Other Dimensions are Available Upon Request

Tolerance

Drill Dia (h7) Inches (in)	Drill Dia (h7) Metric (mm)	Shank Dia (h6) Inches (in)	Shank Dia (h6) Metric (mm)
.0000-.1181: + 0/--.00039	0-3: + 0/--.010	.0000-.1181: + 0/--.00024	0-3: + 0/--.006
.1182-.2362: + 0/--.00047	3.01-6: + 0/--.012	.1182-.2362: + 0/--.00031	3.01-6: + 0/--.008
.2363-.3937: + 0/--.00059	6.01-10.0: + 0/--.015	.2363-.3937: + 0/--.00035	6.01-10.0: + 0/--.009
.3938-.7087: + 0/--.00071	10.01-18.0: + 0/--.018	.3938-.7087: + 0/--.00043	10.01-18.0: + 0/--.011

DX 3xD Speeds and Feeds METRIC	Material	Vc m/min (Cutting speed)	D1mm Dec. Inch.	F[mm/U] Feed Per Revolution				
				> 3.00 ≤ 5.00	> 5.00 ≤ 8.00	> 8.00 ≤ 12.00	> 12.00 ≤ 16.00	> 16.00 ≤ 20.00
P 1	Low - Carbon Steel - 1000 Series (> 25 HRc)	90		0.16	0.22	0.28	0.34	0.38
P 3	Alloy Tool Steels - 300,2000,3000(≤ 35HRc)	75		0.15	0.21	0.27	0.32	0.37
P 4	Alloy Tool Steels - 300,2000,3000 (36-48 HRc)	60		0.08	0.12	0.15	0.20	0.25
K 1	Gray Cast Iron	75		0.20	0.25	0.35	0.40	0.46
K 2	Ductile Iron- 60-40-18, 65-45-12 (<28HRc)	80		0.125	0.175	0.225	0.30	0.375

Note: These are only recommended starting figures that depend on conditions such as machine and material rigidity, type of coating if any, etc. TESTING IS RECOMMENDED

DX 3xD Speeds and Feeds INCHES	Material	SFM(Vc) Surface Feet Per Minute	D1mm Dec. Inch.	IPR=Inches Per Revolution				
				> 3.00 ≤ 5.00	> 5.00 ≤ 8.00	> 8.00 ≤ 12.00	> 12.00 ≤ 16.00	> 16.00 ≤ 20.00
P 1	Low - Carbon Steel - 1000 Series (> 25 HRc)	295.3		0.007	0.009	0.011	0.013	0.015
P 3	Alloy Tool Steels - 300,2000,3000(≤ 35HRc)	246.1		0.006	0.008	0.010	0.012	0.015
P 4	Alloy Tool Steels - 300,2000,3000 (36-48 HRc)	196.9		0.003	0.005	0.006	0.007	0.009
K 1	Gray Cast Iron	246.1		0.008	0.009	0.014	0.015	0.018
K 2	Ductile Iron- 60-40-18, 65-45-12 (<28HRc)	262.5		0.005	0.007	0.008	0.011	0.014

Note: These are only recommended starting figures that depend on conditions such as machine and material rigidity, type of coating if any, etc. TESTING IS RECOMMENDED

General Purpose
Carbide Drills

Aluminum
Carbide Drills

Steels
Carbide Drills

Hardened Steels
Carbide Drills

Spotting
Carbide Drills

General Purpose
Drills up to 30xD

Aluminum Drills
up to 30xD

Drills for Steels

Pilot Drills

Design

Spiral-fluted, right-hand cut, with external coolant and a cylindrical shank.

Coating

Varianta® Supral TiAlCN (ML)

Ideal for

steels and cast materials
(Refer to page 245)



Diseño

Flautas espirales con corte de mano derecha, refrigerante externo y un zanco cilíndrico.

Recubrimiento

Varianta® Supral TiAlCN (ML)

Ideal para

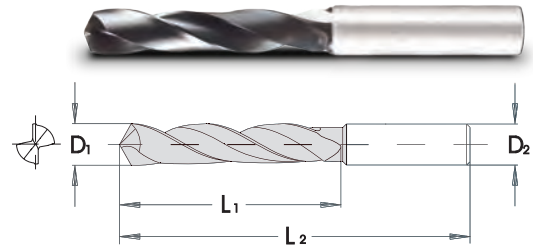
aceros y materiales de fundición
(Consulte la página 246)



Varianta Supral® provides higher cutting speeds and excellent wear resistance.

Speeds & Feeds Refer to Page 49.

****Left-Hand, Available Upon Request****



D ₁	Decimal	D ₁ mm	D ₂ in	L ₁ in	L ₂ in	Part #
1/16	.0625	1.59	1/8	3/4	2-1/2	DX00506250T9
#52	.0635	1.61	1/8	3/4	2-1/2	DX00500520T9
#51	.0670	1.70	1/8	3/4	2-1/2	DX00500510T9
#50	.0700	1.78	1/8	7/8	2-1/2	DX00500500T9
#49	.0730	1.85	1/8	7/8	2-1/2	DX00500490T9
#48	.0760	1.93	1/8	7/8	2-1/2	DX00500480T9
5/64	.0781	1.98	1/8	7/8	2-1/2	DX005007810T9
#47	.0785	1.99	1/8	7/8	2-1/2	DX00500470T9
	.0787	2.00	1/8	7/8	2-1/2	DX00507870T9
#46	.0810	2.06	1/8	7/8	2-1/2	DX00500460T9
#45	.0820	2.08	1/8	7/8	2-1/2	DX00500450T9
#44	.0860	2.18	1/8	1	2-1/2	DX00500440T9
#43	.0890	2.26	1/8	1	2-1/2	DX00500430T9
#42	.0935	2.37	1/8	1	2-1/2	DX00500420T9
3/32	.0938	2.38	1/8	1	2-1/2	DX00509380T9
#41	.0960	2.44	1/8	1	2-1/2	DX00500410T9
#40	.0980	2.49	1/8	1	3	DX00500400T9
	.0984	2.50	1/8	1-1/4	3	DX00509840T9
#39	.0995	2.53	1/8	1-1/4	3	DX00500390T9
#38	.1015	2.58	1/8	1-1/4	3	DX00500380T9
#37	.1040	2.64	1/8	1-1/4	3	DX00500370T9
#36	.1065	2.71	1/8	1-1/4	3	DX00500360T9
7/64	.1094	2.78	1/8	1-1/4	3	DX00501094T9
#35	.1100	2.79	1/8	1-1/4	3	DX00500350T9
#34	.1110	2.82	1/8	1-1/4	3	DX00500340T9
#33	.1130	2.87	1/8	1-1/4	3	DX00500330T9
#32	.1160	2.95	1/8	1-1/4	3	DX00500320T9
	.1181	3.00	1/8	1-1/4	3	DX00503000T9
#31	.1200	3.05	1/8	1-1/4	3	DX00500310T9
1/8	.1250	3.17	1/8	1-1/4	3	DX00503175T9
#30	.1285	3.26	3/16	1-1/4	3	DX00500300T9
#29	.1360	3.45	3/16	1-3/8	3	DX00500290T9
	.1378	3.50	3/16	1-3/8	3	DX00503500T9
#28	.1405	3.57	3/16	1-3/8	3	DX00500280T9
9/64	.1406	3.57	3/16	1-3/8	3	DX00503570T9
#27	.1440	3.66	3/16	1-3/8	3	DX00500270T9

D ₁	Decimal	D ₁ mm	D ₂ in	L ₁ in	L ₂ in	Part #
#26	.1470	3.73	3/16	1-3/8	3	DX00500260T9
#25	.1495	3.80	3/16	1-3/8	3	DX00500250T9
#24	.1520	3.86	3/16	1-3/8	3	DX00500240T9
#23	.1540	3.91	3/16	1-3/8	3	DX00500230T9
5/32	.1562	3.97	3/16	1-3/8	3	DX00503970T9
#22	.1570	3.99	3/16	1-3/8	3	DX00500220T9
	.1575	4.00	3/16	1-3/8	3	DX00504000T9
#21	.1590	4.04	3/16	1-3/8	3	DX00500210T9
#20	.1610	4.09	3/16	1-3/8	3	DX00500200T9
#19	.1660	4.22	3/16	1-5/8	3	DX00500190T9
#18	.1695	4.30	3/16	1-5/8	3	DX00500180T9
11/64	.1719	4.37	3/16	1-5/8	3	DX00504370T9
#17	.1730	4.39	3/16	1-5/8	3	DX00500170T9
#16	.1770	4.49	3/16	1-5/8	3	DX00500160T9
	.1772	4.50	3/16	1-5/8	3	DX00504500T9
#15	.1800	4.57	3/16	1-5/8	3	DX00500150T9
#14	.1820	4.62	3/16	1-5/8	3	DX00500140T9
#13	.1850	4.70	3/16	1-5/8	3	DX00500130T9
3/16	.1875	4.76	3/16	1-5/8	3	DX00504760T9
#12	.1890	4.80	1/4	1-5/8	3	DX00500120T9
#11	.1910	4.85	1/4	1-5/8	3	DX00500110T9
#10	.1935	4.91	1/4	1-5/8	3	DX00500100T9
#9	.1960	4.98	1/4	1-3/4	3	DX00500090T9
	.1969	5.00	1/4	1-3/4	3	DX00505000T9
#8	.1990	5.05	1/4	1-3/4	3	DX00500080T9
#7	.2010	5.10	1/4	1-3/4	3	DX00500070T9
13/64	.2031	5.16	1/4	1-3/4	3	DX00505160T9
#6	.2040	5.18	1/4	1-3/4	3	DX00500060T9
#5	.2055	5.22	1/4	1-3/4	3	DX00500050T9
#4	.2090	5.31	1/4	1-3/4	3	DX00500040T9
#3	.2130	5.41	1/4	1-3/4	3	DX00500030T9
	.2165	5.50	1/4	1-3/4	3	DX00502165T9
7/32	.2188	5.56	1/4	1-3/4	3	DX00505560T9
#2	.2210	5.61	1/4	1-3/4	3	DX00500020T9
#1	.2280	5.79	1/4	1-3/4	3	DX00500010T9
A	.2340	5.94	1/4	2	4	DX005000A0T9

****Other Dimensions are Available Upon Request****

Tolerance

Drill Dia (h7) Inches (in)	Drill Dia (h7) Metric (mm)	Shank Dia (h6) Inches (in)	Shank Dia (h6) Metric (mm)
.0000-.1181: + 0/- .00039	0-3: + 0/- .010	.0000-.1181: + 0/- .00024	0-3: + 0/- .006
.1182-.2362: + 0/- .00047	3.01-6: + 0/- .012	.1182-.2362: + 0/- .00031	3.01-6: + 0/- .008
.2363-.3937: + 0/- .00059	6.01-10.0: + 0/- .015	.2363-.3937: + 0/- .00035	6.01-10.0: + 0/- .009
.3938-.7087: + 0/- .00071	10.01-18.0: + 0/- .018	.3938-.7087: + 0/- .00043	10.01-18.0: + 0/- .011

General Purpose
Carbide Drills

Aluminum
Carbide Drills

Steels
Carbide Drills

Hardened Steels
Carbide Drills

Spotting
Carbide Drills

General Purpose
Drills up to 30xD

Aluminum Drills
up to 30xD

Drills for Steels

Pilot Drills

Solid Carbide Drills Non-Coolant

Solid Carbide Drills Internal Coolant

D ₁	Decimal	D ₁ mm	D ₂ in	L ₁ in	L ₂ in	Part #
15/64	.2344	5.95	1/4	2	4	DX00505950T9
	.2362	6.00	1/4	2	4	DX00506000T9
B	.2380	6.04	1/4	2	4	DX005000B0T9
C	.2420	6.15	1/4	2	4	DX005000C0T9
D	.2460	6.25	1/4	2	4	DX005000D0T9
1/4 / E	.2500	6.35	1/4	2	4	DX00506350T9
	.2559	6.50	5/16	2	4	DX00506500T9
F	.2570	6.53	5/16	2	4	DX005000F0T9
G	.2610	6.63	5/16	2-1/8	4	DX005000G0T9
17/64	.2656	6.75	5/16	2-1/8	4	DX00506750T9
H	.2660	6.76	5/16	2-1/8	4	DX005000H0T9
I	.2720	6.91	5/16	2-1/8	4	DX005000I0T9
	.2756	7.00	5/16	2-1/8	4	DX00507000T9
J	.2770	7.03	5/16	2-1/8	4	DX005000J0T9
K	.2810	7.14	5/16	2-1/8	4	DX005000K0T9
9/32	.2812	7.14	5/16	2-1/8	4	DX00507140T9
L	.2900	7.37	5/16	2-1/8	4	DX005000L0T9
M	.2950	7.49	5/16	2-3/8	4	DX005000M0T9
	.2953	7.50	5/16	2-3/8	4	DX00507500T9
19/64	.2969	7.54	5/16	2-3/8	4	DX00507540T9
N	.3020	7.67	5/16	2-3/8	4	DX005000N0T9
5/16	.3125	7.94	5/16	2-3/8	4	DX00507940T9
	.3150	8.00	3/8	2-3/8	4	DX00508000T9
O	.3160	8.03	3/8	2-3/8	4	DX005000O0T9
P	.3230	8.20	3/8	2-3/8	4	DX005000P0T9
21/64	.3281	8.33	3/8	2-1/2	5	DX00508330T9
Q	.3320	8.43	3/8	2-1/2	5	DX005000Q0T9
	.3346	8.50	3/8	2-1/2	5	DX00508500T9
R	.3390	8.61	3/8	2-1/2	5	DX005000R0T9
11/32	.3438	8.73	3/8	2-1/2	5	DX00508730T9
S	.3480	8.84	3/8	2-1/2	5	DX005000S0T9
	.3543	9.00	3/8	2-1/2	5	DX00509000T9
T	.3580	9.09	3/8	2-3/4	5	DX005000T0T9
23/64	.3594	9.13	3/8	2-3/4	5	DX00509130T9
U	.3680	9.35	3/8	2-3/4	5	DX005000U0T9
	.3740	9.50	3/8	2-3/4	5	DX00509500T9

D ₁	Decimal	D ₁ mm	D ₂ in	L ₁ in	L ₂ in	Part #
3/8	.3750	9.52	3/8	2-3/4	5	DX00509520T9
V	.3770	9.57	7/16	2-3/4	5	DX005000V0T9
W	.3860	9.80	7/16	2-7/8	5	DX005000W0T9
25/64	.3906	9.92	7/16	2-7/8	5	DX00509920T9
	.3937	10.00	7/16	2-7/8	5	DX00510000T9
X	.3970	10.08	7/16	2-7/8	5	DX005000X0T9
Y	.4040	10.26	7/16	2-7/8	5	DX005000Y0T9
13/32	.4062	10.32	7/16	2-7/8	5	DX00510320T9
Z	.4130	10.49	7/16	2-7/8	5	DX005000Z0T9
	.4134	10.50	7/16	2-7/8	5	DX00510500T9
27/64	.4219	10.72	7/16	2-7/8	5	DX00510720T9
	.4252	10.80	7/16	2-7/8	5	DX00510800T9
	.4331	11.00	7/16	2-7/8	5	DX00511000T9
7/16	.4375	11.11	7/16	2-7/8	5	DX00504375T9
	.4528	11.50	1/2	3	5	DX00511500T9
29/64	.4531	11.51	1/2	3	5	DX00511510T9
15/32	.4688	11.91	1/2	3	5	DX00511910T9
	.4724	12.00	1/2	3	5	DX00512000T9
31/64	.4844	12.30	1/2	3	5	DX00512300T9
	.4921	12.50	1/2	3	5	DX00512500T9
1/2	.5000	12.70	1/2	3	5	DX00512700T9
	.5118	13.00	9/16	3	5	DX00513000T9
33/64	.5156	13.10	9/16	3-1/4	5	DX00513100T9
17/32	.5312	13.49	9/16	3-1/4	5	DX00513490T9
	.5315	13.50	9/16	3-1/4	5	DX00513500T9
35/64	.5469	13.89	9/16	3-1/4	5	DX00513890T9
	.5512	14.00	9/16	3-1/4	5	DX00514000T9
9/16	.5625	14.29	9/16	3-1/4	5	DX00514290T9
	.5709	14.50	5/8	3-1/4	5	DX00514500T9
37/64	.5781	14.68	5/8	3-1/2	6	DX00514680T9
	.5906	15.00	5/8	3-1/2	6	DX00515000T9
19/32	.5938	15.08	5/8	3-1/2	6	DX00515080T9
39/64	.6094	15.48	5/8	3-1/2	6	DX00515480T9
	.6102	15.50	5/8	3-1/2	6	DX00515500T9
5/8	.6250	15.87	5/8	3-1/2	6	DX00515870T9
	.6299	16.00	3/4	3-1/2	6	DX00516000T9

Other Dimensions are Available Upon Request

DX 5xD Speeds and Feeds METRIC		Vc m/min (Cutting speed)	D1mm	F[mm/U] Feed Per Revolution				
Material	Dec. Inch.			> 3.00 ≤ 5.00	> 5.00 ≤ 8.00	> 8.00 ≤ 12.00	> 12.00 ≤ 16.00	> 16.00 ≤ 20.00
P1	Low - Carbon Steel - 1000 Series (> 25 HRC)	90		0.16	0.22	0.28	0.34	0.38
P3	Alloy Tool Steels - 300,2000,3000(≤ 35HRC)	75		0.15	0.21	0.27	0.32	0.37
P4	Alloy Tool Steels - 300,2000,3000 (36-48 HRC)	60		0.08	0.12	0.15	0.20	0.25
K1	Gray Cast Iron	75		0.20	0.25	0.35	0.40	0.46
K2	Ductile Iron- 60-40-18, 65-45-12 (<28HRC)	80		0.125	0.175	0.225	0.30	0.375

Note: These are only recommended starting figures that depend on conditions such as machine and material rigidity, type of coating if any, etc. TESTING IS RECOMMENDED

DX 5xD Speeds and Feeds INCHES		SFM(Vc) Surface Feet Per Minute	D1mm	IPR=Inches Per Revolution				
Material	Dec. Inch.			> 3.00 ≤ 5.00	> 5.00 ≤ 8.00	> 8.00 ≤ 12.00	> 12.00 ≤ 16.00	> 16.00 ≤ 20.00
P1	Low - Carbon Steel - 1000 Series (> 25 HRC)	295.3		0.007	0.009	0.011	0.013	0.015
P3	Alloy Tool Steels - 300,2000,3000(≤ 35HRC)	246.1		0.006	0.008	0.010	0.012	0.015
P4	Alloy Tool Steels - 300,2000,3000 (36-48 HRC)	196.9		0.003	0.005	0.006	0.007	0.009
K1	Gray Cast Iron	246.1		0.008	0.009	0.014	0.015	0.018
K2	Ductile Iron- 60-40-18, 65-45-12 (<28HRC)	262.5		0.005	0.007	0.008	0.011	0.014

Note: These are only recommended starting figures that depend on conditions such as machine and material rigidity, type of coating if any, etc. TESTING IS RECOMMENDED

General Purpose Carbide Drills
 Aluminum Carbide Drills
 Steels Carbide Drills
 Hardened Steels Carbide Drills
 Spotting Carbide Drills
 General Purpose Drills up to 30xD
 Aluminum Drills up to 30xD
 Drills for Steels
 Pilot Drills

Design

Spiral-fluted, right-hand cut, with external coolant and a cylindrical shank.

Coating

Varianta® Supral TiAlCN (ML)

Ideal for

steels and cast materials
(Refer to page 245)

P K

Diseño

Flautas espirales con corte de mano derecha, refrigerante externo y un zanco cilíndrico.

Recubrimiento

Varianta® Supral TiAlCN (ML)

Ideal para

aceros y materiales de fundición
(Consulte la página 246)

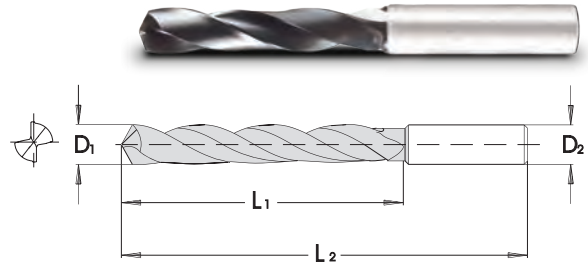
P K



Varianta Supral® provides higher cutting speeds and excellent wear resistance.

Speeds & Feeds Refer to Page 50.

****Left-Hand, Available Upon Request****



D ₁	Decimal	D ₁ mm	D ₂ in	L ₁ in	L ₂ in	Part #
1/8	.1250	3.17	1/8	1 1/2	3	DX00803000T9
9/64	.1406	3.57	3/16	1 1/2	3	DX00803570T9
5/32	.1563	3.97	3/16	1 1/2	3	DX00803970T9
	.1575	4.00	3/16	1 1/2	3	DX00804000T9
	.1654	4.20	3/16	1 1/2	3	DX00804200T9
11/64	.1720	4.37	3/16	1 1/2	3	DX00804370T9
3/16	.1874	4.76	3/16	2 1/4	4	DX00804760T9
	.1969	5.00	1/4	2 1/4	4	DX00805000T9
13/64	.2031	5.16	1/4	2 1/4	4	DX00805160T9
7/32	.2189	5.56	1/4	2 1/4	4	DX00805560T9
15/64	.2343	5.95	1/4	2 1/4	4	DX00805950T9
	.2362	6.00	1/4	2 1/4	4	DX00806000T9
1/4	.2500	6.35	1/4	2 3/4	5	DX00806350T9
17/64	.2657	6.75	5/16	2 3/4	5	DX00806750T9
	.2677	6.80	5/16	2 3/4	5	DX00806800T9
	.2756	7.00	5/16	2 3/4	5	DX00807000T9
9/32	.2811	7.14	5/16	2 3/4	5	DX00807140T9
19/64	.2969	7.54	5/16	2 3/4	5	DX00807540T9
5/16	.3126	7.94	5/16	2 3/4	5	DX00807940T9
	.3150	8.00	3/8	3 1/2	5	DX00808000T9
21/64	.3280	8.33	3/8	3 1/2	5	DX00808330T9

D ₁	Decimal	D ₁ mm	D ₂ in	L ₁ in	L ₂ in	Part #
11/32	.3437	8.73	3/8	3 1/2	5	DX00808730T9
	.3543	9.00	3/8	3 1/2	5	DX00809000T9
23/64	.3594	9.13	3/8	3 1/2	5	DX00809130T9
	.3701	9.40	3/8	3 1/2	5	DX00809400T9
3/8	.3748	9.52	3/8	3 1/2	5	DX00809520T9
25/64	.3906	9.92	1/2	4	6	DX00809920T9
	.3937	10.00	1/2	4	6	DX00810000T9
13/32	.4063	10.32	1/2	4	6	DX00810320T9
27/64	.4220	10.72	1/2	4	6	DX00810720T9
	.4331	11.00	1/2	4	6	DX00811000T9
29/64	.4531	11.51	1/2	4	6	DX00811510T9
15/32	.4689	11.91	1/2	4	6	DX00811910T9
	.4724	12.00	1/2	4	6	DX00812000T9
31/64	.4843	12.30	1/2	5	7	DX00812300T9
1/2	.5000	12.70	1/2	5	7	DX00812700T9
	.5118	13.00	9/16	5	7	DX00813000T9
33/64	.5157	13.10	9/16	5	7	DX00813100T9
	.5512	14.00	9/16	5	7	DX00814000T9
9/16	.5626	14.29	9/16	5 1/2	7	DX00814290T9
	.5906	15.00	5/8	5 1/2	7	DX00815000T9
5/8	.6248	15.87	5/8	5 1/2	7	DX00815870T9

****Other Dimensions are Available Upon Request****

Material	Vc m/min (Cutting speed)	F[mm/U] Feed Per Revolution					
		D1mm	> 3.00 ≤ 5.00	> 5.00 ≤ 8.00	> 8.00 ≤ 12.00	> 12.00 ≤ 16.00	> 16.00 ≤ 20.00
		Dec. Inch.	.1181- .1969	.1970- .3150	.3151- .4724	.4725- .6299	.4726- .7874
P 1 Low - Carbon Steel - 1000 Series (> 25 HRc)	65		0.10	0.15	0.20	0.26	0.325
P 3 Alloy Tool Steels - 300,2000,3000(≤ 35HRc)	65		0.14	0.20	0.275	0.35	0.45
P 4 Alloy Tool Steels - 300,2000,3000 (36-48 HRc)	50		0.10	0.15	0.20	0.26	0.325
K 1 Gray Cast Iron	65		0.23	0.335	0.425	0.52	0.58
K 2 Ductile Iron- 60-40-18, 65-45-12 (<28HRc)	70		0.20	0.25	0.35	0.40	0.46

Note: These are only recommended starting figures that depend on conditions such as machine and material rigidity, type of coating if any, etc. **TESTING IS RECOMMENDED**

Material	SFM(Vc) Surface Feet Per Minute	IPR=Inches Per Revolution					
		D1mm	> 3.00 ≤ 5.00	> 5.00 ≤ 8.00	> 8.00 ≤ 12.00	> 12.00 ≤ 16.00	> 16.00 ≤ 20.00
		Dec. Inch.	.1181- .1969	.1970- .3150	.3151- .4724	.4725- .6299	.4726- .7874
P 1 Low - Carbon Steel - 1000 Series (> 25 HRc)	213.3		0.004	0.005	0.007	0.010	0.012
P 3 Alloy Tool Steels - 300,2000,3000(≤ 35HRc)	213.3		0.005	0.007	0.010	0.013	0.017
P 4 Alloy Tool Steels - 300,2000,3000 (36-48 HRc)	164.1		0.004	0.005	0.007	0.010	0.012
K 1 Gray Cast Iron	213.3		0.009	0.013	0.016	0.020	0.022
K 2 Ductile Iron- 60-40-18, 65-45-12 (<28HRc)	229.7		0.007	0.009	0.013	0.015	0.018

Note: These are only recommended starting figures that depend on conditions such as machine and material rigidity, type of coating if any, etc. **TESTING IS RECOMMENDED**

Design

Spiral-fluted, right-hand cut, with external coolant and a cylindrical shank.

Coating

Varianta® Supral TiAlCN (ML)

Ideal for

steels and cast materials
(Refer to page 245)



Diseño

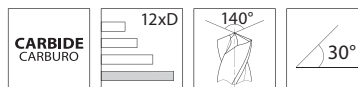
Flautas espirales con corte de mano derecha, refrigerante externo y un zanco cilíndrico.

Recubrimiento

Varianta® Supral TiAlCN (ML)

Ideal para

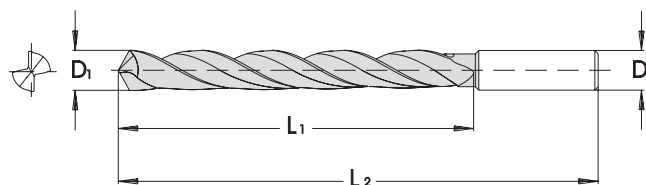
aceros y materiales de fundición
(Consulte la página 246)



Varianta Supral® provides higher cutting speeds and excellent wear resistance.

Speeds & Feeds Refer to Page 51.

Left-Hand, Available Upon Request



D ₁	Decimal	D ₁ mm	D ₂ in	L ₁ in	L ₂ in	Part #
1/8	.1181	3.00	1/8	2 1/4	4	DX01203000T9
1/8	.1250	3.17	1/8	2 1/4	4	DX01203175T9
9/64	.1406	3.57	3/16	2 1/4	4	DX01203570T9
5/32	.1563	3.97	3/16	2 1/2	4	DX01203970T9
	.1575	4.00	3/16	2 1/2	4	DX01204000T9
	.1654	4.20	3/16	2 1/2	4	DX01204200T9
11/64	.1720	4.37	3/16	2 1/2	4	DX01204370T9
3/16	.1874	4.76	3/16	3	5	DX01204760T9
	.1969	5.00	1/4	3	5	DX01205000T9
13/64	.2031	5.16	1/4	3	5	DX01205160T9
7/32	.2189	5.56	1/4	3 1/2	5	DX01205560T9
15/64	.2343	5.95	1/4	3 1/2	5	DX01205950T9
	.2362	6.00	1/4	3 1/2	5	DX01206000T9
1/4	.2500	6.35	1/4	3 1/2	5	DX01206350T9
17/64	.2657	6.75	5/16	4 1/4	6	DX01206750T9
	.2677	6.80	5/16	4 1/4	6	DX01206800T9
	.2756	7.00	5/16	4 1/4	6	DX01207000T9
9/32	.2811	7.14	5/16	4 1/4	6	DX01207140T9
19/64	.2969	7.54	5/16	4 1/4	6	DX01207540T9
5/16	.3126	7.94	5/16	4 1/4	6	DX01207940T9
	.3150	8.00	3/8	4 1/4	6	DX01208000T9
21/64	.3280	8.33	3/8	4 3/4	7	DX01208330T9

D ₁	Decimal	D ₁ mm	D ₂ in	L ₁ in	L ₂ in	Part #
11/32	.3437	8.73	3/8	4 3/4	7	DX01208730T9
	.3543	9.00	3/8	5	7	DX01209000T9
23/64	.3594	9.13	3/8	5	7	DX01209130T9
	.3701	9.40	3/8	5	7	DX01209400T9
3/8	.3748	9.52	3/8	5	7	DX01209520T9
25/64	.3906	9.92	1/2	5	7	DX01209920T9
	.3937	10.00	1/2	5	7	DX01210000T9
13/32	.4063	10.32	1/2	6 1/4	8	DX01210320T9
27/64	.4220	10.72	1/2	6 1/4	8	DX01210720T9
	.4331	11.00	1/2	6 1/4	8	DX01211000T9
29/64	.4531	11.51	1/2	6 1/4	8	DX01211510T9
15/32	.4689	11.91	1/2	6 1/4	8	DX01211910T9
	.4724	12.00	1/2	6 1/4	8	DX01212000T9
31/64	.4843	12.30	1/2	6 1/4	8	DX01212300T9
1/2	.5000	12.70	1/2	7 1/4	9	DX01212700T9
	.5118	13.00	9/16	7 1/4	9	DX01213000T9
33/64	.5157	13.10	9/16	7 1/4	9	DX01213100T9
	.5512	14.00	9/16	7 1/4	9	DX01214000T9
9/16	.5626	14.29	9/16	7 1/4	9	DX01214290T9
	.5906	15.00	5/8	8 1/4	10	DX01215000T9
5/8	.6248	15.87	5/8	8 1/4	10	DX01215870T9

Other Dimensions are Available Upon Request

DX 12xD Speeds and Feeds METRIC		Vc m/min (Cutting speed)	D1mm Dec. Inch.	F[mm/U] Feed Per Revolution				
Material				> 3.00 ≤ 5.00	> 5.00 ≤ 8.00	> 8.00 ≤ 12.00	> 12.00 ≤ 16.00	> 16.00 ≤ 20.00
P1	Low - Carbon Steel - 1000 Series (> 25 HRc)	60	.1181-.1969	0.10	0.15	0.20	0.26	0.325
P3	Alloy Tool Steels - 300,2000,3000(≤ 35HRc)	60		0.14	0.20	0.275	0.35	0.45
P4	Alloy Tool Steels - 300,2000,3000 (36-48 HRc)	45		0.10	0.15	0.20	0.26	0.325
K1	Gray Cast Iron	60		0.23	0.335	0.425	0.52	0.58
K2	Ductile Iron- 60-40-18, 65-45-12 (<28HRc)	65		0.20	0.25	0.35	0.40	0.46

Note: These are only recommended starting figures that depend on conditions such as machine and material rigidity, type of coating if any, etc. TESTING IS RECOMMENDED

DX 12xD Speeds and Feeds INCHES		SFM(Vc) Surface Feet Per Minute	D1mm Dec. Inch.	IPR=Inches Per Revolution				
Material				> 3.00 ≤ 5.00	> 5.00 ≤ 8.00	> 8.00 ≤ 12.00	> 12.00 ≤ 16.00	> 16.00 ≤ 20.00
P1	Low - Carbon Steel - 1000 Series (> 25 HRc)	196.9	.1181-.1969	0.003	0.005	0.007	0.010	0.012
P3	Alloy Tool Steels - 300,2000,3000(≤ 35HRc)	196.9		0.005	0.007	0.010	0.013	0.017
P4	Alloy Tool Steels - 300,2000,3000 (36-48 HRc)	147.6		0.003	0.005	0.007	0.010	0.012
K1	Gray Cast Iron	196.9		0.009	0.013	0.016	0.020	0.022
K2	Ductile Iron- 60-40-18, 65-45-12 (<28HRc)	213.3		0.007	0.009	0.013	0.015	0.018

Note: These are only recommended starting figures that depend on conditions such as machine and material rigidity, type of coating if any, etc. TESTING IS RECOMMENDED

General Purpose Carbide Drills
Aluminum Carbide Drills
Steels Carbide Drills
Hardened Steels Carbide Drills
Spotting Carbide Drills
General Purpose Drills up to 30xD
Aluminum Drills up to 30xD
Drills for Steels
Pilot Drills

Solid Carbide Drills Non-Coolant

Solid Carbide Drills Internal Coolant



**High-Performance Drill
Single-Margin
Ideal for Steels, Gray Cast Iron
& Hardened Materials
3xD-5xD**

Varianta® Supral Coating - Excellent for high-speed drilling operations. Ideal for dry and semi-dry machining.

Recubrimiento Varianta® Supral - Excelente para las operaciones de perforación de alta velocidad. Ideal para el mecanizado seco y semiseco.

140° Point Geometry - Provides a powerful cutting edge and is ideal for hardened materials.

140° Geometría de la Punta - Proporciona un borde de corte potente y es ideal para materiales endurecidos.

Polish - Chip evacuation is improved during deep hole drilling, when the flutes are polished.

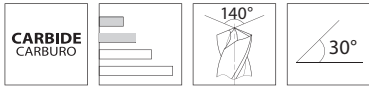
Pulido - Cuando las flautas están pulidas la evacuación de la viruta es mejorada.



Tolerance

Drill Dia (h7) Inches (in)	Drill Dia (h7) Metric (mm)
.0000-.1181: + 0/-0.0039	0-3: + 0/-0.10
.1182-.2362: + 0/-0.0047	3.01-6: + 0/-0.12
.2363-.3937: + 0/-0.0059	6.01-10.0: + 0/-0.15
.3938-.7087: + 0/-0.0071	10.01-18.0: + 0/-0.18

Shank Dia (h6) Inches (in)	Shank Dia (h6) Metric (mm)
.0000-.1181: + 0/-0.0024	0-3: + 0/-0.06
.1182-.2362: + 0/-0.0031	3.01-6: + 0/-0.08
.2363-.3937: + 0/-0.0035	6.01-10.0: + 0/-0.09
.3938-.7087: + 0/-0.0043	10.01-18.0: + 0/-0.11



Varianta Supral® provides higher cutting speeds and excellent wear resistance.

Design

Spiral-fluted, right-hand cut, with external coolant and a cylindrical shank.

Coating

Varianta® Supral TiAlCN (ML)

Ideal for

hardened steels
(Refer to page 245)



Diseño

Flautas espirales con corte de mano derecha, refrigerante externo y un zanco cilíndrico.

Recubrimiento

Varianta® Supral TiAlCN (ML)

Ideal para

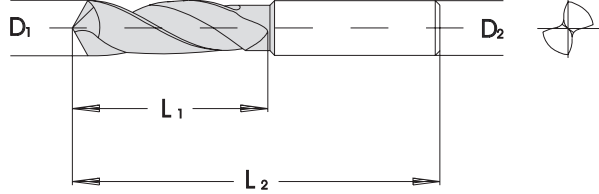
aceros endurecidos
(Consulte la página 246)



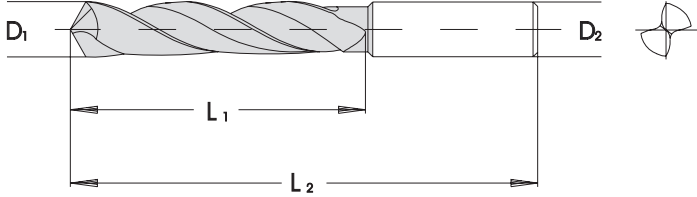
Speeds & Feeds Refer to Page 55 & 57.

****Left-Hand, Available Upon Request****

3xD PAGE 54



5xD PAGE 56



General Purpose
Carbide Drills

Aluminum
Carbide Drills

Steels
Carbide Drills

Hardened Steels
Carbide Drills

Spotting
Carbide Drills

General Purpose
Drills up to 30xD

Aluminum Drills
up to 30xD

Drills for Steels

Pilot Drills

Solid Carbide Drills Non-Coolant

Solid Carbide Drills Internal Coolant

General Purpose
Carbide Drills

Aluminum
Carbide Drills

Steels
Carbide Drills

Hardened Steels
Carbide Drills

Spotting
Carbide Drills

General Purpose
Drills up to 30xD

Aluminum Drills
up to 30xD

Drills for Steels

Pilot Drills

Design

Spiral-fluted, right-hand cut, with external coolant and a cylindrical shank.

Coating

Varianta® Supral TiAlCN (ML)

Ideal for

hardened Steels
(Refer to page 245)



Speeds & Feeds Refer to Page 55.

****Left-Hand, Available Upon Request****

Diseño

Flautas espirales con corte de mano derecha, refrigerante externo y un zanco cilíndrico.

Recubrimiento

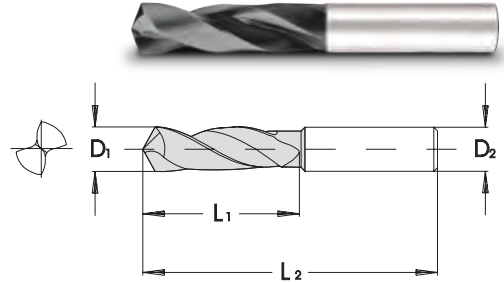
Varianta® Supral TiAlCN (ML)

Ideal para

aceros Endurecidos
(Consulte la página 246)



Varianta Supral® provides higher cutting speeds and excellent wear resistance.



D ₁	Decimal	D ₁ mm	D ₂ in	L ₁ in	L ₂ in	Part #
1/16	.0625	1.59	1/8	5/8	2	HX00306250T9
#52	.0635	1.61	1/8	11/16	2	HX00300520T9
#51	.0670	1.70	1/8	11/16	2	HX00300510T9
#50	.0700	1.78	1/8	11/16	2	HX00300500T9
#49	.0730	1.85	1/8	11/16	2	HX00300490T9
#48	.0760	1.93	1/8	11/16	2	HX00300480T9
5/64	.0781	1.98	1/8	11/16	2	HX00307810T9
#47	.0785	1.99	1/8	3/4	2	HX00300470T9
	.0787	2.00	1/8	3/4	2-1/2	HX00307870T9
#46	.0810	2.06	1/8	3/4	2-1/2	HX00300460T9
#45	.0820	2.08	1/8	3/4	2-1/2	HX00300450T9
#44	.0860	2.18	1/8	3/4	2-1/2	HX00300440T9
#43	.0890	2.26	1/8	3/4	2-1/2	HX00300430T9
#42	.0935	2.37	1/8	3/4	2-1/2	HX00300420T9
3/32	.0938	2.38	1/8	3/4	2-1/2	HX00309380T9
#41	.0960	2.44	1/8	13/16	2-1/2	HX00300410T9
#40	.0980	2.49	1/8	13/16	2-1/2	HX00300400T9
	.0984	2.50	1/8	13/16	2-1/2	HX00309840T9
#39	.0995	2.53	1/8	13/16	2-1/2	HX00300390T9
#38	.1015	2.58	1/8	13/16	2-1/2	HX00300380T9
#37	.1040	2.64	1/8	13/16	2-1/2	HX00300370T9
#36	.1065	2.71	1/8	13/16	2-1/2	HX00300360T9
7/64	.1094	2.78	1/8	13/16	2-1/2	HX00301094T9
#35	.1100	2.79	1/8	7/8	2-1/2	HX00300350T9
#34	.1110	2.82	1/8	7/8	2-1/2	HX00300340T9
#33	.1130	2.87	1/8	7/8	2-1/2	HX00300330T9
#32	.1160	2.95	1/8	7/8	2-1/2	HX00300320T9
	.1181	3.00	1/8	7/8	2-1/2	HX00303000T9
#31	.1200	3.05	1/8	7/8	2-1/2	HX00300310T9
1/8	.1250	3.17	1/8	7/8	2-1/2	HX00303175T9
#30	.1285	3.26	3/16	15/16	2-1/2	HX00300300T9
#29	.1360	3.45	3/16	15/16	2-1/2	HX00300290T9
	.1378	3.50	3/16	15/16	2-1/2	HX00303500T9
#28	.1405	3.57	3/16	15/16	2-1/2	HX00300280T9
9/64	.1406	3.57	3/16	1	2-1/2	HX00303570T9
#27	.1440	3.66	3/16	1	2-1/2	HX00300270T9

D ₁	Decimal	D ₁ mm	D ₂ in	L ₁ in	L ₂ in	Part #
#26	.1470	3.73	3/16	1	2-1/2	HX00300260T9
#25	.1495	3.80	3/16	1	2-1/2	HX00300250T9
#24	.1520	3.86	3/16	1	2-1/2	HX00300240T9
#23	.1540	3.91	3/16	1	2-1/2	HX00300230T9
5/32	.1562	3.97	3/16	1	2-1/2	HX00303970T9
#22	.1570	3.99	3/16	1-1/16	2-1/2	HX00300220T9
	.1575	4.00	3/16	1-1/16	2-1/2	HX00304000T9
#21	.1590	4.04	3/16	1-1/16	2-1/2	HX00300210T9
#20	.1610	4.09	3/16	1-1/16	2-1/2	HX00300200T9
	.1654	4.20	3/16	1-1/16	2-1/2	HX00304200T9
#19	.1660	4.22	3/16	1-1/16	2-1/2	HX00300190T9
#18	.1695	4.30	3/16	1-1/16	2-1/2	HX00300180T9
11/64	.1719	4.37	3/16	1-1/16	2-1/2	HX00304370T9
#17	.1730	4.39	3/16	1-1/8	3	HX00300170T9
#16	.1770	4.49	3/16	1-1/8	3	HX00300160T9
	.1772	4.50	3/16	1-1/8	3	HX00304500T9
#15	.1800	4.57	3/16	1-1/8	3	HX00300150T9
#14	.1820	4.62	3/16	1-1/8	3	HX00300140T9
#13	.1850	4.70	3/16	1-1/8	3	HX00300130T9
3/16	.1875	4.76	3/16	1-1/8	3	HX00304760T9
#12	.1890	4.80	1/4	1-3/16	3	HX00300120T9
#11	.1910	4.85	1/4	1-3/16	3	HX00300110T9
#10	.1935	4.91	1/4	1-3/16	3	HX00300100T9
#9	.1960	4.98	1/4	1-3/16	3	HX00300090T9
	.1969	5.00	1/4	1-3/16	3	HX00305000T9
#8	.1990	5.05	1/4	1-3/16	3	HX00300080T9
	.2008	5.10	1/4	1-3/16	3	HX00305100T9
#7	.2010	5.10	1/4	1-3/16	3	HX00300070T9
13/64	.2031	5.16	1/4	1-3/16	3	HX00305160T9
#6	.2040	5.18	1/4	1-1/4	3	HX00300060T9
#5	.2055	5.22	1/4	1-1/4	3	HX00300050T9
#4	.2090	5.31	1/4	1-1/4	3	HX00300040T9
#3	.2130	5.41	1/4	1-1/4	3	HX00300030T9
	.2165	5.50	1/4	1-1/4	3	HX00302165T9
7/32	.2188	5.56	1/4	1-1/4	3	HX00305560T9
#2	.2210	5.61	1/4	1-5/16	3	HX00300020T9

****Other Dimensions are Available Upon Request****

Tolerance

Drill Dia (h7) Inches (in) .0000-.1181: + 0/- .00039 .1182-.2362: + 0/- .00047 .2363-.3937: + 0/- .00059 .3938-.7087: + 0/- .00071	Drill Dia (h7) Metric (mm) 0-3: + 0/- .010 3.01-6: + 0/- .012 6.01-10.0: + 0/- .015 10.01-18.0: + 0/- .018	Shank Dia (h6) Inches (in) .0000-.1181: + 0/- .00024 .1182-.2362: + 0/- .00031 .2363-.3937: + 0/- .00035 .3938-.7087: + 0/- .00043	Shank Dia (h6) Metric (mm) 0-3: + 0/- .006 3.01-6: + 0/- .008 6.01-10.0: + 0/- .009 10.01-18.0: + 0/- .011
--	--	--	--

D ₁	Decimal	D ₁ mm	D ₂ in	L ₁ in	L ₂ in	Part #
#1	.2280	5.79	1/4	1-5/16	3	HX00300010T9
A	.2340	5.94	1/4	1-5/16	3	HX003000A0T9
15/64	.2344	5.95	1/4	1-5/16	3	HX00305950T9
	.2362	6.00	1/4	1-3/8	3	HX00306000T9
B	.2380	6.04	1/4	1-3/8	3	HX003000B0T9
C	.2420	6.15	1/4	1-3/8	3	HX003000C0T9
D	.2460	6.25	1/4	1-3/8	3	HX003000D0T9
1/4 / E	.2500	6.35	1/4	1-3/8	3	HX00306350T9
	.2559	6.50	5/16	1-7/16	3	HX00306500T9
F	.2570	6.53	5/16	1-7/16	3	HX003000F0T9
G	.2610	6.63	5/16	1-7/16	3	HX003000G0T9
17/64	.2656	6.75	5/16	1-7/16	3	HX00306750T9
H	.2660	6.76	5/16	1-1/2	3	HX003000H0T9
I	.2720	6.91	5/16	1-1/2	3	HX003000I0T9
	.2756	7.00	5/16	1-1/2	3	HX00307000T9
J	.2770	7.03	5/16	1-1/2	3	HX003000J0T9
K	.2810	7.14	5/16	1-1/2	3	HX003000K0T9
9/32	.2812	7.14	5/16	1-1/2	3	HX00307140T9
L	.2900	7.37	5/16	1-9/16	4	HX003000L0T9
M	.2950	7.49	5/16	1-9/16	4	HX003000M0T9
	.2953	7.50	5/16	1-9/16	4	HX00307500T9
19/64	.2969	7.54	5/16	1-9/16	4	HX00307540T9
N	.3020	7.67	5/16	1-5/8	4	HX003000N0T9
5/16	.3125	7.94	5/16	1-5/8	4	HX00307940T9
	.3150	8.00	3/8	1-11/16	4	HX00308000T9
O	.3160	8.03	3/8	1-11/16	4	HX003000O0T9
P	.3230	8.20	3/8	1-11/16	4	HX003000P0T9
21/64	.3281	8.33	3/8	1-11/16	4	HX00308330T9
Q	.3320	8.43	3/8	1-11/16	4	HX003000Q0T9
	.3346	8.50	3/8	1-11/16	4	HX00308500T9

Other Dimensions are Available Upon Request

HX 3xD Speeds and Feeds METRIC		Vc m/min (Cutting speed)	D1mm Dec. Inch.	F[mm/u] Feed Per Revolution				
Material	> 3.00 ≤ 5.00			> 5.00 ≤ 8.00	> 8.00 ≤ 12.00	> 12.00 ≤ 16.00	> 16.00 ≤ 20.00	
P1 Low - Carbon Steel - 1000 Series (> 25 HRC)	80	.18	.24	.30	.35	.40		
P3 Alloy Tool Steels - 300,2000,3000(≤ 35HRC)	65	.15	.21	.27	.32	.37		
P4 Alloy Tool Steels - 300,2000,3000 (36-48 HRC)	40	.15	.21	.27	.32	.37		
K1 Gray Cast Iron	75	.20	.25	.35	.40	.46		
H2 Hardened Tool Steels (48-55 HRC)	23	.08	.09	.11	.13	.15		
H3 Hardened Tool Steels (56-60 HRC)	11	.08	.09	.11	.13	.15		
H4 Hardened Tool Steels (60-62 HRC)	9	.08	.09	.11	.13	.15		
Hardened Tool Steels (62-64 HRC)	7	.08	.09	.11	.13	.15		

Note: These are only recommended starting figures that depend on conditions such as machine and material rigidity, type of coating if any, etc. TESTING IS RECOMMENDED

HX 3xD Speeds and Feeds INCHES		SFM(Vc) Surface Feet Per Minute	D1mm Dec. Inch.	IPR=Inches Per Revolution				
Material	> 3.00 ≤ 5.00			> 5.00 ≤ 8.00	> 8.00 ≤ 12.00	> 12.00 ≤ 16.00	> 16.00 ≤ 20.00	
P1 Low - Carbon Steel - 1000 Series (> 25 HRC)	262.5	0.007	0.009	0.011	0.013	0.015		
P3 Alloy Tool Steels - 300,2000,3000(≤ 35HRC) Austenitic	213.3	0.005	0.008	0.010	0.012	0.014		
P4 Alloy Tool Steels - 300,2000,3000 (36-48 HRC)	131.2	0.005	0.008	0.010	0.012	0.014		
K1 Gray Cast Iron	246.1	0.007	0.009	0.013	0.015	0.018		
H2 Hardened Tool Steels (48-55 HRC)	75.5	0.0032	0.0035	0.0043	0.0051	0.0059		
H3 Hardened Tool Steels (56-60 HRC)	36.1	0.0032	0.0035	0.0043	0.0051	0.0059		
H4 Hardened Tool Steels (60-62 HRC)	29.5	0.0032	0.0035	0.0043	0.0051	0.0059		
Hardened Tool Steels (62-64 HRC)	23.0	0.0032	0.0035	0.0043	0.0051	0.0059		

Note: These are only recommended starting figures that depend on conditions such as machine and material rigidity, type of coating if any, etc. TESTING IS RECOMMENDED

General Purpose
Carbide Drills

Aluminum
Carbide Drills

Steels
Carbide Drills

Hardened Steels
Carbide Drills

Spotting
Carbide Drills

General Purpose
Drills up to 30xD

Aluminum Drills
up to 30xD

Drills for Steels

Pilot Drills

Design

Spiral-flute, right-hand cut, with external coolant and a cylindrical shank.

Coating

Varianta® Supral TiAlCN (ML)

Ideal for

hardened steels
(Refer to page 245)



Speeds & Feeds Refer to Page 57.

****Left-Hand, Available Upon Request****

Diseño

Flautas espirales con corte de mano derecha, refrigerante externo y un zanco cilíndrico.

Recubrimiento

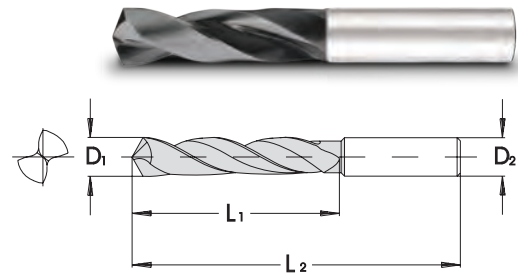
Varianta® Supral TiAlCN (ML)

Ideal para

aceros endurecidos
(Consulte la página 246)



Varianta Supral® provides higher cutting speeds and excellent wear resistance.



D ₁	Decimal	D ₁ mm	D ₂ in	L ₁ in	L ₂ in	Part #
1/16	.0625	1.59	1/8	3/4	2	HX00506250T9
#52	.0635	1.61	1/8	3/4	2	HX00500520T9
#51	.0670	1.70	1/8	3/4	2	HX00500510T9
#50	.0700	1.78	1/8	7/8	2	HX00500500T9
#49	.0730	1.85	1/8	7/8	2	HX00500490T9
#48	.0760	1.93	1/8	7/8	2	HX00500480T9
5/64	.0781	1.98	1/8	7/8	2	HX00507810T9
#47	.0785	1.99	1/8	7/8	2	HX00500470T9
	.0787	2.00	1/8	7/8	2	HX00507870T9
#46	.0810	2.06	1/8	7/8	2	HX00500460T9
#45	.0820	2.08	1/8	7/8	2	HX00500450T9
#44	.0860	2.18	1/8	1	2	HX00500440T9
#43	.0890	2.26	1/8	1	2	HX00500430T9
#42	.0935	2.37	1/8	1	2	HX00500420T9
3/32	.0938	2.38	1/8	1	2	HX00509380T9
#41	.0960	2.44	1/8	1	2	HX00500410T9
#40	.0980	2.49	1/8	1	2	HX00500400T9
	.0984	2.50	1/8	1-1/4	2	HX00509840T9
#39	.0995	2.53	1/8	1-1/4	2-1/2	HX00500390T9
#38	.1015	2.58	1/8	1-1/4	2-1/2	HX00500380T9
#37	.1040	2.64	1/8	1-1/4	2-1/2	HX00500370T9
#36	.1065	2.71	1/8	1-1/4	2-1/2	HX00500360T9
7/64	.1094	2.78	1/8	1-1/4	2-1/2	HX00501094T9
#35	.1100	2.79	1/8	1-1/4	2-1/2	HX00500350T9
#34	.1110	2.82	1/8	1-1/4	2-1/2	HX00500340T9
#33	.1130	2.87	1/8	1-1/4	2-1/2	HX00500330T9
#32	.1160	2.95	1/8	1-1/4	2-1/2	HX00500320T9
	.1181	3.00	1/8	1-1/4	2-1/2	HX00503000T9
#31	.1200	3.05	1/8	1-1/4	2-1/2	HX00500310T9
1/8	.1250	3.17	1/8	1-1/4	2-1/2	HX00503175T9
#30	.1285	3.26	3/16	1-1/4	2-1/2	HX00500300T9
#29	.1360	3.45	3/16	1-3/8	2-1/2	HX00500290T9
	.1378	3.50	3/16	1-3/8	2-1/2	HX00503500T9
#28	.1405	3.57	3/16	1-3/8	2-1/2	HX00500280T9
9/64	.1406	3.57	3/16	1-3/8	2-1/2	HX00503570T9
#27	.1440	3.66	3/16	1-3/8	3	HX00500270T9

D ₁	Decimal	D ₁ mm	D ₂ in	L ₁ in	L ₂ in	Part #
#26	.1470	3.73	3/16	1-3/8	2-1/2	HX00500260T9
#25	.1495	3.80	3/16	1-3/8	2-1/2	HX00500250T9
#24	.1520	3.86	3/16	1-3/8	2-1/2	HX00500240T9
#23	.1540	3.91	3/16	1-3/8	2-1/2	HX00500230T9
5/32	.1562	3.97	3/16	1-3/8	2-1/2	HX00503970T9
#22	.1570	3.99	3/16	1-3/8	2-1/2	HX00500220T9
	.1575	4.00	3/16	1-3/8	2-1/2	HX00504000T9
#21	.1590	4.04	3/16	1-3/8	2-1/2	HX00500210T9
#20	.1610	4.09	3/16	1-5/8	2-1/2	HX00500200T9
#19	.1660	4.22	3/16	1-5/8	3	HX00500190T9
#18	.1695	4.30	3/16	1-5/8	3	HX00500180T9
11/64	.1719	4.37	3/16	1-5/8	3	HX00504370T9
#17	.1730	4.39	3/16	1-5/8	3	HX00500170T9
#16	.1770	4.49	3/16	1-5/8	3	HX00500160T9
	.1772	4.50	3/16	1-5/8	3	HX00504500T9
#15	.1800	4.57	3/16	1-5/8	3	HX00500150T9
#14	.1820	4.62	3/16	1-5/8	3	HX00500140T9
#13	.1850	4.70	3/16	1-5/8	3	HX00500130T9
3/16	.1875	4.76	3/16	1-5/8	3	HX00504760T9
#12	.1890	4.80	1/4	1-5/8	3	HX00500120T9
#11	.1910	4.85	1/4	1-5/8	3	HX00500110T9
#10	.1935	4.91	1/4	1-5/8	3	HX00500100T9
#9	.1960	4.98	1/4	1-3/4	3	HX00500090T9
	.1969	5.00	1/4	1-3/4	3	HX00505000T9
#8	.1990	5.05	1/4	1-3/4	3	HX00500080T9
#7	.2010	5.10	1/4	1-3/4	3	HX00500070T9
13/64	.2031	5.16	1/4	1-3/4	3	HX00505160T9
#6	.2040	5.18	1/4	1-3/4	3	HX00500060T9
#5	.2055	5.22	1/4	1-3/4	3	HX00500050T9
#4	.2090	5.31	1/4	1-3/4	3	HX00500040T9
#3	.2130	5.41	1/4	1-3/4	3	HX00500030T9
	.2165	5.50	1/4	1-3/4	3	HX00502165T9
7/32	.2188	5.56	1/4	1-3/4	3	HX00505560T9
#2	.2210	5.61	1/4	1-3/4	3	HX00500020T9
#1	.2280	5.79	1/4	1-3/4	3	HX00500010T9
A	.2340	5.94	1/4	2	4	HX005000A0T9

****Other Dimensions are Available Upon Request****

Tolerance

Drill Dia (h7) Inches (in)	Drill Dia (h7) Metric (mm)	Shank Dia (h6) Inches (in)	Shank Dia (h6) Metric (mm)
.0000-.1181: +0/-0.0039	0-3: +0/-0.10	.0000-.1181: +0/-0.0024	0-3: +0/-0.06
.1182-.2362: +0/-0.0047	3.01-6: +0/-0.12	.1182-.2362: +0/-0.0031	3.01-6: +0/-0.08
.2363-.3937: +0/-0.0059	6.01-10.0: +0/-0.15	.2363-.3937: +0/-0.0035	6.01-10.0: +0/-0.09
.3938-.7087: +0/-0.0071	10.01-18.0: +0/-0.18	.3938-.7087: +0/-0.0043	10.01-18.0: +0/-0.11

General Purpose Carbide Drills
Aluminum Carbide Drills
Steels Carbide Drills
Hardened Steels Carbide Drills
Spotting Carbide Drills

Solid Carbide Drills Non-Coolant

General Purpose Drills up to 30xD
Aluminum Drills up to 30xD
Drills for Steels
Pilot Drills

Solid Carbide Drills Internal Coolant

D ₁	Decimal	D ₁ mm	D ₂ in	L ₁ in	L ₂ in	Part #
15/64	.2344	5.95	1/4	2	4	HX00505950T9
	.2362	6.00	1/4	2	4	HX00506000T9
B	.2380	6.04	1/4	2	4	HX005000B0T9
C	.2420	6.15	1/4	2	4	HX005000C0T9
D	.2460	6.25	1/4	2	4	HX005000D0T9
1/4 / E	.2500	6.35	1/4	2	4	HX00506350T9
	.2559	6.50	5/16	2	4	HX00506500T9
F	.2570	6.53	5/16	2	4	HX005000F0T9
G	.2610	6.63	5/16	2-1/8	4	HX005000G0T9
17/64	.2656	6.75	5/16	2-1/8	4	HX00506750T9
H	.2660	6.76	5/16	2-1/8	4	HX005000H0T9
I	.2720	6.91	5/16	2-1/8	4	HX005000I0T9
	.2756	7.00	5/16	2-1/8	4	HX00507000T9
J	.2770	7.03	5/16	2-1/8	4	HX005000J0T9
K	.2810	7.14	5/16	2-1/8	4	HX005000K0T9
9/32	.2812	7.14	5/16	2-1/8	4	HX00507140T9
L	.2900	7.37	5/16	2-1/8	4	HX005000L0T9
M	.2950	7.49	5/16	2-3/8	4	HX005000M0T9
	.2953	7.50	5/16	2-3/8	4	HX00507500T9
19/64	.2969	7.54	5/16	2-3/8	4	HX00507540T9
N	.3020	7.67	5/16	2-3/8	4	HX005000N0T9
5/16	.3125	7.94	5/16	2-3/8	4	HX00507940T9
	.3150	8.00	3/8	2-3/8	4	HX00508000T9
O	.3160	8.03	3/8	2-3/8	4	HX005000O0T9
P	.3230	8.20	3/8	2-3/8	4	HX005000P0T9
21/64	.3281	8.33	3/8	2-1/2	4	HX00508330T9
Q	.3320	8.43	3/8	2-1/2	4	HX005000Q0T9
	.3346	8.50	3/8	2-1/2	4	HX00508500T9
R	.3390	8.61	3/8	2-1/2	4	HX005000R0T9
11/32	.3438	8.73	3/8	2-1/2	4	HX00508730T9
S	.3480	8.84	3/8	2-1/2	4	HX00508330T9
	.3543	9.00	3/8	2-1/2	4	HX00509000T9
T	.3580	9.09	3/8	2-3/4	5	HX005000T0T9
23/64	.3594	9.13	3/8	2-3/4	5	HX00509130T9
U	.3680	9.35	3/8	2-3/4	5	HX005000U0T9
	.3740	9.50	3/8	2-3/4	5	HX00509500T9

D ₁	Decimal	D ₁ mm	D ₂ in	L ₁ in	L ₂ in	Part #
3/8	.3750	9.52	3/8	2-3/4	5	HX00509520T9
V	.3770	9.57	7/16	2-3/4	5	HX005000V0T9
W	.3860	9.80	7/16	2-7/8	5	HX005000W0T9
25/64	.3906	9.92	7/16	3	5	HX00509920T9
	.3937	10.00	7/16	3	5	HX00510000T9
X	.3970	10.08	7/16	3	5	HX005000X0T9
Y	.4040	10.26	7/16	3	5	HX005000Y0T9
13/32	.4062	10.32	7/16	3	5	HX00510320T9
Z	.4130	10.49	7/16	2-7/8	5	HX005000Z0T9
	.4134	10.50	7/16	2-7/8	5	HX00510500T9
27/64	.4219	10.72	7/16	2-7/8	5	HX00510720T9
	.4252	10.80	7/16	2-7/8	5	HX00510800T9
	.4331	11.00	7/16	2-7/8	5	HX00511000T9
7/16	.4375	11.11	7/16	2-7/8	5	HX00504375T9
	.4528	11.50	1/2	3	5	HX00511500T9
29/64	.4531	11.51	1/2	3	5	HX00511510T9
15/32	.4688	11.91	1/2	3	5	HX00511910T9
	.4724	12.00	1/2	3	5	HX00512000T9
31/64	.4844	12.30	1/2	3	5	HX00512300T9
	.4921	12.50	1/2	3	5	HX00512500T9
1/2	.5000	12.70	1/2	3	5	HX00512700T9
	.5118	13.00	9/16	3-1/4	5	HX00513000T9
33/64	.5156	13.10	9/16	3-1/4	5	HX00513100T9
17/32	.5312	13.49	9/16	3-1/4	5	HX00513490T9
	.5315	13.50	9/16	3-1/4	5	HX00513500T9
35/64	.5469	13.89	9/16	3-1/4	5	HX00513890T9
	.5512	14.00	9/16	3-1/4	5	HX00514000T9
9/16	.5625	14.29	9/16	3-1/4	5	HX00514290T9
	.5709	14.50	5/8	3-1/4	5	HX00514500T9
37/64	.5781	14.68	5/8	3-1/2	6	HX00514680T9
	.5906	15.00	5/8	3-1/2	6	HX00515000T9
19/32	.5938	15.08	5/8	3-1/2	6	HX00515080T9
39/64	.6094	15.48	5/8	3-1/2	6	HX00515480T9
	.6102	15.50	5/8	3-1/2	6	HX00515500T9
5/8	.6250	15.87	5/8	3-1/2	6	HX00515870T9
	.6299	16.00	3/4	3-1/2	6	HX00516000T9

Other Dimensions are Available Upon Request

HX 5xD Speeds and Feeds METRIC		Vc m/min (Cutting speed)	D1mm Dec. Inch.	F[mm/u] Feed Per Revolution				
Material	> 3.00 ≤ 5.00			> 5.00 ≤ 8.00	> 8.00 ≤ 12.00	> 12.00 ≤ 16.00	> 16.00 ≤ 20.00	
P1	Low - Carbon Steel - 1000 Series (> 25 HRC)	75	.18	.24	.30	.35	.40	
P3	Alloy Tool Steels - 300,2000,3000(≤ 35HRC)	60	.15	.21	.27	.32	.37	
P4	Alloy Tool Steels - 300,2000,3000 (36-48 HRC)	40	.15	.21	.27	.32	.37	
K1	Gray Cast Iron	70	.20	.25	.35	.40	.46	
H2	Hardened Tool Steels (48-55 HRC)	22	.08	.09	.11	.13	.15	
H3	Hardened Tool Steels (56-60 HRC)	11	.08	.09	.11	.13	.15	
H4	Hardened Tool Steels (60-62 HRC)	9	.08	.09	.11	.13	.15	
	Hardened Tool Steels (62-64 HRC)	7	.08	.09	.11	.13	.15	

Note: These are only recommended starting figures that depend on conditions such as machine and material rigidity, type of coating if any, etc. TESTING IS RECOMMENDED

HX 5xD Speeds and Feeds INCHES		SFM(Vc) Surface Feet Per Minute	D1mm Dec. Inch.	IPR=Inches Per Revolution				
Material	> 3.00 ≤ 5.00			> 5.00 ≤ 8.00	> 8.00 ≤ 12.00	> 12.00 ≤ 16.00	> 16.00 ≤ 20.00	
P1	Low - Carbon Steel - 1000 Series (> 25 HRC)	246.1		0.007	0.009	0.011	0.013	0.015
P3	Alloy Tool Steels - 300,2000,3000(≤ 35HRC) Austenitic	196.9		0.005	0.008	0.010	0.012	0.014
P4	Alloy Tool Steels - 300,2000,3000 (36-48 HRC)	131.2		0.005	0.008	0.010	0.012	0.014
K1	Gray Cast Iron	229.7		0.007	0.009	0.013	0.015	0.018
H2	Hardened Tool Steels (48-55 HRC)	72.2		0.0032	0.0035	0.0043	0.0051	0.0059
H3	Hardened Tool Steels (56-60 HRC)	36.1		0.0032	0.0035	0.0043	0.0051	0.0059
	Hardened Tool Steels (60-62 HRC)	29.5		0.0032	0.0035	0.0043	0.0051	0.0059
H4	Hardened Tool Steels (62-64 HRC)	23.0		0.0032	0.0035	0.0043	0.0051	0.0059

Note: These are only recommended starting figures that depend on conditions such as machine and material rigidity, type of coating if any, etc. TESTING IS RECOMMENDED



SPOTTING DRILLS

The SD drill should be utilized to create punctures at the desired location(s).

Please note that our SD drill is not engineered to drill past the angle point's depth

La broca SD debe ser utilizada para crear pinchaduras en el lugar deseado(s).

*Tenga en cuenta que nuestra broca SD no está diseñada para perforar más allá del punto de ángulo de profundidad *



Left- Hand Spiral

Available Upon Request

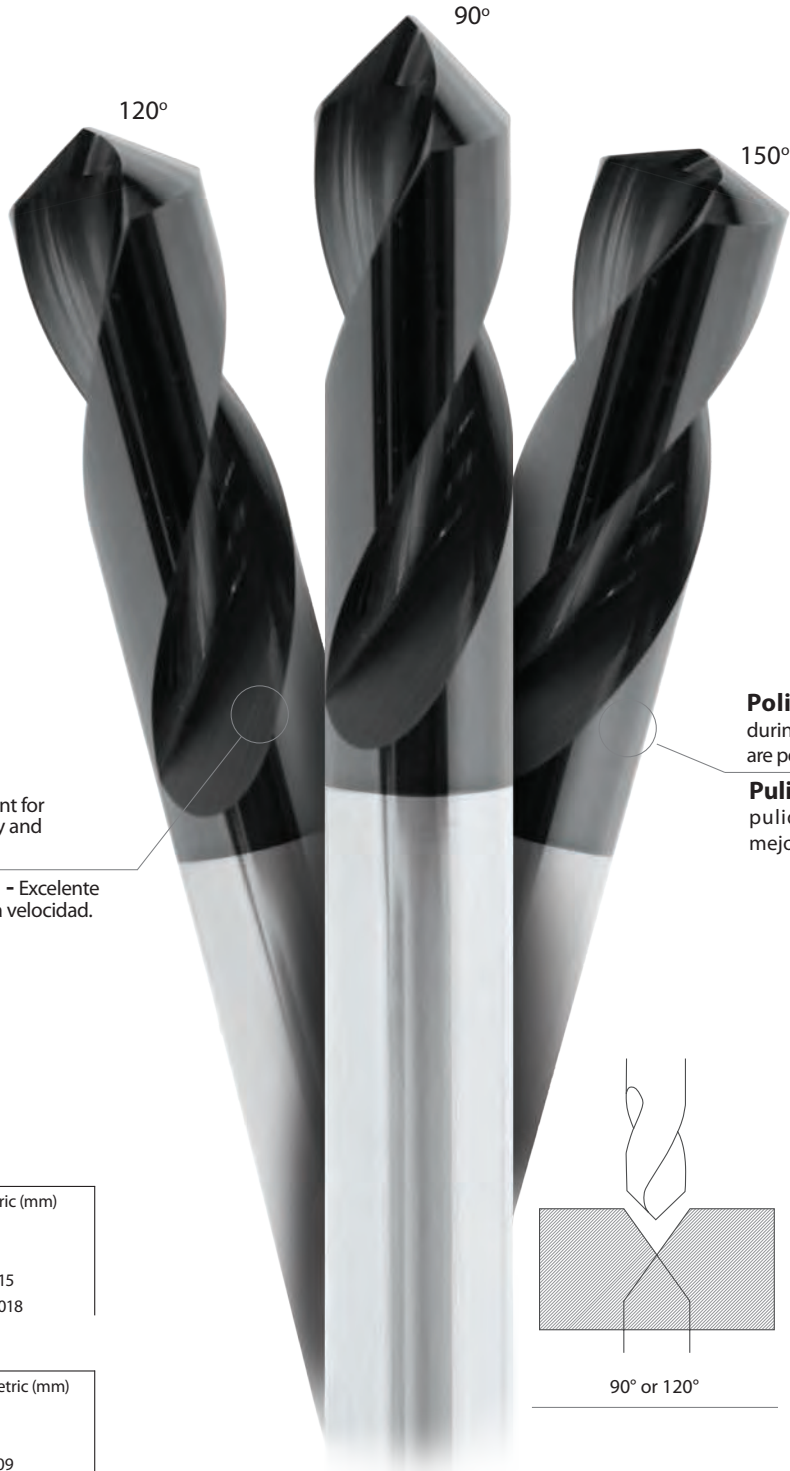
Varianta® Supral Coating - Excellent for high-speed drilling operations. Ideal for dry and semi-dry machining.

Recubrimiento Varianta® Supral - Excelente para las operaciones de perforación de alta velocidad. Ideal para el mecanizado seco y semiseco.

Tolerance

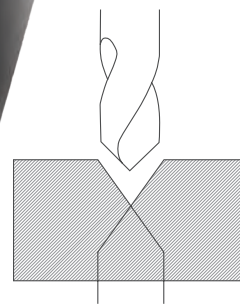
Drill Dia (h7) Inches (in)	Drill Dia (h7) Metric (mm)
.0000-.1181: + 0/-0.0039	0-3: + 0/-0.10
.1182-.2362: + 0/-0.0047	3.01-6: + 0/-0.12
.2363-.3937: + 0/-0.0059	6.01-10.0: + 0/-0.15
.3938-.7087: + 0/-0.0071	10.01-18.0: + 0/-0.18

Shank Dia (h6) Inches (in)	Shank Dia (h6) Metric (mm)
.0000-.1181: + 0/-0.0024	0-3: + 0/-0.06
.1182-.2362: + 0/-0.0031	3.01-6: + 0/-0.08
.2363-.3937: + 0/-0.0035	6.01-10.0: + 0/-0.09
.3938-.7087: + 0/-0.0043	10.01-18.0: + 0/-0.11

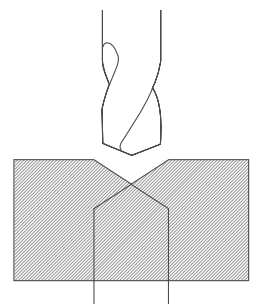


Polish - Chip evacuation is improved during deep hole drilling, when the flutes are polished.

Pulido - Cuando las flautas están pulidas la evacuación de la viruta es mejorada.



90° or 120°



150°

General Purpose
Carbide Drills

Aluminum
Carbide Drills

Steels
Carbide Drills

Hardened Steels
Carbide Drills

Spotting
Carbide Drills

General Purpose
Drills up to 30XD

Aluminum Drills
up to 30XD

Drills for Steels

Pilot Drills

Solid Carbide Drills Non-Coolant

Solid Carbide Drills Internal Coolant

Coating
Varianta® Supral TiAlCN (ML)

High Speed Drilling
Self Centering

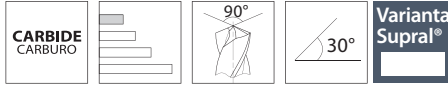
P M K N S

Recubrimiento
Varianta® Supral TiAlCN (ML)

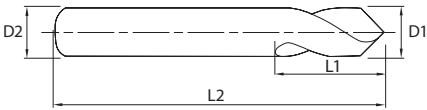
Perforación de alta velocidad
Autocentrante

P M K N S

Speeds & Feeds Refer to Page 59.



Varianta Supral® provides higher cutting speeds and excellent wear resistance.



Inches

D ₁	Dec. Equiv	D ₁ mm	D ₂ in	L ₁ in	L ₂ in	Part #
1/8	.1250	3.17	1/8	5/8	2-1/2	SD00903170T9
3/16	.1875	4.76	3/16	3/4	2-1/2	SD00904760T9
1/4	.2500	6.35	1/4	1	2-1/2	SD00906350T9
5/16	.3125	7.94	5/16	1	2-1/2	SD00907940T9
3/8	.3750	9.52	3/8	1-1/4	3	SD00909520T9
1/2	.5000	12.70	1/2	1-1/4	3	SD00902700T9
3/4	.7500	19.05	3/4	1-1/4	3	SD00909050T9

Metric

Dec. Equiv	D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm	Part #
.1181	3.0	3	10	64	SD00903000T9
.1575	4.0	4	12	64	SD00904000T9
.1968	5.0	5	25	64	SD00905000T9
.2362	6.0	6	25	64	SD00906000T9
.3150	8.0	8	25	64	SD00908000T9
.3937	10.0	10	31	76	SD00910000T9
.4724	12.0	12	38	76	SD00912000T9

Other Dimensions are Available Upon Request

90° SPOTTING DRILL

Speeds and Feeds

METRIC

Material	Vc m/min (Cutting speed)	D1mm Dec. Inch.	F[mm/U] Feed Per Revolution				
			> 3.00 ≤ 5.00	> 5.00 ≤ 8.00	> 8.00 ≤ 12.00	> 12.00 ≤ 16.00	> 16.00 ≤ 20.00
P3 Alloy Tool Steels - 1300,2000,3000(≤ 35HRc)	65		.1181- .1969	.1970- .3150	.3151- .4724	.4725- .6299	.4726- .7874
P4 Alloy Tool Steels - 1300,2000,3000 (36-48 HRc)	50		0.14	0.20	0.275	0.35	0.45
K1 Gray Cast Iron	70		0.10	0.15	0.20	0.28	0.33
N2 Low-Silicon Aluminum Alloys Si- <12.2%- 6061, 7075	160		0.10	0.15	0.20	0.28	0.33
			0.03	0.07	0.11	0.15	0.20

Note: These are only recommended starting figures that depend on conditions such as machine and material rigidity, type of coating if any, etc. **TESTING IS RECOMMENDED**

90° SPOTTING DRILL

Speeds and Feeds

INCHES

Material	SFM(Vc) Surface Feet Per Minute	D1mm Dec. Inch.	IPR=Inches Per Revolution				
			> 3.00 ≤ 5.00	> 5.00 ≤ 8.00	> 8.00 ≤ 12.00	> 12.00 ≤ 16.00	> 16.00 ≤ 20.00
P3 Alloy Tool Steels - 1300,2000,3000(≤ 35HRc)	213.3		.1181- .1969	.1970- .3150	.3151- .4724	.4725- .6299	.4726- .7874
P4 Alloy Tool Steels - 1300,2000,3000 (36-48 HRc)	164.1		0.005	0.007	0.010	0.013	0.017
K1 Gray Cast Iron	229.7		0.003	0.005	0.007	0.010	0.127
N2 Low-Silicon Aluminum Alloys Si- <12.2%- 6061, 7075	525		0.003	0.005	0.007	0.010	0.012
			0.001	0.002	0.004	0.005	0.007

Note: These are only recommended starting figures that depend on conditions such as machine and material rigidity, type of coating if any, etc. **TESTING IS RECOMMENDED**

General Purpose
Carbide Drills

Aluminum
Carbide Drills

Steels
Carbide Drills

Hardened Steels
Carbide Drills

Spotting
Carbide Drills

General Purpose
Drills up to 30xD

Aluminum Drills
up to 30xD

Drills for Steels

Pilot Drills

Coating
Varianta® Supral TiAlCN (ML)

High Speed Drilling
Self Centering

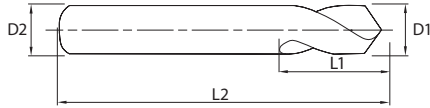


Recubrimiento
Varianta® Supral TiAlCN (ML)

Perforación de alta velocidad
Autocentrante



120° SD Spotting Drill



Varianta Supral® provides higher cutting speeds and excellent wear resistance.

Inches

D ₁	Dec. Equiv	D ₁ mm	D ₂ in	L ₁ in	L ₂ in	Part #
1/8	.1250	3.17	1/8	5/8	2-1/2	SD00203170T9
3/16	.1875	4.76	3/16	3/4	2-1/2	SD00204760T9
1/4	.2500	6.35	1/4	1	2-1/2	SD00206350T9
5/16	.3125	7.94	5/16	1	2-1/2	SD00207940T9
3/8	.3750	9.52	3/8	1-1/4	3	SD00209520T9
1/2	.5000	12.70	1/2	1-1/4	3	SD00202700T9
3/4	.7500	19.05	3/4	1-1/4	3	SD00209050T9

Metric

Dec. Equiv	D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm	Part #
.1181	3.0	3	10	64	SD00203000T9
.1575	4.0	4	12	64	SD00204000T9
.1968	5.0	5	25	64	SD00205000T9
.2362	6.0	6	25	64	SD00206000T9
.3150	8.0	8	25	64	SD00208000T9
.3937	10.0	10	31	76	SD00200000T9
.4724	12.0	12	38	76	SD00202000T9

Other Dimensions are Available Upon Request

Coating
Varianta® Supral TiAlCN (ML)

High Speed Drilling
Self Centering

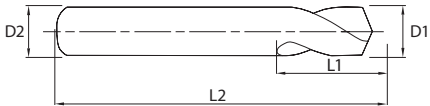


Recubrimiento
Varianta® Supral TiAlCN (ML)

Perforación de alta velocidad
Autocentrante



150° SD Spotting Drill



Varianta Supral® provides higher cutting speeds and excellent wear resistance.

Inches

D ₁	Dec. Equiv	D ₁ mm	D ₂ in	L ₁ in	L ₂ in	Part #
1/8	.1250	3.17	1/8	5/8	2-1/2	SD00503170T9
3/16	.1875	4.76	3/16	3/4	2-1/2	SD00504760T9
1/4	.2500	6.35	1/4	1	2-1/2	SD00506350T9
5/16	.3125	7.94	5/16	1	2-1/2	SD00507940T9
3/8	.3750	9.52	3/8	1-1/4	3	SD00509520T9
1/2	.5000	12.70	1/2	1-1/4	3	SD00502700T9
3/4	.7500	19.05	3/4	1-1/4	3	SD00509050T9

Metric

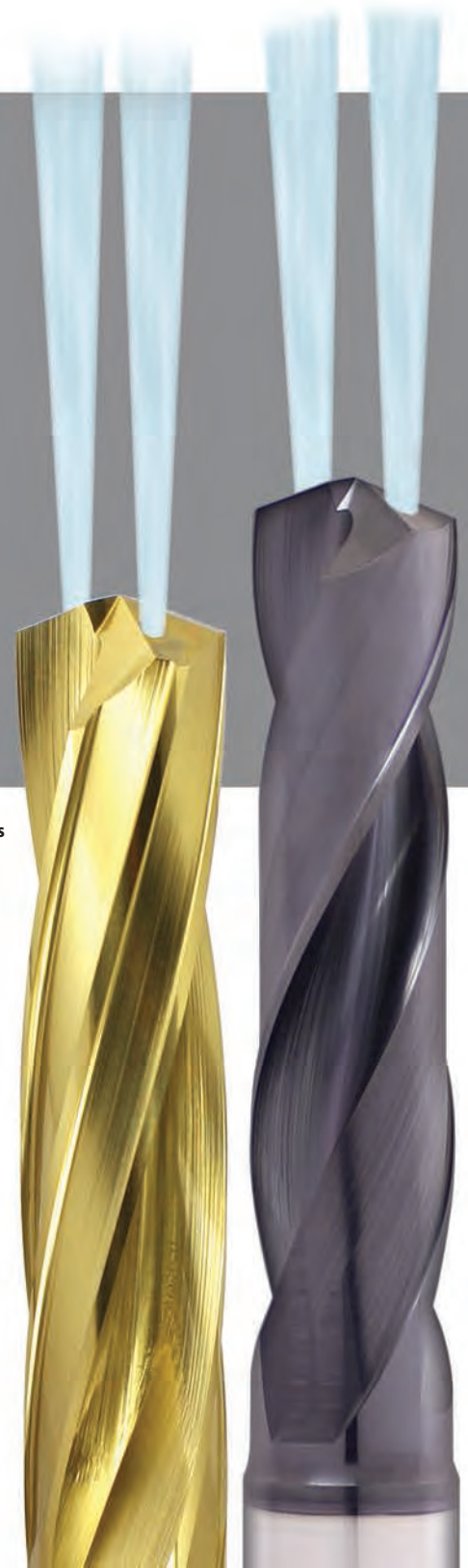
Dec. Equiv	D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm	Part #
.1181	3.0	3	10	64	SD00503000T9
.1575	4.0	4	12	64	SD00504000T9
.1968	5.0	5	25	64	SD00505000T9
.2362	6.0	6	25	64	SD00506000T9
.3150	8.0	8	25	64	SD00508000T9
.3937	10.0	10	31	76	SD00500000T9
.4724	12.0	12	38	76	SD00502000T9

Other Dimensions are Available Upon Request

CARBIDE DRILLS INTERNAL COOLANT

Left: **AXC Series**
p.86

Right: **GXC Series**
p.62





**High-Performance Drill
Single-Margin
Ideal for General Purpose Drilling
3xD-8xD**

Varianta® Supral Coating - Excellent for high-speed drilling operations. Ideal for dry and semi-dry machining.

Recubrimiento Varianta® Supral - Excelente para las operaciones de perforación de alta velocidad. Ideal para el mecanizado seco y semiseco.

135° Point Geometry - Engineered to provide you with advanced drilling capabilities. The 135° split-point is designed to ensure precision when drilling.

135° Geometría de la Punta - Diseñado para ofrecerle capacidades avanzadas de perforación. El punto de división 135 grados está diseñado para asegurar precisión al perforar.

Coolant Holes - Cool the cutting edge and improve chip evacuation.

Refrigerante Interno - Enfría el filo y mejora la evacuación de la viruta.

Polish - Chip evacuation is improved during deep hole drilling, when the flutes are polished.

Pulido - Cuando las flautas están pulidas la evacuación de la viruta es mejorada.

Tolerance

Drill Dia (h7) Inches (in)	Drill Dia (h7) Metric (mm)
.0000-.1181: + 0/- .00039	0-3: + 0/- .010
.1182-.2362: + 0/- .00047	3.01-6: + 0/- .012
.2363-.3937: + 0/- .00059	6.01-10.0: + 0/- .015
.3938-.7087: + 0/- .00071	10.01-18.0: + 0/- .018

Shank Dia (h6) Inches (in)	Shank Dia (h6) Metric (mm)
.0000-.1181: + 0/- .00024	0-3: + 0/- .006
.1182-.2362: + 0/- .00031	3.01-6: + 0/- .008
.2363-.3937: + 0/- .00035	6.01-10.0: + 0/- .009
.3938-.7087: + 0/- .00043	10.01-18.0: + 0/- .011





Varianta Supral® provides higher cutting speeds and excellent wear resistance.

Design

Long spiral-fluted, single margin, right-hand cut and internal coolant.

Coating

Varianta® Supral TiAlCN (ML)

Ideal for

general purpose drilling (Refer to page 245)

P M K S

Diseño

Flautas largas espirales, margen con corte de mano derecha y refrigerante interno.

Recubrimiento

Varianta® Supral TiAlCN (ML)

Ideal para

uso general (Consulte la página 246)

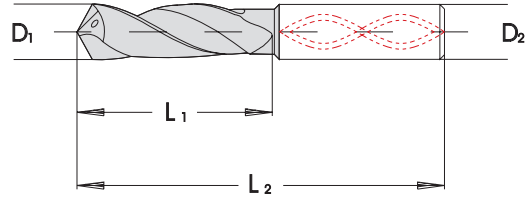
P M K S

Speeds & Feeds Refer to Page 65,67 & 69.

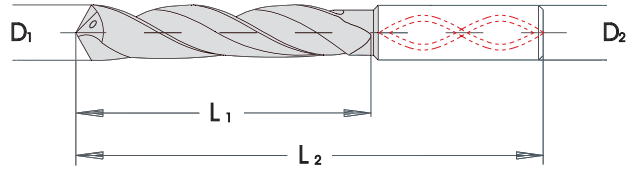
Diameters (2.0 - 2.9mm)
Available Upon Request.

****Left-Hand, Available Upon Request****

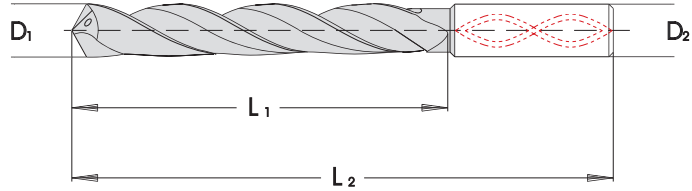
3xD PAGE 64



5xD PAGE 66



8xD PAGE 68



General Purpose
Carbide Drills

Aluminum
Carbide Drills

Steels
Carbide Drills

Hardened Steels
Carbide Drills

Spotting
Carbide Drills

General Purpose
Drills up to 30xD

Aluminum Drills
up to 30xD

Drills for Steels

Pilot Drills

Solid Carbide Drills Non-Coolant

Solid Carbide Drills Internal Coolant

General Purpose
Carbide Drills

Aluminum
Carbide Drills

Steels
Carbide Drills

Hardened Steels
Carbide Drills

Spotting
Carbide Drills

General Purpose
Drills up to 30xD

Aluminum Drills
up to 30xD

Drills for Steels

Pilot Drills

Design

Long spiral-fluted, single margin, right-hand cut and internal coolant.

Coating

Varianta® Supral TIALCN (ML)

Ideal for

general purpose drilling
(Refer to page 245)

P M K S

Speeds & Feeds Refer to Page 65.

Diameters (2.0 - 2.9mm)
Available Upon Request.

****Left-Hand, Available Upon Request****

Diseño

Flautas largas espirales, margen con corte de mano derecha y refrigerante interno.

Recubrimiento

Varianta® Supral TIALCN (ML)

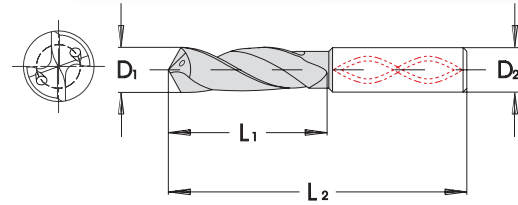
Ideal para

uso general
(Consulte la página 246)

P M K S



Varianta Supral® provides higher cutting speeds and excellent wear resistance.



D ₁	Decimal	D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm	Part #
	0.1181	3.000	6	20	62	GXC0303000T9
	0.1220	3.100	6	20	62	GXC0303100T9
1/8	0.1250	3.175	6	20	62	GXC0303175T9
	0.1260	3.200	6	20	62	GXC0303200T9
	0.1299	3.300	6	20	62	GXC0303300T9
	0.1339	3.400	6	20	62	GXC0303400T9
	0.1378	3.500	6	20	62	GXC0303500T9
9/64	0.1406	3.572	6	20	62	GXC0303572T9
	0.1417	3.600	6	20	62	GXC0303600T9
	0.1457	3.700	6	20	62	GXC0303700T9
25	0.1496	3.800	6	24	66	GXC0303800T9
	0.1535	3.900	6	24	66	GXC0303900T9
5/32	0.1563	3.970	6	24	66	GXC0303970T9
	0.1575	4.000	6	24	66	GXC0304000T9
	0.1614	4.100	6	24	66	GXC0304100T9
	0.1654	4.200	6	24	66	GXC0304200T9
	0.1693	4.300	6	24	66	GXC0304300T9
11/64	0.1719	4.370	6	24	66	GXC0304370T9
	0.1732	4.400	6	24	66	GXC0304400T9
	0.1772	4.500	6	24	66	GXC0304500T9
	0.1811	4.600	6	24	66	GXC0304600T9
	0.1831	4.650	6	24	66	GXC0304650T9
13	0.1850	4.700	6	24	66	GXC0300130T9
3/16	0.1875	4.760	6	28	66	GXC0304760T9
12	0.1890	4.800	6	28	66	GXC0300120T9
	0.1929	4.900	6	28	66	GXC0304900T9
	0.1969	5.000	6	28	66	GXC0305000T9
	0.2008	5.100	6	28	66	GXC0305100T9
13/64	0.2031	5.160	6	28	66	GXC0305160T9
6	0.2040	5.182	6	28	66	GXC0300060T9
	0.2047	5.200	6	28	66	GXC0305200T9
	0.2087	5.300	6	28	66	GXC0305300T9
	0.2126	5.400	6	28	66	GXC0305400T9
	0.2165	5.500	6	28	66	GXC0305500T9
	0.2185	5.550	6	28	66	GXC0305550T9
7/32	0.2187	5.560	6	28	66	GXC0305560T9

D ₁	Decimal	D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm	Part #
	0.2205	5.600	6	28	66	GXC0305600T9
	0.2244	5.700	6	28	66	GXC0305700T9
	0.2283	5.800	6	28	66	GXC0305800T9
	0.2323	5.900	6	28	66	GXC0305900T9
15/64	0.2344	5.950	6	28	66	GXC0305950T9
	0.2362	6.000	6	28	66	GXC0306000T9
	0.2402	6.100	8	34	79	GXC0306100T9
	0.2441	6.200	8	34	79	GXC0306200T9
	0.2480	6.300	8	34	79	GXC0306300T9
1/4	0.2500	6.350	8	34	79	GXC0306350T9
	0.2520	6.400	8	34	79	GXC0306400T9
	0.2559	6.500	8	34	79	GXC0306500T9
	0.2598	6.600	8	34	79	GXC0306600T9
	0.2638	6.700	8	34	79	GXC0306700T9
17/64	0.2656	6.750	8	34	79	GXC0306750T9
	0.2677	6.800	8	34	79	GXC0306800T9
	0.2717	6.900	8	41	79	GXC0306900T9
	0.2756	7.000	8	41	79	GXC0307000T9
	0.2795	7.100	8	41	79	GXC0307100T9
9/32	0.2813	7.140	8	41	79	GXC0307140T9
	0.2835	7.200	8	41	79	GXC0307200T9
	0.2874	7.300	8	41	79	GXC0307300T9
	0.2913	7.400	8	41	79	GXC0307400T9
	0.2953	7.500	8	41	79	GXC0307500T9
19/64	0.2969	7.540	8	41	79	GXC0307540T9
	0.3031	7.700	8	41	79	GXC0307700T9
	0.3071	7.800	8	41	79	GXC0307800T9
	0.3110	7.900	8	41	79	GXC0307900T9
5/16	0.3125	7.940	8	41	79	GXC0307940T9
	0.3150	8.000	8	41	79	GXC0308000T9
	0.3189	8.100	10	47	89	GXC0308100T9
	0.3228	8.200	10	47	89	GXC0308200T9
	0.3268	8.300	10	47	89	GXC0308300T9
21/64	0.3281	8.330	10	47	89	GXC0308330T9
	0.3307	8.400	10	47	89	GXC0308400T9
	0.3346	8.500	10	47	89	GXC0308500T9

****Other Dimensions are Available Upon Request****

Tolerance

Drill Dia (h7) Inches (in)	Drill Dia (h7) Metric (mm)	Shank Dia (h6) Inches (in)	Shank Dia (h6) Metric (mm)
.0000-.1181: +0/-0.0039	0-3: +0/-0.10	.0000-.1181: +0/-0.0024	0-3: +0/-0.06
.1182-.2362: +0/-0.0047	3.01-6: +0/-0.12	.1182-.2362: +0/-0.0031	3.01-6: +0/-0.08
.2363-.3937: +0/-0.0059	6.01-10.0: +0/-0.15	.2363-.3937: +0/-0.0035	6.01-10.0: +0/-0.09
.3938-.7087: +0/-0.0071	10.01-18.0: +0/-0.18	.3938-.7087: +0/-0.0043	10.01-18.0: +0/-0.11

D ₁	Decimal	D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm	Part #
	0.3386	8.600	10	47	89	GXC0308600T9
	0.3425	8.700	10	47	89	GXC0308700T9
11/32	0.3437	8.730	10	47	89	GXC0308730T9
	0.3465	8.800	10	47	89	GXC0308800T9
	0.3543	9.000	10	47	89	GXC0309000T9
23/64	0.3594	9.130	10	47	89	GXC0309130T9
	0.3622	9.200	10	47	89	GXC0309200T9
	0.3661	9.300	10	47	89	GXC0309300T9
	0.3740	9.500	10	47	89	GXC0309500T9
3/8	0.3750	9.520	10	47	89	GXC0309520T9
	0.3780	9.600	10	47	89	GXC0309600T9
	0.3858	9.800	10	47	89	GXC0309800T9
	0.3898	9.900	10	47	89	GXC0309900T9
25/64	0.3906	9.920	10	47	89	GXC0309920T9
	0.3937	10.000	10	47	89	GXC0310000T9
	0.3976	10.100	12	55	102	GXC0310100T9
	0.4016	10.200	12	55	102	GXC0310200T9
	0.4055	10.300	12	55	102	GXC0310300T9
13/32	0.4063	10.320	12	55	102	GXC0310320T9
	0.4094	10.400	12	55	102	GXC0310400T9
	0.4134	10.500	12	55	102	GXC0310500T9
27/64	0.4219	10.720	12	55	102	GXC0310720T9
	0.4252	10.800	12	55	102	GXC0310800T9
	0.4331	11.000	12	55	102	GXC0311000T9
	0.4370	11.100	12	55	102	GXC0311100T9
7/16	0.4375	11.113	12	55	102	GXC03104375T9
	0.4409	11.200	12	55	102	GXC0311200T9
	0.4528	11.500	12	55	102	GXC0311500T9
29/64	0.4531	11.510	12	55	102	GXC0311510T9
	0.4606	11.700	12	55	102	GXC0311700T9

D ₁	Decimal	D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm	Part #
	0.4646	11.800	12	55	102	GXC0311800T9
15/32	0.4687	11.910	12	55	102	GXC0311910T9
	0.4724	12.000	12	55	102	GXC0312000T9
	0.4764	12.100	14	60	107	GXC0312100T9
	0.4803	12.200	14	60	107	GXC0312200T9
	0.4843	12.300	14	60	107	GXC0312300T9
31/64	0.4844	12.303	14	60	107	GXC0304844T9
	0.4921	12.500	14	60	107	GXC0312500T9
	0.4961	12.600	14	60	107	GXC0312600T9
1/2	0.5000	12.700	14	60	107	GXC0312700T9
	0.5118	13.000	14	60	107	GXC0313000T9
	0.5236	13.300	14	60	107	GXC0313300T9
17/32	0.5313	13.490	14	60	107	GXC0313490T9
	0.5315	13.500	14	60	107	GXC0313500T9
	0.5512	14.000	14	60	107	GXC0314000T9
9/16	0.5625	14.290	16	65	115	GXC0314290T9
	0.5709	14.500	16	65	115	GXC0314500T9
	0.5906	15.000	16	65	115	GXC0315000T9
	0.6102	15.500	16	65	115	GXC0315500T9
5/8	0.6250	15.870	16	65	115	GXC0315870T9
	0.6299	16.000	16	65	115	GXC0316000T9
	0.6496	16.500	18	73	123	GXC0316500T9
	0.6693	17.000	18	73	123	GXC0317000T9
	0.6890	17.500	18	73	123	GXC0317500T9
	0.7087	18.000	18	73	123	GXC0318000T9
	0.7283	18.500	20	79	131	GXC0318500T9
3/4	0.7500	19.050	20	79	131	GXC0319050T9
	0.7677	19.500	20	79	131	GXC0319500T9
	0.7874	20.000	20	79	131	GXC0320000T9

Other Dimensions are Available Upon Request

GXC

3xD Speeds and Feeds METRIC

Material	Vc m/min (Cutting speed)	D1mm	F[mm/u] Feed Per Revolution				
			> 3.00 ≤ 5.00	> 5.00 ≤ 8.00	> 8.00 ≤ 12.00	> 12.00 ≤ 16.00	> 16.00 ≤ 20.00
P 1 Low - Carbon Steel - 1000 Series (> 25 HRC)	100		.16	.22	.28	.34	.38
P 3 Alloy Tool Steels - 1300, 2000, 3000 (≤ 35HRC)	75		.08	.12	.15	.21	.25
M 2 Austenitic Stainless Steel & Cast Stainless Steel- 310, 314, 316 (< 25 HRC)	70		.08	.12	.15	.22	.25
S 4 Titanium Alloys- Commercially Pure, 6 Al - AV, AStm 1/2/3, Ti-6Al-2Sn 4Zr-2Mo (≤48 HRC)	30		.04	.08	.12	.16	.20
K 1 Gray Cast Iron	80		.125	.175	.225	.30	.375

Note: These are only recommended starting figures that depend on conditions such as machine and material rigidity, type of coating if any, etc. TESTING IS RECOMMENDED

GXC

3xD Speeds and Feeds INCHES

Material	Vc m/min (Cutting speed)	D1mm	IPR=Inches Per Revolution				
			> 3.00 ≤ 5.00	> 5.00 ≤ 8.00	> 8.00 ≤ 12.00	> 12.00 ≤ 16.00	> 16.00 ≤ 20.00
P 1 Low - Carbon Steel - 1000 Series (> 25 HRC)	328.1		0.006	0.008	0.011	0.013	0.015
P 3 Alloy Tool Steels - 1300, 2000, 3000 (≤ 35HRC)	246.1		0.003	0.004	0.005	0.008	0.009
M 2 Austenitic Stainless Steel & Cast Stainless Steel- 310, 314, 316 (< 25 HRC)	229.7		0.003	0.004	0.005	0.008	0.009
S 4 Titanium Alloys- Commercially Pure, 6 Al - AV, AStm 1/2/3, Ti-6Al-2Sn 4Zr-2Mo (≤48 HRC)	98.4		0.001	0.003	0.004	0.006	0.007
K 1 Gray Cast Iron	262.5		0.004	0.006	0.008	0.011	0.014

Note: These are only recommended starting figures that depend on conditions such as machine and material rigidity, type of coating if any, etc. TESTING IS RECOMMENDED

General Purpose
Carbide Drills

Aluminum
Carbide Drills

Steels
Carbide Drills

Hardened Steels
Carbide Drills

Spotting
Carbide Drills

General Purpose
Drills up to 30xD

Aluminum Drills
up to 30xD

Drills for Steels

Pilot Drills

Design

Long spiral-fluted, single margin, right-hand cut and internal coolant.

Coating

Varianta® Supral TiAlCN (ML)

Ideal for

general purpose drilling
(Refer to page 245)

P M K S

Diseño

Flautas largas espirales, margen con corte de mano derecha y refrigerante interno.

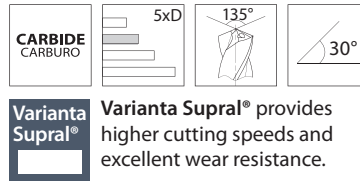
Recubrimiento

Varianta® Supral TiAlCN (ML)

Ideal para

uso general
(Consulte la página 246)

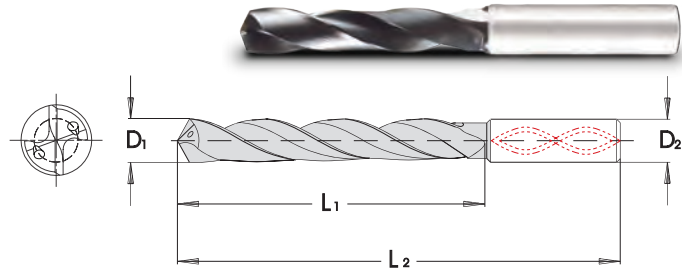
P M K S



Speeds & Feeds Refer to Page 67.

Diameters (2.0 - 2.9mm)
Available Upon Request.

****Left-Hand, Available Upon Request****



D ₁	Decimal	D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm	Part #
	0.1181	3.000	6	28	66	GXC0503000T9
	0.1220	3.100	6	28	66	GXC0503100T9
1/8	0.1250	3.175	6	28	66	GXC0503175T9
	0.1260	3.200	6	28	66	GXC0503200T9
	0.1299	3.300	6	28	66	GXC0503300T9
	0.1339	3.400	6	28	66	GXC0503400T9
	0.1378	3.500	6	28	66	GXC0503500T9
9/64	0.1406	3.572	6	28	66	GXC0503572T9
	0.1417	3.600	6	28	66	GXC0503600T9
	0.1457	3.700	6	28	66	GXC0503700T9
25	0.1496	3.800	6	36	74	GXC0503800T9
	0.1535	3.900	6	36	74	GXC0503900T9
5/32	0.1563	3.970	6	36	74	GXC0503970T9
	0.1575	4.000	6	36	74	GXC0504000T9
	0.1614	4.100	6	36	74	GXC0504100T9
	0.1654	4.200	6	36	74	GXC0504200T9
	0.1693	4.300	6	36	74	GXC0504300T9
11/64	0.1719	4.370	6	36	74	GXC0504370T9
	0.1732	4.400	6	36	74	GXC0504400T9
	0.1772	4.500	6	36	74	GXC0504500T9
	0.1811	4.600	6	36	74	GXC0504600T9
	0.1831	4.650	6	36	74	GXC0504650T9
13	0.1850	4.700	6	36	74	GXC0500130T9
3/16	0.1875	4.760	6	44	82	GXC0504760T9
12	0.1890	4.800	6	44	82	GXC0500120T9
	0.1929	4.900	6	44	82	GXC0504900T9
	0.1969	5.000	6	44	82	GXC0505000T9
	0.2008	5.100	6	44	82	GXC0505100T9
13/64	0.2031	5.160	6	44	82	GXC0505160T9
6	0.2040	5.182	6	44	82	GXC0500060T9
	0.2047	5.200	6	44	82	GXC0505200T9
	0.2087	5.300	6	44	82	GXC0505300T9
	0.2126	5.400	6	44	82	GXC0505400T9
	0.2165	5.500	6	44	82	GXC0505500T9
	0.2185	5.550	6	44	82	GXC0505550T9
7/32	0.2187	5.560	6	44	82	GXC0505560T9

D ₁	Decimal	D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm	Part #
	0.2205	5.600	6	44	82	GXC0505600T9
	0.2244	5.700	6	44	82	GXC0505700T9
	0.2283	5.800	6	44	82	GXC0505800T9
	0.2323	5.900	6	44	82	GXC0505900T9
15/64	0.2344	5.950	6	44	82	GXC0505950T9
	0.2362	6.000	6	44	82	GXC0506000T9
	0.2402	6.100	8	53	91	GXC0506100T9
	0.2441	6.200	8	53	91	GXC0506200T9
	0.2480	6.300	8	53	91	GXC0506300T9
1/4	0.2500	6.350	8	53	91	GXC0506350T9
	0.2520	6.400	8	53	91	GXC0506400T9
	0.2559	6.500	8	53	91	GXC0506500T9
	0.2598	6.600	8	53	91	GXC0506600T9
	0.2638	6.700	8	53	91	GXC0506700T9
17/64	0.2656	6.750	8	53	91	GXC0506750T9
	0.2677	6.800	8	53	91	GXC0506800T9
	0.2717	6.900	8	53	91	GXC0506900T9
	0.2756	7.000	8	53	91	GXC0507000T9
	0.2795	7.100	8	53	91	GXC0507100T9
9/32	0.2813	7.140	8	53	91	GXC0507140T9
	0.2835	7.200	8	53	91	GXC0507200T9
	0.2874	7.300	8	53	91	GXC0507300T9
	0.2913	7.400	8	53	91	GXC0507400T9
	0.2953	7.500	8	53	91	GXC0507500T9
19/64	0.2969	7.540	8	53	91	GXC0507540T9
	0.3031	7.700	8	53	91	GXC0507700T9
	0.3071	7.800	8	53	91	GXC0507800T9
	0.3110	7.900	8	53	91	GXC0507900T9
5/16	0.3125	7.940	8	53	91	GXC0507940T9
	0.3150	8.000	8	53	91	GXC0508000T9
	0.3189	8.100	10	61	103	GXC0508100T9
	0.3228	8.200	10	61	103	GXC0508200T9
	0.3268	8.300	10	61	103	GXC0508300T9
21/64	0.3281	8.330	10	61	103	GXC0508330T9
	0.3307	8.400	10	61	103	GXC0508400T9
	0.3346	8.500	10	61	103	GXC0508500T9

****Other Dimensions are Available Upon Request****

Tolerance

Drill Dia (h7) Inches (in)	Drill Dia (h7) Metric (mm)	Shank Dia (h6) Inches (in)	Shank Dia (h6) Metric (mm)
.0000-.1181: +0/--.00039	0-3: +0/--.010	.0000-.1181: +0/--.00024	0-3: +0/--.006
.1182-.2362: +0/--.00047	3.01-6: +0/--.012	.1182-.2362: +0/--.00031	3.01-6: +0/--.008
.2363-.3937: +0/--.00059	6.01-10.0: +0/--.015	.2363-.3937: +0/--.00035	6.01-10.0: +0/--.009
.3938-.7087: +0/--.00071	10.01-18.0: +0/--.018	.3938-.7087: +0/--.00043	10.01-18.0: +0/--.011

D ₁	Decimal	D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm	Part #
	0.3386	8.600	10	61	103	GXC0508600T9
	0.3425	8.700	10	61	103	GXC0508700T9
11/32	0.3437	8.730	10	61	103	GXC0508730T9
	0.3465	8.800	10	61	103	GXC0508800T9
	0.3543	9.000	10	61	103	GXC0509000T9
23/64	0.3594	9.130	10	61	103	GXC0509130T9
	0.3622	9.200	10	61	103	GXC0509200T9
	0.3661	9.300	10	61	103	GXC0509300T9
	0.3740	9.500	10	61	103	GXC0509500T9
3/8	0.3750	9.520	10	61	103	GXC0509520T9
	0.3780	9.600	10	61	103	GXC0509600T9
	0.3858	9.800	10	61	103	GXC0509800T9
	0.3898	9.900	10	61	103	GXC0509900T9
25/64	0.3906	9.920	10	61	103	GXC0509920T9
	0.3937	10.000	10	61	103	GXC0510000T9
	0.3976	10.100	12	71	118	GXC0510100T9
	0.4016	10.200	12	71	118	GXC0510200T9
	0.4055	10.300	12	71	118	GXC0510300T9
13/32	0.4063	10.320	12	71	118	GXC0510320T9
	0.4094	10.400	12	71	118	GXC0510400T9
	0.4134	10.500	12	71	118	GXC0510500T9
27/64	0.4219	10.720	12	71	118	GXC0510720T9
	0.4252	10.800	12	71	118	GXC0510800T9
	0.4331	11.000	12	71	118	GXC0511000T9
	0.4370	11.100	12	71	118	GXC0511100T9
7/16	0.4375	11.113	12	71	118	GXC0504375T9
	0.4409	11.200	12	71	118	GXC0511200T9
	0.4528	11.500	12	71	118	GXC0511500T9
29/64	0.4531	11.510	12	71	118	GXC0511510T9
	0.4606	11.700	12	71	118	GXC0511700T9

D ₁	Decimal	D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm	Part #
	0.4646	11.800	12	71	118	GXC0511800T9
15/32	0.4687	11.910	12	71	118	GXC0511910T9
	0.4724	12.000	12	71	118	GXC0512000T9
	0.4764	12.100	14	77	124	GXC0512100T9
	0.4803	12.200	14	77	124	GXC0512200T9
	0.4843	12.300	14	77	124	GXC0512300T9
31/64	0.4844	12.303	14	77	124	GXC0504844T9
	0.4921	12.500	14	77	124	GXC0512500T9
	0.4961	12.600	14	77	124	GXC0512600T9
1/2	0.5000	12.700	14	77	124	GXC0512700T9
	0.5118	13.000	14	77	124	GXC0513000T9
	0.5236	13.300	14	77	124	GXC0513300T9
17/32	0.5313	13.490	14	77	124	GXC0513490T9
	0.5315	13.500	14	77	124	GXC0513500T9
	0.5512	14.000	14	77	124	GXC0514000T9
9/16	0.5625	14.290	16	83	133	GXC0514290T9
	0.5709	14.500	16	83	133	GXC0514500T9
	0.5906	15.000	16	83	133	GXC0515000T9
	0.6102	15.500	16	83	133	GXC0515500T9
5/8	0.6250	15.870	16	83	133	GXC0515870T9
	0.6299	16.000	16	83	133	GXC0516000T9
	0.6496	16.500	18	93	143	GXC0516500T9
	0.6693	17.000	18	93	143	GXC0517000T9
	0.6890	17.500	18	93	143	GXC0517500T9
	0.7087	18.000	18	93	143	GXC0518000T9
	0.7283	18.500	20	101	153	GXC0518500T9
3/4	0.7500	19.050	20	101	153	GXC0519050T9
	0.7677	19.500	20	101	153	GXC0519500T9
	0.7874	20.000	20	101	153	GXC0520000T9

Other Dimensions are Available Upon Request

GXC

5xD Speeds and Feeds

METRIC

Material	Vc m/min (Cutting speed)	D1mm	F[mm/u] Feed Per Revolution				
			> 3.00 ≤ 5.00	> 5.00 ≤ 8.00	> 8.00 ≤ 12.00	> 12.00 ≤ 16.00	> 16.00 ≤ 20.00
			Dec. Inch.	.1181-1969	.1970-.3150	.3151-.4724	.4725-.6299
P1 Low - Carbon Steel - 1000 Series (> 25 HRc)	100		.16	.22	.28	.34	.38
P3 Alloy Tool Steels - 1300, 2000, 3000 (≤ 35HRc)	75		.08	.12	.15	.21	.25
M2 Austenitic Stainless Steel & Cast Stainless Steel- 310, 314, 316 (< 25 HRc)	70		.08	.12	.15	.22	.25
S4 Titanium Alloys- Commercially Pure, 6 Al - AV, ASTM 1/2/3, Ti-6Al-2SN 4Zr-2Mo (≤48 HRc)	30		.04	.08	.12	.16	.20
K1 Gray Cast Iron	80		.125	.175	.225	.30	.375

Note: These are only recommended starting figures that depend on conditions such as machine and material rigidity, type of coating if any, etc. TESTING IS RECOMMENDED

GXC

5xD Speeds and Feeds

INCHES

Material	Vc m/min (Cutting speed)	D1mm	IPR=Inches Per Revolution				
			> 3.00 ≤ 5.00	> 5.00 ≤ 8.00	> 8.00 ≤ 12.00	> 12.00 ≤ 16.00	> 16.00 ≤ 20.00
			Dec. Inch.	.1181-1969	.1970-.3150	.3151-.4724	.4725-.6299
P1 Low - Carbon Steel - 1000 Series (> 25 HRc)	328.1		0.006	0.008	0.011	0.013	0.015
P3 Alloy Tool Steels - 1300, 2000, 3000 (≤ 35HRc)	246.1		0.003	0.004	0.005	0.008	0.009
M2 Austenitic Stainless Steel & Cast Stainless Steel- 310, 314, 316 (< 25 HRc)	229.7		0.003	0.004	0.005	0.008	0.009
S4 Titanium Alloys- Commercially Pure, 6 Al - AV, ASTM 1/2/3, Ti-6Al-2SN 4Zr-2Mo (≤48 HRc)	98.4		0.001	0.003	0.004	0.006	0.007
K1 Gray Cast Iron	262.5		0.004	0.006	0.008	0.011	0.014

Note: These are only recommended starting figures that depend on conditions such as machine and material rigidity, type of coating if any, etc. TESTING IS RECOMMENDED

General Purpose
Carbide Drills

Aluminum
Carbide Drills

Steels
Carbide Drills

Hardened Steels
Carbide Drills

Spotting
Carbide Drills

General Purpose
Drills up to 30xD

Aluminum Drills
up to 30xD

Drills for Steels

Pilot Drills

Design

Long spiral-fluted, single margin, right-hand cut and internal coolant.

Coating

Varianta® Supral TiAlCN (ML)

Ideal for

general purpose drilling
(Refer to page 245)

P M K S

Diseño

Flautas largas espirales, margen con corte de mano derecha y refrigerante interno.

Recubrimiento

Varianta® Supral TiAlCN (ML)

Ideal para

uso general
(Consulte la página 246)

P M K S

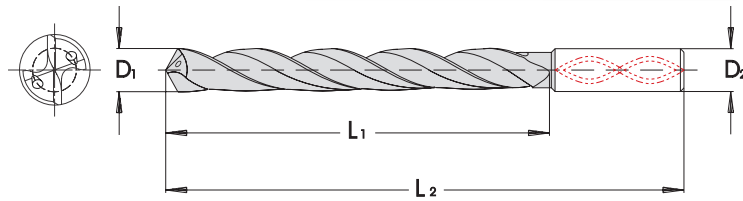


Varianta Supral® provides higher cutting speeds and excellent wear resistance.

Speeds & Feeds Refer to Page 69.

Diameters (2.0 - 2.9mm)
Available Upon Request.

Left-Hand, Available Upon Request



D ₁	Decimal	D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm	Part #
	0.1181	3.000	6	34	72	GXC0803000T9
	0.1220	3.100	6	34	72	GXC0803100T9
1/8	0.1250	3.175	6	34	72	GXC0803175T9
	0.1260	3.200	6	34	72	GXC0803200T9
	0.1299	3.300	6	34	72	GXC0803300T9
	0.1339	3.400	6	34	72	GXC0803400T9
	0.1378	3.500	6	34	72	GXC0803500T9
9/64	0.1406	3.572	6	34	72	GXC0803572T9
	0.1417	3.600	6	34	72	GXC0803600T9
	0.1457	3.700	6	34	72	GXC0803700T9
25	0.1496	3.800	6	43	81	GXC0803800T9
	0.1535	3.900	6	43	81	GXC0803900T9
5/32	0.1563	3.970	6	43	81	GXC0803970T9
	0.1575	4.000	6	43	81	GXC0804000T9
	0.1614	4.100	6	43	81	GXC0804100T9
	0.1654	4.200	6	43	81	GXC0804200T9
	0.1693	4.300	6	43	81	GXC0804300T9
11/64	0.1719	4.370	6	43	81	GXC0804370T9
	0.1732	4.400	6	43	81	GXC0804400T9
	0.1772	4.500	6	43	81	GXC0804500T9
	0.1811	4.600	6	43	81	GXC0804600T9
	0.1831	4.650	6	43	81	GXC0804650T9
13	0.1850	4.700	6	43	81	GXC0800130T9
3/16	0.1875	4.760	6	57	95	GXC0804760T9
12	0.1890	4.800	6	57	95	GXC0800120T9
	0.1929	4.900	6	57	95	GXC0804900T9
	0.1969	5.000	6	57	95	GXC0805000T9
	0.2008	5.100	6	57	95	GXC0805100T9
13/64	0.2031	5.160	6	57	95	GXC0805160T9
6	0.2040	5.182	6	57	95	GXC0800060T9
	0.2047	5.200	6	57	95	GXC0805200T9
	0.2087	5.300	6	57	95	GXC0805300T9
	0.2126	5.400	6	57	95	GXC0805400T9
	0.2165	5.500	6	57	95	GXC0805500T9
	0.2185	5.550	6	57	95	GXC0805550T9
7/32	0.2187	5.560	6	57	95	GXC0805560T9

D ₁	Decimal	D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm	Part #
	0.2205	5.600	6	57	95	GXC0805600T9
	0.2244	5.700	6	57	95	GXC0805700T9
	0.2283	5.800	6	57	95	GXC0805800T9
	0.2323	5.900	6	57	95	GXC0805900T9
15/64	0.2344	5.950	6	57	95	GXC0805950T9
	0.2362	6.000	6	57	95	GXC0806000T9
	0.2402	6.100	8	76	114	GXC0806100T9
	0.2441	6.200	8	76	114	GXC0806200T9
	0.2480	6.300	8	76	114	GXC0806300T9
1/4	0.2500	6.350	8	76	114	GXC0806350T9
	0.2520	6.400	8	76	114	GXC0806400T9
	0.2559	6.500	8	76	114	GXC0806500T9
	0.2598	6.600	8	76	114	GXC0806600T9
	0.2638	6.700	8	76	114	GXC0806700T9
17/64	0.2656	6.750	8	76	114	GXC0806750T9
	0.2677	6.800	8	76	114	GXC0806800T9
	0.2717	6.900	8	76	114	GXC0806900T9
	0.2756	7.000	8	76	114	GXC0807000T9
	0.2795	7.100	8	76	114	GXC0807100T9
9/32	0.2813	7.140	8	76	114	GXC0807140T9
	0.2835	7.200	8	76	114	GXC0807200T9
	0.2874	7.300	8	76	114	GXC0807300T9
	0.2913	7.400	8	76	114	GXC0807400T9
	0.2953	7.500	8	76	114	GXC0807500T9
19/64	0.2969	7.540	8	76	114	GXC0807540T9
	0.3031	7.700	8	76	114	GXC0807700T9
	0.3071	7.800	8	76	114	GXC0807800T9
	0.3110	7.900	8	76	114	GXC0807900T9
5/16	0.3125	7.940	8	76	114	GXC0807940T9
	0.3150	8.000	8	76	114	GXC0808000T9
	0.3189	8.100	10	95	142	GXC0808100T9
	0.3228	8.200	10	95	142	GXC0808200T9
	0.3268	8.300	10	95	142	GXC0808300T9
21/64	0.3281	8.330	10	95	142	GXC0808330T9
	0.3307	8.400	10	95	142	GXC0808400T9
	0.3346	8.500	10	95	142	GXC0808500T9

Other Dimensions are Available Upon Request

Tolerance

Drill Dia (h7) Inches (in)	Drill Dia (h7) Metric (mm)	Shank Dia (h6) Inches (in)	Shank Dia (h6) Metric (mm)
.0000-.1181: +0/-0.00039	0-3: +0/-0.010	.0000-.1181: +0/-0.00024	0-3: +0/-0.006
.1182-.2362: +0/-0.00047	3.01-6: +0/-0.012	.1182-.2362: +0/-0.00031	3.01-6: +0/-0.008
.2363-.3937: +0/-0.00059	6.01-10.0: +0/-0.015	.2363-.3937: +0/-0.00035	6.01-10.0: +0/-0.009
.3938-.7087: +0/-0.00071	10.01-18.0: +0/-0.018	.3938-.7087: +0/-0.00043	10.01-18.0: +0/-0.011

D ₁	Decimal	D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm	Part #
	0.3386	8.600	10	95	142	GXC0808600T9
	0.3425	8.700	10	95	142	GXC0808700T9
11/32	0.3437	8.730	10	95	142	GXC0808730T9
	0.3465	8.800	10	95	142	GXC0808800T9
	0.3543	9.000	10	95	142	GXC0809000T9
23/64	0.3594	9.130	10	95	142	GXC0809130T9
	0.3622	9.200	10	95	142	GXC0809200T9
	0.3661	9.300	10	95	142	GXC0809300T9
	0.3740	9.500	10	95	142	GXC0809500T9
3/8	0.3750	9.520	10	95	142	GXC0809520T9
	0.3780	9.600	10	95	142	GXC0809600T9
	0.3858	9.800	10	95	142	GXC0809800T9
	0.3898	9.900	10	95	142	GXC0809900T9
25/64	0.3906	9.920	10	95	142	GXC0809920T9
	0.3937	10.000	10	95	142	GXC0810000T9
	0.3976	10.100	12	114	162	GXC0810100T9
	0.4016	10.200	12	114	162	GXC0810200T9
	0.4055	10.300	12	114	162	GXC0810300T9
13/32	0.4063	10.320	12	114	162	GXC0810320T9
	0.4094	10.400	12	114	162	GXC0810400T9
	0.4134	10.500	12	114	162	GXC0810500T9
27/64	0.4219	10.720	12	114	162	GXC0810720T9
	0.4252	10.800	12	114	162	GXC0810800T9
	0.4331	11.000	12	114	162	GXC0811000T9
	0.4370	11.100	12	114	162	GXC0811100T9
7/16	0.4375	11.113	12	114	162	GXC08104375T9
	0.4409	11.200	12	114	162	GXC0811200T9
	0.4528	11.500	12	114	162	GXC0811500T9
29/64	0.4531	11.510	12	114	162	GXC0811510T9
	0.4606	11.700	12	114	162	GXC0811700T9

D ₁	Decimal	D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm	Part #
	0.4646	11.800	12	114	162	GXC0811800T9
15/32	0.4687	11.910	12	114	162	GXC0811910T9
	0.4724	12.000	12	114	162	GXC0812000T9
	0.4764	12.100	14	131	178	GXC0812100T9
	0.4803	12.200	14	131	178	GXC0812200T9
	0.4843	12.300	14	131	178	GXC0812300T9
31/64	0.4844	12.303	14	131	178	GXC0804844T9
	0.4921	12.500	14	131	178	GXC0812500T9
	0.4961	12.600	14	131	178	GXC0812600T9
1/2	0.5000	12.700	14	131	178	GXC0812700T9
	0.5118	13.000	14	131	178	GXC0813000T9
	0.5236	13.300	14	131	178	GXC0813300T9
17/32	0.5313	13.490	14	131	178	GXC0813490T9
	0.5315	13.500	14	131	178	GXC0813500T9
	0.5512	14.000	14	131	178	GXC0814000T9
9/16	0.5625	14.290	16	152	203	GXC0814290T9
	0.5709	14.500	16	152	203	GXC0814500T9
	0.5906	15.000	16	152	203	GXC0815000T9
	0.6102	15.500	16	152	203	GXC0815500T9
5/8	0.6250	15.870	16	152	203	GXC0815870T9
	0.6299	16.000	16	152	203	GXC0816000T9
	0.6496	16.500	18	171	222	GXC0816500T9
	0.6693	17.000	18	171	222	GXC0817000T9
	0.6890	17.500	18	171	222	GXC0817500T9
	0.7087	18.000	18	171	222	GXC0818000T9
	0.7283	18.500	20	190	243	GXC0818500T9
3/4	0.7500	19.050	20	190	243	GXC0819050T9
	0.7677	19.500	20	190	243	GXC0819500T9
	0.7874	20.000	20	190	243	GXC0820000T9

Other Dimensions are Available Upon Request

GXC

8xD Speeds and Feeds
METRIC

F[mm/u] Feed Per Revolution

Material	Vc m/min (Cutting speed)	D1mm	> 3.00	> 5.00	> 8.00	> 12.00	> 16.00
			≤ 5.00	≤ 8.00	≤ 12.00	≤ 16.00	≤ 20.00
		Dec. Inch.	.1181-1969	.1970-.3150	.3151-.4724	.4725-.6299	.6299-.7874
P1 Low - Carbon Steel - 1000 Series (> 25 HRC)	90		.10	.15	.20	.26	.33
P3 Alloy Tool Steels - 1300, 2000, 3000 (≤ 35HRC)	70		.10	.15	.20	.26	.33
M2 Austenitic Stainless Steel & Cast Stainless Steel- 310, 314, 316 (< 25 HRC)	65		.08	.12	.15	.20	.25
K1 Gray Cast Iron	70		.20	.25	.35	.40	.46

Note: These are only recommended starting figures that depend on conditions such as machine and material rigidity, type of coating if any, etc. TESTING IS RECOMMENDED

GXC

8xD Speeds and Feeds
INCHES

IPR=Inches Per Revolution

Material	SFM(Vc) Surface Feet Per Minute	D1mm	> 3.00	> 5.00	> 8.00	> 12.00	> 16.00
			≤ 5.00	≤ 8.00	≤ 12.00	≤ 16.00	≤ 20.00
		Dec. Inch.	.1181-1969	.1970-.3150	.3151-.4724	.4725-.6299	.6299-.7874
P1 Low - Carbon Steel - 1000 Series (> 25 HRC)	295.3		0.003	0.005	0.007	0.010	0.012
P3 Alloy Tool Steels - 1300, 2000, 3000 (≤ 35HRC)	229.7		0.003	0.005	0.007	0.010	0.012
M2 Austenitic Stainless Steel & Cast Stainless Steel- 310, 314, 316 (< 25 HRC)	213.3		0.003	0.004	0.005	0.007	0.009
K1 Gray Cast Iron	229.7		0.007	0.009	0.013	0.015	0.018

Note: These are only recommended starting figures that depend on conditions such as machine and material rigidity, type of coating if any, etc. TESTING IS RECOMMENDED



**High-Performance Drill
Double-Margin
Ideal for General Purpose Drilling
12xD-30xD**



135° Point Geometry - Engineered to provide you with advanced drilling capabilities. The 135° split-point is designed to ensure precision when drilling.

135° Geometría de la Punta - Diseñado para ofrecerle capacidades avanzadas de perforación. El punto de 135 grados está diseñado para asegurar precisión al perforar.

Coolant Holes - Cool the cutting edge and improve chip evacuation.

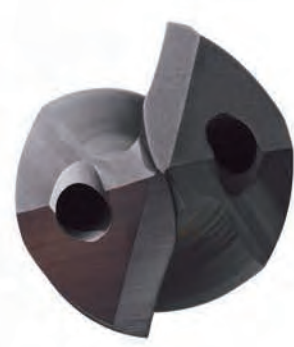
Refrigerante Interno - Enfía el filo y mejora la evacuación de la viruta.

Varianta® Supral Coating - Excellent for high-speed drilling operations. Ideal for dry and semi-dry machining.

Recubrimiento Varianta® Supral - Excelente para las operaciones de perforación de alta velocidad. Ideal para el mecanizado seco y semiseco.

Polish - Chip evacuation is improved during deep hole drilling, when the flutes are polished.

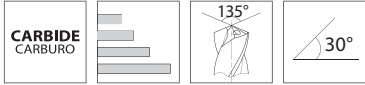
Pulido - Cuando las flautas están pulidas las evacuación de la viruta es mejorada.



Tolerance

Drill Dia (h7) Inches (in)	Drill Dia (h7) Metric (mm)
.0000-.1181: + 0/-0.0039	0-3: + 0/-0.10
.1182-.2362: + 0/-0.0047	3.01-6: + 0/-0.12
.2363-.3937: + 0/-0.0059	6.01-10.0: + 0/-0.15
.3938-.7087: + 0/-0.0071	10.01-18.0: + 0/-0.18

Shank Dia (h6) Inches (in)	Shank Dia (h6) Metric (mm)
.0000-.1181: + 0/-0.0024	0-3: + 0/-0.06
.1182-.2362: + 0/-0.0031	3.01-6: + 0/-0.08
.2363-.3937: + 0/-0.0035	6.01-10.0: + 0/-0.09
.3938-.7087: + 0/-0.0043	10.01-18.0: + 0/-0.11



Varianta Supral® provides higher cutting speeds and excellent wear resistance.

Design

Long spiral-fluted, right-hand cut, double-margin and internal coolant.

Coating

Varianta® Supral TiAlCN (ML)

Ideal for

general purpose drilling (Refer to page 245)

P M K S

**Diameters (2.0 - 2.9mm)
Available Upon Request.**

****Left-Hand, Available Upon Request****

Diseño

Flautas largas espirales, con corte de mano derecha y refrigerante interno.

Recubrimiento

Varianta® Supral TiAlCN (ML)

Ideal para

uso general (Consulte la página 246)

P M K S

Speeds & Feeds Refer to Page 73, 78, 79.



General Purpose
Carbide Drills

Aluminum
Carbide Drills

Steels
Carbide Drills

Hardened Steels
Carbide Drills

Spotting
Carbide Drills

General Purpose
Drills up to 30xD

Aluminum Drills
up to 30xD

Drills for Steels

Pilot Drills

Solid Carbide Drills Non-Coolant

Solid Carbide Drills Internal Coolant

Design

Long spiral-fluted, right-hand cut, double margin and internal coolant.

Coating

Varianta® Supral TiAlCN (ML)

Ideal for

general purpose drilling (Refer to page 245)

P M K S

Diseño

Flautas largas espirales, con corte de mano derecha y refrigerante interno.

Recubrimiento

Varianta® Supral TiAlCN (ML)

Ideal para

uso general (Consulte la página 246)

P M K S



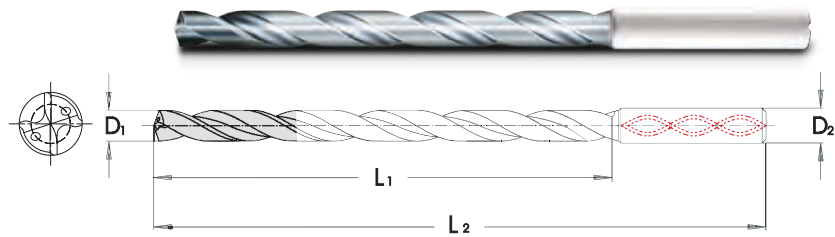
Varianta Supral® provides higher cutting speeds and excellent wear resistance.

■ This drill must utilize a pilot hole drill. (Refer to page 106)

Speeds & Feeds Refer to Page 73.

Diameters (2.0 - 2.9mm) Available Upon Request.

Left-Hand, Available Upon Request



D ₁	Decimal	D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm	Part #
	0.1181	3.000	6	54	92	SXC1203000T9
	0.1220	3.100	6	54	92	SXC1203100T9
1/8	0.1250	3.175	6	54	92	SXC1203175T9
	0.1260	3.200	6	54	92	SXC1203200T9
	0.1299	3.300	6	54	92	SXC1203300T9
	0.1339	3.400	6	54	92	SXC1203400T9
	0.1378	3.500	6	54	92	SXC1203500T9
9/64	0.1406	3.572	6	54	92	SXC1203572T9
	0.1417	3.600	6	54	92	SXC1203600T9
	0.1457	3.700	6	54	92	SXC1203700T9
25	0.1496	3.800	6	64	102	SXC1203800T9
	0.1535	3.900	6	64	102	SXC1203900T9
5/32	0.1563	3.970	6	64	102	SXC1203970T9
	0.1575	4.000	6	64	102	SXC1204000T9
	0.1614	4.100	6	64	102	SXC1204100T9
	0.1654	4.200	6	64	102	SXC1204200T9
	0.1693	4.300	6	64	102	SXC1204300T9
11/64	0.1719	4.370	6	64	102	SXC1204370T9
	0.1732	4.400	6	64	102	SXC1204400T9
	0.1772	4.500	6	64	102	SXC1204500T9
	0.1811	4.600	6	64	102	SXC1204600T9
	0.1831	4.650	6	64	102	SXC1204650T9
13	0.1850	4.700	6	64	102	SXC1200130T9
3/16	0.1875	4.760	6	78	116	SXC1204760T9
12	0.1890	4.800	6	78	116	SXC1200120T9
	0.1929	4.900	6	78	116	SXC1204900T9
	0.1969	5.000	6	78	116	SXC1205000T9
	0.2008	5.100	6	78	116	SXC1205100T9
13/64	0.2031	5.160	6	78	116	SXC1205160T9
6	0.2040	5.182	6	78	116	SXC1200060T9
	0.2047	5.200	6	78	116	SXC1205200T9
	0.2087	5.300	6	78	116	SXC1205300T9
	0.2126	5.400	6	78	116	SXC1205400T9
	0.2165	5.500	6	78	116	SXC1205500T9
	0.2185	5.550	6	78	116	SXC1205550T9
7/32	0.2187	5.560	6	78	116	SXC1205560T9

Other Dimensions are Available Upon Request

D ₁	Decimal	D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm	Part #
	0.2205	5.600	6	78	116	SXC1205600T9
	0.2244	5.700	6	78	116	SXC1205700T9
	0.2283	5.800	6	78	116	SXC1205800T9
	0.2323	5.900	6	78	116	SXC1205900T9
15/64	0.2344	5.950	6	78	116	SXC1205950T9
	0.2362	6.000	6	78	116	SXC1206000T9
	0.2402	6.100	8	108	146	SXC1206100T9
	0.2441	6.200	8	108	146	SXC1206200T9
	0.2480	6.300	8	108	146	SXC1206300T9
1/4	0.2500	6.350	8	108	146	SXC1206350T9
	0.2520	6.400	8	108	146	SXC1206400T9
	0.2559	6.500	8	108	146	SXC1206500T9
	0.2598	6.600	8	108	146	SXC1206600T9
	0.2638	6.700	8	108	146	SXC1206700T9
17/64	0.2656	6.750	8	108	146	SXC1206750T9
	0.2677	6.800	8	108	146	SXC1206800T9
	0.2717	6.900	8	108	146	SXC1206900T9
	0.2756	7.000	8	108	146	SXC1207000T9
	0.2795	7.100	8	108	146	SXC1207100T9
9/32	0.2813	7.140	8	108	146	SXC1207140T9
	0.2835	7.200	8	108	146	SXC1207200T9
	0.2874	7.300	8	108	146	SXC1207300T9
	0.2913	7.400	8	108	146	SXC1207400T9
	0.2953	7.500	8	108	146	SXC1207500T9
19/64	0.2969	7.540	8	108	146	SXC1207540T9
	0.3031	7.700	8	108	146	SXC1207700T9
	0.3071	7.800	8	108	146	SXC1207800T9
	0.3110	7.900	8	108	146	SXC1207900T9
5/16	0.3125	7.940	8	108	146	SXC1207940T9
	0.3150	8.000	8	108	146	SXC1208000T9
	0.3189	8.100	10	120	162	SXC1208100T9
	0.3228	8.200	10	120	162	SXC1208200T9
	0.3268	8.300	10	120	162	SXC1208300T9
21/64	0.3281	8.330	10	120	162	SXC1208330T9
	0.3307	8.400	10	120	162	SXC1208400T9
	0.3346	8.500	10	120	162	SXC1208500T9

D ₁	Decimal	D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm	Part #
	0.3386	8.600	10	120	162	SXC1208600T9
	0.3425	8.700	10	120	162	SXC1208700T9
11/32	0.3437	8.730	10	120	162	SXC1208730T9
	0.3465	8.800	10	120	162	SXC1208800T9
	0.3543	9.000	10	120	162	SXC1209000T9
23/64	0.3594	9.130	10	120	162	SXC1209130T9
	0.3622	9.200	10	120	162	SXC1209200T9
	0.3661	9.300	10	120	162	SXC1209300T9
	0.3740	9.500	10	120	162	SXC1209500T9
3/8	0.3750	9.520	10	120	162	SXC1209520T9
	0.3780	9.600	10	120	162	SXC1209600T9
	0.3858	9.800	10	120	162	SXC1209800T9
	0.3898	9.900	10	120	162	SXC1209900T9
25/64	0.3906	9.920	10	120	162	SXC1209920T9
	0.3937	10.000	10	120	162	SXC1210000T9
	0.3976	10.100	12	156	204	SXC1210100T9
	0.4016	10.200	12	156	204	SXC1210200T9
	0.4055	10.300	12	156	204	SXC1210300T9
13/32	0.4063	10.320	12	156	204	SXC1210320T9
	0.4094	10.400	12	156	204	SXC1210400T9
	0.4134	10.500	12	156	204	SXC1210500T9
27/64	0.4219	10.720	12	156	204	SXC1210720T9
	0.4252	10.800	12	156	204	SXC1210800T9
	0.4331	11.000	12	156	204	SXC1211000T9
	0.4370	11.100	12	156	204	SXC1211100T9
7/16	0.4375	11.113	12	156	204	SXC1204375T9
	0.4409	11.200	12	156	204	SXC1211200T9
	0.4528	11.500	12	156	204	SXC1211500T9
29/64	0.4531	11.510	12	156	204	SXC1211510T9
	0.4606	11.700	12	156	204	SXC1211700T9

D ₁	Decimal	D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm	Part #
	0.4646	11.800	12	156	204	SXC1211800T9
15/32	0.4687	11.910	12	156	204	SXC1211910T9
	0.4724	12.000	12	156	204	SXC1212000T9
	0.4764	12.100	14	182	230	SXC1212100T9
	0.4803	12.200	14	182	230	SXC1212200T9
	0.4843	12.300	14	182	230	SXC1212300T9
31/64	0.4844	12.303	14	182	230	SXC1204844T9
	0.4921	12.500	14	182	230	SXC1212500T9
	0.4961	12.600	14	182	230	SXC1212600T9
1/2	0.5000	12.700	14	182	230	SXC1212700T9
	0.5118	13.000	14	182	230	SXC1213000T9
	0.5236	13.300	14	182	230	SXC1213300T9
17/32	0.5313	13.490	14	182	230	SXC1213490T9
	0.5315	13.500	14	182	230	SXC1213500T9
	0.5512	14.000	14	182	230	SXC1214000T9
9/16	0.5625	14.290	16	208	260	SXC1214290T9
	0.5709	14.500	16	208	260	SXC1214500T9
	0.5906	15.000	16	208	260	SXC1215000T9
	0.6102	15.500	16	208	260	SXC1215500T9
5/8	0.6250	15.870	16	208	260	SXC1215870T9
	0.6299	16.000	16	208	260	SXC1216000T9
	0.6496	16.500	18	234	285	SXC1216500T9
	0.6693	17.000	18	234	285	SXC1217000T9
	0.6890	17.500	18	234	285	SXC1217500T9
	0.7087	18.000	18	234	285	SXC1218000T9
	0.7283	18.500	20	258	310	SXC1218500T9
3/4	0.7500	19.050	20	258	310	SXC1219050T9
	0.7677	19.500	20	258	310	SXC1219500T9
	0.7874	20.000	20	258	310	SXC1220000T9

Other Dimensions are Available Upon Request

SXC 12xD Speeds and Feeds		F[mm/u] Feed Per Revolution						
METRIC	Material	Vc m/min (Cutting speed)	D1mm	> 3.00 ≤ 5.00	> 5.00 ≤ 8.00	> 8.00 ≤ 12.00	> 12.00 ≤ 16.00	> 16.00 ≤ 20.00
			Dec. Inch.	.1181- .1969	.1970- .3150	.3151- .4724	.4725- .6299	.4726- .7874
P 1	Low - Carbon Steel - 1000 Series (> 25 HRc)	90		.10	.15	.20	.26	.33
P 3	Alloy Tool Steels - 1300, 2000, 3000 (≤ 35HRc)	70		.10	.15	.20	.26	.33
M 2	Austenitic Stainless Steel & Cast Stainless Steel- 310, 314, 316 (< 25 HRc)	65		.08	.12	.15	.20	.25
K 1	Gray Cast Iron	70		.20	.25	.35	.40	.46

Note: These are only recommended starting figures that depend on conditions such as machine and material rigidity, type of coating if any, etc. TESTING IS RECOMMENDED

SXC 12xD Speeds and Feeds		IPR=Inches Per Revolution						
INCHES	Material	SFM(Vc) Surface Feet Per Minute	D1mm	> 3.00 ≤ 5.00	> 5.00 ≤ 8.00	> 8.00 ≤ 12.00	> 12.00 ≤ 16.00	> 16.00 ≤ 20.00
			Dec. Inch.	.1181- .1969	.1970- .3150	.3151- .4724	.4725- .6299	.4726- .7874
P 1	Low - Carbon Steel - 1000 Series (> 25 HRc)	295.3		0.003	0.005	0.007	0.010	0.012
P 3	Alloy Tool Steels - 1300, 2000, 3000 (≤ 35HRc)	229.7		0.003	0.005	0.007	0.010	0.012
M 2	Austenitic Stainless Steel & Cast Stainless Steel- 310, 314, 316 (< 25 HRc)	213.3		0.003	0.004	0.005	0.007	0.009
K 1	Gray Cast Iron	229.7		0.007	0.009	0.013	0.015	0.018

Note: These are only recommended starting figures that depend on conditions such as machine and material rigidity, type of coating if any, etc. TESTING IS RECOMMENDED

General Purpose Carbide Drills
 Aluminum Carbide Drills
 Steels Carbide Drills
 Hardened Steels Carbide Drills
 Spotting Carbide Drills
 General Purpose Drills up to 30xD
 Aluminum Drills up to 30xD
 Drills for Steels
 Pilot Drills

Design

Long spiral-fluted, right-hand cut, double margin and internal coolant.

Coating

Varianta® Supral TiAlCN (ML)

Ideal for

general purpose drilling (Refer to page 245)

P M K S

Speeds & Feeds Refer to Page 78.

Diameters (2.0 - 2.9mm)
Available Upon Request.

****Left-Hand, Available Upon Request****

Diseño

Flautas largas espirales, con corte de mano derecha y refrigerante interno.

Recubrimiento

Varianta® Supral TiAlCN (ML)

Ideal para

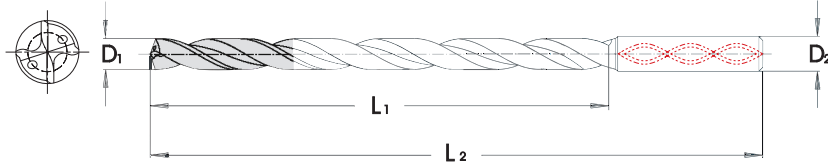
uso general (Consulte la página 246)

P M K S



Varianta Supral® provides higher cutting speeds and excellent wear resistance.

■ This drill must utilize a pilot hole drill.
 (Refer to page 114)



D ₁	Decimal	D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm	Part #
	0.1181	3.000	6	60	100	SXC1603000T9
	0.1220	3.100	6	60	100	SXC1603100T9
1/8	0.1250	3.175	6	60	100	SXC1603175T9
	0.1260	3.200	6	60	100	SXC1603200T9
	0.1299	3.300	6	60	100	SXC1603300T9
	0.1339	3.400	6	60	100	SXC1603400T9
	0.1378	3.500	6	60	100	SXC1603500T9
9/64	0.1406	3.572	6	75	115	SXC1603572T9
	0.1417	3.600	6	75	115	SXC1603600T9
	0.1457	3.700	6	75	115	SXC1603700T9
25	0.1496	3.800	6	75	115	SXC1603800T9
	0.1535	3.900	6	75	115	SXC1603900T9
5/32	0.1563	3.970	6	75	115	SXC1603970T9
	0.1575	4.000	6	75	115	SXC1604000T9
	0.1614	4.100	6	75	115	SXC1604100T9
	0.1654	4.200	6	75	115	SXC1604200T9
	0.1693	4.300	6	90	130	SXC1604300T9
11/64	0.1719	4.370	6	90	130	SXC1604370T9
	0.1732	4.400	6	90	130	SXC1604400T9
	0.1772	4.500	6	90	130	SXC1604500T9
	0.1811	4.600	6	90	130	SXC1604600T9
	0.1831	4.650	6	90	130	SXC1604650T9
13	0.1850	4.700	6	90	130	SXC1600130T9
3/16	0.1875	4.760	6	90	130	SXC1604760T9
12	0.1890	4.800	6	90	130	SXC1600120T9
	0.1929	4.900	6	90	130	SXC1604900T9
	0.1969	5.000	6	90	130	SXC1605000T9
	0.2008	5.100	6	108	150	SXC1605100T9
13/64	0.2031	5.160	6	108	150	SXC1605160T9
	0.2047	5.200	6	108	150	SXC1605200T9
	0.2087	5.300	6	108	150	SXC1605300T9
	0.2126	5.400	6	108	150	SXC1605400T9
	0.2165	5.500	6	108	150	SXC1605500T9
	0.2185	5.550	6	108	150	SXC1605550T9
7/32	0.2187	5.560	6	108	150	SXC1605560T9
	0.2205	5.600	6	108	150	SXC1605600T9
	0.2244	5.700	6	108	150	SXC1605700T9
	0.2283	5.800	6	108	150	SXC1605800T9
	0.2323	5.900	6	108	150	SXC1605900T9
15/64	0.2344	5.950	6	108	150	SXC1605950T9
	0.2362	6.000	6	108	150	SXC1606000T9
	0.2402	6.100	8	125	165	SXC1606100T9
	0.2441	6.200	8	125	165	SXC1606200T9
	0.2480	6.300	8	125	165	SXC1606300T9
1/4	0.2500	6.350	8	125	165	SXC1606350T9
	0.2520	6.400	8	125	165	SXC1606400T9
	0.2559	6.500	8	125	165	SXC1606500T9
	0.2598	6.600	8	125	165	SXC1606600T9

D ₁	Decimal	D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm	Part #
	0.2638	6.700	8	125	165	SXC1606700T9
17/64	0.2656	6.750	8	125	165	SXC1606750T9
	0.2677	6.800	8	125	165	SXC1606800T9
	0.2717	6.900	8	125	165	SXC1606900T9
	0.2756	7.000	8	125	165	SXC1607000T9
	0.2795	7.100	8	140	180	SXC1607100T9
9/32	0.2813	7.140	8	140	180	SXC1607140T9
	0.2835	7.200	8	140	180	SXC1607200T9
	0.2874	7.300	8	140	180	SXC1607300T9
	0.2913	7.400	8	140	180	SXC1607400T9
	0.2953	7.500	8	140	180	SXC1607500T9
19/64	0.2969	7.540	8	140	180	SXC1607540T9
	0.3071	7.800	8	140	180	SXC1607800T9
	0.3110	7.900	8	140	180	SXC1607900T9
5/16	0.3125	7.940	8	140	180	SXC1607940T9
	0.3150	8.000	8	140	180	SXC1608000T9
	0.3189	8.100	10	160	205	SXC1608100T9
	0.3228	8.200	10	160	205	SXC1608200T9
21/64	0.3281	8.330	10	160	205	SXC1608330T9
	0.3307	8.400	10	160	205	SXC1608400T9
	0.3346	8.500	10	160	205	SXC1608500T9
	0.3386	8.600	10	160	205	SXC1608600T9
	0.3425	8.700	10	160	205	SXC1608700T9
11/32	0.3437	8.730	10	160	205	SXC1608730T9
	0.3465	8.800	10	160	205	SXC1608800T9
	0.3543	9.000	10	160	205	SXC1609000T9
23/64	0.3594	9.130	10	180	225	SXC1609130T9
	0.3622	9.200	10	180	225	SXC1609200T9
	0.3661	9.300	10	180	225	SXC1609300T9
	0.3740	9.500	10	180	225	SXC1609500T9
3/8	0.3750	9.520	10	180	225	SXC1609520T9
	0.3780	9.600	10	180	225	SXC1609600T9
	0.3858	9.800	10	180	225	SXC1609800T9
25/64	0.3906	9.920	10	180	225	SXC1609920T9
	0.3937	10.000	10	180	225	SXC1610000T9
	0.3976	10.100	12	190	240	SXC1610100T9
	0.4016	10.200	12	190	240	SXC1610200T9
13/32	0.4063	10.320	12	190	240	SXC1610320T9
	0.4094	10.400	12	190	240	SXC1610400T9
	0.4134	10.500	12	190	240	SXC1610500T9
27/64	0.4219	10.720	12	190	240	SXC1610720T9
	0.4252	10.800	12	190	240	SXC1610800T9
	0.4331	11.000	12	190	240	SXC1611000T9
7/16	0.4375	11.113	12	215	265	SXC1604375T9
	0.4528	11.500	12	215	265	SXC1611500T9
29/64	0.4531	11.510	12	215	265	SXC1611510T9
15/32	0.4687	11.910	12	215	265	SXC1611910T9
	0.4724	12.000	12	215	265	SXC1612000T9

Other Dimensions are Available Upon Request

Design

Long spiral-fluted, right-hand cut, double margin and internal coolant.

Coating

Varianta® Supral TiAlCN (ML)

Ideal for

general purpose drilling
(Refer to page 245)

P M K S

Speeds & Feeds Refer to Page 78.

Diameters (2.0 - 2.9mm)
Available Upon Request.

Left-Hand, Available Upon Request

Diseño

Flautas largas espirales, con corte de mano derecha y refrigerante interno.

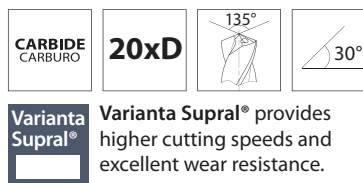
Recubrimiento

Varianta® Supral TiAlCN (ML)

Ideal para

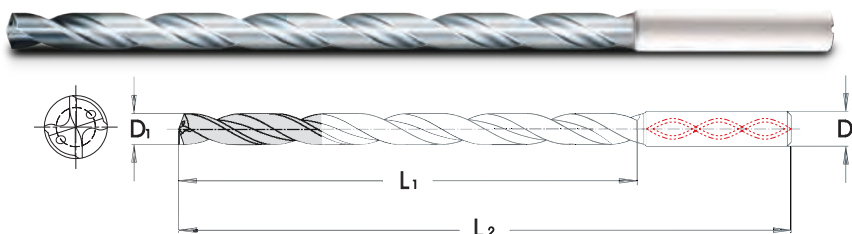
uso general
(Consulte la página 246)

P M K S



Varianta Supral® provides higher cutting speeds and excellent wear resistance.

■ This drill must utilize a pilot hole drill.
(Refer to page 114)



D ₁	Decimal	D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm	Part #
	0.1181	3.000	6	80	120	SXC2003000T9
	0.1220	3.100	6	80	120	SXC2003100T9
1/8	0.1250	3.175	6	80	120	SXC2003175T9
	0.1260	3.200	6	80	120	SXC2003200T9
	0.1299	3.300	6	80	120	SXC2003300T9
	0.1339	3.400	6	80	120	SXC2003400T9
	0.1378	3.500	6	80	120	SXC2003500T9
9/64	0.1406	3.572	6	90	130	SXC2003572T9
	0.1417	3.600	6	90	130	SXC2003600T9
	0.1457	3.700	6	90	130	SXC2003700T9
25	0.1496	3.800	6	90	130	SXC2003800T9
	0.1535	3.900	6	90	130	SXC2003900T9
5/32	0.1563	3.970	6	90	130	SXC2003970T9
	0.1575	4.000	6	90	130	SXC2004000T9
	0.1614	4.100	6	110	160	SXC2004100T9
	0.1654	4.200	6	110	160	SXC2004200T9
	0.1693	4.300	6	110	160	SXC2004300T9
11/64	0.1719	4.370	6	110	160	SXC2004370T9
	0.1732	4.400	6	110	160	SXC2004400T9
	0.1772	4.500	6	110	160	SXC2004500T9
	0.1811	4.600	6	120	160	SXC2004600T9
	0.1831	4.650	6	120	160	SXC2004650T9
13	0.1850	4.700	6	120	160	SXC2000130T9
3/16	0.1875	4.760	6	120	160	SXC2004760T9
12	0.1890	4.800	6	120	160	SXC2000120T9
	0.1929	4.900	6	120	160	SXC2004900T9
	0.1969	5.000	6	120	160	SXC2005000T9
	0.2008	5.100	6	140	185	SXC2005100T9
13/64	0.2031	5.160	6	140	185	SXC2005160T9
	0.2047	5.200	6	140	185	SXC2005200T9
	0.2087	5.300	6	140	185	SXC2005300T9
	0.2126	5.400	6	140	185	SXC2005400T9
	0.2165	5.500	6	140	185	SXC2005500T9
	0.2185	5.550	6	140	185	SXC2005550T9
7/32	0.2187	5.560	6	140	185	SXC2005560T9
	0.2205	5.600	6	140	185	SXC2005600T9
	0.2244	5.700	6	140	185	SXC2005700T9
	0.2283	5.800	6	140	185	SXC2005800T9
	0.2323	5.900	6	140	185	SXC2005900T9
15/64	0.2344	5.950	6	140	185	SXC2005950T9
	0.2362	6.000	6	140	185	SXC2006000T9
	0.2402	6.100	8	160	210	SXC2006100T9
	0.2441	6.200	8	160	210	SXC2006200T9
	0.2480	6.300	8	160	210	SXC2006300T9
1/4	0.2500	6.350	8	160	210	SXC2006350T9
	0.2520	6.400	8	160	210	SXC2006400T9
	0.2559	6.500	8	160	210	SXC2006500T9
	0.2598	6.600	8	160	210	SXC2006600T9

D ₁	Decimal	D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm	Part #
	0.2638	6.700	8	160	210	SXC2006700T9
17/64	0.2656	6.750	8	160	210	SXC2006750T9
	0.2677	6.800	8	160	210	SXC2006800T9
	0.2717	6.900	8	160	210	SXC2006900T9
	0.2756	7.000	8	160	210	SXC2007000T9
	0.2795	7.100	8	180	230	SXC2007100T9
9/32	0.2813	7.140	8	180	230	SXC2007140T9
	0.2835	7.200	8	180	230	SXC2007200T9
	0.2874	7.300	8	180	230	SXC2007300T9
	0.2913	7.400	8	180	230	SXC2007400T9
	0.2953	7.500	8	180	230	SXC2007500T9
19/64	0.2969	7.540	8	180	230	SXC2007540T9
	0.3071	7.800	8	180	230	SXC2007800T9
	0.3110	7.900	8	180	230	SXC2007900T9
5/16	0.3125	7.940	8	180	230	SXC2007940T9
	0.3150	8.000	8	180	230	SXC2008000T9
	0.3189	8.100	10	195	260	SXC2008100T9
	0.3228	8.200	10	195	260	SXC2008200T9
21/64	0.3281	8.330	10	195	260	SXC2008330T9
	0.3307	8.400	10	195	260	SXC2008400T9
	0.3346	8.500	10	195	260	SXC2008500T9
	0.3386	8.600	10	230	290	SXC2008600T9
	0.3425	8.700	10	230	290	SXC2008700T9
11/32	0.3437	8.730	10	230	290	SXC2008730T9
	0.3465	8.800	10	230	290	SXC2008800T9
	0.3543	9.000	10	230	290	SXC2009000T9
23/64	0.3594	9.130	10	230	290	SXC2009130T9
	0.3622	9.200	10	230	290	SXC2009200T9
	0.3661	9.300	10	230	290	SXC2009300T9
	0.3740	9.500	10	230	290	SXC2009500T9
3/8	0.3750	9.520	10	230	290	SXC2009520T9
	0.3780	9.600	10	230	290	SXC2009600T9
	0.3858	9.800	10	230	290	SXC2009800T9
25/64	0.3906	9.920	10	230	290	SXC2009920T9
	0.3937	10.000	10	230	290	SXC2010000T9
	0.3976	10.100	12	268	315	SXC2010100T9
	0.4016	10.200	12	268	315	SXC2010200T9
13/32	0.4063	10.320	12	268	315	SXC2010320T9
	0.4094	10.400	12	268	315	SXC2010400T9
	0.4134	10.500	12	268	315	SXC2010500T9
27/64	0.4219	10.720	12	268	315	SXC2010720T9
	0.4252	10.800	12	268	315	SXC2010800T9
	0.4331	11.000	12	268	315	SXC2011000T9
7/16	0.4375	11.113	12	268	315	SXC2004375T9
	0.4528	11.500	12	268	315	SXC2011500T9
29/64	0.4531	11.510	12	268	315	SXC2011510T9
15/32	0.4687	11.910	12	268	315	SXC2011910T9
	0.4724	12.000	12	268	315	SXC2012000T9

Other Dimensions are Available Upon Request

General Purpose Carbide Drills
Aluminum Carbide Drills
Steels Carbide Drills
Hardened Steels Carbide Drills
Spotting Carbide Drills
General Purpose Drills up to 30xD
Aluminum Drills up to 30xD
Drills for Steels
Pilot Drills

Solid Carbide Drills Non-Coolant

Solid Carbide Drills Internal Coolant

Design

Long spiral-fluted, right-hand cut, double margin and internal coolant.

Coating

Varianta[®] Supral TIALCN (ML)

Ideal for

general purpose drilling (Refer to page 245)

P M K S

Diseño

Flautas largas espirales, con corte de mano derecha y refrigerante interno.

Recubrimiento

Varianta[®] Supral TIALCN (ML)

Ideal para

uso general (Consulte la página 246)

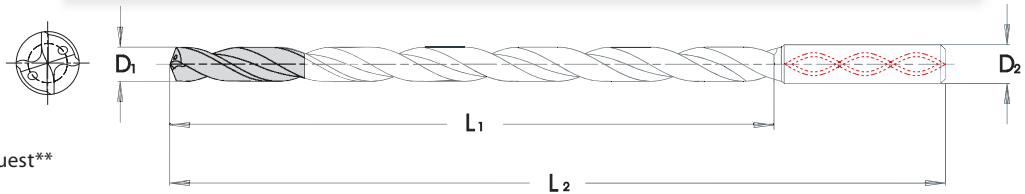
P M K S



Varianta Supral[®] provides higher cutting speeds and excellent wear resistance.

■ This drill must utilize a pilot hole drill. (Refer to page 114)

Speeds & Feeds Refer to Page 79.



Diameters (2.0 - 2.9mm) Available Upon Request.

Left-Hand, Available Upon Request

D ₁	Decimal	D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm	Part #
	0.1181	3.000	6	98	135	SXC2503000T9
	0.1220	3.100	6	98	135	SXC2503100T9
1/8	0.1250	3.175	6	98	135	SXC2503175T9
	0.1260	3.200	6	110	150	SXC2503200T9
	0.1299	3.300	6	110	150	SXC2503300T9
	0.1339	3.400	6	110	150	SXC2503400T9
	0.1378	3.500	6	110	150	SXC2503500T9
9/64	0.1406	3.572	6	120	160	SXC2503572T9
	0.1417	3.600	6	120	160	SXC2503600T9
	0.1457	3.700	6	120	160	SXC2503700T9
25	0.1496	3.800	6	120	160	SXC2503800T9
	0.1535	3.900	6	120	160	SXC2503900T9
5/32	0.1563	3.970	6	120	160	SXC2503970T9
	0.1575	4.000	6	120	160	SXC2504000T9
	0.1614	4.100	6	120	160	SXC2504100T9
	0.1654	4.200	6	120	160	SXC2504200T9
	0.1693	4.300	6	135	180	SXC2504300T9
11/64	0.1719	4.370	6	135	180	SXC2504370T9
	0.1732	4.400	6	135	180	SXC2504400T9
	0.1772	4.500	6	135	180	SXC2504500T9
	0.1811	4.600	6	135	180	SXC2504600T9
	0.1831	4.650	6	135	180	SXC2504650T9
13	0.1850	4.700	6	135	180	SXC2500130T9
3/16	0.1875	4.760	6	135	180	SXC2504760T9
12	0.1890	4.800	6	135	180	SXC2500120T9
	0.1929	4.900	6	135	180	SXC2504900T9
	0.1969	5.000	6	135	180	SXC2505000T9
	0.2008	5.100	6	168	205	SXC2505100T9
13/64	0.2031	5.160	6	168	205	SXC2505160T9
6	0.2040	5.182	6	168	205	SXC2500060T9
	0.2047	5.200	6	168	205	SXC2505200T9
	0.2087	5.300	6	168	205	SXC2505300T9
	0.2126	5.400	6	168	205	SXC2505400T9
	0.2165	5.500	6	168	205	SXC2505500T9
	0.2185	5.550	6	168	205	SXC2505550T9
7/32	0.2187	5.560	6	168	205	SXC2505560T9
	0.2205	5.600	6	168	205	SXC2505600T9
	0.2244	5.700	6	168	205	SXC2505700T9
	0.2283	5.800	6	168	205	SXC2505800T9
	0.2323	5.900	6	168	205	SXC2505900T9
15/64	0.2344	5.950	6	168	205	SXC2505950T9
	0.2362	6.000	6	168	205	SXC2506000T9
	0.2402	6.100	8	200	240	SXC2506100T9
	0.2441	6.200	8	200	240	SXC2506200T9

D ₁	Decimal	D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm	Part #
	0.2480	6.300	8	200	240	SXC2506300T9
1/4	0.2500	6.350	8	200	240	SXC2506350T9
	0.2520	6.400	8	200	240	SXC2506400T9
	0.2559	6.500	8	200	240	SXC2506500T9
	0.2598	6.600	8	200	240	SXC2506600T9
	0.2638	6.700	8	200	240	SXC2506700T9
17/64	0.2656	6.750	8	200	240	SXC2506750T9
	0.2677	6.800	8	200	240	SXC2506800T9
	0.2717	6.900	8	200	240	SXC2506900T9
	0.2756	7.000	8	200	240	SXC2507000T9
	0.2795	7.100	8	220	260	SXC2507100T9
9/32	0.2813	7.140	8	220	260	SXC2507140T9
	0.2835	7.200	8	220	260	SXC2507200T9
	0.2874	7.300	8	220	260	SXC2507300T9
	0.2913	7.400	8	220	260	SXC2507400T9
	0.2953	7.500	8	220	260	SXC2507500T9
19/64	0.2969	7.540	8	220	260	SXC2507540T9
	0.3031	7.700	8	220	260	SXC2507700T9
	0.3071	7.800	8	220	260	SXC2507800T9
	0.3110	7.900	8	220	260	SXC2507900T9
5/16	0.3125	7.940	8	220	260	SXC2507940T9
	0.3150	8.000	8	220	260	SXC2508000T9
	0.3189	8.100	10	240	285	SXC2508100T9
	0.3228	8.200	10	240	285	SXC2508200T9
	0.3268	8.300	10	240	285	SXC2508300T9
21/64	0.3281	8.330	10	240	285	SXC2508330T9
	0.3307	8.400	10	240	285	SXC2508400T9
	0.3346	8.500	10	240	285	SXC2508500T9
	0.3386	8.600	10	268	310	SXC2508600T9
	0.3425	8.700	10	268	310	SXC2508700T9
11/32	0.3437	8.730	10	268	310	SXC2508730T9
	0.3465	8.800	10	268	310	SXC2508800T9
	0.3543	9.000	10	268	310	SXC2509000T9
23/64	0.3594	9.130	10	268	310	SXC2509130T9
	0.3622	9.200	10	268	310	SXC2509200T9
	0.3661	9.300	10	268	310	SXC2509300T9
	0.3740	9.500	10	268	310	SXC2509500T9
3/8	0.3750	9.520	10	268	310	SXC2509520T9
	0.3780	9.600	10	268	310	SXC2509600T9
	0.3858	9.800	10	268	310	SXC2509800T9
	0.3898	9.900	10	268	310	SXC2509900T9
25/64	0.3906	9.920	10	268	310	SXC2509920T9
	0.3937	10.000	10	268	310	SXC2510000T9

Other Dimensions are Available Upon Request

Solid Carbide Drills Non-Coolant

Solid Carbide Drills Internal Coolant

Design

Long spiral-fluted, right-hand cut, double margin and internal coolant.

Coating

Varianta® Supral TiAlCN (ML)

Ideal for

general purpose drilling
(Refer to page 245)

P M K S

Speeds & Feeds Refer to Page 79.

Diseño

Flautas largas espirales, con corte de mano derecha y refrigerante interno.

Recubrimiento

Varianta® Supral TiAlCN (ML)

Ideal para

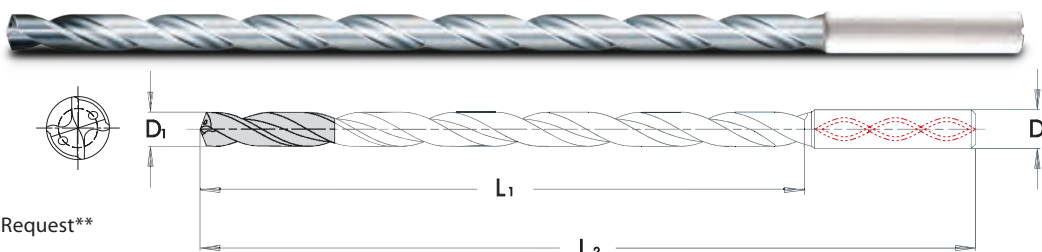
uso general
(Consulte la página 246)

P M K S



Varianta Supral® provides higher cutting speeds and excellent wear resistance.

■ This drill must utilize a pilot hole drill.
(Refer to page 114)



Diameters (2.0 - 2.9mm)
Available Upon Request.

Left-Hand, Available Upon Request

D ₁	Decimal	D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm	Part #
	0.1181	3.000	6	105	150	SXC3003000T9
	0.1220	3.100	6	105	150	SXC3003100T9
1/8	0.1250	3.175	6	105	150	SXC3003175T9
	0.1260	3.200	6	105	150	SXC3003200T9
	0.1299	3.300	6	135	185	SXC3003300T9
	0.1339	3.400	6	135	185	SXC3003400T9
	0.1378	3.500	6	135	185	SXC3003500T9
9/64	0.1406	3.572	6	135	185	SXC3003572T9
	0.1417	3.600	6	135	185	SXC3003600T9
	0.1457	3.700	6	135	185	SXC3003700T9
25	0.1496	3.800	6	135	185	SXC3003800T9
	0.1535	3.900	6	135	185	SXC3003900T9
5/32	0.1563	3.970	6	135	185	SXC3003970T9
	0.1575	4.000	6	135	185	SXC3004000T9
	0.1614	4.100	6	135	185	SXC3004100T9
	0.1654	4.200	6	135	185	SXC3004200T9
	0.1693	4.300	6	165	215	SXC3004300T9
11/64	0.1719	4.370	6	165	215	SXC3004370T9
	0.1732	4.400	6	165	215	SXC3004400T9
	0.1772	4.500	6	165	215	SXC3004500T9
	0.1811	4.600	6	165	215	SXC3004600T9
	0.1831	4.650	6	165	215	SXC3004650T9
13	0.1850	4.700	6	165	215	SXC3000130T9
3/16	0.1875	4.760	6	165	215	SXC3004760T9
12	0.1890	4.800	6	165	215	SXC3000120T9
	0.1929	4.900	6	165	215	SXC3004900T9
	0.1969	5.000	6	165	215	SXC3005000T9
	0.2008	5.100	6	180	230	SXC3005100T9
13/64	0.2031	5.160	6	180	230	SXC3005160T9
6	0.2040	5.182	6	180	230	SXC3000060T9
	0.2047	5.200	6	180	230	SXC3005200T9
	0.2087	5.300	6	180	230	SXC3005300T9
	0.2126	5.400	6	180	230	SXC3005400T9

D ₁	Decimal	D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm	Part #
	0.2165	5.500	6	180	230	SXC3005500T9
	0.2185	5.550	6	180	230	SXC3005550T9
7/32	0.2187	5.560	6	180	230	SXC3005560T9
	0.2205	5.600	6	180	230	SXC3005600T9
	0.2244	5.700	6	180	230	SXC3005700T9
	0.2283	5.800	6	180	230	SXC3005800T9
	0.2323	5.900	6	180	230	SXC3005900T9
15/64	0.2344	5.950	6	180	230	SXC3005950T9
	0.2362	6.000	6	180	230	SXC3006000T9
	0.2402	6.100	8	215	280	SXC3006100T9
	0.2441	6.200	8	215	280	SXC3006200T9
	0.2480	6.300	8	215	280	SXC3006300T9
1/4	0.2500	6.350	8	215	280	SXC3006350T9
	0.2520	6.400	8	215	280	SXC3006400T9
	0.2559	6.500	8	215	280	SXC3006500T9
	0.2598	6.600	8	230	280	SXC3006600T9
	0.2638	6.700	8	230	280	SXC3006700T9
17/64	0.2656	6.750	8	230	280	SXC3006750T9
	0.2677	6.800	8	230	280	SXC3006800T9
	0.2717	6.900	8	230	280	SXC3006900T9
	0.2756	7.000	8	230	280	SXC3007000T9
	0.2795	7.100	8	230	280	SXC3007100T9
9/32	0.2813	7.140	8	230	280	SXC3007140T9
	0.2835	7.200	8	230	280	SXC3007200T9
	0.2874	7.300	8	230	280	SXC3007300T9
	0.2913	7.400	8	230	280	SXC3007400T9
	0.2953	7.500	8	230	280	SXC3007500T9
19/64	0.2969	7.540	8	265	315	SXC3007540T9
	0.3031	7.700	8	265	315	SXC3007700T9
	0.3071	7.800	8	265	315	SXC3007800T9
	0.3110	7.900	8	265	315	SXC3007900T9
5/16	0.3125	7.940	8	265	315	SXC3007940T9
	0.3150	8.000	8	265	315	SXC3008000T9

General Purpose Carbide Drills
Aluminum Carbide Drills
Steels Carbide Drills
Hardened Steels Carbide Drills
Spotting Carbide Drills
General Purpose Drills up to 30xD
Aluminum Drills up to 30xD
Drills for Steels
Pilot Drills

Solid Carbide Drills Non-Coolant

Solid Carbide Drills Internal Coolant

General Purpose Carbide Drills
Aluminum Carbide Drills
Steels Carbide Drills
Hardened Steels Carbide Drills
Spotting Carbide Drills

Spotting Carbide Drills

General Purpose Drills up to 30xD

Aluminum Drills up to 30xD

Drills for Steels

Pilot Drills

Solid Carbide Drills Non-Coolant

Solid Carbide Drills Internal Coolant

SXC 16xD Speeds and Feeds

METRIC	Material	Vc m/min (Cutting speed)	D1mm	F[mm/u] Feed Per Revolution				
				> 3.00 ≤ 5.00	> 5.00 ≤ 8.00	> 8.00 ≤ 12.00	> 12.00 ≤ 16.00	> 16.00 ≤ 20.00
				Dec. Inch.	.1181-1969	.1970-.3150	.3151-.4724	.4725-.6299
P 3	Alloy Tool Steels- 1300,2000, 3000 (≤35HRc)	80		.10	.15	.20	.26	.325
P 4	Alloy Tool Steels- 1300,2000,3000 (36-48 HRc)	75		.10	.15	.20	.26	.325
M 2	Austenitic Stainless Steel & Cast Stainless Steel- 310, 314, 316 (<25HRc)	55		.08	.12	.15	.20	.25
K 1	Gray Cast Iron	100		.20	.25	.35	.40	.46

Note: These are only recommended starting figures that depend on conditions such as machine and material rigidity, type of coating if any, etc. TESTING IS RECOMMENDED

SXC 16xD Speeds and Feeds

INCHES	Material	SFM(Vc) Surface Feet Per Minute	D1mm	IPR=Inches Per Revolution				
				> 3.00 ≤ 5.00	> 5.00 ≤ 8.00	> 8.00 ≤ 12.00	> 12.00 ≤ 16.00	> 16.00 ≤ 20.00
				Dec. Inch.	.1181-1969	.1970-.3150	.3151-.4724	.4725-.6299
P 3	Alloy Tool Steels- 1300,2000, 3000 (≤35HRc)	262.5		0.003	0.005	0.007	0.010	0.012
P 4	Alloy Tool Steels- 1300,2000,3000 (36-48 HRc)	246.1		0.003	0.005	0.007	0.010	0.012
M 2	Austenitic Stainless Steel & Cast Stainless Steel- 310, 314, 316 (<25HRc)	180.5		0.003	0.004	0.005	0.007	0.009
K 1	Gray Cast Iron	328.1		0.007	0.009	0.013	0.015	0.018

Note: These are only recommended starting figures that depend on conditions such as machine and material rigidity, type of coating if any, etc. TESTING IS RECOMMENDED

SXC 20xD Speeds and Feeds

METRIC	Material	Vc m/min (Cutting speed)	D1mm	F[mm/u] Feed Per Revolution				
				> 3.00 ≤ 5.00	> 5.00 ≤ 8.00	> 8.00 ≤ 12.00	> 12.00 ≤ 16.00	> 16.00 ≤ 20.00
				Dec. Inch.	.1181-1969	.1970-.3150	.3151-.4724	.4725-.6299
P 3	Alloy Tool Steels- 1300,2000, 3000 (≤35HRc)	75		.10	.15	.20	.26	.325
P 4	Alloy Tool Steels- 1300,2000,3000 (36-48 HRc)	70		.10	.15	.20	.26	.325
M 2	Austenitic Stainless Steel & Cast Stainless Steel- 310, 314, 316 (<25HRc)	50		.08	.12	.15	.20	.25
K 1	Gray Cast Iron	95		.20	.25	.35	.40	.46

Note: These are only recommended starting figures that depend on conditions such as machine and material rigidity, type of coating if any, etc. TESTING IS RECOMMENDED

SXC 20xD Speeds and Feeds

INCHES	Material	SFM(Vc) Surface Feet Per Minute	D1mm	IPR=Inches Per Revolution				
				> 3.00 ≤ 5.00	> 5.00 ≤ 8.00	> 8.00 ≤ 12.00	> 12.00 ≤ 16.00	> 16.00 ≤ 20.00
				Dec. Inch.	.1181-1969	.1970-.3150	.3151-.4724	.4725-.6299
P 3	Alloy Tool Steels- 1300,2000, 3000 (≤35HRc)	246.1		0.003	0.005	0.007	0.010	0.012
P 4	Alloy Tool Steels- 1300,2000,3000 (36-48 HRc)	229.7		0.003	0.005	0.007	0.010	0.012
M 2	Austenitic Stainless Steel & Cast Stainless Steel- 310, 314, 316 (<25HRc)	164.1		0.003	0.004	0.005	0.007	0.009
K 1	Gray Cast Iron	311.7		0.007	0.009	0.013	0.015	0.018

Note: These are only recommended starting figures that depend on conditions such as machine and material rigidity, type of coating if any, etc. TESTING IS RECOMMENDED

General Purpose
Carbide Drills

Aluminum
Carbide Drills

Steels
Carbide Drills

Hardened Steels
Carbide Drills

Spotting
Carbide Drills

General Purpose
Drills up to 30xD

Aluminum Drills
up to 30xD

Drills for Steels

Pilot Drills

Solid Carbide Drills Non-Coolant

Solid Carbide Drills Internal Coolant

SXC
25xD Speeds and Feeds
METRIC

Material	Vc m/min (Cutting speed)	D1mm Dec. Inch.	F[mm/u] Feed Per Revolution				
			> 3.00 ≤ 5.00	> 5.00 ≤ 8.00	> 8.00 ≤ 12.00	> 12.00 ≤ 16.00	> 16.00 ≤ 20.00
			.1181- .1969	.1970- .3150	.3151- .4724	.4725- .6299	.4726- .7874
P3 Alloy Tool Steels- 1300,2000,3000 (≤35HRc)	70		.10	.15	.20	.26	.325
P4 Alloy Tool Steels- 1300,2000,3000 (36-48 HRc)	65		.10	.15	.20	.26	.325
M2 Austenitic Stainless Steel & Cast Stainless Steel- 310, 314, 316 (<25HRc)	50		.10	.12	.20	.26	.325
K1 Gray Cast Iron	85		.20	.25	.35	.40	.46

Note: These are only recommended starting figures that depend on conditions such as machine and material rigidity, type of coating if any, etc. TESTING IS RECOMMENDED

SXC
25xD Speeds and Feeds
INCHES

Material	SFM(Vc) Surface Feet Per Minute	D1mm Dec. Inch.	IPR=Inches Per Revolution				
			> 3.00 ≤ 5.00	> 5.00 ≤ 8.00	> 8.00 ≤ 12.00	> 12.00 ≤ 16.00	> 16.00 ≤ 20.00
			.1181- .1969	.1970- .3150	.3151- .4724	.4725- .6299	.4726- .7874
P3 Alloy Tool Steels- 1300,2000,3000 (≤35HRc)	229.7		0.003	0.005	0.007	0.010	0.012
P4 Alloy Tool Steels- 1300,2000,3000 (36-48 HRc)	213.3		0.003	0.005	0.007	0.010	0.012
M2 Austenitic Stainless Steel & Cast Stainless Steel- 310, 314, 316 (<25HRc)	164.1		0.003	0.004	0.005	0.007	0.009
K1 Gray Cast Iron	278.9		0.007	0.009	0.013	0.015	0.018

Note: These are only recommended starting figures that depend on conditions such as machine and material rigidity, type of coating if any, etc. TESTING IS RECOMMENDED

SXC
30xD Speeds and Feeds
METRIC

Material	Vc m/min (Cutting speed)	D1mm Dec. Inch.	F[mm/u] Feed Per Revolution				
			> 3.00 ≤ 5.00	> 5.00 ≤ 8.00	> 8.00 ≤ 12.00	> 12.00 ≤ 16.00	> 16.00 ≤ 20.00
			.1181- .1969	.1970- .3150	.3151- .4724	.4725- .6299	.4726- .7874
P3 Alloy Tool Steels- 1300,2000,3000 (≤35HRc)	65		.10	.15	.20	.26	.325
P4 Alloy Tool Steels- 1300,2000,3000 (36-48 HRc)	60		.10	.15	.20	.26	.325
M2 Austenitic Stainless Steel & Cast Stainless Steel- 310, 314, 316 (<25HRc)	45		.08	.12	.15	.20	.25
K1 Gray Cast Iron	80		.20	.25	.35	.40	.46

Note: These are only recommended starting figures that depend on conditions such as machine and material rigidity, type of coating if any, etc. TESTING IS RECOMMENDED

SXC
30xD Speeds and Feeds
INCHES

Material	SFM(Vc) Surface Feet Per Minute	D1mm Dec. Inch.	IPR=Inches Per Revolution				
			> 3.00 ≤ 5.00	> 5.00 ≤ 8.00	> 8.00 ≤ 12.00	> 12.00 ≤ 16.00	> 16.00 ≤ 20.00
			.1181- .1969	.1970- .3150	.3151- .4724	.4725- .6299	.4726- .7874
P3 Alloy Tool Steels- 1300,2000,3000 (≤35HRc)	213.3		0.003	0.005	0.007	0.010	0.012
P4 Alloy Tool Steels- 1300,2000,3000 (36-48 HRc)	196.9		0.003	0.005	0.007	0.010	0.012
M2 Austenitic Stainless Steel & Cast Stainless Steel- 310, 314, 316 (<25HRc)	147.6		0.003	0.004	0.005	0.007	0.009
K1 Gray Cast Iron	262.5		0.007	0.009	0.013	0.015	0.018

Note: These are only recommended starting figures that depend on conditions such as machine and material rigidity, type of coating if any, etc. TESTING IS RECOMMENDED



**High-Performance Drill
Single-Margin
Ideal for Multi-Purpose Drilling
3xD-5xD**



140° Point Geometry - For improved accuracy and thicker chip removal.

140° Geometría de la Punta - Para mejor Precisión y la evacuación de las virutas más gruesas.

Coolant Holes - Cool the cutting edge and improve chip evacuation.

Refrigerante Interno - Enfría el filo y mejora la evacuación de la viruta.

Polish - Chip evacuation is improved during deep hole drilling, when the flutes are polished.

Pulido - Cuando las flautas están pulidas la evacuación de la viruta es mejorada.

Varianta® Supral Coating - Excellent for high-speed drilling operations. Ideal for dry and semi-dry machining.

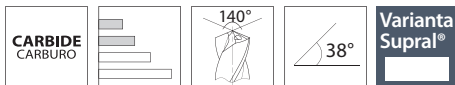
Recubrimiento Varianta® Supral - Excelente para las operaciones de perforación de alta velocidad. Ideal para el mecanizado seco y semiseco.

Tolerance

Drill Dia (h7) Inches (in)	Drill Dia (h7) Metric (mm)
.0000-.1181: + 0/- .00039	0-3: + 0/- .010
.1182-.2362: + 0/- .00047	3.01-6: + 0/- .012
.2363-.3937: + 0/- .00059	6.01-10.0: + 0/- .015
.3938-.7087: + 0/- .00071	10.01-18.0: + 0/- .018

Shank Dia (h6) Inches (in)	Shank Dia (h6) Metric (mm)
.0000-.1181: + 0/- .00024	0-3: + 0/- .006
.1182-.2362: + 0/- .00031	3.01-6: + 0/- .008
.2363-.3937: + 0/- .00035	6.01-10.0: + 0/- .009
.3938-.7087: + 0/- .00043	10.01-18.0: + 0/- .011





Varianta Supral® provides higher cutting speeds and excellent wear resistance.

Design

Spiral-fluted, right-hand cut, with internal coolant and a cylindrical shank.

Coating

Varianta® Supral TiAlCN (ML)

Ideal for

multi-purpose drilling
(Refer to page 245)

P M N S

Diseño

Flautas espirales con corte de mano dercha, refrigerante interno y un zanco cilindrico.

Recubrimiento

Varianta® Supral TiAlCN (ML)

Ideal para

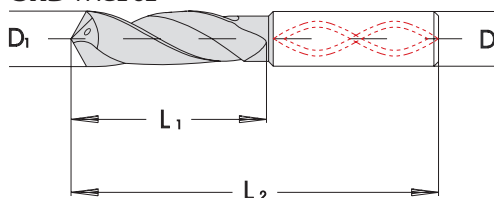
usos múltiples
(Consulte la página 246)

P M N S

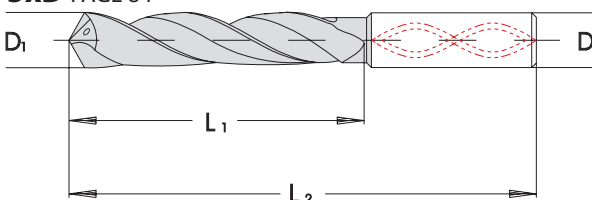
Speeds & Feeds Refer to Page 83 & 85.

****Left-Hand, Available Upon Request****

3xD PAGE 82



5xD PAGE 84



General Purpose Carbide Drills	Aluminum Carbide Drills	Steels Carbide Drills	Hardened Steels Carbide Drills	Spotting Carbide Drills
--------------------------------	-------------------------	-----------------------	--------------------------------	-------------------------

Solid Carbide Drills Non-Coolant

General Purpose Drills up to 30xD	Aluminum Drills up to 30xD	Drills for Steels	Pilot Drills
-----------------------------------	----------------------------	-------------------	--------------

Solid Carbide Drills Internal Coolant

General Purpose
Carbide Drills

Aluminum
Carbide Drills

Steels
Carbide Drills

Hardened Steels
Carbide Drills

Spotting
Carbide Drills

General Purpose
Drills up to 30xD

Aluminum Drills
up to 30xD

Drills for Steels

Pilot Drills

Design

Spiral-fluted, right-hand cut, with internal coolant and a cylindrical shank.

Coating

Varianta® Supral TiAlCN (ML)

Ideal for

multi-purpose drilling
(Refer to page 245)

P M N S

Speeds & Feeds Refer to Page 83.

Diameters (2.0 - 2.9mm)
Available Upon Request.

****Left-Hand, Available Upon Request****

Diseño

Flautas espirales con corte de mano dercha, refrigerante interno y un zanco cilíndrico.

Recubrimiento

Varianta® Supral TiAlCN (ML)

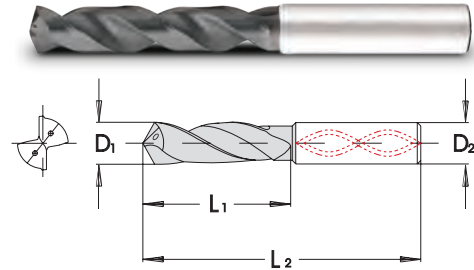
Ideal para

usos múltiples
(Consulte la página 246)

P M N S



Varianta Supral® provides higher cutting speeds and excellent wear resistance.



D ₁	Decimal	D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm	Part #
	0.1181	3.000	6	20	62	TXC0303000T9
	0.1220	3.100	6	20	62	TXC0303100T9
1/8	0.1250	3.175	6	20	62	TXC0303175T9
	0.1260	3.200	6	20	62	TXC0303200T9
	0.1299	3.300	6	20	62	TXC0303300T9
	0.1339	3.400	6	20	62	TXC0303400T9
	0.1378	3.500	6	20	62	TXC0303500T9
9/64	0.1406	3.572	6	20	62	TXC0303572T9
	0.1417	3.600	6	20	62	TXC0303600T9
	0.1457	3.700	6	20	62	TXC0303700T9
25	0.1496	3.800	6	24	66	TXC0303800T9
	0.1535	3.900	6	24	66	TXC0303900T9
5/32	0.1563	3.970	6	24	66	TXC0303970T9
	0.1575	4.000	6	24	66	TXC0304000T9
	0.1614	4.100	6	24	66	TXC0304100T9
	0.1654	4.200	6	24	66	TXC0304200T9
	0.1693	4.300	6	24	66	TXC0304300T9
11/64	0.1719	4.370	6	24	66	TXC0304370T9
	0.1732	4.400	6	24	66	TXC0304400T9
	0.1772	4.500	6	24	66	TXC0304500T9
	0.1811	4.600	6	24	66	TXC0304600T9
	0.1831	4.650	6	24	66	TXC0304650T9
13	0.1850	4.700	6	24	66	TXC0300130T9
3/16	0.1875	4.760	6	28	66	TXC0304760T9
12	0.1890	4.800	6	28	66	TXC0300120T9
	0.1929	4.900	6	28	66	TXC0304900T9
	0.1969	5.000	6	28	66	TXC0305000T9
	0.2008	5.100	6	28	66	TXC0305100T9
13/64	0.2031	5.160	6	28	66	TXC0305160T9
6	0.2040	5.182	6	28	66	TXC0300060T9
	0.2047	5.200	6	28	66	TXC0305200T9
	0.2087	5.300	6	28	66	TXC0305300T9
	0.2126	5.400	6	28	66	TXC0305400T9
	0.2165	5.500	6	28	66	TXC0305500T9
	0.2185	5.550	6	28	66	TXC0305550T9
7/32	0.2187	5.560	6	28	66	TXC0305560T9

D ₁	Decimal	D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm	Part #
	0.2205	5.600	6	28	66	TXC0305600T9
	0.2244	5.700	6	28	66	TXC0305700T9
	0.2283	5.800	6	28	66	TXC0305800T9
	0.2323	5.900	6	28	66	TXC0305900T9
15/64	0.2344	5.950	6	28	66	TXC0305950T9
	0.2362	6.000	6	28	66	TXC0306000T9
	0.2402	6.100	8	34	79	TXC0306100T9
	0.2441	6.200	8	34	79	TXC0306200T9
	0.2480	6.300	8	34	79	TXC0306300T9
1/4	0.2500	6.350	8	34	79	TXC0306350T9
	0.2520	6.400	8	34	79	TXC0306400T9
	0.2559	6.500	8	34	79	TXC0306500T9
	0.2598	6.600	8	34	79	TXC0306600T9
	0.2638	6.700	8	34	79	TXC0306700T9
17/64	0.2656	6.750	8	34	79	TXC0306750T9
	0.2677	6.800	8	34	79	TXC0306800T9
	0.2717	6.900	8	41	79	TXC0306900T9
	0.2756	7.000	8	41	79	TXC0307000T9
	0.2795	7.100	8	41	79	TXC0307100T9
9/32	0.2813	7.140	8	41	79	TXC0307140T9
	0.2835	7.200	8	41	79	TXC0307200T9
	0.2874	7.300	8	41	79	TXC0307300T9
	0.2913	7.400	8	41	79	TXC0307400T9
	0.2953	7.500	8	41	79	TXC0307500T9
19/64	0.2969	7.540	8	41	79	TXC0307540T9
	0.3031	7.700	8	41	79	TXC0307700T9
	0.3071	7.800	8	41	79	TXC0307800T9
	0.3110	7.900	8	41	79	TXC0307900T9
5/16	0.3125	7.940	8	41	79	TXC0307940T9
	0.3150	8.000	8	41	79	TXC0308000T9
	0.3189	8.100	10	47	89	TXC0308100T9
	0.3228	8.200	10	47	89	TXC0308200T9
	0.3268	8.300	10	47	89	TXC0308300T9
21/64	0.3281	8.330	10	47	89	TXC0308330T9
	0.3307	8.400	10	47	89	TXC0308400T9
	0.3346	8.500	10	47	89	TXC0308500T9

****Other Dimensions are Available Upon Request****

Tolerance

Drill Dia (h7) Inches (in)	Drill Dia (h7) Metric (mm)	Shank Dia (h6) Inches (in)	Shank Dia (h6) Metric (mm)
.0000-.1181: + 0/-0.0039	0-3: + 0/-0.10	.0000-.1181: + 0/-0.0024	0-3: + 0/-0.06
.1182-.2362: + 0/-0.0047	3.01-6: + 0/-0.12	.1182-.2362: + 0/-0.0031	3.01-6: + 0/-0.08
.2363-.3937: + 0/-0.0059	6.01-10.0: + 0/-0.15	.2363-.3937: + 0/-0.0035	6.01-10.0: + 0/-0.09
.3938-.7087: + 0/-0.0071	10.01-18.0: + 0/-0.18	.3938-.7087: + 0/-0.0043	10.01-18.0: + 0/-0.11

D ₁	Decimal	D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm	Part #
	0.3386	8.600	10	47	89	TXC0308600T9
	0.3425	8.700	10	47	89	TXC0308700T9
11/32	0.3437	8.730	10	47	89	TXC0308730T9
	0.3465	8.800	10	47	89	TXC0308800T9
	0.3543	9.000	10	47	89	TXC0309000T9
23/64	0.3594	9.130	10	47	89	TXC0309130T9
	0.3622	9.200	10	47	89	TXC0309200T9
	0.3661	9.300	10	47	89	TXC0309300T9
	0.3740	9.500	10	47	89	TXC0309500T9
3/8	0.3750	9.520	10	47	89	TXC0309520T9
	0.3780	9.600	10	47	89	TXC0309600T9
	0.3858	9.800	10	47	89	TXC0309800T9
	0.3898	9.900	10	47	89	TXC0309900T9
25/64	0.3906	9.920	10	47	89	TXC0309920T9
	0.3937	10.000	10	47	89	TXC0310000T9
	0.3976	10.100	12	55	102	TXC0310100T9
	0.4016	10.200	12	55	102	TXC0310200T9
	0.4055	10.300	12	55	102	TXC0310300T9
13/32	0.4063	10.320	12	55	102	TXC0310320T9
	0.4094	10.400	12	55	102	TXC0310400T9
	0.4134	10.500	12	55	102	TXC0310500T9
27/64	0.4219	10.720	12	55	102	TXC0310720T9
	0.4252	10.800	12	55	102	TXC0310800T9
	0.4331	11.000	12	55	102	TXC0311000T9
	0.4370	11.100	12	55	102	TXC0311100T9
7/16	0.4375	11.113	12	55	102	TXC0304375T9
	0.4409	11.200	12	55	102	TXC0311200T9
	0.4528	11.500	12	55	102	TXC0311500T9
29/64	0.4531	11.510	12	55	102	TXC0311510T9
	0.4606	11.700	12	55	102	TXC0311700T9

D ₁	Decimal	D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm	Part #
	0.4646	11.800	12	55	102	TXC0311800T9
15/32	0.4687	11.910	12	55	102	TXC0311910T9
	0.4724	12.000	12	55	102	TXC0312000T9
	0.4764	12.100	14	60	107	TXC0312100T9
	0.4803	12.200	14	60	107	TXC0312200T9
	0.4843	12.300	14	60	107	TXC0312300T9
31/64	0.4844	12.303	14	60	107	TXC0304844T9
	0.4921	12.500	14	60	107	TXC0312500T9
	0.4961	12.600	14	60	107	TXC0312600T9
1/2	0.5000	12.700	14	60	107	TXC0312700T9
	0.5118	13.000	14	60	107	TXC0313000T9
	0.5236	13.300	14	60	107	TXC0313300T9
17/32	0.5313	13.490	14	60	107	TXC0313490T9
	0.5315	13.500	14	60	107	TXC0313500T9
	0.5512	14.000	14	60	107	TXC0314000T9
9/16	0.5625	14.290	16	65	115	TXC0314290T9
	0.5709	14.500	16	65	115	TXC0314500T9
	0.5906	15.000	16	65	115	TXC0315000T9
	0.6102	15.500	16	65	115	TXC0315500T9
5/8	0.6250	15.870	16	65	115	TXC0315870T9
	0.6299	16.000	16	65	115	TXC0316000T9
	0.6496	16.500	18	73	123	TXC0316500T9
	0.6693	17.000	18	73	123	TXC0317000T9
	0.6890	17.500	18	73	123	TXC0317500T9
	0.7087	18.000	18	73	123	TXC0318000T9
	0.7283	18.500	20	79	131	TXC0318500T9
3/4	0.7500	19.050	20	79	131	TXC0319050T9
	0.7677	19.500	20	79	131	TXC0319500T9
	0.7874	20.000	20	79	131	TXC0320000T9

Other Dimensions are Available Upon Request

TXC 3xD Speeds and Feeds METRIC		Vc m/min (Cutting speed)	D1mm Dec. Inch.	F[mm/u] Feed Per Revolution				
Material	> 3.00 ≤ 5.00			> 5.00 ≤ 8.00	> 8.00 ≤ 12.00	> 12.00 ≤ 16.00	> 16.00 ≤ 20.00	
				.1181- .1969	.1970- .3150	.3151- .4724	.4725- .6299	.4726- .7874
P1	Low - Carbon Steel - 1000 Series (> 25 HRc)	75		.14	.20	.275	.35	.45
P3	Alloy Tool Steels - 1300, 2000, 3000 (≤ 35HRc)	70		.14	.20	.28	.35	.45
M2	Austenitic Stainless Steel & Cast Stainless Steel- 310, 314, 316 (< 25 HRc)	70		.08	.12	.15	.20	.25
N2	Low-Silicon Aluminum Alloys Si < 12.2%- 6061,7075	155		.14	.20	.275	.35	.45
S2	Nickel Based, Cobalt Based, Heat Resistant Alloys- Haynes 188, Haynes 21, Hastelloy, Waspalloy, Inconel 625/718 (≤48hRc)	40		.04	.08	.12	.16	.20

Note: These are only recommended starting figures that depend on conditions such as machine and material rigidity, type of coating if any, etc. TESTING IS RECOMMENDED

TXC 3xD Speeds and Feeds INCHES		SFM(Vc) Surface Feet Per Minute	D1mm Dec. Inch.	IPR=Inches Per Revolution				
Material	> 3.00 ≤ 5.00			> 5.00 ≤ 8.00	> 8.00 ≤ 12.00	> 12.00 ≤ 16.00	> 16.00 ≤ 20.00	
				.1181- .1969	.1970- .3150	.3151- .4724	.4725- .6299	.4726- .7874
P1	Low - Carbon Steel - 1000 Series (> 25 HRc)	246.1		0.005	0.007	0.010	0.013	0.017
P3	Alloy Tool Steels - 1300, 2000, 3000 (≤ 35HRc)	229.1		0.005	0.007	0.010	0.013	0.017
M2	Austenitic Stainless Steel & Cast Stainless Steel- 310, 314, 316 (< 25 HRc)	229.1		0.003	0.004	0.005	0.007	0.009
N2	Low-Silicon Aluminum Alloys Si < 12.2%- 6061,7075	508.6		0.005	0.007	0.010	0.013	0.017
S2	Nickel Based, Cobalt Based, Heat Resistant Alloys- Haynes 188, Haynes 21, Hastelloy, Waspalloy, Inconel 625/718 (≤48hRc)	131.2		0.001	0.003	0.004	0.006	0.007

Note: These are only recommended starting figures that depend on conditions such as machine and material rigidity, type of coating if any, etc. TESTING IS RECOMMENDED

General Purpose
Carbide Drills

Aluminum
Carbide Drills

Steels
Carbide Drills

Hardened Steels
Carbide Drills

Spotting
Carbide Drills

General Purpose
Drills up to 30xD

Aluminum Drills
up to 30xD

Drills for Steels

Pilot Drills

Design

Spiral-fluted, right-hand cut, with internal coolant and a cylindrical shank.

Coating

Varianta® Supral TiAlCN (ML)

Ideal for

multi-purpose drilling
(Refer to page 245)

P M N S

Speeds & Feeds Refer to Page 85.

Diseño

Flautas espirales con corte de mano dercha, refrigerante interno y un zanco cilíndrico.

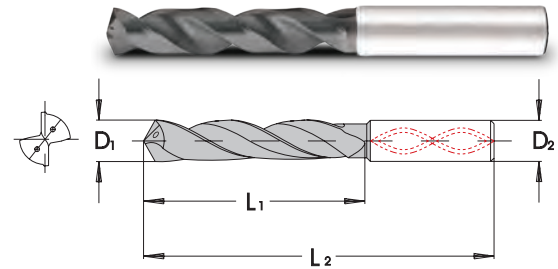
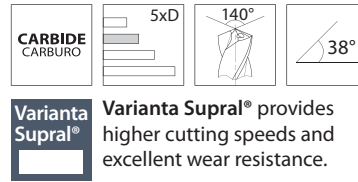
Recubrimiento

Varianta® Supral TiAlCN (ML)

Ideal para

usos múltiples
(Consulte la página 246)

P M N S



D ₁	Decimal	D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm	Part #
	0.1181	3.000	6	28	66	TXC0503000T9
	0.1220	3.100	6	28	66	TXC0503100T9
1/8	0.1250	3.175	6	28	66	TXC0503175T9
	0.1260	3.200	6	28	66	TXC0503200T9
	0.1299	3.300	6	28	66	TXC0503300T9
	0.1339	3.400	6	28	66	TXC0503400T9
	0.1378	3.500	6	28	66	TXC0503500T9
9/64	0.1406	3.572	6	28	66	TXC0503572T9
	0.1417	3.600	6	28	66	TXC0503600T9
	0.1457	3.700	6	28	66	TXC0503700T9
25	0.1496	3.800	6	36	74	TXC0503800T9
	0.1535	3.900	6	36	74	TXC0503900T9
5/32	0.1563	3.970	6	36	74	TXC0503970T9
	0.1575	4.000	6	36	74	TXC0504000T9
	0.1614	4.100	6	36	74	TXC0504100T9
	0.1654	4.200	6	36	74	TXC0504200T9
	0.1693	4.300	6	36	74	TXC0504300T9
11/64	0.1719	4.370	6	36	74	TXC0504370T9
	0.1732	4.400	6	36	74	TXC0504400T9
	0.1772	4.500	6	36	74	TXC0504500T9
	0.1811	4.600	6	36	74	TXC0504600T9
	0.1831	4.650	6	36	74	TXC0504650T9
13	0.1850	4.700	6	36	74	TXC0500130T9
3/16	0.1875	4.760	6	44	82	TXC0504760T9
12	0.1890	4.800	6	44	82	TXC0500120T9
	0.1929	4.900	6	44	82	TXC0504900T9
	0.1969	5.000	6	44	82	TXC0505000T9
	0.2008	5.100	6	44	82	TXC0505100T9
13/64	0.2031	5.160	6	44	82	TXC0505160T9
6	0.2040	5.182	6	44	82	TXC0500060T9
	0.2047	5.200	6	44	82	TXC0505200T9
	0.2087	5.300	6	44	82	TXC0505300T9
	0.2126	5.400	6	44	82	TXC0505400T9
	0.2165	5.500	6	44	82	TXC0505500T9
	0.2185	5.550	6	44	82	TXC0505550T9
7/32	0.2187	5.560	6	44	82	TXC0505560T9

D ₁	Decimal	D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm	Part #
	0.2205	5.600	6	44	82	TXC0505600T9
	0.2244	5.700	6	44	82	TXC0505700T9
	0.2283	5.800	6	44	82	TXC0505800T9
	0.2323	5.900	6	44	82	TXC0505900T9
15/64	0.2344	5.950	6	44	82	TXC0505950T9
	0.2362	6.000	6	44	82	TXC0506000T9
	0.2402	6.100	8	53	91	TXC0506100T9
	0.2441	6.200	8	53	91	TXC0506200T9
	0.2480	6.300	8	53	91	TXC0506300T9
1/4	0.2500	6.350	8	53	91	TXC0506350T9
	0.2520	6.400	8	53	91	TXC0506400T9
	0.2559	6.500	8	53	91	TXC0506500T9
	0.2598	6.600	8	53	91	TXC0506600T9
	0.2638	6.700	8	53	91	TXC0506700T9
17/64	0.2656	6.750	8	53	91	TXC0506750T9
	0.2677	6.800	8	53	91	TXC0506800T9
	0.2717	6.900	8	53	91	TXC0506900T9
	0.2756	7.000	8	53	91	TXC0507000T9
	0.2795	7.100	8	53	91	TXC0507100T9
9/32	0.2813	7.140	8	53	91	TXC0507140T9
	0.2835	7.200	8	53	91	TXC0507200T9
	0.2874	7.300	8	53	91	TXC0507300T9
	0.2913	7.400	8	53	91	TXC0507400T9
	0.2953	7.500	8	53	91	TXC0507500T9
19/64	0.2969	7.540	8	53	91	TXC0507540T9
	0.3031	7.700	8	53	91	TXC0507700T9
	0.3071	7.800	8	53	91	TXC0507800T9
	0.3110	7.900	8	53	91	TXC0507900T9
5/16	0.3125	7.940	8	53	91	TXC0507940T9
	0.3150	8.000	8	53	91	TXC0508000T9
	0.3189	8.100	10	61	103	TXC0508100T9
	0.3228	8.200	10	61	103	TXC0508200T9
	0.3268	8.300	10	61	103	TXC0508300T9
21/64	0.3281	8.330	10	61	103	TXC0508330T9
	0.3307	8.400	10	61	103	TXC0508400T9
	0.3346	8.500	10	61	103	TXC0508500T9

Other Dimensions are Available Upon Request

Tolerance

Drill Dia (h7) Inches (in)	Drill Dia (h7) Metric (mm)	Shank Dia (h6) Inches (in)	Shank Dia (h6) Metric (mm)
.0000-.1181: +0/-0.0039	0-3: +0/-0.010	.0000-.1181: +0/-0.0024	0-3: +0/-0.006
.1182-.2362: +0/-0.0047	3.01-6: +0/-0.012	.1182-.2362: +0/-0.0031	3.01-6: +0/-0.008
.2363-.3937: +0/-0.0059	6.01-10.0: +0/-0.015	.2363-.3937: +0/-0.0035	6.01-10.0: +0/-0.009
.3938-.7087: +0/-0.0071	10.01-18.0: +0/-0.018	.3938-.7087: +0/-0.0043	10.01-18.0: +0/-0.011

General Purpose Carbide Drills
Aluminum Carbide Drills
Steels Carbide Drills
Hardened Steels Carbide Drills
Spotting Carbide Drills

Solid Carbide Drills Non-Coolant

General Purpose Drills up to 30xD
Aluminum Drills up to 30xD
Drills for Steels
Pilot Drills

Solid Carbide Drills Internal Coolant

D ₁	Decimal	D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm	Part #
	0.3386	8.600	10	61	103	TXC0508600T9
	0.3425	8.700	10	61	103	TXC0508700T9
11/32	0.3437	8.730	10	61	103	TXC0508730T9
	0.3465	8.800	10	61	103	TXC0508800T9
	0.3543	9.000	10	61	103	TXC0509000T9
23/64	0.3594	9.130	10	61	103	TXC0509130T9
	0.3622	9.200	10	61	103	TXC0509200T9
	0.3661	9.300	10	61	103	TXC0509300T9
	0.3740	9.500	10	61	103	TXC0509500T9
3/8	0.3750	9.520	10	61	103	TXC0509520T9
	0.3780	9.600	10	61	103	TXC0509600T9
	0.3858	9.800	10	61	103	TXC0509800T9
	0.3898	9.900	10	61	103	TXC0509900T9
25/64	0.3906	9.920	10	61	103	TXC0509920T9
	0.3937	10.000	10	61	103	TXC0510000T9
	0.3976	10.100	12	71	118	TXC0510100T9
	0.4016	10.200	12	71	118	TXC0510200T9
	0.4055	10.300	12	71	118	TXC0510300T9
13/32	0.4063	10.320	12	71	118	TXC0510320T9
	0.4094	10.400	12	71	118	TXC0510400T9
	0.4134	10.500	12	71	118	TXC0510500T9
27/64	0.4219	10.720	12	71	118	TXC0510720T9
	0.4252	10.800	12	71	118	TXC0510800T9
	0.4331	11.000	12	71	118	TXC0511000T9
	0.4370	11.100	12	71	118	TXC0511100T9
7/16	0.4375	11.113	12	71	118	TXC0504375T9
	0.4409	11.200	12	71	118	TXC0511200T9
	0.4528	11.500	12	71	118	TXC0511500T9
29/64	0.4531	11.510	12	71	118	TXC0511510T9
	0.4606	11.700	12	71	118	TXC0511700T9

D ₁	Decimal	D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm	Part #
	0.4646	11.800	12	71	118	TXC0511800T9
15/32	0.4687	11.910	12	71	118	TXC0511910T9
	0.4724	12.000	12	71	118	TXC0512000T9
	0.4764	12.100	14	77	124	TXC0512100T9
	0.4803	12.200	14	77	124	TXC0512200T9
	0.4843	12.300	14	77	124	TXC0512300T9
31/64	0.4844	12.303	14	77	124	TXC0504844T9
	0.4921	12.500	14	77	124	TXC0512500T9
	0.4961	12.600	14	77	124	TXC0512600T9
1/2	0.5000	12.700	14	77	124	TXC0512700T9
	0.5118	13.000	14	77	124	TXC0513000T9
	0.5236	13.300	14	77	124	TXC0513300T9
17/32	0.5313	13.490	14	77	124	TXC0513490T9
	0.5315	13.500	14	77	124	TXC0513500T9
	0.5512	14.000	14	77	124	TXC0514000T9
9/16	0.5625	14.290	16	83	133	TXC0514290T9
	0.5709	14.500	16	83	133	TXC0514500T9
	0.5906	15.000	16	83	133	TXC0515000T9
	0.6102	15.500	16	83	133	TXC0515500T9
5/8	0.6250	15.870	16	83	133	TXC0515870T9
	0.6299	16.000	16	83	133	TXC0516000T9
	0.6496	16.500	18	93	143	TXC0516500T9
	0.6693	17.000	18	93	143	TXC0517000T9
	0.6890	17.500	18	93	143	TXC0517500T9
	0.7087	18.000	18	93	143	TXC0518000T9
	0.7283	18.500	20	101	153	TXC0518500T9
3/4	0.7500	19.050	20	101	153	TXC0519050T9
	0.7677	19.500	20	101	153	TXC0519500T9
	0.7874	20.000	20	101	153	TXC0520000T9

Other Dimensions are Available Upon Request

TXC 5xD Speeds and Feeds METRIC		Vc m/min (Cutting speed)	D1mm	F[mm/u] Feed Per Revolution				
Material				> 3.00 ≤ 5.00	> 5.00 ≤ 8.00	> 8.00 ≤ 12.00	> 12.00 ≤ 16.00	> 16.00 ≤ 20.00
			Dec. Inch.	.1181- .1969	.1970- .3150	.3151- .4724	.4725- .6299	.4726- .7874
P1	Low - Carbon Steel - 1000 Series (> 25 HRC)	70		.14	.20	.275	.35	.45
P3	Alloy Tool Steels - 1300, 2000, 3000 (≤ 35HRC)	65		.14	.20	.28	.35	.45
M2	Austenitic Stainless Steel & Cast Stainless Steel- 310, 314, 316 (< 25 HRC)	65		.08	.12	.15	.20	.25
N2	Low-Silicon Aluminum Alloys Si < 12.2%- 6061,7075	150		.14	.20	.275	.35	.45
S2	Nickel Based, cobalt Based, Heat Resistant Alloys- Haynes 188, Haynes 21, Hastelloy, Waspalloy, Inconel 625/718 (≤48hRc)	35		.04	.08	.12	.16	.20

Note: These are only recommended starting figures that depend on conditions such as machine and material rigidity, type of coating if any, etc. TESTING IS RECOMMENDED

TXC 5xD Speeds and Feeds INCHES		SFM(Vc) Surface Feet Per Minute	D1mm	IPR=Inches Per Revolution				
Material				> 3.00 ≤ 5.00	> 5.00 ≤ 8.00	> 8.00 ≤ 12.00	> 12.00 ≤ 16.00	> 16.00 ≤ 20.00
			Dec. Inch.	.1181- .1969	.1970- .3150	.3151- .4724	.4725- .6299	.4726- .7874
P1	Low - Carbon Steel - 1000 Series (> 25 HRC)	229.7		0.005	0.007	0.010	0.013	0.017
P3	Alloy Tool Steels - 1300, 2000, 3000 (≤ 35HRC)	213.3		0.005	0.007	0.010	0.013	0.017
M2	Austenitic Stainless Steel & Cast Stainless Steel- 310, 314, 316 (< 25 HRC)	213.3		0.003	0.004	0.005	0.007	0.009
N2	Low-Silicon Aluminum Alloys Si < 12.2%- 6061,7075	492.2		0.005	0.007	0.010	0.013	0.017
S2	Nickel Based, cobalt Based, Heat Resistant Alloys- Haynes 188, Haynes 21, Hastelloy, Waspalloy, Inconel 625/718 (≤48hRc)	114.8		0.001	0.003	0.004	0.006	0.007

Note: These are only recommended starting figures that depend on conditions such as machine and material rigidity, type of coating if any, etc. TESTING IS RECOMMENDED



**High-Performance Drill
Triple-Margin
Ideal for Aluminum and Cast Materials
3xD-30xD**

Triple Margin Design - Ideal for improving surface finish and increasing stability.

Triple Diseño Margen - Ideal para mejorar el acabado superficial y aumentar la estabilidad.

Z-Power Coating - Reduces friction between the chip and tool, preventing chip clogging. In addition, the coating reduces heat and abrasion wear.

Z-Power Recubrimiento - Reduce la fricción entre la viruta y la herramienta, previniendo el atasco de viruta. Además, el recubrimiento reduce la temperatura y abrasión.

135° Point Geometry - Engineered to provide you with advanced drilling capabilities. The 135° split-point is designed to ensure precision when drilling.

135° Geometría de la Punta - Diseñado para ofrecerle capacidades avanzadas de perforación. El punto de 135 grados está diseñado para asegurar precisión al perforar.

Coolant Holes - Cool the cutting edge and improve chip evacuation.

Refrigerante Interno - Enfría el filo y mejora la evacuación de la viruta.

Polish - Chip evacuation is improved during deep hole drilling, when the flutes are polished.

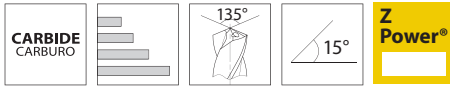
Pulido - Cuando las flautas están pulidas la evacuación de la viruta es mejorada.

Tolerance

Drill Dia (h7) Inches (in)	Drill Dia (h7) Metric (mm)
.0000-.1181: + 0/-0.0039	0-3: + 0/-0.10
.1182-.2362: + 0/-0.0047	3.01-6: + 0/-0.12
.2363-.3937: + 0/-0.0059	6.01-10.0: + 0/-0.15
.3938-.7087: + 0/-0.0071	10.01-18.0: + 0/-0.18

Shank Dia (h6) Inches (in)	Shank Dia (h6) Metric (mm)
.0000-.1181: + 0/-0.0024	0-3: + 0/-0.06
.1182-.2362: + 0/-0.0031	3.01-6: + 0/-0.08
.2363-.3937: + 0/-0.0035	6.01-10.0: + 0/-0.09
.3938-.7087: + 0/-0.0043	10.01-18.0: + 0/-0.11





Z-Power® has excellent corrosion and adhesion resistant properties.

Design

Long spiral-fluted, triple-margin, right-hand cut and internal coolant.

Coating

Z-Power (ZrN)

Ideal for

aluminum, cast materials and non-ferrous materials (Refer to page 245)

K N

Diseño

Flautas largas espirales, margen triple con corte de mano derecha y refrigerante interno.

Recubrimiento

Z-Power (ZrN)

Ideal para

aluminio, materiales de fundición y materiales no ferrosos (Consulte la página 246)

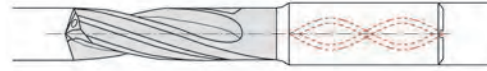
K N

Speeds & Feeds Refer to Page 89,91,93,100 & 101.

Diameters (2.0 - 2.9mm)
Available Upon Request.

****Left-Hand, Available Upon Request****

3xD PAGE 88



5xD PAGE 90



8xD PAGE 92



12xD PAGE 94



16xD PAGE 96



Must utilize a pilot hole drill. Refer to page 114

20xD PAGE 97



Must utilize a pilot hole drill. Refer to page 114

25xD PAGE 98



Must utilize a pilot hole drill. Refer to page 114

30xD PAGE 99



Must utilize a pilot hole drill. Refer to page 114

General Purpose
Carbide Drills

Aluminum
Carbide Drills

Steels
Carbide Drills

Hardened Steels
Carbide Drills

Spotting
Carbide Drills

General Purpose
Drills up to 30xD

Aluminum Drills
up to 30xD

Drills for Steels

Pilot Drills

Solid Carbide Drills Non-Coolant

Solid Carbide Drills Internal Coolant

General Purpose
Carbide Drills

Aluminum
Carbide Drills

Steels
Carbide Drills

Hardened Steels
Carbide Drills

Spotting
Carbide Drills

General Purpose
Drills up to 30xD

Aluminum Drills
up to 30xD

Drills for Steel

Pilot Drills

Design

Long spiral-fluted, triple-margin, right-hand cut and internal coolant.

Coating

Z-Power (ZrN)

Ideal for

aluminum, cast materials and non-ferrous materials (Refer to page 245)



Speeds & Feeds Refer to Page 89.

**Diameters (2.0 - 2.9mm)
Available Upon Request.**

****Left-Hand, Available Upon Request****

Diseño

Flautas largas espirales, margen triple con corte de mano derecha y refrigerante interno.

Recubrimiento

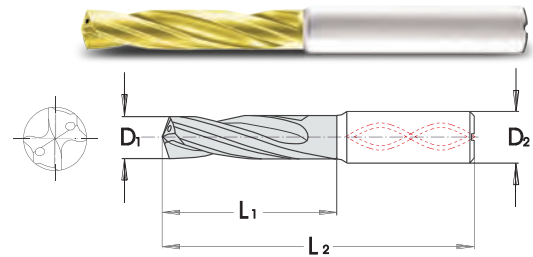
Z-Power (ZrN)

Ideal para

aluminio, materiales de fundición y materiales no ferrosos (Consulte la página 246)



Z-Power® has excellent corrosion and adhesion resistant properties.



D ₁	Decimal	D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm	Part #
	0.1181	3.000	6	20	62	AXC0303000T6
	0.1220	3.100	6	20	62	AXC0303100T6
1/8	0.1250	3.175	6	20	62	AXC0303175T6
	0.1260	3.200	6	20	62	AXC0303200T6
	0.1299	3.300	6	20	62	AXC0303300T6
	0.1339	3.400	6	20	62	AXC0303400T6
	0.1378	3.500	6	20	62	AXC0303500T6
9/64	0.1406	3.572	6	20	62	AXC0303572T6
	0.1417	3.600	6	20	62	AXC0303600T6
	0.1457	3.700	6	20	62	AXC0303700T6
25	0.1496	3.800	6	24	66	AXC0303800T6
	0.1535	3.900	6	24	66	AXC0303900T6
5/32	0.1563	3.970	6	24	66	AXC0303970T6
	0.1575	4.000	6	24	66	AXC0304000T6
	0.1614	4.100	6	24	66	AXC0304100T6
	0.1654	4.200	6	24	66	AXC0304200T6
	0.1693	4.300	6	24	66	AXC0304300T6
11/64	0.1719	4.370	6	24	66	AXC0304370T6
	0.1732	4.400	6	24	66	AXC0304400T6
	0.1772	4.500	6	24	66	AXC0304500T6
	0.1811	4.600	6	24	66	AXC0304600T6
	0.1831	4.650	6	24	66	AXC0304650T6
13	0.1850	4.700	6	24	66	AXC0300130T6
3/16	0.1875	4.760	6	28	66	AXC0304760T6
12	0.1890	4.800	6	28	66	AXC0300120T6
	0.1929	4.900	6	28	66	AXC0304900T6
	0.1969	5.000	6	28	66	AXC0305000T6
	0.2008	5.100	6	28	66	AXC0305100T6
13/64	0.2031	5.160	6	28	66	AXC0305160T6
6	0.2040	5.182	6	28	66	AXC0300060T6
	0.2047	5.200	6	28	66	AXC0305200T6
	0.2087	5.300	6	28	66	AXC0305300T6
	0.2126	5.400	6	28	66	AXC0305400T6
	0.2165	5.500	6	28	66	AXC0305500T6
	0.2185	5.550	6	28	66	AXC0305550T6
7/32	0.2187	5.560	6	28	66	AXC0305560T6

D ₁	Decimal	D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm	Part #
	0.2205	5.600	6	28	66	AXC0305600T6
	0.2244	5.700	6	28	66	AXC0305700T6
	0.2283	5.800	6	28	66	AXC0305800T6
	0.2323	5.900	6	28	66	AXC0305900T6
15/64	0.2344	5.950	6	28	66	AXC0305950T6
	0.2362	6.000	6	28	66	AXC0306000T6
	0.2402	6.100	8	34	79	AXC0306100T6
	0.2441	6.200	8	34	79	AXC0306200T6
	0.2480	6.300	8	34	79	AXC0306300T6
1/4	0.2500	6.350	8	34	79	AXC0306350T6
	0.2520	6.400	8	34	79	AXC0306400T6
	0.2559	6.500	8	34	79	AXC0306500T6
	0.2598	6.600	8	34	79	AXC0306600T6
	0.2638	6.700	8	34	79	AXC0306700T6
17/64	0.2656	6.750	8	34	79	AXC0306750T6
	0.2677	6.800	8	34	79	AXC0306800T6
	0.2717	6.900	8	41	79	AXC0306900T6
	0.2756	7.000	8	41	79	AXC0307000T6
	0.2795	7.100	8	41	79	AXC0307100T6
9/32	0.2813	7.140	8	41	79	AXC0307140T6
	0.2835	7.200	8	41	79	AXC0307200T6
	0.2874	7.300	8	41	79	AXC0307300T6
	0.2913	7.400	8	41	79	AXC0307400T6
	0.2953	7.500	8	41	79	AXC0307500T6
19/64	0.2969	7.540	8	41	79	AXC0307540T6
	0.3031	7.700	8	41	79	AXC0307700T6
	0.3071	7.800	8	41	79	AXC0307800T6
	0.3110	7.900	8	41	79	AXC0307900T6
5/16	0.3125	7.940	8	41	79	AXC0307940T6
	0.3150	8.000	8	41	79	AXC0308000T6
	0.3189	8.100	10	47	89	AXC0308100T6
	0.3228	8.200	10	47	89	AXC0308200T6
	0.3268	8.300	10	47	89	AXC0308300T6
21/64	0.3281	8.330	10	47	89	AXC0308330T6
	0.3307	8.400	10	47	89	AXC0308400T6
	0.3346	8.500	10	47	89	AXC0308500T6

****Other Dimensions are Available Upon Request****

Tolerance

Drill Dia (h7) Inches (in)	Drill Dia (h7) Metric (mm)	Shank Dia (h6) Inches (in)	Shank Dia (h6) Metric (mm)
.0000-.1181: +0/-0.0039	0-3: +0/-0.10	.0000-.1181: +0/-0.0024	0-3: +0/-0.06
.1182-.2362: +0/-0.0047	3.01-6: +0/-0.12	.1182-.2362: +0/-0.0031	3.01-6: +0/-0.08
.2363-.3937: +0/-0.0059	6.01-10.0: +0/-0.15	.2363-.3937: +0/-0.0035	6.01-10.0: +0/-0.09
.3938-.7087: +0/-0.0071	10.01-18.0: +0/-0.18	.3938-.7087: +0/-0.0043	10.01-18.0: +0/-0.11

D ₁	Decimal	D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm	Part #
	0.3386	8.600	10	47	89	AXC0308600T6
	0.3425	8.700	10	47	89	AXC0308700T6
11/32	0.3437	8.730	10	47	89	AXC0308730T6
	0.3465	8.800	10	47	89	AXC0308800T6
	0.3543	9.000	10	47	89	AXC0309000T6
23/64	0.3594	9.130	10	47	89	AXC0309130T6
	0.3622	9.200	10	47	89	AXC0309200T6
	0.3661	9.300	10	47	89	AXC0309300T6
	0.3740	9.500	10	47	89	AXC0309500T6
3/8	0.3750	9.520	10	47	89	AXC0309520T6
	0.3780	9.600	10	47	89	AXC0309600T6
	0.3858	9.800	10	47	89	AXC0309800T6
	0.3898	9.900	10	47	89	AXC0309900T6
25/64	0.3906	9.920	10	47	89	AXC0309920T6
	0.3937	10.000	10	47	89	AXC0310000T6
	0.3976	10.100	12	55	102	AXC0310100T6
	0.4016	10.200	12	55	102	AXC0310200T6
	0.4055	10.300	12	55	102	AXC0310300T6
13/32	0.4063	10.320	12	55	102	AXC0310320T6
	0.4094	10.400	12	55	102	AXC0310400T6
	0.4134	10.500	12	55	102	AXC0310500T6
27/64	0.4219	10.720	12	55	102	AXC0310720T6
	0.4252	10.800	12	55	102	AXC0310800T6
	0.4331	11.000	12	55	102	AXC0311000T6
	0.4370	11.100	12	55	102	AXC0311100T6
7/16	0.4375	11.113	12	55	102	AXC0304375T6
	0.4409	11.200	12	55	102	AXC0311200T6
	0.4528	11.500	12	55	102	AXC0311500T6
29/64	0.4531	11.510	12	55	102	AXC0311510T6
	0.4606	11.700	12	55	102	AXC0311700T6

D ₁	Decimal	D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm	Part #
	0.4646	11.800	12	55	102	AXC0311800T6
15/32	0.4687	11.910	12	55	102	AXC0311910T6
	0.4724	12.000	12	55	102	AXC0312000T6
	0.4764	12.100	14	60	107	AXC0312100T6
	0.4803	12.200	14	60	107	AXC0312200T6
	0.4843	12.300	14	60	107	AXC0312300T6
31/64	0.4844	12.303	14	60	107	AXC0304844T6
	0.4921	12.500	14	60	107	AXC0312500T6
	0.4961	12.600	14	60	107	AXC0312600T6
1/2	0.5000	12.700	14	60	107	AXC0312700T6
	0.5118	13.000	14	60	107	AXC0313000T6
	0.5236	13.300	14	60	107	AXC0313300T6
17/32	0.5313	13.490	14	60	107	AXC0313490T6
	0.5315	13.500	14	60	107	AXC0313500T6
	0.5512	14.000	14	60	107	AXC0314000T6
9/16	0.5625	14.290	16	65	115	AXC0314290T6
	0.5709	14.500	16	65	115	AXC0314500T6
	0.5906	15.000	16	65	115	AXC0315000T6
	0.6102	15.500	16	65	115	AXC0315500T6
5/8	0.6250	15.870	16	65	115	AXC0315870T6
	0.6299	16.000	16	65	115	AXC0316000T6
	0.6496	16.500	18	73	123	AXC0316500T6
	0.6693	17.000	18	73	123	AXC0317000T6
	0.6890	17.500	18	73	123	AXC0317500T6
	0.7087	18.000	18	73	123	AXC0318000T6
	0.7283	18.500	20	79	131	AXC0318500T6
3/4	0.7500	19.050	20	79	131	AXC0319050T6
	0.7677	19.500	20	79	131	AXC0319500T6
	0.7874	20.000	20	79	131	AXC0320000T6

Other Dimensions are Available Upon Request

AXC 3xD Speeds and Feeds METRIC		Vc m/min (Cutting speed)	D1mm	F[mm/u] Feed Per Revolution				
Material				Dec. Inch.	> 3.00 ≤ 5.00	> 5.00 ≤ 8.00	> 8.00 ≤ 12.00	> 12.00 ≤ 16.00
N1	Wrought Aluminum Alloys	340		.1181-.1969	.1970-.3150	.3151-.4724	.4725-.6299	.4726-.7874
N2	Low-Silicon Aluminum Alloys Si <12.2% - 6061, 7075	340						
N3	High-Silicon Aluminum Alloys Si >12.2% - 6061, 7075	325						
N5	Copper & Copper Alloys	158						

Note: These are only recommended starting figures that depend on conditions such as machine and material rigidity, type of coating if any, etc. TESTING IS RECOMMENDED

AXC 3xD Speeds and Feeds INCHES		SFM(Vc) Surface Feet Per Minute	D1mm	IPR=Inches Per Revolution				
Material				Dec. Inch.	> 3.00 ≤ 5.00	> 5.00 ≤ 8.00	> 8.00 ≤ 12.00	> 12.00 ≤ 16.00
N1	Wrought Aluminum Alloys	1115.5		0.012	0.015	0.019	0.023	0.025
N2	Low-Silicon Aluminum Alloys Si <12.2% - 6061, 7075	1115.5						
N3	High-Silicon Aluminum Alloys Si >12.2% - 6061, 7075	1066.3						
N5	Copper & Copper Alloys	518.4						

Note: These are only recommended starting figures that depend on conditions such as machine and material rigidity, type of coating if any, etc. TESTING IS RECOMMENDED

General Purpose
Carbide Drills

Aluminum
Carbide Drills

Steels
Carbide Drills

Hardened Steels
Carbide Drills

Spotting
Carbide Drills

General Purpose
Drills up to 30xD

Aluminum Drills
up to 30xD

Drills for Steel

Pilot Drills

Design

Long spiral-fluted, triple-margin, right-hand cut and internal coolant.

Coating

Z-Power (ZrN)

Ideal for

aluminum, cast materials and non-ferrous materials (Refer to page 245)



Speeds & Feeds Refer to Page 91.

Diameters (2.0 - 2.9mm)
Available Upon Request.

****Left-Hand, Available Upon Request****

Diseño

Flautas largas espirales, margen triple con corte de mano derecha y refrigerante interno.

Recubrimiento

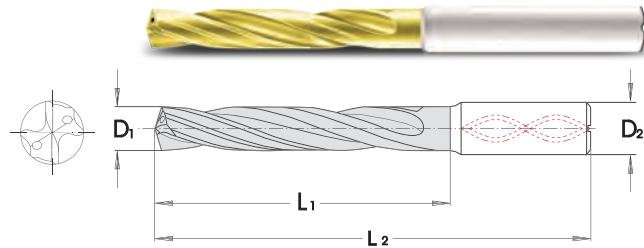
Z-Power (ZrN)

Ideal para

aluminio, materiales de fundición y materiales no ferrosos (Consulte la página 246)



Z-Power® has excellent corrosion and adhesion resistant properties.



D ₁	Decimal	D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm	Part #
	0.1181	3.000	6	28	66	AXC0503000T6
	0.1220	3.100	6	28	66	AXC0503100T6
1/8	0.1250	3.175	6	28	66	AXC0503175T6
	0.1260	3.200	6	28	66	AXC0503200T6
	0.1299	3.300	6	28	66	AXC0503300T6
	0.1339	3.400	6	28	66	AXC0503400T6
	0.1378	3.500	6	28	66	AXC0503500T6
9/64	0.1406	3.572	6	28	66	AXC0503572T6
	0.1417	3.600	6	28	66	AXC0503600T6
	0.1457	3.700	6	28	66	AXC0503700T6
25	0.1496	3.800	6	36	74	AXC0503800T6
	0.1535	3.900	6	36	74	AXC0503900T6
5/32	0.1563	3.970	6	36	74	AXC0503970T6
	0.1575	4.000	6	36	74	AXC0504000T6
	0.1614	4.100	6	36	74	AXC0504100T6
	0.1654	4.200	6	36	74	AXC0504200T6
	0.1693	4.300	6	36	74	AXC0504300T6
11/64	0.1719	4.370	6	36	74	AXC0504370T6
	0.1732	4.400	6	36	74	AXC0504400T6
	0.1772	4.500	6	36	74	AXC0504500T6
	0.1811	4.600	6	36	74	AXC0504600T6
	0.1831	4.650	6	36	74	AXC0504650T6
13	0.1850	4.700	6	36	74	AXC0500130T6
3/16	0.1875	4.760	6	44	82	AXC0504760T6
12	0.1890	4.800	6	44	82	AXC0500120T6
	0.1929	4.900	6	44	82	AXC0504900T6
	0.1969	5.000	6	44	82	AXC0505000T6
	0.2008	5.100	6	44	82	AXC0505100T6
13/64	0.2031	5.160	6	44	82	AXC0505160T6
6	0.2040	5.182	6	44	82	AXC0500060T6
	0.2047	5.200	6	44	82	AXC0505200T6
	0.2087	5.300	6	44	82	AXC0505300T6
	0.2126	5.400	6	44	82	AXC0505400T6
	0.2165	5.500	6	44	82	AXC0505500T6
	0.2185	5.550	6	44	82	AXC0505550T6
7/32	0.2187	5.560	6	44	82	AXC0505560T6

D ₁	Decimal	D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm	Part #
	0.2205	5.600	6	44	82	AXC0505600T6
	0.2244	5.700	6	44	82	AXC0505700T6
	0.2283	5.800	6	44	82	AXC0505800T6
	0.2323	5.900	6	44	82	AXC0505900T6
15/64	0.2344	5.950	6	44	82	AXC0505950T6
	0.2362	6.000	6	44	82	AXC0506000T6
	0.2402	6.100	8	53	91	AXC0506100T6
	0.2441	6.200	8	53	91	AXC0506200T6
	0.2480	6.300	8	53	91	AXC0506300T6
1/4	0.2500	6.350	8	53	91	AXC0506350T6
	0.2520	6.400	8	53	91	AXC0506400T6
	0.2559	6.500	8	53	91	AXC0506500T6
	0.2598	6.600	8	53	91	AXC0506600T6
	0.2638	6.700	8	53	91	AXC0506700T6
17/64	0.2656	6.750	8	53	91	AXC0506750T6
	0.2677	6.800	8	53	91	AXC0506800T6
	0.2717	6.900	8	53	91	AXC0506900T6
	0.2756	7.000	8	53	91	AXC0507000T6
	0.2795	7.100	8	53	91	AXC0507100T6
9/32	0.2813	7.140	8	53	91	AXC0507140T6
	0.2835	7.200	8	53	91	AXC0507200T6
	0.2874	7.300	8	53	91	AXC0507300T6
	0.2913	7.400	8	53	91	AXC0507400T6
	0.2953	7.500	8	53	91	AXC0507500T6
19/64	0.2969	7.540	8	53	91	AXC0507540T6
	0.3031	7.700	8	53	91	AXC0507700T6
	0.3071	7.800	8	53	91	AXC0507800T6
	0.3110	7.900	8	53	91	AXC0507900T6
5/16	0.3125	7.940	8	53	91	AXC0507940T6
	0.3150	8.000	8	53	91	AXC0508000T6
	0.3189	8.100	10	61	103	AXC0508100T6
	0.3228	8.200	10	61	103	AXC0508200T6
	0.3268	8.300	10	61	103	AXC0508300T6
21/64	0.3281	8.330	10	61	103	AXC0508330T6
	0.3307	8.400	10	61	103	AXC0508400T6
	0.3346	8.500	10	61	103	AXC0508500T6

****Other Dimensions are Available Upon Request****

Tolerance

Drill Dia (h7) Inches (in)	Drill Dia (h7) Metric (mm)	Shank Dia (h6) Inches (in)	Shank Dia (h6) Metric (mm)
.0000-.1181: +0/--.00039	0-3: +0/--.010	.0000-.1181: +0/--.00024	0-3: +0/--.006
.1182-.2362: +0/--.00047	3.01-6: +0/--.012	.1182-.2362: +0/--.00031	3.01-6: +0/--.008
.2363-.3937: +0/--.00059	6.01-10.0: +0/--.015	.2363-.3937: +0/--.00035	6.01-10.0: +0/--.009
.3938-.7087: +0/--.00071	10.01-18.0: +0/--.018	.3938-.7087: +0/--.00043	10.01-18.0: +0/--.011

D ₁	Decimal	D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm	Part #
	0.3386	8.600	10	61	103	AXC0508600T6
	0.3425	8.700	10	61	103	AXC0508700T6
11/32	0.3437	8.730	10	61	103	AXC0508730T6
	0.3465	8.800	10	61	103	AXC0508800T6
	0.3543	9.000	10	61	103	AXC0509000T6
23/64	0.3594	9.130	10	61	103	AXC0509130T6
	0.3622	9.200	10	61	103	AXC0509200T6
	0.3661	9.300	10	61	103	AXC0509300T6
	0.3740	9.500	10	61	103	AXC0509500T6
3/8	0.3750	9.520	10	61	103	AXC0509520T6
	0.3780	9.600	10	61	103	AXC0509600T6
	0.3858	9.800	10	61	103	AXC0509800T6
	0.3898	9.900	10	61	103	AXC0509900T6
25/64	0.3906	9.920	10	61	103	AXC0509920T6
	0.3937	10.000	10	61	103	AXC0510000T6
	0.3976	10.100	12	71	118	AXC0510100T6
	0.4016	10.200	12	71	118	AXC0510200T6
	0.4055	10.300	12	71	118	AXC0510300T6
13/32	0.4063	10.320	12	71	118	AXC0510320T6
	0.4094	10.400	12	71	118	AXC0510400T6
	0.4134	10.500	12	71	118	AXC0510500T6
27/64	0.4219	10.720	12	71	118	AXC0510720T6
	0.4252	10.800	12	71	118	AXC0510800T6
	0.4331	11.000	12	71	118	AXC0511000T6
	0.4370	11.100	12	71	118	AXC0511100T6
7/16	0.4375	11.113	12	71	118	AXC0504375T6
	0.4409	11.200	12	71	118	AXC0511200T6
	0.4528	11.500	12	71	118	AXC0511500T6
29/64	0.4531	11.510	12	71	118	AXC0511510T6
	0.4606	11.700	12	71	118	AXC0511700T6

D ₁	Decimal	D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm	Part #
	0.4646	11.800	12	71	118	AXC0511800T6
15/32	0.4687	11.910	12	71	118	AXC0511910T6
	0.4724	12.000	12	71	118	AXC0512000T6
	0.4764	12.100	14	77	124	AXC0512100T6
	0.4803	12.200	14	77	124	AXC0512200T6
	0.4843	12.300	14	77	124	AXC0512300T6
31/64	0.4844	12.303	14	77	124	AXC0504844T6
	0.4921	12.500	14	77	124	AXC0512500T6
	0.4961	12.600	14	77	124	AXC0512600T6
1/2	0.5000	12.700	14	77	124	AXC0512700T6
	0.5118	13.000	14	77	124	AXC0513000T6
	0.5236	13.300	14	77	124	AXC0513300T6
17/32	0.5313	13.490	14	77	124	AXC0513490T6
	0.5315	13.500	14	77	124	AXC0513500T6
	0.5512	14.000	14	77	124	AXC0514000T6
9/16	0.5625	14.290	16	83	133	AXC0514290T6
	0.5709	14.500	16	83	133	AXC0514500T6
	0.5906	15.000	16	83	133	AXC0515000T6
	0.6102	15.500	16	83	133	AXC0515500T6
5/8	0.6250	15.870	16	83	133	AXC0515870T6
	0.6299	16.000	16	83	133	AXC0516000T6
	0.6496	16.500	18	93	143	AXC0516500T6
	0.6693	17.000	18	93	143	AXC0517000T6
	0.6890	17.500	18	93	143	AXC0517500T6
	0.7087	18.000	18	93	143	AXC0518000T6
	0.7283	18.500	20	101	153	AXC0518500T6
3/4	0.7500	19.050	20	101	153	AXC0519050T6
	0.7677	19.500	20	101	153	AXC0519500T6
	0.7874	20.000	20	101	153	AXC0520000T6

Other Dimensions are Available Upon Request

AXC		F[mm/u] Feed Per Revolution						
5xD Speeds and Feeds		Vc m/min (Cutting speed)	D1mm	> 3.00 ≤ 5.00	> 5.00 ≤ 8.00	> 8.00 ≤ 12.00	> 12.00 ≤ 16.00	> 16.00 ≤ 20.00
METRIC			Dec. Inch.	.1181- .1969	.1970- .3150	.3151- .4724	.4725- .6299	.4726- .7874
Material								
N 1	Wrought Aluminum Alloys	360		.30	.40	.50	.60	.65
N 2	Low-Silicon Aluminum Alloys Si <12.2% - 6061, 7075	360		.35	.45	.55	.65	.70
N 3	High-Silicon Aluminum Alloys Si >12.2% - 6061, 7075	350		.30	.40	.50	.60	.65
N 5	Copper & Copper Alloys	160		.23	.30	.38	.45	.52

Note: These are only recommended starting figures that depend on conditions such as machine and material rigidity, type of coating if any, etc. TESTING IS RECOMMENDED

AXC		IPR=Inches Per Revolution						
5xD Speeds and Feeds		SFM(Vc) Surface Feet Per Minute	D1mm	> 3.00 ≤ 5.00	> 5.00 ≤ 8.00	> 8.00 ≤ 12.00	> 12.00 ≤ 16.00	> 16.00 ≤ 20.00
INCHES			Dec. Inch.	.1181- .1969	.1970- .3150	.3151- .4724	.4725- .6299	.4726- .7874
Material								
N 1	Wrought Aluminum Alloys	1181.2		0.012	0.015	0.019	0.023	0.025
N 2	Low-Silicon Aluminum Alloys Si <12.2% - 6061, 7075	1181.2		0.013	0.017	0.022	0.025	0.027
N 3	High-Silicon Aluminum Alloys Si >12.2% - 6061, 7075	1148.4		0.011	0.015	0.019	0.023	0.025
N 5	Copper & Copper Alloys	525.0		0.009	0.011	0.015	0.015	0.021

Note: These are only recommended starting figures that depend on conditions such as machine and material rigidity, type of coating if any, etc. TESTING IS RECOMMENDED

General Purpose
Carbide Drills

Aluminum
Carbide Drills

Steels
Carbide Drills

Hardened Steels
Carbide Drills

Spotting
Carbide Drills

General Purpose
Drills up to 30xD

Aluminum Drills
up to 30xD

Drills for Steel

Pilot Drills

Design

Long spiral-fluted, triple-margin, right-hand cut and internal coolant.

Coating

Z-Power (ZrN)

Ideal for

aluminum, cast materials and non-ferrous materials (Refer to page 245)



Speeds & Feeds Refer to Page 93.

Diameters (2.0 - 2.9mm)
Available Upon Request.

****Left-Hand, Available Upon Request****

Diseño

Flautas largas espirales, margen triple con corte de mano derecha y refrigerante interno.

Recubrimiento

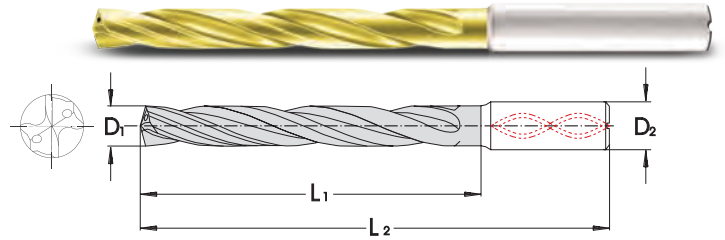
Z-Power (ZrN)

Ideal para

aluminio, materiales de fundición y materiales no ferrosos (Consulte la página 246)



Z-Power® has excellent corrosion and adhesion resistant properties.



D ₁	Decimal	D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm	Part #
	0.1181	3.000	6	34	72	AXC0803000T6
	0.1220	3.100	6	34	72	AXC0803100T6
1/8	0.1250	3.175	6	34	72	AXC0803175T6
	0.1260	3.200	6	34	72	AXC0803200T6
	0.1299	3.300	6	34	72	AXC0803300T6
	0.1339	3.400	6	34	72	AXC0803400T6
	0.1378	3.500	6	34	72	AXC0803500T6
9/64	0.1406	3.572	6	34	72	AXC0803572T6
	0.1417	3.600	6	34	72	AXC0803600T6
	0.1457	3.700	6	34	72	AXC0803700T6
25	0.1496	3.800	6	43	81	AXC0803800T6
	0.1535	3.900	6	43	81	AXC0803900T6
5/32	0.1563	3.970	6	43	81	AXC0803970T6
	0.1575	4.000	6	43	81	AXC0804000T6
	0.1614	4.100	6	43	81	AXC0804100T6
	0.1654	4.200	6	43	81	AXC0804200T6
	0.1693	4.300	6	43	81	AXC0804300T6
11/64	0.1719	4.370	6	43	81	AXC0804370T6
	0.1732	4.400	6	43	81	AXC0804400T6
	0.1772	4.500	6	43	81	AXC0804500T6
	0.1811	4.600	6	43	81	AXC0804600T6
	0.1831	4.650	6	43	81	AXC0804650T6
13	0.1850	4.700	6	43	81	AXC0800130T6
3/16	0.1875	4.760	6	57	95	AXC0804760T6
12	0.1890	4.800	6	57	95	AXC0800120T6
	0.1929	4.900	6	57	95	AXC0804900T6
	0.1969	5.000	6	57	95	AXC0805000T6
	0.2008	5.100	6	57	95	AXC0805100T6
13/64	0.2031	5.160	6	57	95	AXC0805160T6
6	0.2040	5.182	6	57	95	AXC0800060T6
	0.2047	5.200	6	57	95	AXC0805200T6
	0.2087	5.300	6	57	95	AXC0805300T6
	0.2126	5.400	6	57	95	AXC0805400T6
	0.2165	5.500	6	57	95	AXC0805500T6
	0.2185	5.550	6	57	95	AXC0805550T6
7/32	0.2187	5.560	6	57	95	AXC0805560T6

D ₁	Decimal	D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm	Part #
	0.2205	5.600	6	57	95	AXC0805600T6
	0.2244	5.700	6	57	95	AXC0805700T6
	0.2283	5.800	6	57	95	AXC0805800T6
	0.2323	5.900	6	57	95	AXC0805900T6
15/64	0.2344	5.950	6	57	95	AXC0805950T6
	0.2362	6.000	6	57	95	AXC0806000T6
	0.2402	6.100	8	76	114	AXC0806100T6
	0.2441	6.200	8	76	114	AXC0806200T6
	0.2480	6.300	8	76	114	AXC0806300T6
1/4	0.2500	6.350	8	76	114	AXC0806350T6
	0.2520	6.400	8	76	114	AXC0806400T6
	0.2559	6.500	8	76	114	AXC0806500T6
	0.2598	6.600	8	76	114	AXC0806600T6
	0.2638	6.700	8	76	114	AXC0806700T6
17/64	0.2656	6.750	8	76	114	AXC0806750T6
	0.2677	6.800	8	76	114	AXC0806800T6
	0.2717	6.900	8	76	114	AXC0806900T6
	0.2756	7.000	8	76	114	AXC0807000T6
	0.2795	7.100	8	76	114	AXC0807100T6
9/32	0.2813	7.140	8	76	114	AXC0807140T6
	0.2835	7.200	8	76	114	AXC0807200T6
	0.2874	7.300	8	76	114	AXC0807300T6
	0.2913	7.400	8	76	114	AXC0807400T6
	0.2953	7.500	8	76	114	AXC0807500T6
19/64	0.2969	7.540	8	76	114	AXC0807540T6
	0.3031	7.700	8	76	114	AXC0807700T6
	0.3071	7.800	8	76	114	AXC0807800T6
	0.3110	7.900	8	76	114	AXC0807900T6
5/16	0.3125	7.940	8	76	114	AXC0807940T6
	0.3150	8.000	8	76	114	AXC0808000T6
	0.3189	8.100	10	95	142	AXC0808100T6
	0.3228	8.200	10	95	142	AXC0808200T6
	0.3268	8.300	10	95	142	AXC0808300T6
21/64	0.3281	8.330	10	95	142	AXC0808330T6
	0.3307	8.400	10	95	142	AXC0808400T6
	0.3346	8.500	10	95	142	AXC0808500T6

****Other Dimensions are Available Upon Request****

Tolerance

Drill Dia (h7) Inches (in)	Drill Dia (h7) Metric (mm)	Shank Dia (h6) Inches (in)	Shank Dia (h6) Metric (mm)
.0000-.1181: + 0/-0.0039	0-3: + 0/-0.10	.0000-.1181: + 0/-0.0024	0-3: + 0/-0.006
.1182-.2362: + 0/-0.0047	3.01-6: + 0/-0.12	.1182-.2362: + 0/-0.0031	3.01-6: + 0/-0.008
.2363-.3937: + 0/-0.0059	6.01-10.0: + 0/-0.15	.2363-.3937: + 0/-0.0035	6.01-10.0: + 0/-0.009
.3938-.7087: + 0/-0.0071	10.01-18.0: + 0/-0.18	.3938-.7087: + 0/-0.0043	10.01-18.0: + 0/-0.11

D ₁	Decimal	D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm	Part #
	0.3386	8.600	10	95	142	AXC0808600T6
	0.3425	8.700	10	95	142	AXC0808700T6
11/32	0.3437	8.730	10	95	142	AXC0808730T6
	0.3465	8.800	10	95	142	AXC0808800T6
	0.3543	9.000	10	95	142	AXC0809000T6
23/64	0.3594	9.130	10	95	142	AXC0809130T6
	0.3622	9.200	10	95	142	AXC0809200T6
	0.3661	9.300	10	95	142	AXC0809300T6
	0.3740	9.500	10	95	142	AXC0809500T6
3/8	0.3750	9.520	10	95	142	AXC0809520T6
	0.3780	9.600	10	95	142	AXC0809600T6
	0.3858	9.800	10	95	142	AXC0809800T6
	0.3898	9.900	10	95	142	AXC0809900T6
25/64	0.3906	9.920	10	95	142	AXC0809920T6
	0.3937	10.000	10	95	142	AXC0810000T6
	0.3976	10.100	12	114	162	AXC0810100T6
	0.4016	10.200	12	114	162	AXC0810200T6
	0.4055	10.300	12	114	162	AXC0810300T6
13/32	0.4063	10.320	12	114	162	AXC0810320T6
	0.4094	10.400	12	114	162	AXC0810400T6
	0.4134	10.500	12	114	162	AXC0810500T6
27/64	0.4219	10.720	12	114	162	AXC0810720T6
	0.4252	10.800	12	114	162	AXC0810800T6
	0.4331	11.000	12	114	162	AXC0811000T6
	0.4370	11.100	12	114	162	AXC0811100T6
7/16	0.4375	11.113	12	114	162	AXC0804375T6
	0.4409	11.200	12	114	162	AXC0811200T6
	0.4528	11.500	12	114	162	AXC0811500T6
29/64	0.4531	11.510	12	114	162	AXC0811510T6
	0.4606	11.700	12	114	162	AXC0811700T6

D ₁	Decimal	D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm	Part #
	0.4646	11.800	12	114	162	AXC0811800T6
15/32	0.4687	11.910	12	114	162	AXC0811910T6
	0.4724	12.000	12	114	162	AXC0812000T6
	0.4764	12.100	14	131	178	AXC0812100T6
	0.4803	12.200	14	131	178	AXC0812200T6
	0.4843	12.300	14	131	178	AXC0812300T6
31/64	0.4844	12.303	14	131	178	AXC0804844T6
	0.4921	12.500	14	131	178	AXC0812500T6
	0.4961	12.600	14	131	178	AXC0812600T6
1/2	0.5000	12.700	14	131	178	AXC0812700T6
	0.5118	13.000	14	131	178	AXC0813000T6
	0.5236	13.300	14	131	178	AXC0813300T6
17/32	0.5313	13.490	14	131	178	AXC0813490T6
	0.5315	13.500	14	131	178	AXC0813500T6
	0.5512	14.000	14	131	178	AXC0814000T6
9/16	0.5625	14.290	16	152	203	AXC0814290T6
	0.5709	14.500	16	152	203	AXC0814500T6
	0.5906	15.000	16	152	203	AXC0815000T6
	0.6102	15.500	16	152	203	AXC0815500T6
5/8	0.6250	15.870	16	152	203	AXC0815870T6
	0.6299	16.000	16	152	203	AXC0816000T6
	0.6496	16.500	18	171	222	AXC0816500T6
	0.6693	17.000	18	171	222	AXC0817000T6
	0.6890	17.500	18	171	222	AXC0817500T6
	0.7087	18.000	18	171	222	AXC0818000T6
	0.7283	18.500	20	190	243	AXC0818500T6
3/4	0.7500	19.050	20	190	243	AXC0819050T6
	0.7677	19.500	20	190	243	AXC0819500T6
	0.7874	20.000	20	190	243	AXC0820000T6

Other Dimensions are Available Upon Request

AXC 8xD Speeds and Feeds METRIC		Vc m/min (Cutting speed)	D1mm	F[mm/u] Feed Per Revolution				
Material				> 3.00 ≤ 5.00	> 5.00 ≤ 8.00	> 8.00 ≤ 12.00	> 12.00 ≤ 16.00	> 16.00 ≤ 20.00
N1	Wrought Aluminum Alloys	320		.30	.40	.50	.60	.65
N2	Low-Silicon Aluminum Alloys Si <12.2% - 6061, 7075	320		.35	.45	.55	.65	.70
N3	High-Silicon Aluminum Alloys Si>12.2% - 6061, 7075	310		.30	.40	.50	.60	.65
N5	Copper & Copper Alloys	135		.23	.30	.38	.45	.52

Note: These are only recommended starting figures that depend on conditions such as machine and material rigidity, type of coating if any, etc. TESTING IS RECOMMENDED

AXC 8xD Speeds and Feeds INCHES		SFM(Vc) Surface Feet Per Minute	D1mm	IPR=Inches Per Revolution				
Material				> 3.00 ≤ 5.00	> 5.00 ≤ 8.00	> 8.00 ≤ 12.00	> 12.00 ≤ 16.00	> 16.00 ≤ 20.00
N1	Wrought Aluminum Alloys	1049.9		0.012	0.015	0.019	0.023	0.025
N2	Low-Silicon Aluminum Alloys Si <12.2% - 6061, 7075	1049.9		0.013	0.017	0.022	0.025	0.027
N3	High-Silicon Aluminum Alloys Si>12.2% - 6061, 7075	1017.9		0.011	0.015	0.019	0.023	0.025
N5	Copper & Copper Alloys	442.9		0.009	0.011	0.015	0.015	0.021

Note: These are only recommended starting figures that depend on conditions such as machine and material rigidity, type of coating if any, etc. TESTING IS RECOMMENDED

General Purpose Carbide Drills
Aluminum Carbide Drills
Steels Carbide Drills
Hardened Steels Carbide Drills
Spotting Carbide Drills
General Purpose Drills up to 30XD
Aluminum Drills up to 30XD
Drills for Steel
Pilot Drills

Solid Carbide Drills Non-Coolant

Solid Carbide Drills Internal Coolant

Design

Long spiral-fluted, triple-margin, right-hand cut and internal coolant.

Coating

Z-Power (ZrN)

Ideal for

aluminum, cast materials and non-ferrous materials (Refer to page 245)



Speeds & Feeds Refer to Page 100.

Diameters (2.0 - 2.9mm)

Available Upon Request.

Left-Hand, Available Upon Request

Diseño

Flautas largas espirales, margen triple con corte de mano derecha y refrigerante interno.

Recubrimiento

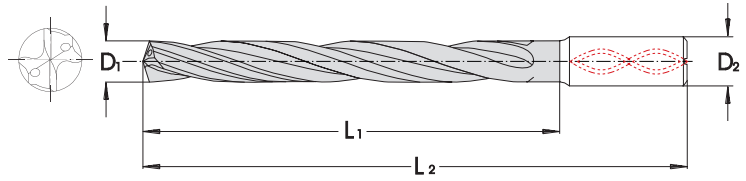
Z-Power (ZrN)

Ideal para

aluminio, materiales de fundición y materiales no ferrosos (Consulte la página 246)



Z-Power® has excellent corrosion and adhesion resistant properties.



D ₁	Decimal	D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm	Part #
	0.1181	3.000	6	54	92	AXC1203000T6
	0.1220	3.100	6	54	92	AXC1203100T6
1/8	0.1250	3.175	6	54	92	AXC1203175T6
	0.1260	3.200	6	54	92	AXC1203200T6
	0.1299	3.300	6	54	92	AXC1203300T6
	0.1339	3.400	6	54	92	AXC1203400T6
	0.1378	3.500	6	54	92	AXC1203500T6
9/64	0.1406	3.572	6	54	92	AXC1203572T6
	0.1417	3.600	6	54	92	AXC1203600T6
	0.1457	3.700	6	54	92	AXC1203700T6
25	0.1496	3.800	6	64	102	AXC1203800T6
	0.1535	3.900	6	64	102	AXC1203900T6
5/32	0.1563	3.970	6	64	102	AXC1203970T6
	0.1575	4.000	6	64	102	AXC1204000T6
	0.1614	4.100	6	64	102	AXC1204100T6
	0.1654	4.200	6	64	102	AXC1204200T6
	0.1693	4.300	6	64	102	AXC1204300T6
11/64	0.1719	4.370	6	64	102	AXC1204370T6
	0.1732	4.400	6	64	102	AXC1204400T6
	0.1772	4.500	6	64	102	AXC1204500T6
	0.1811	4.600	6	64	102	AXC1204600T6
	0.1831	4.650	6	64	102	AXC1204650T6
13	0.1850	4.700	6	64	102	AXC1200130T6
3/16	0.1875	4.760	6	78	116	AXC1204760T6
12	0.1890	4.800	6	78	116	AXC1200120T6
	0.1929	4.900	6	78	116	AXC1204900T6
	0.1969	5.000	6	78	116	AXC1205000T6
	0.2008	5.100	6	78	116	AXC1205100T6
13/64	0.2031	5.160	6	78	116	AXC1205160T6
6	0.2040	5.182	6	78	116	AXC1200060T6
	0.2047	5.200	6	78	116	AXC1205200T6
	0.2087	5.300	6	78	116	AXC1205300T6
	0.2126	5.400	6	78	116	AXC1205400T6
	0.2165	5.500	6	78	116	AXC1205500T6
	0.2185	5.550	6	78	116	AXC1205550T6
7/32	0.2187	5.560	6	78	116	AXC1205560T6

D ₁	Decimal	D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm	Part #
	0.2205	5.600	6	78	116	AXC1205600T6
	0.2244	5.700	6	78	116	AXC1205700T6
	0.2283	5.800	6	78	116	AXC1205800T6
	0.2323	5.900	6	78	116	AXC1205900T6
15/64	0.2344	5.950	6	78	116	AXC1205950T6
	0.2362	6.000	6	78	116	AXC1206000T6
	0.2402	6.100	8	108	146	AXC1206100T6
	0.2441	6.200	8	108	146	AXC1206200T6
	0.2480	6.300	8	108	146	AXC1206300T6
1/4	0.2500	6.350	8	108	146	AXC1206350T6
	0.2520	6.400	8	108	146	AXC1206400T6
	0.2559	6.500	8	108	146	AXC1206500T6
	0.2598	6.600	8	108	146	AXC1206600T6
	0.2638	6.700	8	108	146	AXC1206700T6
17/64	0.2656	6.750	8	108	146	AXC1206750T6
	0.2677	6.800	8	108	146	AXC1206800T6
	0.2717	6.900	8	108	146	AXC1206900T6
	0.2756	7.000	8	108	146	AXC1207000T6
	0.2795	7.100	8	108	146	AXC1207100T6
9/32	0.2813	7.140	8	108	146	AXC1207140T6
	0.2835	7.200	8	108	146	AXC1207200T6
	0.2874	7.300	8	108	146	AXC1207300T6
	0.2913	7.400	8	108	146	AXC1207400T6
	0.2953	7.500	8	108	146	AXC1207500T6
19/64	0.2969	7.540	8	108	146	AXC1207540T6
	0.3031	7.700	8	108	146	AXC1207700T6
	0.3071	7.800	8	108	146	AXC1207800T6
	0.3110	7.900	8	108	146	AXC1207900T6
5/16	0.3125	7.940	8	108	146	AXC1207940T6
	0.3150	8.000	8	108	146	AXC1208000T6
	0.3189	8.100	10	120	162	AXC1208100T6
	0.3228	8.200	10	120	162	AXC1208200T6
	0.3268	8.300	10	120	162	AXC1208300T6
21/64	0.3281	8.330	10	120	162	AXC1208330T6
	0.3307	8.400	10	120	162	AXC1208400T6
	0.3346	8.500	10	120	162	AXC1208500T6

Other Dimensions are Available Upon Request

General Purpose Carbide Drills
Aluminum Carbide Drills
Steels Carbide Drills
Hardened Steels Carbide Drills
Spotting Carbide Drills

Solid Carbide Drills Non-Coolant

General Purpose Drills up to 30xD

Aluminum Drills up to 30xD

Drills for Steels

Pilot Drills

Solid Carbide Drills Internal Coolant

D ₁	Decimal	D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm	Part #
	0.3386	8.600	10	120	162	AXC1208600T6
	0.3425	8.700	10	120	162	AXC1208700T6
11/32	0.3437	8.730	10	120	162	AXC1208730T6
	0.3465	8.800	10	120	162	AXC1208800T6
	0.3543	9.000	10	120	162	AXC1209000T6
23/64	0.3594	9.130	10	120	162	AXC1209130T6
	0.3622	9.200	10	120	162	AXC1209200T6
	0.3661	9.300	10	120	162	AXC1209300T6
	0.3740	9.500	10	120	162	AXC1209500T6
3/8	0.3750	9.520	10	120	162	AXC1209520T6
	0.3780	9.600	10	120	162	AXC1209600T6
	0.3858	9.800	10	120	162	AXC1209800T6
	0.3898	9.900	10	120	162	AXC1209900T6
25/64	0.3906	9.920	10	120	162	AXC1209920T6
	0.3937	10.000	10	120	162	AXC1210000T6
	0.3976	10.100	12	156	204	AXC1210100T6
	0.4016	10.200	12	156	204	AXC1210200T6
	0.4055	10.300	12	156	204	AXC1210300T6
13/32	0.4063	10.320	12	156	204	AXC1210320T6
	0.4094	10.400	12	156	204	AXC1210400T6
	0.4134	10.500	12	156	204	AXC1210500T6
27/64	0.4219	10.720	12	156	204	AXC1210720T6
	0.4252	10.800	12	156	204	AXC1210800T6
	0.4331	11.000	12	156	204	AXC1211000T6
	0.4370	11.100	12	156	204	AXC1211100T6
7/16	0.4375	11.113	12	156	204	AXC1204375T6
	0.4409	11.200	12	156	204	AXC1211200T6
	0.4528	11.500	12	156	204	AXC1211500T6
29/64	0.4531	11.510	12	156	204	AXC1211510T6
	0.4606	11.700	12	156	204	AXC1211700T6

D ₁	Decimal	D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm	Part #
	0.4646	11.800	12	156	204	AXC1211800T6
15/32	0.4687	11.910	12	156	204	AXC1211910T6
	0.4724	12.000	12	156	204	AXC1212000T6
	0.4764	12.100	14	182	230	AXC1212100T6
	0.4803	12.200	14	182	230	AXC1212200T6
	0.4843	12.300	14	182	230	AXC1212300T6
31/64	0.4844	12.303	14	182	230	AXC1204844T6
	0.4921	12.500	14	182	230	AXC1212500T6
	0.4961	12.600	14	182	230	AXC1212600T6
1/2	0.5000	12.700	14	182	230	AXC1212700T6
	0.5118	13.000	14	182	230	AXC1213000T6
	0.5236	13.300	14	182	230	AXC1213300T6
17/32	0.5313	13.490	14	182	230	AXC1213490T6
	0.5315	13.500	14	182	230	AXC1213500T6
	0.5512	14.000	14	182	230	AXC1214000T6
9/16	0.5625	14.290	16	208	260	AXC1214290T6
	0.5709	14.500	16	208	260	AXC1214500T6
	0.5906	15.000	16	208	260	AXC1215000T6
	0.6102	15.500	16	208	260	AXC1215500T6
5/8	0.6250	15.870	16	208	260	AXC1215870T6
	0.6299	16.000	16	208	260	AXC1216000T6
	0.6496	16.500	18	234	285	AXC1216500T6
	0.6693	17.000	18	234	285	AXC1217000T6
	0.6890	17.500	18	234	285	AXC1217500T6
	0.7087	18.000	18	234	285	AXC1218000T6
	0.7283	18.500	20	258	310	AXC1218500T6
3/4	0.7500	19.050	20	258	310	AXC1219050T6
	0.7677	19.500	20	258	310	AXC1219500T6
	0.7874	20.000	20	258	310	AXC1220000T6

Other Dimensions are Available Upon Request

Tolerance

Drill Dia (h7) Inches (in)	Drill Dia (h7) Metric (mm)	Shank Dia (h6) Inches (in)	Shank Dia (h6) Metric (mm)
.0000-.1181: + 0/- .00039	0-3: + 0/- .010	.0000-.1181: + 0/- .00024	0-3: + 0/- .006
.1182-.2362: + 0/- .00047	3.01-6: + 0/- .012	.1182-.2362: + 0/- .00031	3.01-6: + 0/- .008
.2363-.3937: + 0/- .00059	6.01-10.0: + 0/- .015	.2363-.3937: + 0/- .00035	6.01-10.0: + 0/- .009
.3938-.7087: + 0/- .00071	10.01-18.0: + 0/- .018	.3938-.7087: + 0/- .00043	10.01-18.0: + 0/- .011

General Purpose Carbide Drills
 Aluminum Carbide Drills
 Steels Carbide Drills
 Hardened Steels Carbide Drills
 Spotting Carbide Drills
 General Purpose Drills up to 30xD
 Aluminum Drills up to 30xD
 Drills for Steel
 Pilot Drills
Solid Carbide Drills Non-Coolant
Solid Carbide Drills Internal Coolant

Design

Long spiral-fluted, triple-margin, right-hand cut and internal coolant.

Coating

Z-Power (ZrN)

Ideal for

aluminum, cast materials and non-ferrous materials (Refer to page 245)



Diseño

Flautas largas espirales, margen triple con corte de mano derecha y refrigerante interno.

Recubrimiento

Z-Power (ZrN)

Ideal para

aluminio, materiales de fundición y materiales no ferrosos (Consulte la página 246)



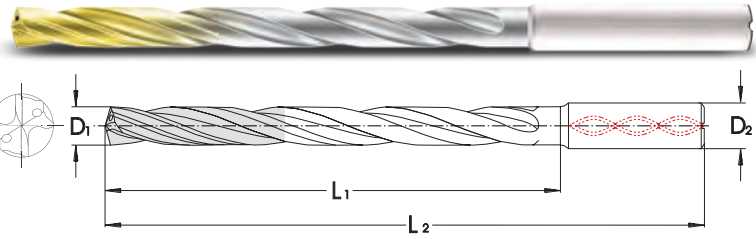
Z-Power® has excellent corrosion and adhesion resistant properties.

Speeds & Feeds Refer to Page 100.

■ This drill must utilize a pilot hole drill. (Refer to page 114)

Diameters (2.0 - 2.9mm) Available Upon Request.

Left-Hand, Available Upon Request



D ₁	Decimal	D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm	Part #
	0.1181	3.000	6	60	100	AXC1603000T6
	0.1220	3.100	6	60	100	AXC1603100T6
1/8	0.1250	3.175	6	60	100	AXC1603175T6
	0.1260	3.200	6	60	100	AXC1603200T6
	0.1299	3.300	6	60	100	AXC1603300T6
	0.1339	3.400	6	60	100	AXC1603400T6
	0.1378	3.500	6	60	100	AXC1603500T6
9/64	0.1406	3.572	6	75	115	AXC1603572T6
	0.1417	3.600	6	75	115	AXC1603600T6
	0.1457	3.700	6	75	115	AXC1603700T6
25	0.1496	3.800	6	75	115	AXC1603800T6
	0.1535	3.900	6	75	115	AXC1603900T6
5/32	0.1563	3.970	6	75	115	AXC1603970T6
	0.1575	4.000	6	75	115	AXC1604000T6
	0.1614	4.100	6	75	115	AXC1604100T6
	0.1654	4.200	6	75	115	AXC1604200T6
	0.1693	4.300	6	90	130	AXC1604300T6
11/64	0.1719	4.370	6	90	130	AXC1604370T6
	0.1732	4.400	6	90	130	AXC1604400T6
	0.1772	4.500	6	90	130	AXC1604500T6
	0.1811	4.600	6	90	130	AXC1604600T6
	0.1831	4.650	6	90	130	AXC1604650T6
13	0.1850	4.700	6	90	130	AXC1600130T6
3/16	0.1875	4.760	6	90	130	AXC1604760T6
12	0.1890	4.800	6	90	130	AXC1600120T6
	0.1929	4.900	6	90	130	AXC1604900T6
	0.1969	5.000	6	90	130	AXC1605000T6
	0.2008	5.100	6	108	150	AXC1605100T6
13/64	0.2031	5.160	6	108	150	AXC1605160T6
	0.2047	5.200	6	108	150	AXC1605200T6
	0.2087	5.300	6	108	150	AXC1605300T6
	0.2126	5.400	6	108	150	AXC1605400T6
	0.2165	5.500	6	108	150	AXC1605500T6
	0.2185	5.550	6	108	150	AXC1605550T6
7/32	0.2187	5.560	6	108	150	AXC1605560T6
	0.2205	5.600	6	108	150	AXC1605600T6
	0.2244	5.700	6	108	150	AXC1605700T6
	0.2283	5.800	6	108	150	AXC1605800T6
	0.2323	5.900	6	108	150	AXC1605900T6
15/64	0.2344	5.950	6	108	150	AXC1605950T6
	0.2362	6.000	6	108	150	AXC1606000T6
	0.2402	6.100	8	125	165	AXC1606100T6
	0.2441	6.200	8	125	165	AXC1606200T6
	0.2480	6.300	8	125	165	AXC1606300T6
1/4	0.2500	6.350	8	125	165	AXC1606350T6
	0.2520	6.400	8	125	165	AXC1606400T6
	0.2559	6.500	8	125	165	AXC1606500T6
	0.2598	6.600	8	125	165	AXC1606600T6

D ₁	Decimal	D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm	Part #
	0.2638	6.700	8	125	165	AXC1606700T6
17/64	0.2656	6.750	8	125	165	AXC1606750T6
	0.2677	6.800	8	125	165	AXC1606800T6
	0.2717	6.900	8	125	165	AXC1606900T6
	0.2756	7.000	8	125	165	AXC1607000T6
	0.2795	7.100	8	140	180	AXC1607100T6
9/32	0.2813	7.140	8	140	180	AXC1607140T6
	0.2835	7.200	8	140	180	AXC1607200T6
	0.2874	7.300	8	140	180	AXC1607300T6
	0.2913	7.400	8	140	180	AXC1607400T6
	0.2953	7.500	8	140	180	AXC1607500T6
19/64	0.2969	7.540	8	140	180	AXC1607540T6
	0.3071	7.800	8	140	180	AXC1607800T6
	0.3110	7.900	8	140	180	AXC1607900T6
5/16	0.3125	7.940	8	140	180	AXC1607940T6
	0.3150	8.000	8	140	180	AXC1608000T6
	0.3189	8.100	10	160	205	AXC1608100T6
	0.3228	8.200	10	160	205	AXC1608200T6
21/64	0.3281	8.330	10	160	205	AXC1608330T6
	0.3307	8.400	10	160	205	AXC1608400T6
	0.3346	8.500	10	160	205	AXC1608500T6
	0.3386	8.600	10	160	205	AXC1608600T6
	0.3425	8.700	10	160	205	AXC1608700T6
11/32	0.3437	8.730	10	160	205	AXC1608730T6
	0.3465	8.800	10	160	205	AXC1608800T6
	0.3543	9.000	10	160	205	AXC1609000T6
23/64	0.3594	9.130	10	180	225	AXC1609130T6
	0.3622	9.200	10	180	225	AXC1609200T6
	0.3661	9.300	10	180	225	AXC1609300T6
	0.3740	9.500	10	180	225	AXC1609500T6
3/8	0.3750	9.520	10	180	225	AXC1609520T6
	0.3780	9.600	10	180	225	AXC1609600T6
	0.3858	9.800	10	180	225	AXC1609800T6
25/64	0.3906	9.920	10	180	225	AXC1609920T6
	0.3937	10.000	10	180	225	AXC1610000T6
	0.3976	10.100	12	190	240	AXC1610100T6
	0.4016	10.200	12	190	240	AXC1610200T6
13/32	0.4063	10.320	12	190	240	AXC1610320T6
	0.4094	10.400	12	190	240	AXC1610400T6
	0.4134	10.500	12	190	240	AXC1610500T6
27/64	0.4219	10.720	12	190	240	AXC1610720T6
	0.4252	10.800	12	190	240	AXC1610800T6
	0.4331	11.000	12	190	240	AXC1611000T6
7/16	0.4375	11.113	12	215	265	AXC1604375T6
	0.4528	11.500	12	215	265	AXC1611500T6
29/64	0.4531	11.510	12	215	265	AXC1611510T6
15/32	0.4687	11.910	12	215	265	AXC1611910T6
	0.4724	12.000	12	215	265	AXC1612000T6

Other Dimensions are Available Upon Request

Design

Long spiral-fluted, triple-margin, right-hand cut and internal coolant.

Coating

Z-Power (ZrN)

Ideal for

aluminum, cast materials and non-ferrous materials (Refer to page 245)

K N

Speeds & Feeds Refer to Page 100.

Diameters (2.0 - 2.9mm)
Available Upon Request.

****Left-Hand, Available Upon Request****

Diseño

Flautas largas espirales, margen triple con corte de mano derecha y refrigerante interno.

Recubrimiento

Z-Power (ZrN)

Ideal para

aluminio, materiales de fundición y materiales no ferrosos (Consulte la página 246)

K N



Z-Power® has excellent corrosion and adhesion resistant properties.

■ This drill must utilize a pilot hole drill. (Refer to page 114)



D ₁	Decimal	D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm	Part #
	0.1181	3.000	6	80	120	AXC2003000T6
	0.1220	3.100	6	80	120	AXC2003100T6
1/8	0.1250	3.175	6	80	120	AXC2003175T6
	0.1260	3.200	6	80	120	AXC2003200T6
	0.1299	3.300	6	80	120	AXC2003300T6
	0.1339	3.400	6	80	120	AXC2003400T6
	0.1378	3.500	6	80	120	AXC2003500T6
9/64	0.1406	3.572	6	90	130	AXC2003572T6
	0.1417	3.600	6	90	130	AXC2003600T6
	0.1457	3.700	6	90	130	AXC2003700T6
25	0.1496	3.800	6	90	130	AXC2003800T6
	0.1535	3.900	6	90	130	AXC2003900T6
5/32	0.1563	3.970	6	90	130	AXC2003970T6
	0.1575	4.000	6	90	130	AXC2004000T6
	0.1614	4.100	6	110	160	AXC2004100T6
	0.1654	4.200	6	110	160	AXC2004200T6
	0.1693	4.300	6	110	160	AXC2004300T6
11/64	0.1719	4.370	6	110	160	AXC2004370T6
	0.1732	4.400	6	110	160	AXC2004400T6
	0.1772	4.500	6	110	160	AXC2004500T6
	0.1811	4.600	6	120	160	AXC2004600T6
	0.1831	4.650	6	120	160	AXC2004650T6
13	0.1850	4.700	6	120	160	AXC2000130T6
3/16	0.1875	4.760	6	120	160	AXC2004760T6
12	0.1890	4.800	6	120	160	AXC2000120T6
	0.1929	4.900	6	120	160	AXC2004900T6
	0.1969	5.000	6	120	160	AXC2005000T6
	0.2008	5.100	6	140	185	AXC2005100T6
13/64	0.2031	5.160	6	140	185	AXC2005160T6
	0.2047	5.200	6	140	185	AXC2005200T6
	0.2087	5.300	6	140	185	AXC2005300T6
	0.2126	5.400	6	140	185	AXC2005400T6
	0.2165	5.500	6	140	185	AXC2005500T6
	0.2185	5.550	6	140	185	AXC2005550T6
7/32	0.2187	5.560	6	140	185	AXC2005560T6
	0.2205	5.600	6	140	185	AXC2005600T6
	0.2244	5.700	6	140	185	AXC2005700T6
	0.2283	5.800	6	140	185	AXC2005800T6
	0.2323	5.900	6	140	185	AXC2005900T6
15/64	0.2344	5.950	6	140	185	AXC2005950T6
	0.2362	6.000	6	140	185	AXC2006000T6
	0.2402	6.100	8	160	210	AXC2006100T6
	0.2441	6.200	8	160	210	AXC2006200T6
	0.2480	6.300	8	160	210	AXC2006300T6
1/4	0.2500	6.350	8	160	210	AXC2006350T6
	0.2520	6.400	8	160	210	AXC2006400T6
	0.2559	6.500	8	160	210	AXC2006500T6
	0.2598	6.600	8	160	210	AXC2006600T6

****Other Dimensions are Available Upon Request****

D ₁	Decimal	D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm	Part #
	0.2638	6.700	8	160	210	AXC2006700T6
17/64	0.2656	6.750	8	160	210	AXC2006750T6
	0.2677	6.800	8	160	210	AXC2006800T6
	0.2717	6.900	8	160	210	AXC2006900T6
	0.2756	7.000	8	160	210	AXC2007000T6
	0.2795	7.100	8	180	230	AXC2007100T6
9/32	0.2813	7.140	8	180	230	AXC2007140T6
	0.2835	7.200	8	180	230	AXC2007200T6
	0.2874	7.300	8	180	230	AXC2007300T6
	0.2913	7.400	8	180	230	AXC2007400T6
	0.2953	7.500	8	180	230	AXC2007500T6
19/64	0.2969	7.540	8	180	230	AXC2007540T6
	0.3071	7.800	8	180	230	AXC2007800T6
	0.3110	7.900	8	180	230	AXC2007900T6
5/16	0.3125	7.940	8	180	230	AXC2007940T6
	0.3150	8.000	8	180	230	AXC2008000T6
	0.3189	8.100	10	195	260	AXC2008100T6
	0.3228	8.200	10	195	260	AXC2008200T6
21/64	0.3281	8.330	10	195	260	AXC2008330T6
	0.3307	8.400	10	195	260	AXC2008400T6
	0.3346	8.500	10	195	260	AXC2008500T6
	0.3386	8.600	10	230	290	AXC2008600T6
	0.3425	8.700	10	230	290	AXC2008700T6
11/32	0.3437	8.730	10	230	290	AXC2008730T6
	0.3465	8.800	10	230	290	AXC2008800T6
	0.3543	9.000	10	230	290	AXC2009000T6
23/64	0.3594	9.130	10	230	290	AXC2009130T6
	0.3622	9.200	10	230	290	AXC2009200T6
	0.3661	9.300	10	230	290	AXC2009300T6
	0.3740	9.500	10	230	290	AXC2009500T6
3/8	0.3750	9.520	10	230	290	AXC2009520T6
	0.3780	9.600	10	230	290	AXC2009600T6
	0.3858	9.800	10	230	290	AXC2009800T6
25/64	0.3906	9.920	10	230	290	AXC2009920T6
	0.3937	10.000	10	230	290	AXC2010000T6
	0.3976	10.100	12	268	315	AXC2010100T6
	0.4016	10.200	12	268	315	AXC2010200T6
13/32	0.4063	10.320	12	268	315	AXC2010320T6
	0.4094	10.400	12	268	315	AXC2010400T6
	0.4134	10.500	12	268	315	AXC2010500T6
27/64	0.4219	10.720	12	268	315	AXC2010720T6
	0.4252	10.800	12	268	315	AXC2010800T6
	0.4331	11.000	12	268	315	AXC2011000T6
7/16	0.4375	11.113	12	268	315	AXC2004375T6
	0.4528	11.500	12	268	315	AXC2011500T6
29/64	0.4531	11.510	12	268	315	AXC2011510T6
15/32	0.4687	11.910	12	268	315	AXC2011910T6
	0.4724	12.000	12	268	315	AXC2012000T6

Solid Carbide Drills Non-Coolant

Solid Carbide Drills Internal Coolant

General Purpose Carbide Drills
 Aluminum Carbide Drills
 Steels Carbide Drills
 Hardened Steels Carbide Drills
 Spotting Carbide Drills
 General Purpose Drills up to 30xD
 Aluminum Drills up to 30xD
 Drills for Steels
 Pilot Drills

General Purpose
Carbide Drills

Aluminum
Carbide Drills

Steels
Carbide Drills

Hardened Steels
Carbide Drills

Spotting
Carbide Drills

General Purpose
Drills up to 30xD

Aluminum Drills
up to 30xD

Drills for Steel

Pilot Drills

Design

Long spiral-fluted, triple-margin, right-hand cut and internal coolant.

Coating

Z-Power (ZrN)

Ideal for

aluminum, cast materials and non-ferrous materials (Refer to page 245)



Speeds & Feeds Refer to Page 101.

Diseño

Flautas largas espirales, margen triple con corte de mano derecha y refrigerante interno.

Recubrimiento

Z-Power (ZrN)

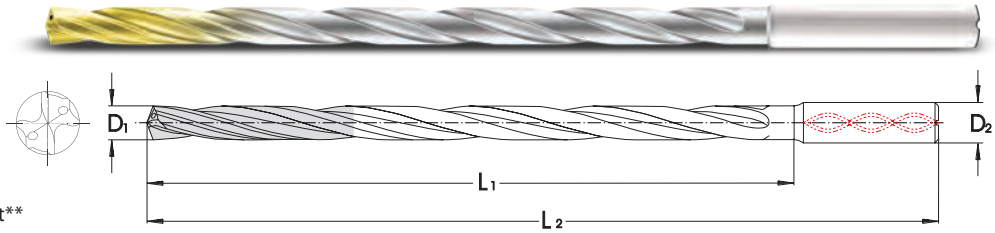
Ideal para

aluminio, materiales de fundición y materiales no ferrosos (Consulte la página 246)



Z-Power® has excellent corrosion and adhesion resistant properties.

■ This drill must utilize a pilot hole drill. (Refer to page 114)



**Diameters (2.0 - 2.9mm)
Available Upon Request.**

Left-Hand, Available Upon Request

D ₁	Decimal	D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm	Part #
	0.1181	3.000	6	98	135	AXC2503000T6
	0.1220	3.100	6	98	135	AXC2503100T6
1/8	0.1250	3.175	6	98	135	AXC2503175T6
	0.1260	3.200	6	110	150	AXC2503200T6
	0.1299	3.300	6	110	150	AXC2503300T6
	0.1339	3.400	6	110	150	AXC2503400T6
	0.1378	3.500	6	110	150	AXC2503500T6
9/64	0.1406	3.572	6	120	160	AXC2503572T6
	0.1417	3.600	6	120	160	AXC2503600T6
	0.1457	3.700	6	120	160	AXC2503700T6
25	0.1496	3.800	6	120	160	AXC2503800T6
	0.1535	3.900	6	120	160	AXC2503900T6
5/32	0.1563	3.970	6	120	160	AXC2503970T6
	0.1575	4.000	6	120	160	AXC2504000T6
	0.1614	4.100	6	120	160	AXC2504100T6
	0.1654	4.200	6	120	160	AXC2504200T6
	0.1693	4.300	6	135	180	AXC2504300T6
11/64	0.1719	4.370	6	135	180	AXC2504370T6
	0.1732	4.400	6	135	180	AXC2504400T6
	0.1772	4.500	6	135	180	AXC2504500T6
	0.1811	4.600	6	135	180	AXC2504600T6
	0.1831	4.650	6	135	180	AXC2504650T6
13	0.1850	4.700	6	135	180	AXC2500130T6
3/16	0.1875	4.760	6	135	180	AXC2504760T6
12	0.1890	4.800	6	135	180	AXC2500120T6
	0.1929	4.900	6	135	180	AXC2504900T6
	0.1969	5.000	6	135	180	AXC2505000T6
	0.2008	5.100	6	168	205	AXC2505100T6
13/64	0.2031	5.160	6	168	205	AXC2505160T6
6	0.2040	5.182	6	168	205	AXC2500060T6
	0.2047	5.200	6	168	205	AXC2505200T6
	0.2087	5.300	6	168	205	AXC2505300T6
	0.2126	5.400	6	168	205	AXC2505400T6
	0.2165	5.500	6	168	205	AXC2505500T6
	0.2185	5.550	6	168	205	AXC2505550T6
7/32	0.2187	5.560	6	168	205	AXC2505560T6
	0.2205	5.600	6	168	205	AXC2505600T6
	0.2244	5.700	6	168	205	AXC2505700T6
	0.2283	5.800	6	168	205	AXC2505800T6
	0.2323	5.900	6	168	205	AXC2505900T6
15/64	0.2344	5.950	6	168	205	AXC2505950T6
	0.2362	6.000	6	168	205	AXC2506000T6
	0.2402	6.100	8	200	240	AXC2506100T6
	0.2441	6.200	8	200	240	AXC2506200T6

D ₁	Decimal	D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm	Part #
	0.2480	6.300	8	200	240	AXC2506300T6
1/4	0.2500	6.350	8	200	240	AXC2506350T6
	0.2520	6.400	8	200	240	AXC2506400T6
	0.2559	6.500	8	200	240	AXC2506500T6
	0.2598	6.600	8	200	240	AXC2506600T6
	0.2638	6.700	8	200	240	AXC2506700T6
17/64	0.2656	6.750	8	200	240	AXC2506750T6
	0.2677	6.800	8	200	240	AXC2506800T6
	0.2717	6.900	8	200	240	AXC2506900T6
	0.2756	7.000	8	200	240	AXC2507000T6
	0.2795	7.100	8	220	260	AXC2507100T6
9/32	0.2813	7.140	8	220	260	AXC2507140T6
	0.2835	7.200	8	220	260	AXC2507200T6
	0.2874	7.300	8	220	260	AXC2507300T6
	0.2913	7.400	8	220	260	AXC2507400T6
	0.2953	7.500	8	220	260	AXC2507500T6
19/64	0.2969	7.540	8	220	260	AXC2507540T6
	0.3031	7.700	8	220	260	AXC2507700T6
	0.3071	7.800	8	220	260	AXC2507800T6
	0.3110	7.900	8	220	260	AXC2507900T6
5/16	0.3125	7.940	8	220	260	AXC2507940T6
	0.3150	8.000	8	220	260	AXC2508000T6
	0.3189	8.100	10	240	285	AXC2508100T6
	0.3228	8.200	10	240	285	AXC2508200T6
	0.3268	8.300	10	240	285	AXC2508300T6
21/64	0.3281	8.330	10	240	285	AXC2508330T6
	0.3307	8.400	10	240	285	AXC2508400T6
	0.3346	8.500	10	240	285	AXC2508500T6
	0.3386	8.600	10	268	310	AXC2508600T6
	0.3425	8.700	10	268	310	AXC2508700T6
11/32	0.3437	8.730	10	268	310	AXC2508730T6
	0.3465	8.800	10	268	310	AXC2508800T6
	0.3543	9.000	10	268	310	AXC2509000T6
23/64	0.3594	9.130	10	268	310	AXC2509130T6
	0.3622	9.200	10	268	310	AXC2509200T6
	0.3661	9.300	10	268	310	AXC2509300T6
	0.3740	9.500	10	268	310	AXC2509500T6
3/8	0.3750	9.520	10	268	310	AXC2509520T6
	0.3780	9.600	10	268	310	AXC2509600T6
	0.3858	9.800	10	268	310	AXC2509800T6
	0.3898	9.900	10	268	310	AXC2509900T6
25/64	0.3906	9.920	10	268	310	AXC2509920T6
	0.3937	10.000	10	268	310	AXC2510000T6

Other Dimensions are Available Upon Request

Design

Long spiral-fluted, triple-margin, right-hand cut and internal coolant.

Coating

Z-Power (ZrN)

Ideal for

aluminum, cast materials and non-ferrous materials (Refer to page 245)

K N

Speeds & Feeds Refer to Page 101.

Diseño

Flautas largas espirales, margen triple con corte de mano derecha y refrigerante interno.

Recubrimiento

Z-Power (ZrN)

Ideal para

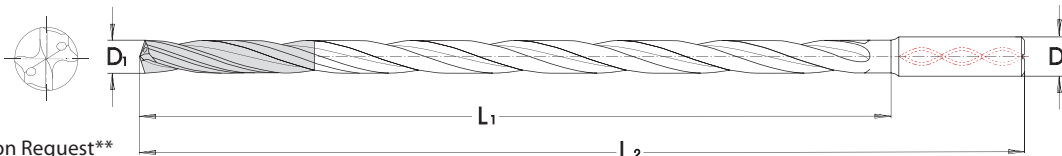
aluminio, materiales de fundición y materiales no ferrosos (Consulte la página 246)

K N



Z-Power® has excellent corrosion and adhesion resistant properties.

■ This drill must utilize a pilot hole drill. (Refer to page 114)



Diameters (2.0 - 2.9mm)
Available Upon Request.

****Left-Hand, Available Upon Request****

D ₁	Decimal	D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm	Part #
	0.1181	3.000	6	105	150	AXC3003000T6
	0.1220	3.100	6	105	150	AXC3003100T6
1/8	0.1250	3.175	6	105	150	AXC3003175T6
	0.1260	3.200	6	105	150	AXC3003200T6
	0.1299	3.300	6	135	185	AXC3003300T6
	0.1339	3.400	6	135	185	AXC3003400T6
	0.1378	3.500	6	135	185	AXC3003500T6
9/64	0.1406	3.572	6	135	185	AXC3003572T6
	0.1417	3.600	6	135	185	AXC3003600T6
	0.1457	3.700	6	135	185	AXC3003700T6
25	0.1496	3.800	6	135	185	AXC3003800T6
	0.1535	3.900	6	135	185	AXC3003900T6
5/32	0.1563	3.970	6	135	185	AXC3003970T6
	0.1575	4.000	6	135	185	AXC3004000T6
	0.1614	4.100	6	135	185	AXC3004100T6
	0.1654	4.200	6	135	185	AXC3004200T6
	0.1693	4.300	6	165	215	AXC3004300T6
11/64	0.1719	4.370	6	165	215	AXC3004370T6
	0.1732	4.400	6	165	215	AXC3004400T6
	0.1772	4.500	6	165	215	AXC3004500T6
	0.1811	4.600	6	165	215	AXC3004600T6
	0.1831	4.650	6	165	215	AXC3004650T6
13	0.1850	4.700	6	165	215	AXC3000130T6
3/16	0.1875	4.760	6	165	215	AXC3004760T6
12	0.1890	4.800	6	165	215	AXC3000120T6
	0.1929	4.900	6	165	215	AXC3004900T6
	0.1969	5.000	6	165	215	AXC3005000T6
	0.2008	5.100	6	180	230	AXC3005100T6
13/64	0.2031	5.160	6	180	230	AXC3005160T6
6	0.2040	5.182	6	180	230	AXC3000060T6
	0.2047	5.200	6	180	230	AXC3005200T6
	0.2087	5.300	6	180	230	AXC3005300T6
	0.2126	5.400	6	180	230	AXC3005400T6

****Other Dimensions are Available Upon Request****

D ₁	Decimal	D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm	Part #
	0.2165	5.500	6	180	230	AXC3005500T6
	0.2185	5.550	6	180	230	AXC3005550T6
7/32	0.2187	5.560	6	180	230	AXC3005560T6
	0.2205	5.600	6	180	230	AXC3005600T6
	0.2244	5.700	6	180	230	AXC3005700T6
	0.2283	5.800	6	180	230	AXC3005800T6
	0.2323	5.900	6	180	230	AXC3005900T6
15/64	0.2344	5.950	6	180	230	AXC3005950T6
	0.2362	6.000	6	180	230	AXC3006000T6
	0.2402	6.100	8	215	280	AXC3006100T6
	0.2441	6.200	8	215	280	AXC3006200T6
	0.2480	6.300	8	215	280	AXC3006300T6
1/4	0.2500	6.350	8	215	280	AXC3006350T6
	0.2520	6.400	8	215	280	AXC3006400T6
	0.2559	6.500	8	215	280	AXC3006500T6
	0.2598	6.600	8	230	280	AXC3006600T6
	0.2638	6.700	8	230	280	AXC3006700T6
17/64	0.2656	6.750	8	230	280	AXC3006750T6
	0.2677	6.800	8	230	280	AXC3006800T6
	0.2717	6.900	8	230	280	AXC3006900T6
	0.2756	7.000	8	230	280	AXC3007000T6
	0.2795	7.100	8	230	280	AXC3007100T6
9/32	0.2813	7.140	8	230	280	AXC3007140T6
	0.2835	7.200	8	230	280	AXC3007200T6
	0.2874	7.300	8	230	280	AXC3007300T6
	0.2913	7.400	8	230	280	AXC3007400T6
	0.2953	7.500	8	230	280	AXC3007500T6
19/64	0.2969	7.540	8	265	315	AXC3007540T6
	0.3031	7.700	8	265	315	AXC3007700T6
	0.3071	7.800	8	265	315	AXC3007800T6
	0.3110	7.900	8	265	315	AXC3007900T6
5/16	0.3125	7.940	8	265	315	AXC3007940T6
	0.3150	8.000	8	265	315	AXC3008000T6

General Purpose Carbide Drills
Aluminum Carbide Drills
Steels Carbide Drills
Hardened Steels Carbide Drills
Spotting Carbide Drills
General Purpose Drills up to 30xD
Aluminum Drills up to 30xD
Drills for Steels
Pilot Drills

Solid Carbide Drills Non-Coolant

Solid Carbide Drills Internal Coolant

General Purpose Carbide Drills
 Aluminum Carbide Drills
 Steels Carbide Drills
 Hardened Steels Carbide Drills
 Spotting Carbide Drills
 General Purpose Drills up to 30xD
 Aluminum Drills up to 30xD
 Drills for Steel
 Pilot Drills

AXC 12xD Speeds and Feeds METRIC

Material	Vc m/min (Cutting speed)	D1mm	F[mm/u] Feed Per Revolution							
			> 3.00 ≤ 5.00		> 5.00 ≤ 8.00		> 8.00 ≤ 12.00		> 12.00 ≤ 16.00	
			Dec. Inch.	.1181-1969	.1970-.3150	.3151-.4724	.4725-.6299	.6299-.7874	.7874-1.1811	
N1 Wrought Aluminum Alloys	250		.30	.40	.50	.60	.65			
N2 Low-Silicon Aluminum Alloys Si <12.2% - 6061, 7075	250		.35	.45	.55	.65	.70			
N3 High-Silicon Aluminum Alloys Si>12.2% - 6061, 7075	245		.30	.40	.50	.60	.65			
N5 Copper & Copper Alloys	120		.23	.30	.38	.45	.52			

Note: These are only recommended starting figures that depend on conditions such as machine and material rigidity, type of coating if any, etc. TESTING IS RECOMMENDED

AXC 12xD Speeds and Feeds INCHES

Material	SFM(Vc) Surface Feet Per Minute	D1mm	IPR=Inches Per Revolution							
			> 3.00 ≤ 5.00		> 5.00 ≤ 8.00		> 8.00 ≤ 12.00		> 12.00 ≤ 16.00	
			Dec. Inch.	.1181-1969	.1970-.3150	.3151-.4724	.4725-.6299	.6299-.7874	.7874-1.1811	
N1 Wrought Aluminum Alloys	820.3		0.012	0.015	0.019	0.023	0.025			
N2 Low-Silicon Aluminum Alloys Si <12.2% - 6061, 7075	820.3		0.013	0.017	0.022	0.025	0.027			
N3 High-Silicon Aluminum Alloys Si>12.2% - 6061, 7075	803.8		0.011	0.015	0.019	0.023	0.025			
N5 Copper & Copper Alloys	393.7		0.009	0.011	0.015	0.015	0.021			

Note: These are only recommended starting figures that depend on conditions such as machine and material rigidity, type of coating if any, etc. TESTING IS RECOMMENDED

AXC 16xD Speeds and Feeds METRIC

Material	Vc m/min (Cutting speed)	D1mm	F[mm/u] Feed Per Revolution							
			> 3.00 ≤ 5.00		> 5.00 ≤ 8.00		> 8.00 ≤ 12.00		> 12.00 ≤ 16.00	
			Dec. Inch.	.1181-1969	.1970-.3150	.3151-.4724	.4725-.6299	.6299-.7874	.7874-1.1811	
N1 Wrought Aluminum Alloys	160		.20	.25	.35	.40	.46			
N2 Low-Silicon Aluminum Alloys Si <12.2% - 6061, 7075	160		.25	.30	.38	.45	.52			
N3 High-Silicon Aluminum Alloys Si>12.2% - 6061, 7075	140		.20	.25	.35	.40	.46			
N5 Copper & Copper Alloys	90		.20	.25	.35	.40	.46			

Note: These are only recommended starting figures that depend on conditions such as machine and material rigidity, type of coating if any, etc. TESTING IS RECOMMENDED

AXC 16xD Speeds and Feeds INCHES

Material	SFM(Vc) Surface Feet Per Minute	D1mm	IPR=Inches Per Revolution							
			> 3.00 ≤ 5.00		> 5.00 ≤ 8.00		> 8.00 ≤ 12.00		> 12.00 ≤ 16.00	
			Dec. Inch.	.1181-1969	.1970-.3150	.3151-.4724	.4725-.6299	.6299-.7874	.7874-1.1811	
N1 Wrought Aluminum Alloys	525		0.012	0.015	0.019	0.023	0.025			
N2 Low-Silicon Aluminum Alloys Si <12.2% - 6061, 7075	525		0.013	0.017	0.022	0.025	0.027			
N3 High-Silicon Aluminum Alloys Si>12.2% - 6061, 7075	459.3		0.011	0.015	0.019	0.023	0.025			
N5 Copper & Copper Alloys	295.3		0.009	0.011	0.015	0.015	0.021			

Note: These are only recommended starting figures that depend on conditions such as machine and material rigidity, type of coating if any, etc. TESTING IS RECOMMENDED

AXC 20xD Speeds and Feeds METRIC

Material	Vc m/min (Cutting speed)	D1mm	F[mm/u] Feed Per Revolution							
			> 3.00 ≤ 5.00		> 5.00 ≤ 8.00		> 8.00 ≤ 12.00		> 12.00 ≤ 16.00	
			Dec. Inch.	.1181-1969	.1970-.3150	.3151-.4724	.4725-.6299	.6299-.7874	.7874-1.1811	
N1 Wrought Aluminum Alloys	150		.20	.25	.35	.40	.46			
N2 Low-Silicon Aluminum Alloys Si <12.2% - 6061, 7075	150		.23	.30	.38	.45	.52			
N3 High-Silicon Aluminum Alloys Si>12.2% - 6061, 7075	130		.20	.25	.35	.40	.46			
N5 Copper & Copper Alloys	80		.20	.25	.35	.40	.46			

Note: These are only recommended starting figures that depend on conditions such as machine and material rigidity, type of coating if any, etc. TESTING IS RECOMMENDED

AXC 20xD Speeds and Feeds INCHES

Material	SFM(Vc) Surface Feet Per Minute	D1mm	IPR=Inches Per Revolution							
			> 3.00 ≤ 5.00		> 5.00 ≤ 8.00		> 8.00 ≤ 12.00		> 12.00 ≤ 16.00	
			Dec. Inch.	.1181-1969	.1970-.3150	.3151-.4724	.4725-.6299	.6299-.7874	.7874-1.1811	
N1 Wrought Aluminum Alloys	492.2		0.012	0.015	0.019	0.023	0.025			
N2 Low-Silicon Aluminum Alloys Si <12.2% - 6061, 7075	492.2		0.013	0.017	0.022	0.025	0.027			
N3 High-Silicon Aluminum Alloys Si>12.2% - 6061, 7075	426.5		0.011	0.015	0.019	0.023	0.025			
N5 Copper & Copper Alloys	262.5		0.009	0.011	0.015	0.015	0.021			

Note: These are only recommended starting figures that depend on conditions such as machine and material rigidity, type of coating if any, etc. TESTING IS RECOMMENDED

AXC
25xD Speeds and Feeds

METRIC	Material	Vc m/min (Cutting speed)	D1mm	F[mm/u] Feed Per Revolution				
				> 3.00 ≤ 5.00	> 5.00 ≤ 8.00	> 8.00 ≤ 12.00	> 12.00 ≤ 16.00	> 16.00 ≤ 20.00
				Dec. Inch.	.1181- .1969	.1970- .3150	.3151- .4724	.4725- .6299
N 1	Wrought Aluminum Alloys	130		.20	.25	.35	.40	.46
N 2	Low-Silicon Aluminum Alloys Si <12.2% - 6061, 7075	130		.23	.30	.38	.45	.52
N 3	High-Silicon Aluminum Alloys Si>12.2% - 6061, 7075	120		.20	.25	.35	.40	.46
N 5	Copper & Copper Alloys	75		.20	.25	.35	.40	.46

Note: These are only recommended starting figures that depend on conditions such as machine and material rigidity, type of coating if any, etc. **TESTING IS RECOMMENDED**

AXC
25xD Speeds and Feeds

INCHES	Material	SFM(Vc) Surface Feet Per Minute	D1mm	IPR=Inches Per Revolution				
				> 3.00 ≤ 5.00	> 5.00 ≤ 8.00	> 8.00 ≤ 12.00	> 12.00 ≤ 16.00	> 16.00 ≤ 20.00
				Dec. Inch.	.1181- .1969	.1970- .3150	.3151- .4724	.4725- .6299
N 1	Wrought Aluminum Alloys	426.5		0.012	0.015	0.019	0.023	0.025
N 2	Low-Silicon Aluminum Alloys Si <12.2% - 6061, 7075	426.5		0.013	0.017	0.022	0.025	0.027
N 3	High-Silicon Aluminum Alloys Si>12.2% - 6061, 7075	393.7		0.011	0.015	0.019	0.023	0.025
N 5	Copper & Copper Alloys	246.1		0.009	0.011	0.015	0.015	0.021

Note: These are only recommended starting figures that depend on conditions such as machine and material rigidity, type of coating if any, etc. **TESTING IS RECOMMENDED**

AXC
30xD Speeds and Feeds

METRIC	Material	Vc m/min (Cutting speed)	D1mm	F[mm/u] Feed Per Revolution				
				> 3.00 ≤ 5.00	> 5.00 ≤ 8.00	> 8.00 ≤ 12.00	> 12.00 ≤ 16.00	> 16.00 ≤ 20.00
				Dec. Inch.	.1181- .1969	.1970- .3150	.3151- .4724	.4725- .6299
N 1	Wrought Aluminum Alloys	120		.20	.25	.35	.40	.46
N 2	Low-Silicon Aluminum Alloys Si <12.2% - 6061, 7075	120		.23	.30	.38	.45	.52
N 3	High-Silicon Aluminum Alloys Si>12.2% - 6061, 7075	115		.20	.25	.35	.40	.46
N 5	Copper & Copper Alloys	65		.20	.25	.35	.40	.46

Note: These are only recommended starting figures that depend on conditions such as machine and material rigidity, type of coating if any, etc. **TESTING IS RECOMMENDED**

AXC
30xD Speeds and Feeds

INCHES	Material	SFM(Vc) Surface Feet Per Minute	D1mm	IPR=Inches Per Revolution				
				> 3.00 ≤ 5.00	> 5.00 ≤ 8.00	> 8.00 ≤ 12.00	> 12.00 ≤ 16.00	> 16.00 ≤ 20.00
				Dec. Inch.	.1181- .1969	.1970- .3150	.3151- .4724	.4725- .6299
N 1	Wrought Aluminum Alloys	397.7		0.012	0.015	0.019	0.023	0.025
N 2	Low-Silicon Aluminum Alloys Si <12.2% - 6061, 7075	397.7		0.013	0.017	0.022	0.025	0.027
N 3	High-Silicon Aluminum Alloys Si>12.2% - 6061, 7075	377.3		0.011	0.015	0.019	0.023	0.025
N 5	Copper & Copper Alloys	213.3		0.009	0.011	0.015	0.015	0.021

Note: These are only recommended starting figures that depend on conditions such as machine and material rigidity, type of coating if any, etc. **TESTING IS RECOMMENDED**

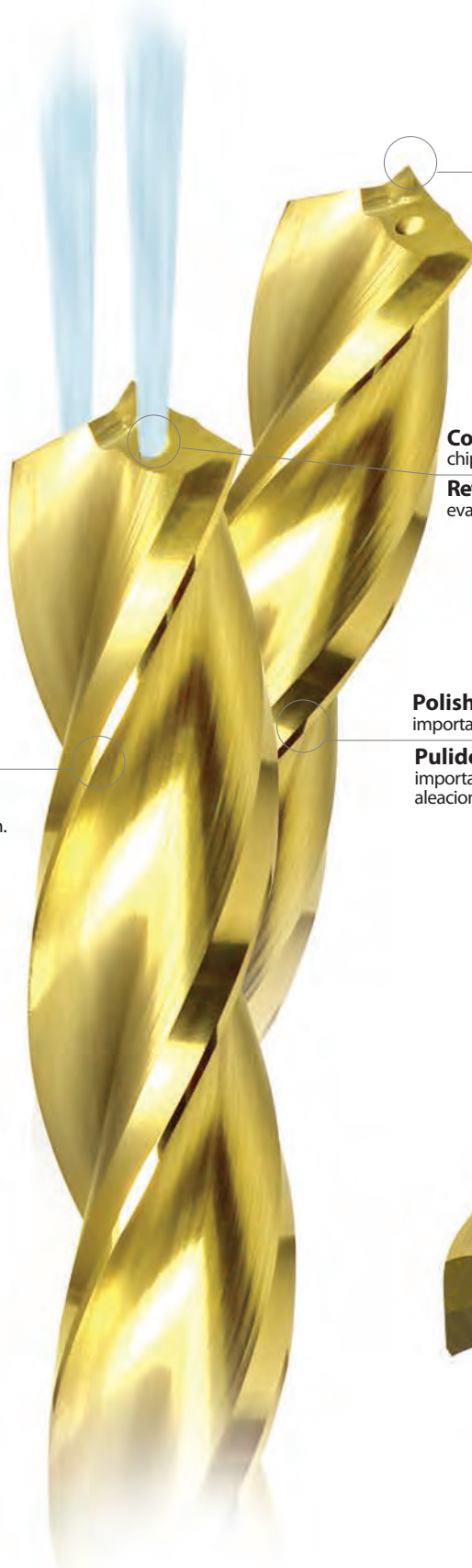
General Purpose Carbide Drills
Aluminum Carbide Drills
Steels Carbide Drills
Hardened Steels Carbide Drills
Spotting Carbide Drills
General Purpose Drills up to 30xD
Aluminum Drills up to 30xD
Drills for Steels
Pilot Drills

Solid Carbide Drills Non-Coolant

Solid Carbide Drills Internal Coolant



**High-Performance Drill
Single-Margin
Ideal for Aluminum and Cast Materials
3xD-5xD**



130° Point Geometry - The 130° self-centering point is engineered for fast and precise drilling.

130° Punto de Geometría - El punto autocentrante de 130 grados está diseñado para la perforación rápida y precisa.

Coolant Holes - Cool the cutting edge and improve chip evacuation.

Refrigerante Interno - Enfría el filo y mejora la evacuación de la viruta.

Z-Power Coating - Reduces friction between the chip and tool, preventing chip clogging. In addition, the coating reduces heat and abrasion wear.

Z-Power Recubrimiento - Reduce la fricción entre la viruta y la herramienta, previniendo el atasco de viruta. Además, el recubrimiento reduce la temperatura y abrasión.

Polished - Polishing the flutes in a drill is extremely important when machining aluminum and its alloys.

Pulido - El pulido de las flautas en una broca es muy importante durante el mecanizado de aluminio y sus aleaciones.

Tolerance

Drill Dia (h7) Inches (in)	Drill Dia (h7) Metric (mm)
.0000-.1181: + 0/--.00039	0-3: + 0/--.010
.1182-.2362: + 0/--.00047	3.01-6: + 0/--.012
.2363-.3937: + 0/--.00059	6.01-10.0: + 0/--.015
.3938-.7087: + 0/--.00071	10.01-18.0: + 0/--.018

Shank Dia (h6) Inches (in)	Shank Dia (h6) Metric (mm)
.0000-.1181: + 0/--.00024	0-3: + 0/--.006
.1182-.2362: + 0/--.00031	3.01-6: + 0/--.008
.2363-.3937: + 0/--.00035	6.01-10.0: + 0/--.009
.3938-.7087: + 0/--.00043	10.01-18.0: + 0/--.011





Z-Power® has excellent corrosion and adhesion resistant properties.

Design

Spiral-fluted, right-hand cut, with internal coolant and a cylindrical shank

Coating

Z-Power (ZrN)

Ideal for

aluminum, cast materials and non-ferrous materials (Refer to page 245)



Diseño

Flautas espirales con corte de mano derecha, refrigerante interno y un zanco cilíndrico.

Recubrimiento

Z-Power (ZrN)

Ideal para

aluminio, materiales de fundición y materiales no ferrosos (Consulte la página 246)

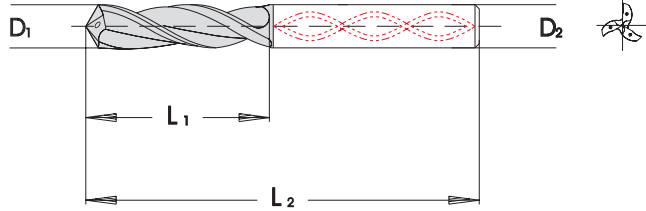


Speeds & Feeds Refer to Page 105 & 107.

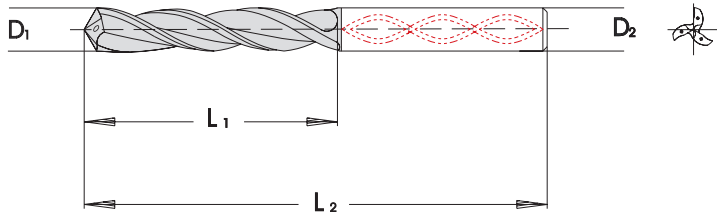
**Diameters (2.0 - 2.9mm)
Available Upon Request.**

****Left-Hand, Available Upon Request****

3xD PAGE 104



5xD PAGE 106



General Purpose
Carbide Drills

Aluminum
Carbide Drills

Steels
Carbide Drills

Hardened Steels
Carbide Drills

Spotting
Carbide Drills

General Purpose
Drills up to 30xD

Aluminum Drills
up to 30xD

Drills for Steels

Pilot Drills

Solid Carbide Drills Non-Coolant

Solid Carbide Drills Internal Coolant

General Purpose Carbide Drills
Aluminum Carbide Drills
Steels Carbide Drills
Hardened Steels Carbide Drills
Spotting Carbide Drills
General Purpose Drills up to 30xD
Aluminum Drills up to 30xD
Drills for Steel
Pilot Drills

Solid Carbide Drills Non-Coolant

Solid Carbide Drills Internal Coolant

Design

Spiral-fluted, right-hand-cut, with internal coolant and a cylindrical shank.

Coating

Z-Power (ZrN)

Ideal for

aluminum, cast materials and non-ferrous materials (Refer to page 245)



Diseño

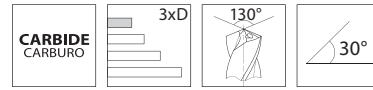
Flautas espirales con corte de mano derecha, refrigerante interno y un zanco cilíndrico.

Recubrimiento

Z-Power (ZrN)

Ideal para

aluminio, materiales de fundición y materiales no ferrosos (Consulte la página 246)

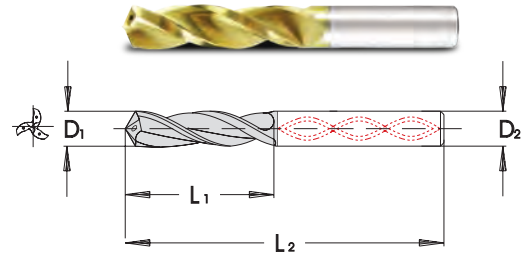


Z-Power® has excellent corrosion and adhesion resistant properties.

Speeds & Feeds Refer to Page 105.

Diameters (2.0 - 2.9mm)
Available Upon Request.

****Left-Hand, Available Upon Request****



D ₁	Decimal	D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm	Part #
	0.1181	3.000	6	20	62	CXC0303000T6
	0.1220	3.100	6	20	62	CXC0303100T6
1/8	0.1250	3.175	6	20	62	CXC0303175T6
	0.1260	3.200	6	20	62	CXC0303200T6
	0.1299	3.300	6	20	62	CXC0303300T6
	0.1339	3.400	6	20	62	CXC0303400T6
	0.1378	3.500	6	20	62	CXC0303500T6
9/64	0.1406	3.572	6	20	62	CXC0303572T6
	0.1417	3.600	6	20	62	CXC0303600T6
	0.1457	3.700	6	20	62	CXC0303700T6
25	0.1496	3.800	6	24	66	CXC0303800T6
	0.1535	3.900	6	24	66	CXC0303900T6
5/32	0.1563	3.970	6	24	66	CXC0303970T6
	0.1575	4.000	6	24	66	CXC0304000T6
	0.1614	4.100	6	24	66	CXC0304100T6
	0.1654	4.200	6	24	66	CXC0304200T6
	0.1693	4.300	6	24	66	CXC0304300T6
11/64	0.1719	4.370	6	24	66	CXC0304370T6
	0.1732	4.400	6	24	66	CXC0304400T6
	0.1772	4.500	6	24	66	CXC0304500T6
	0.1811	4.600	6	24	66	CXC0304600T6
	0.1831	4.650	6	24	66	CXC0304650T6
13	0.1850	4.700	6	24	66	CXC0300130T6
3/16	0.1875	4.760	6	28	66	CXC0304760T6
12	0.1890	4.800	6	28	66	CXC0300120T6
	0.1929	4.900	6	28	66	CXC0304900T6
	0.1969	5.000	6	28	66	CXC0305000T6
	0.2008	5.100	6	28	66	CXC0305100T6
13/64	0.2031	5.160	6	28	66	CXC0305160T6
6	0.2040	5.182	6	28	66	CXC0300060T6
	0.2047	5.200	6	28	66	CXC0305200T6
	0.2087	5.300	6	28	66	CXC0305300T6
	0.2126	5.400	6	28	66	CXC0305400T6
	0.2165	5.500	6	28	66	CXC0305500T6
	0.2185	5.550	6	28	66	CXC0305550T6
7/32	0.2187	5.560	6	28	66	CXC0305560T6

D ₁	Decimal	D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm	Part #
	0.2205	5.600	6	28	66	CXC0305600T6
	0.2244	5.700	6	28	66	CXC0305700T6
	0.2283	5.800	6	28	66	CXC0305800T6
	0.2323	5.900	6	28	66	CXC0305900T6
15/64	0.2344	5.950	6	28	66	CXC0305950T6
	0.2362	6.000	6	28	66	CXC0306000T6
	0.2402	6.100	8	34	79	CXC0306100T6
	0.2441	6.200	8	34	79	CXC0306200T6
	0.2480	6.300	8	34	79	CXC0306300T6
1/4	0.2500	6.350	8	34	79	CXC0306350T6
	0.2520	6.400	8	34	79	CXC0306400T6
	0.2559	6.500	8	34	79	CXC0306500T6
	0.2598	6.600	8	34	79	CXC0306600T6
	0.2638	6.700	8	34	79	CXC0306700T6
17/64	0.2656	6.750	8	34	79	CXC0306750T6
	0.2677	6.800	8	34	79	CXC0306800T6
	0.2717	6.900	8	41	79	CXC0306900T6
	0.2756	7.000	8	41	79	CXC0307000T6
	0.2795	7.100	8	41	79	CXC0307100T6
9/32	0.2813	7.140	8	41	79	CXC0307140T6
	0.2835	7.200	8	41	79	CXC0307200T6
	0.2874	7.300	8	41	79	CXC0307300T6
	0.2913	7.400	8	41	79	CXC0307400T6
	0.2953	7.500	8	41	79	CXC0307500T6
19/64	0.2969	7.540	8	41	79	CXC0307540T6
	0.3031	7.700	8	41	79	CXC0307700T6
	0.3071	7.800	8	41	79	CXC0307800T6
	0.3110	7.900	8	41	79	CXC0307900T6
5/16	0.3125	7.940	8	41	79	CXC0307940T6
	0.3150	8.000	8	41	79	CXC0308000T6
	0.3189	8.100	10	47	89	CXC0308100T6
	0.3228	8.200	10	47	89	CXC0308200T6
	0.3268	8.300	10	47	89	CXC0308300T6
21/64	0.3281	8.330	10	47	89	CXC0308330T6
	0.3307	8.400	10	47	89	CXC0308400T6
	0.3346	8.500	10	47	89	CXC0308500T6

****Other Dimensions are Available Upon Request****

Tolerance

Drill Dia (h7) Inches (in)	Drill Dia (h7) Metric (mm)	Shank Dia (h6) Inches (in)	Shank Dia (h6) Metric (mm)
.0000-.1181: +0/-0.0039	0-3: +0/-0.10	.0000-.1181: +0/-0.0024	0-3: +0/-0.06
.1182-.2362: +0/-0.0047	3.01-6: +0/-0.12	.1182-.2362: +0/-0.0031	3.01-6: +0/-0.08
.2363-.3937: +0/-0.0059	6.01-10.0: +0/-0.15	.2363-.3937: +0/-0.0035	6.01-10.0: +0/-0.09
.3938-.7087: +0/-0.0071	10.01-18.0: +0/-0.18	.3938-.7087: +0/-0.0043	10.01-18.0: +0/-0.11

D ₁	Decimal	D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm	Part #
	0.3386	8.600	10	47	89	CXC0308600T6
	0.3425	8.700	10	47	89	CXC0308700T6
11/32	0.3437	8.730	10	47	89	CXC0308730T6
	0.3465	8.800	10	47	89	CXC0308800T6
	0.3543	9.000	10	47	89	CXC0309000T6
23/64	0.3594	9.130	10	47	89	CXC0309130T6
	0.3622	9.200	10	47	89	CXC0309200T6
	0.3661	9.300	10	47	89	CXC0309300T6
	0.3740	9.500	10	47	89	CXC0309500T6
3/8	0.3750	9.520	10	47	89	CXC0309520T6
	0.3780	9.600	10	47	89	CXC0309600T6
	0.3858	9.800	10	47	89	CXC0309800T6
	0.3898	9.900	10	47	89	CXC0309900T6
25/64	0.3906	9.920	10	47	89	CXC0309920T6
	0.3937	10.000	10	47	89	CXC0310000T6
	0.3976	10.100	12	55	102	CXC0310100T6
	0.4016	10.200	12	55	102	CXC0310200T6
	0.4055	10.300	12	55	102	CXC0310300T6
13/32	0.4063	10.320	12	55	102	CXC0310320T6
	0.4094	10.400	12	55	102	CXC0310400T6
	0.4134	10.500	12	55	102	CXC0310500T6
27/64	0.4219	10.720	12	55	102	CXC0310720T6
	0.4252	10.800	12	55	102	CXC0310800T6
	0.4331	11.000	12	55	102	CXC0311000T6
	0.4370	11.100	12	55	102	CXC0311100T6
7/16	0.4375	11.113	12	55	102	CXC0304375T6
	0.4409	11.200	12	55	102	CXC0311200T6
	0.4528	11.500	12	55	102	CXC0311500T6
29/64	0.4531	11.510	12	55	102	CXC0311510T6
	0.4606	11.700	12	55	102	CXC0311700T6

Other Dimensions are Available Upon Request

D ₁	Decimal	D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm	Part #
	0.4646	11.800	12	55	102	CXC0311800T6
15/32	0.4687	11.910	12	55	102	CXC0311910T6
	0.4724	12.000	12	55	102	CXC0312000T6
	0.4764	12.100	14	60	107	CXC0312100T6
	0.4803	12.200	14	60	107	CXC0312200T6
	0.4843	12.300	14	60	107	CXC0312300T6
31/64	0.4844	12.303	14	60	107	CXC0304844T6
	0.4921	12.500	14	60	107	CXC0312500T6
	0.4961	12.600	14	60	107	CXC0312600T6
1/2	0.5000	12.700	14	60	107	CXC0312700T6
	0.5118	13.000	14	60	107	CXC0313000T6
	0.5236	13.300	14	60	107	CXC0313300T6
17/32	0.5313	13.490	14	60	107	CXC0313490T6
	0.5315	13.500	14	60	107	CXC0313500T6
	0.5512	14.000	14	60	107	CXC0314000T6
9/16	0.5625	14.290	16	65	115	CXC0314290T6
	0.5709	14.500	16	65	115	CXC0314500T6
	0.5906	15.000	16	65	115	CXC0315000T6
	0.6102	15.500	16	65	115	CXC0315500T6
5/8	0.6250	15.870	16	65	115	CXC0315870T6
	0.6299	16.000	16	65	115	CXC0316000T6
	0.6496	16.500	18	73	123	CXC0316500T6
	0.6693	17.000	18	73	123	CXC0317000T6
	0.6890	17.500	18	73	123	CXC0317500T6
	0.7087	18.000	18	73	123	CXC0318000T6
	0.7283	18.500	20	79	131	CXC0318500T6
3/4	0.7500	19.050	20	79	131	CXC0319050T6
	0.7677	19.500	20	79	131	CXC0319500T6
	0.7874	20.000	20	79	131	CXC0320000T6

CXC 3xD Speeds and Feeds METRIC		Vc m/min (Cutting speed)	F[mm/u] Feed Per Revolution				
Material	D1mm Dec. Inch.		> 3.00 ≤ 5.00	> 5.00 ≤ 8.00	> 8.00 ≤ 12.00	> 12.00 ≤ 16.00	> 16.00 ≤ 20.00
K1 Gray Cast Iron		80	.1181-.1969	.1970-.3150	.3151-.4724	.4725-.6299	.4726-.7874
N1 Wrought Aluminum Alloys		190					
N2 Low-Silicon Aluminum Alloys Si <12.2% - 6061, 7075		150					
N3 High-Silicon Aluminum Alloys Si >12.2% - 6061, 7075		120					
N5 Copper & Copper Alloys		150					

Note: These are only recommended starting figures that depend on conditions such as machine and material rigidity, type of coating if any, etc. TESTING IS RECOMMENDED

CXC 3xD Speeds and Feeds INCHES		SFM(Vc) Surface Feet Per Minute	IPR=Inches Per Revolution				
Material	D1mm Dec. Inch.		> 3.00 ≤ 5.00	> 5.00 ≤ 8.00	> 8.00 ≤ 12.00	> 12.00 ≤ 16.00	> 16.00 ≤ 20.00
K1 Gray Cast Iron		262.5	0.005	0.007	0.010	0.013	0.017
N1 Wrought Aluminum Alloys		623.4					
N2 Low-Silicon Aluminum Alloys Si <12.2% - 6061, 7075		492.2					
N3 High-Silicon Aluminum Alloys Si >12.2% - 6061, 7075		393.7					
N5 Copper & Copper Alloys		492.2					

Note: These are only recommended starting figures that depend on conditions such as machine and material rigidity, type of coating if any, etc. TESTING IS RECOMMENDED

General Purpose
Carbide Drills

Aluminum
Carbide Drills

Steels
Carbide Drills

Hardened Steels
Carbide Drills

Spotting
Carbide Drills

General Purpose
Drills up to 30xD

Aluminum Drills
up to 30xD

Drills for Steel

Pilot Drills

Design

Spiral-fluted, right-hand-cut, with internal coolant and a cylindrical shank.

Coating

Z-Power (ZrN)

Ideal for

aluminum, cast materials and non-ferrous materials (Refer to page 245)



Speeds & Feeds Refer to Page 107.

Diameters (2.0 - 2.9mm)
Available Upon Request.

Left-Hand, Available Upon Request

Diseño

Flautas espirales con corte de mano derecha, refrigerante interno y un zanco cilíndrico.

Recubrimiento

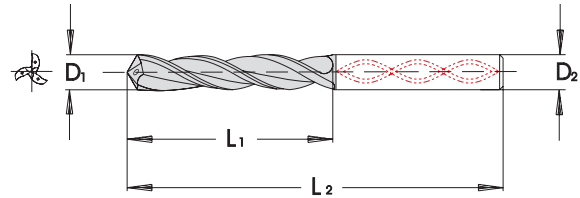
Z-Power (ZrN)

Ideal para

aluminio, materiales de fundición y materiales no ferrosos (Consulte la página 246)



Z-Power® has excellent corrosion and adhesion resistant properties.



D ₁	Decimal	D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm	Part #
	0.1181	3.000	6	28	66	CXC0503000T6
	0.1220	3.100	6	28	66	CXC0503100T6
1/8	0.1250	3.175	6	28	66	CXC0503175T6
	0.1260	3.200	6	28	66	CXC0503200T6
	0.1299	3.300	6	28	66	CXC0503300T6
	0.1339	3.400	6	28	66	CXC0503400T6
	0.1378	3.500	6	28	66	CXC0503500T6
9/64	0.1406	3.572	6	28	66	CXC0503572T6
	0.1417	3.600	6	28	66	CXC0503600T6
	0.1457	3.700	6	28	66	CXC0503700T6
25	0.1496	3.800	6	36	74	CXC0503800T6
	0.1535	3.900	6	36	74	CXC0503900T6
5/32	0.1563	3.970	6	36	74	CXC0503970T6
	0.1575	4.000	6	36	74	CXC0504000T6
	0.1614	4.100	6	36	74	CXC0504100T6
	0.1654	4.200	6	36	74	CXC0504200T6
	0.1693	4.300	6	36	74	CXC0504300T6
11/64	0.1719	4.370	6	36	74	CXC0504370T6
	0.1732	4.400	6	36	74	CXC0504400T6
	0.1772	4.500	6	36	74	CXC0504500T6
	0.1811	4.600	6	36	74	CXC0504600T6
	0.1831	4.650	6	36	74	CXC0504650T6
13	0.1850	4.700	6	36	74	CXC0500130T6
3/16	0.1875	4.760	6	44	82	CXC0504760T6
12	0.1890	4.800	6	44	82	CXC0500120T6
	0.1929	4.900	6	44	82	CXC0504900T6
	0.1969	5.000	6	44	82	CXC0505000T6
	0.2008	5.100	6	44	82	CXC0505100T6
13/64	0.2031	5.160	6	44	82	CXC0505160T6
6	0.2040	5.182	6	44	82	CXC0500060T6
	0.2047	5.200	6	44	82	CXC0505200T6
	0.2087	5.300	6	44	82	CXC0505300T6
	0.2126	5.400	6	44	82	CXC0505400T6
	0.2165	5.500	6	44	82	CXC0505500T6
	0.2185	5.550	6	44	82	CXC0505550T6
7/32	0.2187	5.560	6	44	82	CXC0505560T6

D ₁	Decimal	D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm	Part #
	0.2205	5.600	6	44	82	CXC0505600T6
	0.2244	5.700	6	44	82	CXC0505700T6
	0.2283	5.800	6	44	82	CXC0505800T6
	0.2323	5.900	6	44	82	CXC0505900T6
15/64	0.2344	5.950	6	44	82	CXC0505950T6
	0.2362	6.000	6	44	82	CXC0506000T6
	0.2402	6.100	8	53	91	CXC0506100T6
	0.2441	6.200	8	53	91	CXC0506200T6
	0.2480	6.300	8	53	91	CXC0506300T6
1/4	0.2500	6.350	8	53	91	CXC0506350T6
	0.2520	6.400	8	53	91	CXC0506400T6
	0.2559	6.500	8	53	91	CXC0506500T6
	0.2598	6.600	8	53	91	CXC0506600T6
	0.2638	6.700	8	53	91	CXC0506700T6
17/64	0.2656	6.750	8	53	91	CXC0506750T6
	0.2677	6.800	8	53	91	CXC0506800T6
	0.2717	6.900	8	53	91	CXC0506900T6
	0.2756	7.000	8	53	91	CXC0507000T6
	0.2795	7.100	8	53	91	CXC0507100T6
9/32	0.2813	7.140	8	53	91	CXC0507140T6
	0.2835	7.200	8	53	91	CXC0507200T6
	0.2874	7.300	8	53	91	CXC0507300T6
	0.2913	7.400	8	53	91	CXC0507400T6
	0.2953	7.500	8	53	91	CXC0507500T6
19/64	0.2969	7.540	8	53	91	CXC0507540T6
	0.3031	7.700	8	53	91	CXC0507700T6
	0.3071	7.800	8	53	91	CXC0507800T6
	0.3110	7.900	8	53	91	CXC0507900T6
5/16	0.3125	7.940	8	53	91	CXC0507940T6
	0.3150	8.000	8	53	91	CXC0508000T6
	0.3189	8.100	10	61	103	CXC0508100T6
	0.3228	8.200	10	61	103	CXC0508200T6
	0.3268	8.300	10	61	103	CXC0508300T6
21/64	0.3281	8.330	10	61	103	CXC0508330T6
	0.3307	8.400	10	61	103	CXC0508400T6
	0.3346	8.500	10	61	103	CXC0508500T6

Other Dimensions are Available Upon Request

Tolerance

Drill Dia (h7) Inches (in)	Drill Dia (h7) Metric (mm)	Shank Dia (h6) Inches (in)	Shank Dia (h6) Metric (mm)
.0000-.1181: +0/-0.0039	0-3: +0/-0.10	.0000-.1181: +0/-0.0024	0-3: +0/-0.06
.1182-.2362: +0/-0.0047	3.01-6: +0/-0.12	.1182-.2362: +0/-0.0031	3.01-6: +0/-0.08
.2363-.3937: +0/-0.0059	6.01-10.0: +0/-0.15	.2363-.3937: +0/-0.0035	6.01-10.0: +0/-0.09
.3938-.7087: +0/-0.0071	10.01-18.0: +0/-0.18	.3938-.7087: +0/-0.0043	10.01-18.0: +0/-0.11

General Purpose Carbide Drills
Aluminum Carbide Drills
Steels Carbide Drills
Hardened Steels Carbide Drills
Spotting Carbide Drills

Solid Carbide Drills Non-Coolant

General Purpose Drills up to 30xD
Aluminum Drills up to 30xD
Drills for Steels
Pilot Drills

Solid Carbide Drills Internal Coolant

D ₁	Decimal	D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm	Part #
	0.3386	8.600	10	61	103	CXC0508600T6
	0.3425	8.700	10	61	103	CXC0508700T6
11/32	0.3437	8.730	10	61	103	CXC0508730T6
	0.3465	8.800	10	61	103	CXC0508800T6
	0.3543	9.000	10	61	103	CXC0509000T6
23/64	0.3594	9.130	10	61	103	CXC0509130T6
	0.3622	9.200	10	61	103	CXC0509200T6
	0.3661	9.300	10	61	103	CXC0509300T6
	0.3740	9.500	10	61	103	CXC0509500T6
3/8	0.3750	9.520	10	61	103	CXC0509520T6
	0.3780	9.600	10	61	103	CXC0509600T6
	0.3858	9.800	10	61	103	CXC0509800T6
	0.3898	9.900	10	61	103	CXC0509900T6
25/64	0.3906	9.920	10	61	103	CXC0509920T6
	0.3937	10.000	10	61	103	CXC0510000T6
	0.3976	10.100	12	71	118	CXC0510100T6
	0.4016	10.200	12	71	118	CXC0510200T6
	0.4055	10.300	12	71	118	CXC0510300T6
13/32	0.4063	10.320	12	71	118	CXC0510320T6
	0.4094	10.400	12	71	118	CXC0510400T6
	0.4134	10.500	12	71	118	CXC0510500T6
27/64	0.4219	10.720	12	71	118	CXC0510720T6
	0.4252	10.800	12	71	118	CXC0510800T6
	0.4331	11.000	12	71	118	CXC0511000T6
	0.4370	11.100	12	71	118	CXC0511100T6
7/16	0.4375	11.113	12	71	118	CXC0504375T6
	0.4409	11.200	12	71	118	CXC0511200T6
	0.4528	11.500	12	71	118	CXC0511500T6
29/64	0.4531	11.510	12	71	118	CXC0511510T6
	0.4606	11.700	12	71	118	CXC0511700T6

D ₁	Decimal	D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm	Part #
	0.4646	11.800	12	71	118	CXC0511800T6
15/32	0.4687	11.910	12	71	118	CXC0511910T6
	0.4724	12.000	12	71	118	CXC0512000T6
	0.4764	12.100	14	77	124	CXC0512100T6
	0.4803	12.200	14	77	124	CXC0512200T6
	0.4843	12.300	14	77	124	CXC0512300T6
31/64	0.4844	12.303	14	77	124	CXC0504844T6
	0.4921	12.500	14	77	124	CXC0512500T6
	0.4961	12.600	14	77	124	CXC0512600T6
1/2	0.5000	12.700	14	77	124	CXC0512700T6
	0.5118	13.000	14	77	124	CXC0513000T6
	0.5236	13.300	14	77	124	CXC0513300T6
17/32	0.5313	13.490	14	77	124	CXC0513490T6
	0.5315	13.500	14	77	124	CXC0513500T6
	0.5512	14.000	14	77	124	CXC0514000T6
9/16	0.5625	14.290	16	83	133	CXC0514290T6
	0.5709	14.500	16	83	133	CXC0514500T6
	0.5906	15.000	16	83	133	CXC0515000T6
	0.6102	15.500	16	83	133	CXC0515500T6
5/8	0.6250	15.870	16	83	133	CXC0515870T6
	0.6299	16.000	16	83	133	CXC0516000T6
	0.6496	16.500	18	93	143	CXC0516500T6
	0.6693	17.000	18	93	143	CXC0517000T6
	0.6890	17.500	18	93	143	CXC0517500T6
	0.7087	18.000	18	93	143	CXC0518000T6
	0.7283	18.500	20	101	153	CXC0518500T6
3/4	0.7500	19.050	20	101	153	CXC0519050T6
	0.7677	19.500	20	101	153	CXC0519500T6
	0.7874	20.000	20	101	153	CXC0520000T6

Other Dimensions are Available Upon Request

CXC 5xD Speeds and Feeds		F[mm/u] Feed Per Revolution						
METRIC		Vc m/min (Cutting speed)	D1mm	> 3.00	> 5.00	> 8.00	> 12.00	> 16.00
Material				≤ 5.00	≤ 8.00	≤ 12.00	≤ 16.00	≤ 20.00
			Dec. Inch.	.1181-.1969	.1970-.3150	.3151-.4724	.4725-.6299	.4726-.7874
K1	Gray Cast Iron	70		.14	.20	.275	.35	.45
N1	Wrought Aluminum Alloys	180		.14	.20	.275	.35	.45
N2	Low-Silicon Aluminum Alloys Si <12.2% - 6061, 7075	140		.14	.20	.275	.35	.45
N3	High-Silicon Aluminum Alloys Si >12.2% - 6061, 7075	110		.14	.20	.275	.35	.45
N5	Copper & Copper Alloys	140		.10	.15	.20	.26	.33

Note: These are only recommended starting figures that depend on conditions such as machine and material rigidity, type of coating if any, etc. TESTING IS RECOMMENDED

CXC 5xD Speeds and Feeds		IPR=Inches Per Revolution						
INCHES		SFM(Vc) Surface Feet Per Minute	D1mm	> 3.00	> 5.00	> 8.00	> 12.00	> 16.00
Material				≤ 5.00	≤ 8.00	≤ 12.00	≤ 16.00	≤ 20.00
			Dec. Inch.	.1181-.1969	.1970-.3150	.3151-.4724	.4725-.6299	.4726-.7874
K1	Gray Cast Iron	229.7		0.005	0.007	0.010	0.013	0.017
N1	Wrought Aluminum Alloys	590.6		0.005	0.007	0.010	0.013	0.017
N2	Low-Silicon Aluminum Alloys Si <12.2% - 6061, 7075	459.3		0.005	0.007	0.010	0.013	0.017
N3	High-Silicon Aluminum Alloys Si >12.2% - 6061, 7075	360.9		0.005	0.007	0.010	0.013	0.017
N5	Copper & Copper Alloys	459.3		0.003	0.005	0.007	0.010	0.012

Note: These are only recommended starting figures that depend on conditions such as machine and material rigidity, type of coating if any, etc. TESTING IS RECOMMENDED



**High-Performance Drill
Single-Margin
Ideal for Steels, Gray Cast
Iron & Hardened Materials
3xD-5xD**



140° Point Geometry - Designed for low-cutting force and small chip evacuation.

140° Geometría de la Punta - Diseñado para fuerza moderada y evacuación de la viruta pequeña.

Coolant Holes - Cool the cutting edge and improve chip evacuation.

Refrigerante Interno - Enfría el filo y mejora la evacuación de la viruta.

Polish - Chip evacuation is improved during deep hole drilling, when the flutes are polished.

Pulido - Cuando las flautas están pulidas la evacuación de la viruta es mejorada.



Varianta® Supral Coating - Excellent for high-speed drilling operations. Ideal for dry and semi-dry machining.

Recubrimiento Varianta® Supral - Excelente para las operaciones de perforación de alta velocidad. Ideal para el mecanizado seco y semiseco.

Tolerance

Drill Dia (h7) Inches (in)	Drill Dia (h7) Metric (mm)
.0000-.1181: + 0/-0.0039	0-3: + 0/-0.10
.1182-.2362: + 0/-0.0047	3.01-6: + 0/-0.12
.2363-.3937: + 0/-0.0059	6.01-10.0: + 0/-0.15
.3938-.7087: + 0/-0.0071	10.01-18.0: + 0/-0.18

Shank Dia (h6) Inches (in)	Shank Dia (h6) Metric (mm)
.0000-.1181: + 0/-0.0024	0-3: + 0/-0.06
.1182-.2362: + 0/-0.0031	3.01-6: + 0/-0.08
.2363-.3937: + 0/-0.0035	6.01-10.0: + 0/-0.09
.3938-.7087: + 0/-0.0043	10.01-18.0: + 0/-0.11



Varianta Supral® provides higher cutting speeds and excellent wear resistance.

Design

Spiral-fluted, right hand cut, with internal coolant and a cylindrical shank.

Coating

Varianta® Supral TiAlCN (ML)

Ideal for

hardened materials (Refer to page 245)



Diseño

Flautas espirales con corte de mano derecha, refrigerante interno y un zanco cilíndrico.

Recubrimiento

Varianta® Supral TiAlCN (ML)

Ideal para

materiales endurecidos (Consulte la página 246)



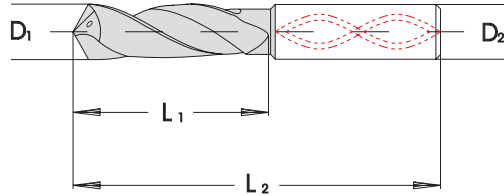
Speeds & Feeds Refer to Page 111 & 113.

Diameters (2.0 - 2.9mm)

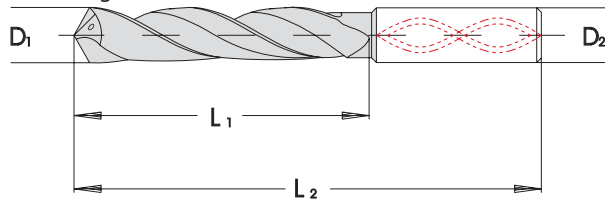
Available Upon Request.

****Left-Hand, Available Upon Request****

3xD PAGE 110



5xD Page 112



General Purpose Carbide Drills	Aluminum Carbide Drills	Steels Carbide Drills	Hardened Steels Carbide Drills	Spotting Carbide Drills
--------------------------------	-------------------------	-----------------------	--------------------------------	-------------------------

Solid Carbide Drills Non-Coolant

General Purpose Drills up to 30xD	Aluminum Drills up to 30xD	Drills for Steels	Pilot Drills
-----------------------------------	----------------------------	-------------------	--------------

Solid Carbide Drills Internal Coolant

General Purpose
Carbide Drills

Aluminum
Carbide Drills

Steels
Carbide Drills

Hardened Steels
Carbide Drills

Spotting
Carbide Drills

General Purpose
Drills up to 30xD

Aluminum Drills
up to 30xD

Drills for Steels

Pilot Drills

Design

Long spiral-fluted, right-hand cut and internal coolant.

Coating

Varianta® Supral TiAlCN (ML)

Ideal for

hardened materials
(Refer to page 245)

P K H

Speeds & Feeds Refer to Page 111.

Diameters (2.0 - 2.9mm)
Available Upon Request.

****Left-Hand, Available Upon Request****

Diseño

Flautas largas espirales, con corte de mano derecha y refrigerante interno.

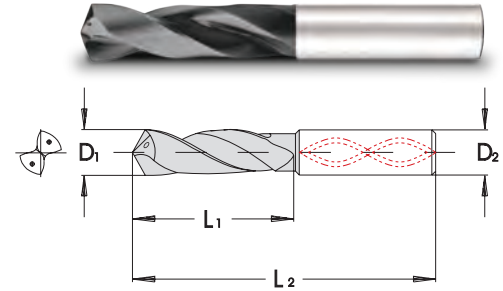
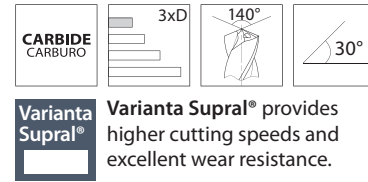
Recubrimiento

Varianta® Supral TiAlCN (ML)

Ideal para

materiales endurecidos
(Consulte la página 246)

P K H



D ₁	Decimal	D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm	Part #
	0.1181	3.000	6	20	62	HXC0303000T9
	0.1220	3.100	6	20	62	HXC0303100T9
1/8	0.1250	3.175	6	20	62	HXC0303175T9
	0.1260	3.200	6	20	62	HXC0303200T9
	0.1299	3.300	6	20	62	HXC0303300T9
	0.1339	3.400	6	20	62	HXC0303400T9
	0.1378	3.500	6	20	62	HXC0303500T9
9/64	0.1406	3.572	6	20	62	HXC0303572T9
	0.1417	3.600	6	20	62	HXC0303600T9
	0.1457	3.700	6	20	62	HXC0303700T9
25	0.1496	3.800	6	24	66	HXC0303800T9
	0.1535	3.900	6	24	66	HXC0303900T9
5/32	0.1563	3.970	6	24	66	HXC0303970T9
	0.1575	4.000	6	24	66	HXC0304000T9
	0.1614	4.100	6	24	66	HXC0304100T9
	0.1654	4.200	6	24	66	HXC0304200T9
	0.1693	4.300	6	24	66	HXC0304300T9
11/64	0.1719	4.370	6	24	66	HXC0304370T9
	0.1732	4.400	6	24	66	HXC0304400T9
	0.1772	4.500	6	24	66	HXC0304500T9
	0.1811	4.600	6	24	66	HXC0304600T9
	0.1831	4.650	6	24	66	HXC0304650T9
13	0.1850	4.700	6	24	66	HXC0300130T9
3/16	0.1875	4.760	6	28	66	HXC0304760T9
12	0.1890	4.800	6	28	66	HXC0300120T9
	0.1929	4.900	6	28	66	HXC0304900T9
	0.1969	5.000	6	28	66	HXC0305000T9
	0.2008	5.100	6	28	66	HXC0305100T9
13/64	0.2031	5.160	6	28	66	HXC0305160T9
6	0.2040	5.182	6	28	66	HXC0300060T9
	0.2047	5.200	6	28	66	HXC0305200T9
	0.2087	5.300	6	28	66	HXC0305300T9
	0.2126	5.400	6	28	66	HXC0305400T9
	0.2165	5.500	6	28	66	HXC0305500T9
	0.2185	5.550	6	28	66	HXC0305550T9
7/32	0.2187	5.560	6	28	66	HXC0305560T9

D ₁	Decimal	D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm	Part #
	0.2205	5.600	6	28	66	HXC0305600T9
	0.2244	5.700	6	28	66	HXC0305700T9
	0.2283	5.800	6	28	66	HXC0305800T9
	0.2323	5.900	6	28	66	HXC0305900T9
15/64	0.2344	5.950	6	28	66	HXC0305950T9
	0.2362	6.000	6	28	66	HXC0306000T9
	0.2402	6.100	8	34	79	HXC0306100T9
	0.2441	6.200	8	34	79	HXC0306200T9
	0.2480	6.300	8	34	79	HXC0306300T9
1/4	0.2500	6.350	8	34	79	HXC0306350T9
	0.2520	6.400	8	34	79	HXC0306400T9
	0.2559	6.500	8	34	79	HXC0306500T9
	0.2598	6.600	8	34	79	HXC0306600T9
	0.2638	6.700	8	34	79	HXC0306700T9
17/64	0.2656	6.750	8	34	79	HXC0306750T9
	0.2677	6.800	8	34	79	HXC0306800T9
	0.2717	6.900	8	41	79	HXC0306900T9
	0.2756	7.000	8	41	79	HXC0307000T9
	0.2795	7.100	8	41	79	HXC0307100T9
9/32	0.2813	7.140	8	41	79	HXC0307140T9
	0.2835	7.200	8	41	79	HXC0307200T9
	0.2874	7.300	8	41	79	HXC0307300T9
	0.2913	7.400	8	41	79	HXC0307400T9
	0.2953	7.500	8	41	79	HXC0307500T9
19/64	0.2969	7.540	8	41	79	HXC0307540T9
	0.3031	7.700	8	41	79	HXC0307700T9
	0.3071	7.800	8	41	79	HXC0307800T9
	0.3110	7.900	8	41	79	HXC0307900T9
5/16	0.3125	7.940	8	41	79	HXC0307940T9
	0.3150	8.000	8	41	79	HXC0308000T9
	0.3189	8.100	10	47	89	HXC0308100T9
	0.3228	8.200	10	47	89	HXC0308200T9
	0.3268	8.300	10	47	89	HXC0308300T9
21/64	0.3281	8.330	10	47	89	HXC0308330T9
	0.3307	8.400	10	47	89	HXC0308400T9
	0.3346	8.500	10	47	89	HXC0308500T9

****Other Dimensions are Available Upon Request****

Tolerance

Drill Dia (h7) Inches (in)	Drill Dia (h7) Metric (mm)	Shank Dia (h6) Inches (in)	Shank Dia (h6) Metric (mm)
.0000-.1181: +0/-0.0039	0-3: +0/-0.10	.0000-.1181: +0/-0.0024	0-3: +0/-0.06
.1182-.2362: +0/-0.0047	3.01-6: +0/-0.12	.1182-.2362: +0/-0.0031	3.01-6: +0/-0.08
.2363-.3937: +0/-0.0059	6.01-10.0: +0/-0.15	.2363-.3937: +0/-0.0035	6.01-10.0: +0/-0.09
.3938-.7087: +0/-0.0071	10.01-18.0: +0/-0.18	.3938-.7087: +0/-0.0043	10.01-18.0: +0/-0.11

D ₁	Decimal	D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm	Part #
	0.3386	8.600	10	47	89	HXC0308600T9
	0.3425	8.700	10	47	89	HXC0308700T9
11/32	0.3437	8.730	10	47	89	HXC0308730T9
	0.3465	8.800	10	47	89	HXC0308800T9
	0.3543	9.000	10	47	89	HXC0309000T9
23/64	0.3594	9.130	10	47	89	HXC0309130T9
	0.3622	9.200	10	47	89	HXC0309200T9
	0.3661	9.300	10	47	89	HXC0309300T9
	0.3740	9.500	10	47	89	HXC0309500T9
3/8	0.3750	9.520	10	47	89	HXC0309520T9
	0.3780	9.600	10	47	89	HXC0309600T9
	0.3858	9.800	10	47	89	HXC0309800T9
	0.3898	9.900	10	47	89	HXC0309900T9
25/64	0.3906	9.920	10	47	89	HXC0309920T9
	0.3937	10.000	10	47	89	HXC0310000T9
	0.3976	10.100	12	55	102	HXC0310100T9
	0.4016	10.200	12	55	102	HXC0310200T9
	0.4055	10.300	12	55	102	HXC0310300T9
13/32	0.4063	10.320	12	55	102	HXC0310320T9
	0.4094	10.400	12	55	102	HXC0310400T9
	0.4134	10.500	12	55	102	HXC0310500T9
27/64	0.4219	10.720	12	55	102	HXC0310720T9
	0.4252	10.800	12	55	102	HXC0310800T9
	0.4331	11.000	12	55	102	HXC0311000T9
	0.4370	11.100	12	55	102	HXC0311100T9
7/16	0.4375	11.113	12	55	102	HXC03104375T9
	0.4409	11.200	12	55	102	HXC0311200T9
	0.4528	11.500	12	55	102	HXC0311500T9
29/64	0.4531	11.510	12	55	102	HXC0311510T9
	0.4606	11.700	12	55	102	HXC0311700T9

D ₁	Decimal	D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm	Part #
	0.4646	11.800	12	55	102	HXC0311800T9
15/32	0.4687	11.910	12	55	102	HXC0311910T9
	0.4724	12.000	12	55	102	HXC0312000T9
	0.4764	12.100	14	60	107	HXC0312100T9
	0.4803	12.200	14	60	107	HXC0312200T9
	0.4843	12.300	14	60	107	HXC0312300T9
31/64	0.4844	12.303	14	60	107	HXC0304844T9
	0.4921	12.500	14	60	107	HXC0312500T9
	0.4961	12.600	14	60	107	HXC0312600T9
1/2	0.5000	12.700	14	60	107	HXC0312700T9
	0.5118	13.000	14	60	107	HXC0313000T9
	0.5236	13.300	14	60	107	HXC0313300T9
17/32	0.5313	13.490	14	60	107	HXC0313490T9
	0.5315	13.500	14	60	107	HXC0313500T9
	0.5512	14.000	14	60	107	HXC0314000T9
9/16	0.5625	14.290	16	65	115	HXC0314290T9
	0.5709	14.500	16	65	115	HXC0314500T9
	0.5906	15.000	16	65	115	HXC0315000T9
	0.6102	15.500	16	65	115	HXC0315500T9
5/8	0.6250	15.870	16	65	115	HXC0315870T9
	0.6299	16.000	16	65	115	HXC0316000T9
	0.6496	16.500	18	73	123	HXC0316500T9
	0.6693	17.000	18	73	123	HXC0317000T9
	0.6890	17.500	18	73	123	HXC0317500T9
	0.7087	18.000	18	73	123	HXC0318000T9
	0.7283	18.500	20	79	131	HXC0318500T9
3/4	0.7500	19.050	20	79	131	HXC0319050T9
	0.7677	19.500	20	79	131	HXC0319500T9
	0.7874	20.000	20	79	131	HXC0320000T9

Other Dimensions are Available Upon Request

HXC 3xD Speeds and Feeds METRIC		Vc m/min (Cutting speed)	D1mm	F[mm/u] Feed Per Revolution				
Material	Dec. Inch.			> 3.00 ≤ 5.00	> 5.00 ≤ 8.00	> 8.00 ≤ 12.00	> 12.00 ≤ 16.00	> 16.00 ≤ 20.00
P1	Low - Carbon Steel - 1000 Series (> 25 HRC)	85		.18	.24	.30	.35	.40
P3	Alloy Tool Steels - 300,2000,3000(≤ 35HRC) Austenitic	70		.15	.21	.27	.32	.37
P4	Alloy Tool Steels - 300,2000,3000 (36-48 HRC)	45		.15	.21	.27	.32	.37
K1	Gray Cast Iron	80		.20	.25	.35	.40	.46
H2	Hardened Tool Steels (48-55 HRC)	28		0.08	0.09	0.11	0.13	0.15
H3	Hardened Tool Steels (56-60 HRC)	16		0.08	0.09	0.11	0.13	0.15
	Hardened Tool Steels (60-62 HRC)	14		0.08	0.09	0.11	0.13	0.15
H4	Hardened Tool Steels (62-64 HRC)	10		0.08	0.09	0.11	0.13	0.15

Note: These are only recommended starting figures that depend on conditions such as machine and material rigidity, type of coating if any, etc. TESTING IS RECOMMENDED

HXC 3xD Speeds and Feeds INCHES		SFM(Vc) Surface Feet Per Minute	D1mm	IPR=Inches Per Revolution				
Material	Dec. Inch.			> 3.00 ≤ 5.00	> 5.00 ≤ 8.00	> 8.00 ≤ 12.00	> 12.00 ≤ 16.00	> 16.00 ≤ 20.00
P1	Low - Carbon Steel - 1000 Series (> 25 HRC)	278.9		0.007	0.009	0.011	0.013	0.015
P3	Alloy Tool Steels - 300,2000,3000(≤ 35HRC) Austenitic	229.7		0.005	0.008	0.010	0.012	0.014
P4	Alloy Tool Steels - 300,2000,3000 (36-48 HRC)	147.6		0.005	0.008	0.010	0.012	0.014
K1	Gray Cast Iron	262.5		0.007	0.009	0.013	0.015	0.018
H2	Hardened Tool Steels (48-55 HRC)	91.9		0.0032	0.0035	0.0043	0.0051	0.0059
H3	Hardened Tool Steels (56-60 HRC)	52.5		0.0032	0.0035	0.0043	0.0051	0.0059
	Hardened Tool Steels (60-62 HRC)	45.9		0.0032	0.0035	0.0043	0.0051	0.0059
H4	Hardened Tool Steels (60-62 HRC)	32.8		0.0032	0.0035	0.0043	0.0051	0.0059

Note: These are only recommended starting figures that depend on conditions such as machine and material rigidity, type of coating if any, etc. TESTING IS RECOMMENDED

General Purpose
Carbide Drills

Aluminum
Carbide Drills

Steels
Carbide Drills

Hardened Steels
Carbide Drills

Spotting
Carbide Drills

General Purpose
Drills up to 30xD

Aluminum Drills
up to 30xD

Drills for Steels

Pilot Drills

Design

Long spiral-fluted, right-hand cut and internal coolant.

Coating

Varianta® Supral TiAlCN (ML)

Ideal for

hardened materials
(Refer to page 245)



Speeds & Feeds Refer to Page 113.

Diameters (2.0 - 2.9mm)
Available Upon Request.

****Left-Hand, Available Upon Request****

Diseño

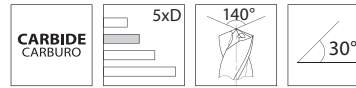
Flautas largas espirales, con corte de mano derecha y refrigerante interno.

Recubrimiento

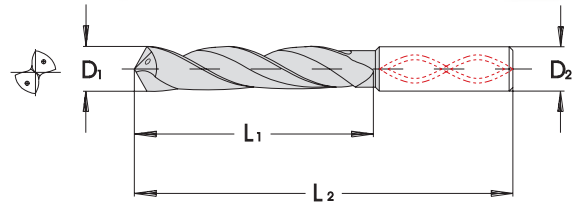
Varianta® Supral TiAlCN (ML)

Ideal para

materiales endurecidos
(Consulte la página 246)



Varianta Supral® provides higher cutting speeds and excellent wear resistance.



D ₁	Decimal	D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm	Part #
	0.1181	3.000	6	28	66	HXC0503000T9
	0.1220	3.100	6	28	66	HXC0503100T9
1/8	0.1250	3.175	6	28	66	HXC0503175T9
	0.1260	3.200	6	28	66	HXC0503200T9
	0.1299	3.300	6	28	66	HXC0503300T9
	0.1339	3.400	6	28	66	HXC0503400T9
	0.1378	3.500	6	28	66	HXC0503500T9
9/64	0.1406	3.572	6	28	66	HXC0503572T9
	0.1417	3.600	6	28	66	HXC0503600T9
	0.1457	3.700	6	28	66	HXC0503700T9
25	0.1496	3.800	6	36	74	HXC0503800T9
	0.1535	3.900	6	36	74	HXC0503900T9
5/32	0.1563	3.970	6	36	74	HXC0503970T9
	0.1575	4.000	6	36	74	HXC0504000T9
	0.1614	4.100	6	36	74	HXC0504100T9
	0.1654	4.200	6	36	74	HXC0504200T9
	0.1693	4.300	6	36	74	HXC0504300T9
11/64	0.1719	4.370	6	36	74	HXC0504370T9
	0.1732	4.400	6	36	74	HXC0504400T9
	0.1772	4.500	6	36	74	HXC0504500T9
	0.1811	4.600	6	36	74	HXC0504600T9
	0.1831	4.650	6	36	74	HXC0504650T9
13	0.1850	4.700	6	36	74	HXC0500130T9
3/16	0.1875	4.760	6	44	82	HXC0504760T9
12	0.1890	4.800	6	44	82	HXC0500120T9
	0.1929	4.900	6	44	82	HXC0504900T9
	0.1969	5.000	6	44	82	HXC0505000T9
	0.2008	5.100	6	44	82	HXC0505100T9
13/64	0.2031	5.160	6	44	82	HXC0505160T9
6	0.2040	5.182	6	44	82	HXC0500060T9
	0.2047	5.200	6	44	82	HXC0505200T9
	0.2087	5.300	6	44	82	HXC0505300T9
	0.2126	5.400	6	44	82	HXC0505400T9
	0.2165	5.500	6	44	82	HXC0505500T9
	0.2185	5.550	6	44	82	HXC0505550T9
7/32	0.2187	5.560	6	44	82	HXC0505560T9

D ₁	Decimal	D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm	Part #
	0.2205	5.600	6	44	82	HXC0505600T9
	0.2244	5.700	6	44	82	HXC0505700T9
	0.2283	5.800	6	44	82	HXC0505800T9
	0.2323	5.900	6	44	82	HXC0505900T9
15/64	0.2344	5.950	6	44	82	HXC0505950T9
	0.2362	6.000	6	44	82	HXC0506000T9
	0.2402	6.100	8	53	91	HXC0506100T9
	0.2441	6.200	8	53	91	HXC0506200T9
	0.2480	6.300	8	53	91	HXC0506300T9
1/4	0.2500	6.350	8	53	91	HXC0506350T9
	0.2520	6.400	8	53	91	HXC0506400T9
	0.2559	6.500	8	53	91	HXC0506500T9
	0.2598	6.600	8	53	91	HXC0506600T9
	0.2638	6.700	8	53	91	HXC0506700T9
17/64	0.2656	6.750	8	53	91	HXC0506750T9
	0.2677	6.800	8	53	91	HXC0506800T9
	0.2717	6.900	8	53	91	HXC0506900T9
	0.2756	7.000	8	53	91	HXC0507000T9
	0.2795	7.100	8	53	91	HXC0507100T9
9/32	0.2813	7.140	8	53	91	HXC0507140T9
	0.2835	7.200	8	53	91	HXC0507200T9
	0.2874	7.300	8	53	91	HXC0507300T9
	0.2913	7.400	8	53	91	HXC0507400T9
	0.2953	7.500	8	53	91	HXC0507500T9
19/64	0.2969	7.540	8	53	91	HXC0507540T9
	0.3031	7.700	8	53	91	HXC0507700T9
	0.3071	7.800	8	53	91	HXC0507800T9
	0.3110	7.900	8	53	91	HXC0507900T9
5/16	0.3125	7.940	8	53	91	HXC0507940T9
	0.3150	8.000	8	53	91	HXC0508000T9
	0.3189	8.100	10	61	103	HXC0508100T9
	0.3228	8.200	10	61	103	HXC0508200T9
	0.3268	8.300	10	61	103	HXC0508300T9
21/64	0.3281	8.330	10	61	103	HXC0508330T9
	0.3307	8.400	10	61	103	HXC0508400T9
	0.3346	8.500	10	61	103	HXC0508500T9

****Other Dimensions are Available Upon Request****

Tolerance

Drill Dia (h7) Inches (in)	Drill Dia (h7) Metric (mm)	Shank Dia (h6) Inches (in)	Shank Dia (h6) Metric (mm)
.0000-.1181: +0/-0.0039	0-3: +0/-0.10	.0000-.1181: +0/-0.0024	0-3: +0/-0.06
.1182-.2362: +0/-0.0047	3.01-6: +0/-0.12	.1182-.2362: +0/-0.0031	3.01-6: +0/-0.08
.2363-.3937: +0/-0.0059	6.01-10.0: +0/-0.15	.2363-.3937: +0/-0.0035	6.01-10.0: +0/-0.09
.3938-.7087: +0/-0.0071	10.01-18.0: +0/-0.18	.3938-.7087: +0/-0.0043	10.01-18.0: +0/-0.11

General Purpose Carbide Drills
For Aluminum Carbide Drills
For Steels Carbide Drills
For Harden Steels Carbide Drills
Spotting Carbide Drills

Solid Carbide Drills Non-Coolant

General Purpose Drills up to 30xD
Aluminum Drills up to 30xD
Drills for Steels
Pilot Drills

Solid Carbide Drills Internal Coolant

D ₁	Decimal	D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm	Part #
	0.3386	8.600	10	61	103	HXC0508600T9
	0.3425	8.700	10	61	103	HXC0508700T9
11/32	0.3437	8.730	10	61	103	HXC0508730T9
	0.3465	8.800	10	61	103	HXC0508800T9
	0.3543	9.000	10	61	103	HXC0509000T9
23/64	0.3594	9.130	10	61	103	HXC0509130T9
	0.3622	9.200	10	61	103	HXC0509200T9
	0.3661	9.300	10	61	103	HXC0509300T9
	0.3740	9.500	10	61	103	HXC0509500T9
3/8	0.3750	9.520	10	61	103	HXC0509520T9
	0.3780	9.600	10	61	103	HXC0509600T9
	0.3858	9.800	10	61	103	HXC0509800T9
	0.3898	9.900	10	61	103	HXC0509900T9
25/64	0.3906	9.920	10	61	103	HXC0509920T9
	0.3937	10.000	10	61	103	HXC0510000T9
	0.3976	10.100	12	71	118	HXC0510100T9
	0.4016	10.200	12	71	118	HXC0510200T9
	0.4055	10.300	12	71	118	HXC0510300T9
13/32	0.4063	10.320	12	71	118	HXC0510320T9
	0.4094	10.400	12	71	118	HXC0510400T9
	0.4134	10.500	12	71	118	HXC0510500T9
27/64	0.4219	10.720	12	71	118	HXC0510720T9
	0.4252	10.800	12	71	118	HXC0510800T9
	0.4331	11.000	12	71	118	HXC0511000T9
	0.4370	11.100	12	71	118	HXC0511100T9
7/16	0.4375	11.113	12	71	118	HXC0504375T9
	0.4409	11.200	12	71	118	HXC0511200T9
	0.4528	11.500	12	71	118	HXC0511500T9
29/64	0.4531	11.510	12	71	118	HXC0511510T9
	0.4606	11.700	12	71	118	HXC0511700T9

D ₁	Decimal	D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm	Part #
	0.4646	11.800	12	71	118	HXC0511800T9
15/32	0.4687	11.910	12	71	118	HXC0511910T9
	0.4724	12.000	12	71	118	HXC0512000T9
	0.4764	12.100	14	77	124	HXC0512100T9
	0.4803	12.200	14	77	124	HXC0512200T9
	0.4843	12.300	14	77	124	HXC0512300T9
31/64	0.4844	12.303	14	77	124	HXC0504844T9
	0.4921	12.500	14	77	124	HXC0512500T9
	0.4961	12.600	14	77	124	HXC0512600T9
1/2	0.5000	12.700	14	77	124	HXC0512700T9
	0.5118	13.000	14	77	124	HXC0513000T9
	0.5236	13.300	14	77	124	HXC0513300T9
17/32	0.5313	13.490	14	77	124	HXC0513490T9
	0.5315	13.500	14	77	124	HXC0513500T9
	0.5512	14.000	14	77	124	HXC0514000T9
9/16	0.5625	14.290	16	83	133	HXC0514290T9
	0.5709	14.500	16	83	133	HXC0514500T9
	0.5906	15.000	16	83	133	HXC0515000T9
	0.6102	15.500	16	83	133	HXC0515500T9
5/8	0.6250	15.870	16	83	133	HXC0515870T9
	0.6299	16.000	16	83	133	HXC0516000T9
	0.6496	16.500	18	93	143	HXC0516500T9
	0.6693	17.000	18	93	143	HXC0517000T9
	0.6890	17.500	18	93	143	HXC0517500T9
	0.7087	18.000	18	93	143	HXC0518000T9
	0.7283	18.500	20	101	153	HXC0518500T9
3/4	0.7500	19.050	20	101	153	HXC0519050T9
	0.7677	19.500	20	101	153	HXC0519500T9
	0.7874	20.000	20	101	153	HXC0520000T9

Other Dimensions are Available Upon Request

HXC 5xD Speeds and Feeds METRIC		Vc m/min (Cutting speed)	D1mm Dec. Inch.	F[mm/u] Feed Per Revolution				
Material	> 3.00 ≤ 5.00			> 5.00 ≤ 8.00	> 8.00 ≤ 12.00	> 12.00 ≤ 16.00	> 16.00 ≤ 20.00	
P1 Low - Carbon Steel - 1000 Series (> 25 HRC)	80	.18	.24	.30	.35	.40		
P3 Alloy Tool Steels - 300,2000,3000(≤ 35HRC)	65	.15	.21	.27	.32	.37		
P4 Alloy Tool Steels - 300,2000,3000 (36-48 HRC)	40	.15	.21	.27	.32	.37		
K1 Gray Cast Iron	75	.20	.25	.35	.40	.46		
H2 Hardened Tool Steels (48-55 HRC)	23	.08	.09	.11	.13	.15		
H3 Hardened Tool Steels (56-60 HRC)	11	.08	.09	.11	.13	.15		
H4 Hardened Tool Steels (60-62 HRC)	9	.08	.09	.11	.13	.15		
Hardened Tool Steels (62-64 HRC)	7	.08	.09	.11	.13	.15		

Note: These are only recommended starting figures that depend on conditions such as machine and material rigidity, type of coating if any, etc. TESTING IS RECOMMENDED

HXC 5xD Speeds and Feeds INCHES		SFM(Vc) Surface Feet Per Minute	D1mm Dec. Inch.	IPR=Inches Per Revolution				
Material	> 3.00 ≤ 5.00			> 5.00 ≤ 8.00	> 8.00 ≤ 12.00	> 12.00 ≤ 16.00	> 16.00 ≤ 20.00	
P1 Low - Carbon Steel - 1000 Series (> 25 HRC)	262.5	0.007	0.009	0.011	0.013	0.015		
P3 Alloy Tool Steels - 300,2000,3000(≤ 35HRC) Austenitic	213.3	0.005	0.008	0.010	0.012	0.014		
P4 Alloy Tool Steels - 300,2000,3000 (36-48 HRC)	131.2	0.005	0.008	0.010	0.012	0.014		
K1 Gray Cast Iron	246.1	0.007	0.009	0.013	0.015	0.018		
H2 Hardened Tool Steels (48-55 HRC)	75.5	0.0032	0.0035	0.0043	0.0051	0.0059		
H3 Hardened Tool Steels (56-60 HRC)	36.1	0.0032	0.0035	0.0043	0.0051	0.0059		
Hardened Tool Steels (60-62 HRC)	29.5	0.0032	0.0035	0.0043	0.0051	0.0059		
H4 Hardened Tool Steels (62-64 HRC)	23.0	0.0032	0.0035	0.0043	0.0051	0.0059		

Note: These are only recommended starting figures that depend on conditions such as machine and material rigidity, type of coating if any, etc. TESTING IS RECOMMENDED



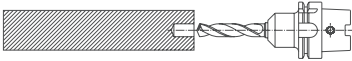
PILOT DRILLS



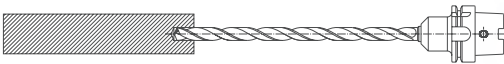
Before a long-drill begins perforation, we recommend our PXC Pilot Drill for deep-hole drilling.

Antes de utilizar una broca larga para perforaciones profundas, recomendamos nuestra PXC Pilot Drill.

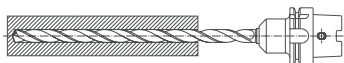
All deep hole drills must utilize a pilot hole drill.



Utilize a pilot hole drill to a minimum pilot depth of 1 to 1.5 x D. The pilot drill must be .00078 in (.02mm) bigger in diameter than the diameter of the long drill.



Introduce the long drill in the hole at a speed of 300 RPM.



After entering the hole, increase to the recommended speed.



Before taking the drill out of the hole, reduce the speed back to 300 RPM and withdraw the long drill.

Varianta® Supral Coating - Excellent for high-speed drilling operations. Ideal for dry and semi-dry machining.

Recubrimiento Varianta® Supral - Excelente para las operaciones de perforación de alta velocidad. Ideal para el mecanizado seco y semiseco.

140° Point Geometry - Split-point geometry for superior drill penetration and accuracy. It has a self-centering point with high penetration capabilities.

140° Geometría de la Punta - Diseño con punto dividido para superior perforación y precisión. Tiene un punto autocentrante con alto poder de penetración.

Coolant Holes - Cool the cutting edge and improve chip evacuation.

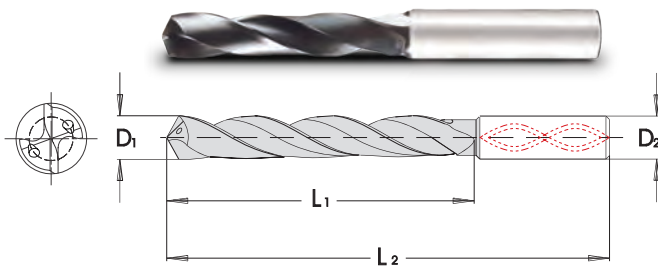
Refrigerante Interno - Enfría el filo y mejora la evacuación de la viruta.

Tolerance

Drill Dia (h7) Inches (in)	Drill Dia (h7) Metric (mm)
.0000-.1181: + 0/- .00039	0-3: + 0/- .010
.1182-.2362: + 0/- .00047	3.01-6: + 0/- .012
.2363-.3937: + 0/- .00059	6.01-10.0: + 0/- .015
.3938-.7087: + 0/- .00071	10.01-18.0: + 0/- .018

Shank Dia (h6) Inches (in)	Shank Dia (h6) Metric (mm)
.0000-.1181: + 0/- .00024	0-3: + 0/- .006
.1182-.2362: + 0/- .00031	3.01-6: + 0/- .008
.2363-.3937: + 0/- .00035	6.01-10.0: + 0/- .009
.3938-.7087: + 0/- .00043	10.01-18.0: + 0/- .011





Left-Hand, Available Upon Request



Varianta Supral® provides higher cutting speeds and excellent wear resistance.

The pilot drill is .00078 in (.02mm) larger in diameter than the diameter of the long drill

Example: If diameter is shown as 3.00 mm we add an additional .02mm in diameter to make it a pilot drill. (3.00mm + .02mm = 3.02mm)

**Diameters (2.0 - 2.9mm)
Available Upon Request.**

General Purpose Carbide Drills
Aluminum Carbide Drills
Steels Carbide Drills
Hardened Steels Carbide Drills
Spotting Carbide Drills
General Purpose Drills up to 30xD
Aluminum Drills up to 30xD
Drills for Steels
Pilot Drills

Solid Carbide Drills Non-Coolant

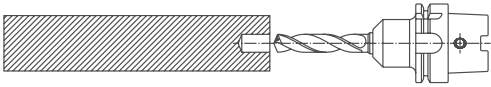
Solid Carbide Drills Internal Coolant

D ₁	Decimal	D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm	Part #
1/8	0.1181	3.000	6	28	66	PXC0503000T9
	0.1220	3.100	6	28	66	PXC0503100T9
	0.1250	3.175	6	28	66	PXC0503175T9
	0.1260	3.200	6	28	66	PXC0503200T9
	0.1299	3.300	6	28	66	PXC0503300T9
	0.1339	3.400	6	28	66	PXC0503400T9
	0.1378	3.500	6	28	66	PXC0503500T9
9/64	0.1406	3.572	6	28	66	PXC0503572T9
	0.1417	3.600	6	28	66	PXC0503600T9
	0.1457	3.700	6	28	66	PXC0503700T9
25	0.1496	3.800	6	36	74	PXC0503800T9
	0.1535	3.900	6	36	74	PXC0503900T9
5/32	0.1563	3.970	6	36	74	PXC0503970T9
	0.1575	4.000	6	36	74	PXC0504000T9
	0.1614	4.100	6	36	74	PXC0504100T9
	0.1654	4.200	6	36	74	PXC0504200T9
	0.1693	4.300	6	36	74	PXC0504300T9
11/64	0.1719	4.370	6	36	74	PXC0504370T9
	0.1732	4.400	6	36	74	PXC0504400T9
	0.1772	4.500	6	36	74	PXC0504500T9
	0.1811	4.600	6	36	74	PXC0504600T9
	0.1831	4.650	6	36	74	PXC0504650T9
13	0.1850	4.700	6	36	74	PXC0500130T9
3/16	0.1875	4.760	6	44	82	PXC0504760T9
12	0.1890	4.800	6	44	82	PXC0500120T9
	0.1929	4.900	6	44	82	PXC0504900T9
	0.1969	5.000	6	44	82	PXC0505000T9
	0.2008	5.100	6	44	82	PXC0505100T9
13/64	0.2031	5.160	6	44	82	PXC0505160T9
6	0.2040	5.182	6	44	82	PXC0500060T9
	0.2047	5.200	6	44	82	PXC0505200T9
	0.2087	5.300	6	44	82	PXC0505300T9
	0.2126	5.400	6	44	82	PXC0505400T9
	0.2165	5.500	6	44	82	PXC0505500T9
	0.2185	5.550	6	44	82	PXC0505550T9
7/32	0.2187	5.560	6	44	82	PXC0505560T9
	0.2205	5.600	6	44	82	PXC0505600T9
	0.2244	5.700	6	44	82	PXC0505700T9
	0.2283	5.800	6	44	82	PXC0505800T9
	0.2323	5.900	6	44	82	PXC0505900T9
15/64	0.2344	5.950	6	44	82	PXC0505950T9
	0.2362	6.000	8	44	82	PXC0506000T9
	0.2402	6.100	8	53	91	PXC0506100T9
	0.2441	6.200	8	53	91	PXC0506200T9
	0.2480	6.300	8	53	91	PXC0506300T9
1/4	0.2500	6.350	8	53	91	PXC0506350T9
	0.2520	6.400	8	53	91	PXC0506400T9
	0.2559	6.500	8	53	91	PXC0506500T9
	0.2598	6.600	8	53	91	PXC0506600T9
	0.2638	6.700	8	53	91	PXC0506700T9
17/64	0.2656	6.750	8	53	91	PXC0506750T9
	0.2677	6.800	8	53	91	PXC0506800T9
	0.2717	6.900	8	53	91	PXC0506900T9

Other Dimensions are Available Upon Request

D ₁	Decimal	D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm	Part #
	0.2756	7.000	8	53	91	PXC0507000T9
	0.2795	7.100	8	53	91	PXC0507100T9
9/32	0.2813	7.140	8	53	91	PXC0507140T9
	0.2835	7.200	8	53	91	PXC0507200T9
	0.2874	7.300	8	53	91	PXC0507300T9
	0.2913	7.400	8	53	91	PXC0507400T9
	0.2953	7.500	8	53	91	PXC0507500T9
19/64	0.2969	7.540	8	53	91	PXC0507540T9
	0.3031	7.700	8	53	91	PXC0507700T9
	0.3071	7.800	8	53	91	PXC0507800T9
	0.3110	7.900	8	53	91	PXC0507900T9
5/16	0.3125	7.940	8	53	91	PXC0507940T9
	0.3150	8.000	10	53	91	PXC0508000T9
	0.3189	8.100	10	61	103	PXC0508100T9
	0.3228	8.200	10	61	103	PXC0508200T9
	0.3268	8.300	10	61	103	PXC0508300T9
21/64	0.3281	8.330	10	61	103	PXC0508330T9
	0.3307	8.400	10	61	103	PXC0508400T9
	0.3346	8.500	10	61	103	PXC0508500T9
	0.3386	8.600	10	61	103	PXC0508600T9
	0.3425	8.700	10	61	103	PXC0508700T9
11/32	0.3437	8.730	10	61	103	PXC0508730T9
	0.3465	8.800	10	61	103	PXC0508800T9
	0.3543	9.000	10	61	103	PXC0509000T9
23/64	0.3594	9.130	10	61	103	PXC0509130T9
	0.3622	9.200	10	61	103	PXC0509200T9
	0.3661	9.300	10	61	103	PXC0509300T9
	0.3740	9.500	10	61	103	PXC0509500T9
3/8	0.3750	9.520	10	61	103	PXC0509520T9
	0.3780	9.600	10	61	103	PXC0509600T9
	0.3858	9.800	10	61	103	PXC0509800T9
	0.3898	9.900	10	61	103	PXC0509900T9
25/64	0.3906	9.920	10	61	103	PXC0509920T9
	0.3937	10.000	12	61	103	PXC0510000T9
	0.3976	10.100	12	71	118	PXC0510100T9
	0.4016	10.200	12	71	118	PXC0510200T9
	0.4055	10.300	12	71	118	PXC0510300T9
13/32	0.4063	10.320	12	71	118	PXC0510320T9
	0.4094	10.400	12	71	118	PXC0510400T9
	0.4134	10.500	12	71	118	PXC0510500T9
27/64	0.4219	10.720	12	71	118	PXC0510720T9
	0.4252	10.800	12	71	118	PXC0510800T9
	0.4331	11.000	12	71	118	PXC0511000T9
	0.4370	11.100	12	71	118	PXC0511100T9
7/16	0.4375	11.113	12	71	118	PXC0504375T9
	0.4409	11.200	12	71	118	PXC0511200T9
	0.4528	11.500	12	71	118	PXC0511500T9
29/64	0.4531	11.510	12	71	118	PXC0511510T9
	0.4606	11.700	12	71	118	PXC0511700T9
	0.4646	11.800	12	71	118	PXC0511800T9
15/32	0.4687	11.910	12	71	118	PXC0511910T9
	0.4724	12.000	12	71	118	PXC0512000T9

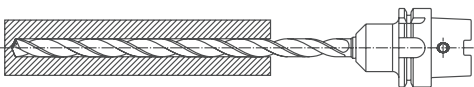
Manual for Pilot Drill



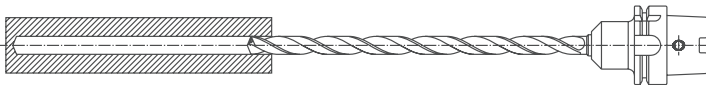
Utilize a pilot hole drill to a minimum pilot depth of 1 to 1.5 x D. The pilot drill must be .00078 in (.02mm) bigger in diameter than the diameter of the long drill.



Enter long drill in the hole at a low revolution.

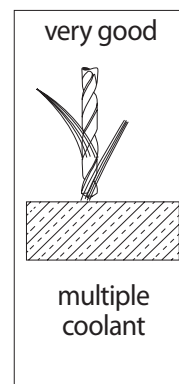
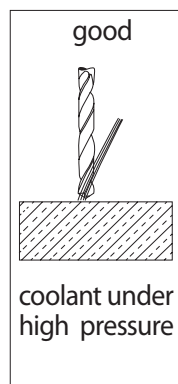
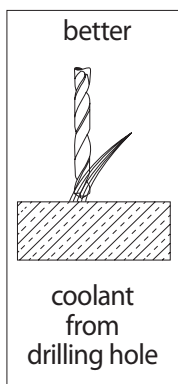
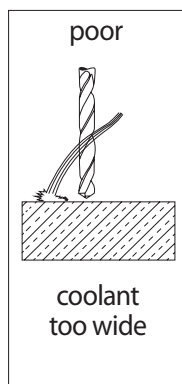
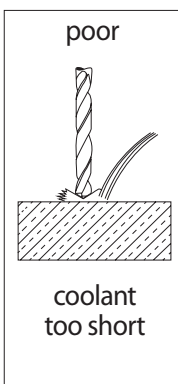


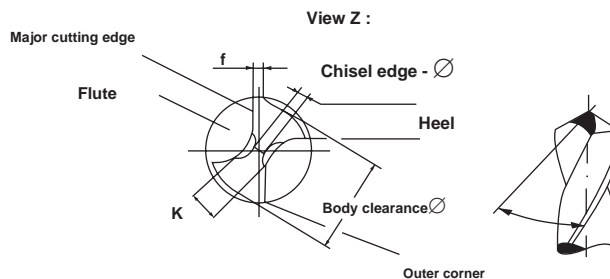
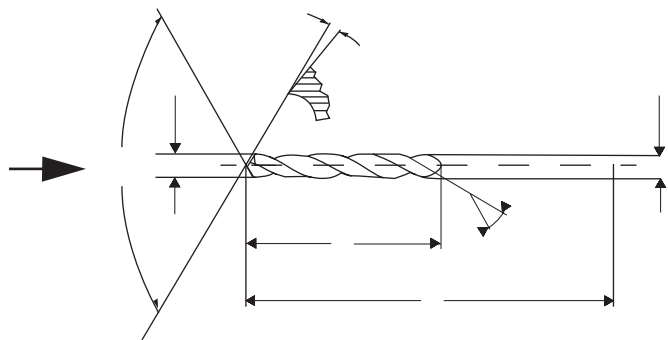
After entering the hole, increase to the recommended speed of the long drill.



Before taking the long drill out, reduce cutting speed to 300 RPM..

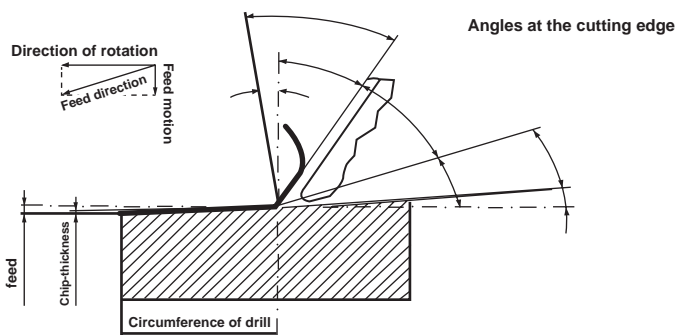
Coolant Fed:





abbreviations and dimension letters

- α : the clearance angle
- α_1 : the clearance angle measured at the cutting corner
- α_2 : the effective clearance angle of inclination
- β : the tool - orthogonal plane on the cutting corners
- γ : the spiral angle
- γ^1 : the tool orthogonal plane on the cutting corners
- γ^2 : the spiral angle on the cutting corners
- δ : the advance angle of inclination
- $\varnothing D1$: the blade diameter
- $\varnothing D2$: the shaft diameter
- f : the width of land
- K : the core \varnothing
- $L1$: the flute length
- $L2$: the total length
- σ : the apex angle
- ψ : the chisel edge angle



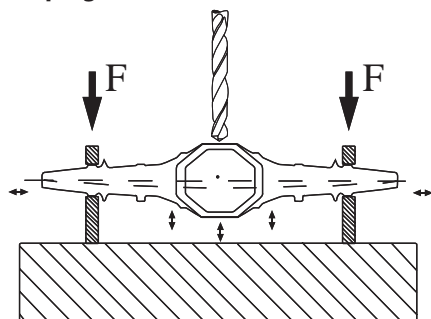
Correction Factors

The following correction factors should be used to get the most out of our drilling tools.

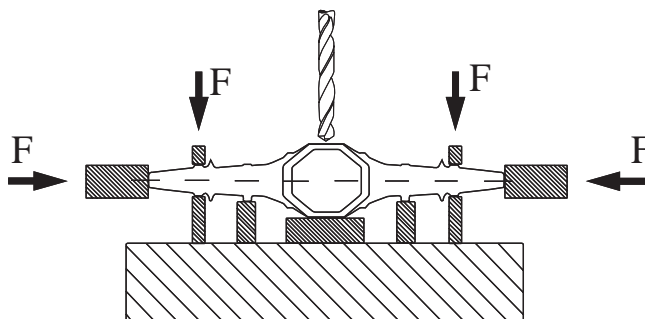
length corrections:

drilling depth	1 x d	3 x d	4 x d	5 x d	6 x d	7 x d	8 x d	10 x d	>10 x d
factor for v_c	1,2	1,0	0,95	0,9	0,85	0,8	0,75	0,7	0,6

clamping:



Poor clamping: Since the workpiece is not protected against bending and axial slipping.



Good clamping: Since the workpiece can neither bend nor slip.

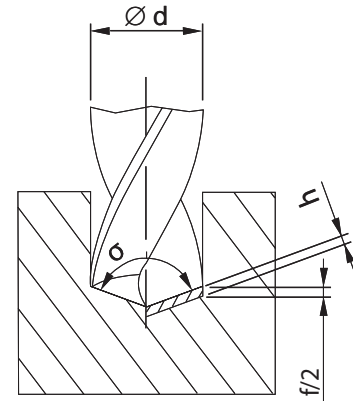
Machining and Cutting Forces

We can determine machining forces with the cut cross-section "A" by calculating rise per tooth and advance per rotation.

the cut cross-section:	$A = \frac{d \cdot f}{2}$
the cutting force:	$F_c = A \cdot k_c \cdot f_B$
the cutting moment:	$M_c = \frac{F_c \cdot d}{4}$
the rate of metal removal:	$Q = \frac{A \cdot V_c}{2}$
the cutting performance:	$P_c = \frac{F_c \cdot v_c}{2} = Q \cdot k_c$
the rise per tooth:	$h \approx 0,43 \cdot f$
the specific cutting force:	$k_c = k \cdot C_1 \cdot C_2$

the symbols of the formula:

- F_c the cutting force
- A cut cross-section
- C_1 correction factor
- C_2 the correction factor for the production technique
- d the drill diameter
- σ the apex angle
- f the advance per rotation
- h the rise per tooth
- v_c the cutting speed
- k_c the specific cutting force
- k the table value of the specific cutting force
- M_c the cutting momentum
- Q the rate of metal removal
- P_c the cutting performance
- f_B the process factor (=1x cutting into the solid = 0.95 boring)

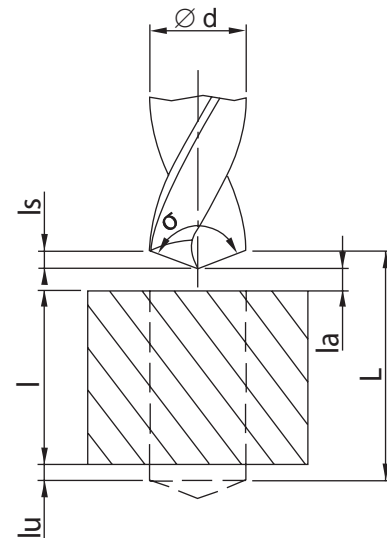


Calculating the Production Time and Application Values

the main application time	$t_h = \frac{L \cdot i}{n \cdot f}$
the feed path:	$L = l + l_s + l_a + l_u$
the revolution:	$n = \frac{V_c \cdot 1000}{d \cdot \pi}$
the cutting time:	$v_c = \frac{n \cdot \pi \cdot d}{1000}$

the symbols of the formula:

- t_h the main application time
- d the drill diameter
- l the drilling depth
- l_a the run-on
- l_u the overrun
- l_s the first cut
- L the feed path
- f the feed per rotation
- n the revolution
- v_c the cutting speed
- i the number of cuts
- σ the apex angle
- π Pi (= 3,1416)



the first out l_s	
σ	l_s
80°	$0,6 \cdot d$
118°	$0,3 \cdot d$
130°	$0,23 \cdot d$
140°	$0,18 \cdot d$

Specific Cutting force

Standard values for specific cutting cutting force											
Material	k_c 1.1 N/mm ²	m_c	Specific cutting force k in N/mm ² for rise per tooth h in mm								
			0,08	0,1	0,16	0,2	0,31	0,5	0,08	1,0	1,6
E 295	1500	0,3	3200	2995	2600	2430	2130	1845	1605	1500	1305
C 35, C45	1450	0,27	2870	2700	2380	2240	1990	1750	1540	1450	1275
C 60	1690	0,22	2945	2805	2530	2410	2185	1970	1775	1690	1525
9S20	1390	0,18	2190	2105	1935	1855	1715	1575	1445	1390	1275
9SMn28	1310	0,18	2065	1985	1820	1750	1615	1485	1365	1310	1205
35S20	1420	0,17	2180	2100	1940	1865	1735	1600	1475	1420	1310
16MnCr5	1400	0,30	2985	2795	2425	2270	1990	1725	1495	1400	1215
18CrNi8	1450	0,27	2870	2700	2380	2240	1990	1750	1540	1450	1275
20MnCr5	1465	0,26	2825	2665	2360	2225	1985	1755	1555	1465	1295
34CrMo4	1550	0,28	3145	2955	2590	2430	2150	1880	1550	1550	1360
37MnSi5	1580	0,25	2970	2810	2500	2365	2115	1880	1670	1580	1405
40Mn4	1600	0,26	3085	2910	2575	2430	2170	1915	1695	1600	1415
42CrMo4	1565	0,26	3020	2850	2520	2380	2120	1875	1660	1565	1385
50CrV4	1585	0,27	3135	2950	2600	2450	2175	1910	1685	1585	1395
X210Cr12	1720	0,26	3315	3130	2770	2615	2330	2060	1825	1720	1520
EN-GJL-200	825	0,33	1900	1765	1510	1405	1215	1035	890	825	705
EN-GJL-300	900	0,42	2600	2365	1945	1740	1470	1205	990	900	740
CuZn37	1180	0,15	1725	1665	1555	1500	1405	1310	1220	1180	1100
CuZn36Pb1,5	835	0,15	1220	1180	1100	1065	995	925	865	835	780
CuZn40Pb2	500	0,32	1120	1045	900	835	725	625	535	500	430

cutting speed v_c in m/min	C_1
10... 30	1,3
31... 80	1,1
81... 400	1,0
>400	0,9
production technique	C_2
milling	0,8
drilling	1,2

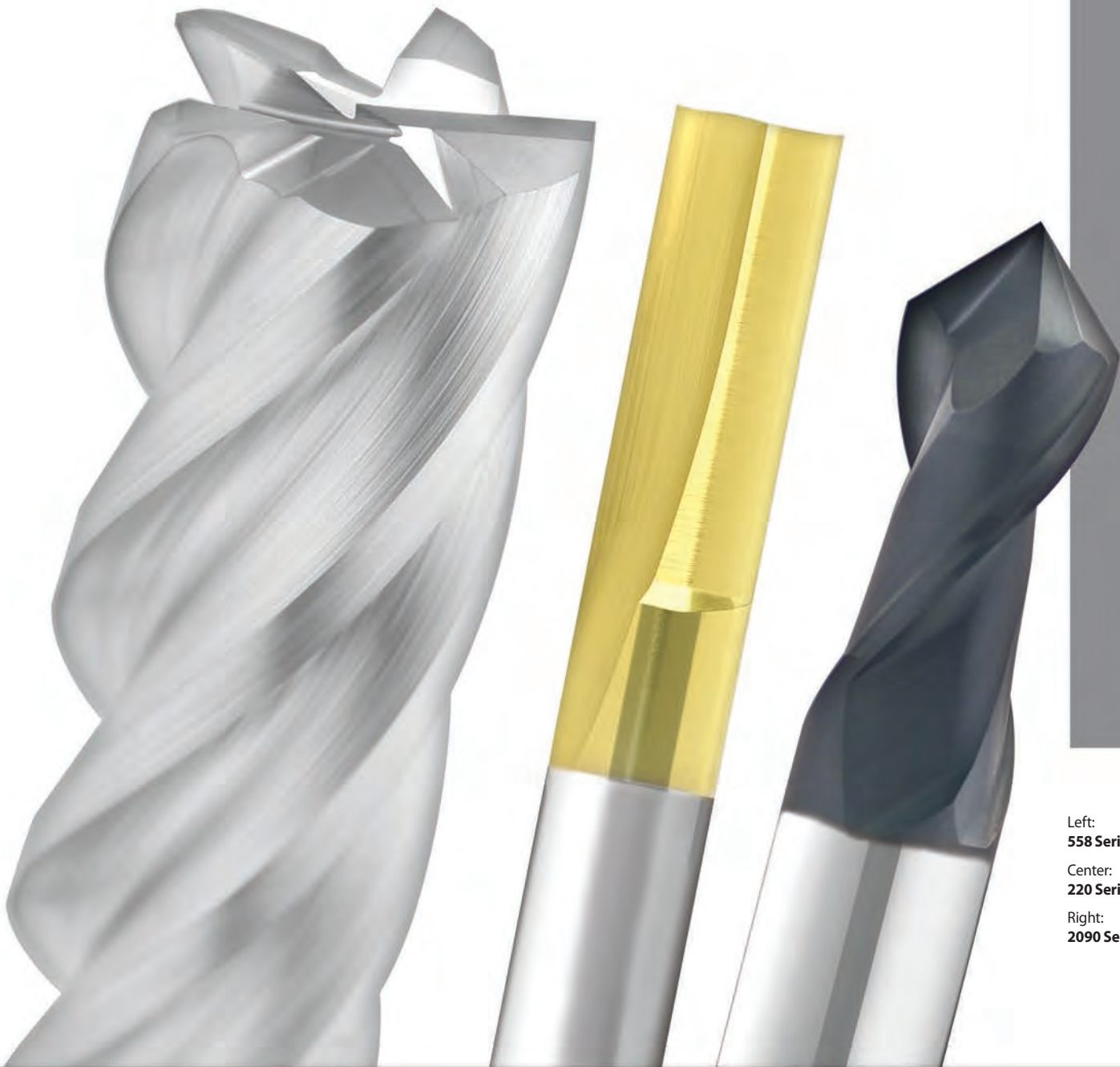
Tolerance Tables

above	to	H				e						f						
		5	6	7	8	5	6	7	8	9	10	5	6	7	8	9	10	
		in μm				in μm						in μm						
1	3	4	6	10	14	25	-14	-14	-14	-14	-14	-14	-6	-6	-6	-6	-6	-6
		0	0	0	0	0	-18	-20	-24	-28	-39	-54	-10	-12	-16	-20	-31	-46
3	6	5	8	12	18	30	-20	-20	-20	-20	-20	-20	-10	-10	-10	-10	10	10
		0	0	0	0	0	-25	-28	-32	-32	-50	-68	-15	-18	-22	-28	-40	-58
6	10	6	9	15	22	36	-25	-25	-25	-25	-25	-25	-13	-13	-13	-13	-13	-13
		0	0	0	0	0	-31	-34	-40	-47	-61	-83	-19	-22	-28	-35	-49	-71
10	18	8	11	18	27	43	-32	-32	-32	-32	-32	-32	-16	-16	-16	-16	-16	-16
		0	0	0	0	0	-40	-43	-50	-59	-75	-102	-24	-27	-34	-43	-59	-86
18	30	9	13	21	33	52	-40	-40	-40	-40	-40	-40	-20	-20	-20	-20	-20	-20
		0	0	0	0	0	-49	-53	-61	-73	-92	-124	-29	-33	-41	-53	-72	-104

above	to	h									js						m								
		5	6	7	8	9	10	11	10	11	12	13	14	16	16	3	4	5	6	7	8	9			
		in μm									in μm						in μm								
1	3	0	0	0	0	0	0	0	0	0	±20	±30	±0,05	±0,07	±0,125	±0,2	±0,2	4	4	6	8	12	16	27	
		-4	-6	-10	-14	-25	-40	-60										2	2	2	2	2	2	2	
3	6	0	0	0	0	0	0	0	0	0	±24	±37,5	±0,06	±0,09	±0,15	±0,24	±0,375	6,5	8	9	12	16	22	34	
		-5	-8	-12	-18	-30	-48	-75										4	4	4	4	4	4	4	
6	10	0	0	0	0	0	0	0	0	0	±29	±45	±0,075	±0,11	±0,18	±0,29	±0,45	8,5	10	12	15	21	28	42	
		-6	-9	-15	-22	-36	-58	-90										6	6	6	6	6	6	6	
10	18	0	0	0	0	0	0	0	0	0	±35	±55	±0,09	±0,135	±0,215	±0,35	±0,55	10	12	15	18	25	34	50	
		-8	-11	-18	-27	-43	-70	-110										7	7	7	7	7	7	7	
18	30	0	0	0	0	0	0	0	0	0	±42	±65	±0,105	±0,165	±0,126	±0,42	±0,65	12	14	17	21	29	41	60	
		-9	-13	-21	-33	-52	-84	-130										8	8	8	8	8	8	8	



PRECISION CUTTING TOOLS, INC.



Left:
558 Series p.130
Center:
220 Series p.189
Right:
2090 Series p.191

SOLID CARBIDE

EndMills, Routers and Drill Mills

VARIABLE HELIX

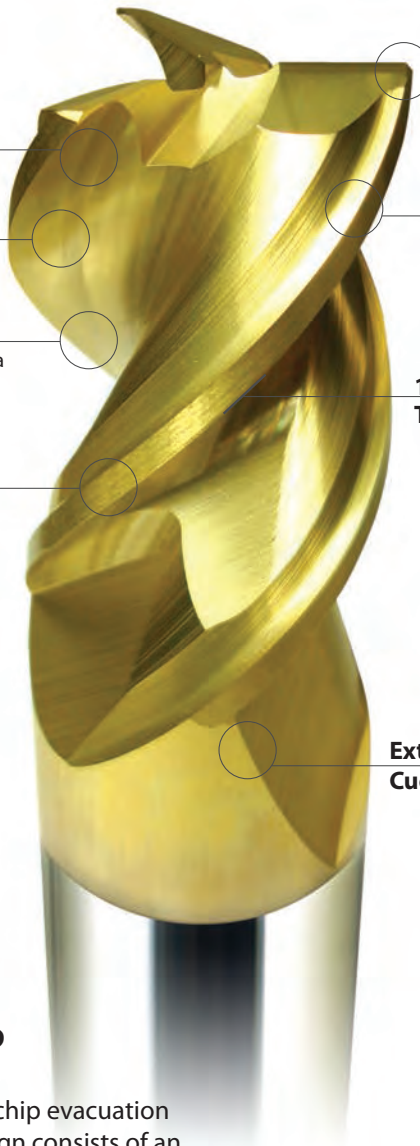
HIGH PERFORMANCE MACHINING +

HIGH PERFORMANCE

STANDARD

Variable Endmills

IDEAL FOR HIGH-SPEED MACHINING (HSM)



3 Flute Variable - Eliminates harmonics

3 Flauta Variable - Elimina los armónicos

E-Cut - Faster chip evacuation

Corte-E - Evacuación más rápida de la viruta

Large Gullet - For better chip flow

Gaznate grande - Para mejor el flujo de viruta

Eccentric OD - For a tougher cutting edge

Diámetro Exterior Excéntrico
Para un borde de corte más resistente

Standard Chamfer

****Corner Radii** (Available upon request)

Chamfer estándar de esquina

****Radios** (Disponibles a petición)

Z-Power Coating - Reduces friction between the chip and tool.

Revestimiento Z-Power - Reduce la fricción entre la viruta y herramienta.

1° Radial Land - Reduce chatter

Tierra Radial - Reduce la vibración

Extended Neck - Available for deep-pocket applications.

Cuello extendido - Disponible para aplicaciones de bolsillos profundos.

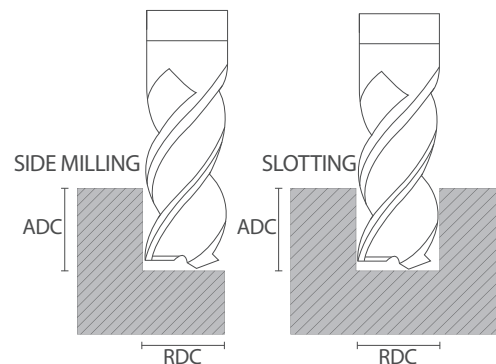
360 SERIES

3 Flute Variable End Mill, Eccentric OD Aluminum Applications

The 360 Series is engineered for improved chip evacuation and maximum metal removal rates. Its design consists of an eccentric OD, standard chamfer, large gullet and a 1° radial land; excellent features for chatter-free machining. Our 360 Series can be used for both roughing and finishing applications of Aluminum alloys.

3 Flautas Variable, Diámetro Excéntrico Aplicaciones de Aluminio

La Serie 360 está diseñada para máxima evacuación de la viruta. Su diseño consiste de un diámetro excéntrico, chamfer estándar y un gaznate grande; características necesarias para el mecanizado sin vibración. Además, nuestra Serie 360 se puede utilizar para ambos el desbaste y acabado de aluminio.



Speed & Feeds for High Performance Milling

Material	SFM (Vc)	Chipload per Tooth Recommendations (CPT)							Profiling Radial (ADC) (RDC)	Slotting Axial (ADC)	
		1/4"	5/16"	3/8"	1/2"	5/8"	3/4"	1"			
N1 Aluminum Alloys	up to 6,000	.002	.002	.004	.006	.007	.008	.0095	1.5xD	.5xD	1.5xD
N2 Aluminum High Silicon	up to 6,000	.002	.002	.004	.006	.007	.008	.0095	1.5xD	.5xD	1.5xD

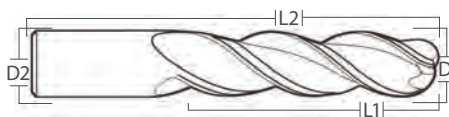
Note: These are only recommended starting figures that depend on conditions such as machine and material rigidity, type of coating if any, etc. TESTING IS RECOMMENDED
Z-Power Coating Recommended for High Silicon



3 Flute Variable EndMill

- Tool comes with 45° chamfer
- Z-Power (ZrN) recommended (up to 25% faster than uncoated)
- Radii (available upon request)
- Left Hand (available upon request)
- Flats added within 24 hrs.
- Eccentric OD
- Material Code Refer to Page 245 & 246.

N



CARBIDE	3 Flutes	38°

Z-Power® has excellent corrosion and adhesion resistant properties.

Speeds & Feeds Refer to Page 122.

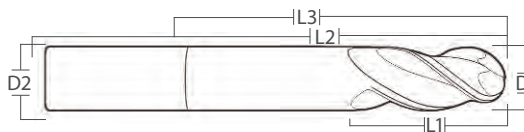
Fractional

D1 Cutting Dia	D2 Shank Dia	L1 LOC	L2 OAL	Available Radius	ZrN Z-Power Coated	ZrN Ball End Coated
1/4	1/4	1/2	2	.015 .020 .030 .045	0360T60405002	0360T60405002B
1/4	1/4	3/4	2-1/2	.015 .020 .030 .045	0360T604075025	0360T604075025B
5/16	5/16	1/2	2	.015 .020 .030 .045	0360T60505002	0360T60505002B
5/16	5/16	3/4	2-1/2	.015 .020 .030 .045	0360T605075025	0360T605075025B
3/8	3/8	5/8	2	.015 .020 .030 .045	0360T60606252	0360T60606252B
3/8	3/8	1	2-1/2	.015 .020 .030 .045	0360T606100025	0360T606100025B
1/2	1/2	5/8	2-1/2	.015 .020 .030 .045 .060	0360T608062525	0360T608062525B
1/2	1/2	1	3	.015 .020 .030 .045 .060	0360T60810003	0360T60810003B
5/8	5/8	3/4	3	.015 .020 .030 .045 .060 .090	0360T61007503	0360T61007503B
5/8	5/8	1-1/4	3-1/2	.015 .020 .030 .045 .060 .090	0360T610125035	0360T610125035B
3/4	3/4	1	3	.015 .020 .030 .045 .060 .090 .125	0360T61210003	0360T61210003B
3/4	3/4	1-1/2	4	.015 .020 .030 .045 .060 .090 .125	0360T61215004	0360T61215004B
7/8	7/8	1-1/2	4	.015 .020 .030 .045 .060 .090 .125	0360T61415004	0360T61415004B
1	1	1-1/2	4	.015 .020 .030 .045 .060 .090 .125	0360T61615004	0360T61615004B

Other Dimensions & Radii are Available Upon Request

NOTE: When ordering with radius, include the series and part number.

Example: (.015(radius) + 0360(series) + T6 04 0500 2(part) = .015-0360T6 04 0500 2)



Extended Neck

D1 Cutting Dia	D2 Shank Dia	L1 LOC	L3 REACH	L2 OAL	Available Radius	ZrN Z-Power Coated	ZrN Ball End Coated
1/4	1/4	3/8	1-1/8	3	.015 .020 .030 .045	0360T60403753.1	0360T60403753.1B
1/4	1/4	3/8	2-1/8	4	.015 .020 .030 .045	0360T60403754.2	0360T60403754.2B
3/8	3/8	1/2	1-1/8	3	.015 .020 .030 .045	0360T60605003.1	0360T60605003.1B
3/8	3/8	1/2	2-1/8	4	.015 .020 .030 .045	0360T60605004.2	0360T60605004.2B
1/2	1/2	5/8	2-1/8	4	.015 .020 .030 .045 .060	0360T60806254.2	0360T60806254.2B
1/2	1/2	5/8	3-1/8	5	.015 .020 .030 .045 .060	0360T60806255.3	0360T60806255.3B
1/2	1/2	5/8	4-1/8	6	.015 .020 .030 .045 .060	0360T60806256.4	0360T60806256.4B
5/8	5/8	3/4	2-1/8	4	.015 .020 .030 .045 .060 .090	0360T61007504.2	0360T61007504.2B
5/8	5/8	3/4	3-1/8	5	.015 .020 .030 .045 .060 .090	0360T61007505.3	0360T61007505.3B
5/8	5/8	3/4	4-1/8	6	.015 .020 .030 .045 .060 .090	0360T61007506.4	0360T61007506.4B
3/4	3/4	1	2	4	.015 .020 .030 .045 .060 .090 .125	0360T61210004.2	0360T61210004.2B
3/4	3/4	1	3	5	.015 .020 .030 .045 .060 .090 .125	0360T61210005.3	0360T61210005.3B
3/4	3/4	1	4	6	.015 .020 .030 .045 .060 .090 .125	0360T61210006.4	0360T61210006.4B
1	1	1-1/4	3	5	.015 .020 .030 .045 .060 .090 .125	0360T61612505.3	0360T61612505.3B
1	1	1-1/4	4	6	.015 .020 .030 .045 .060 .090 .125	0360T61612506.4	0360T61612506.4B

Tolerance

Cutting Diameter (D1)	Shank Diameter (D2)
1/8"-1/4": +.000"/-.0012"	1/8"-1/4": -.0001"/-.0003"
1/4"-1/2": +.000"/-.0016"	1/4"-1/2": -.0001"/-.0003"
1/2"-1": +.000"/-.0020"	1/2"-1": -.0001"/-.0004"

Runout 0.0005"max (shank to cutting diameter)
Back Taper 0.0005"max | Ball Nose Radius +.000"/-.001"

Variable Helix Endmills
HPM+ Endmills
High Performance Endmills
Standard Endmills
Solid Carbide Endmills
Metric Carbide Endmills
Routers Solid Carbide Routers
Drill Mills Solid Carbide Drill Mills
Powder Metal Endmills (PM30) Endmills
Powder Metal Endmills (PM4) Endmills
Cobalt Endmills (M42) Endmills
High Speed Steel (M7) Endmills

Variable Endmills

HIGH PERFORMANCE MILLING

4 Flute Variable - Eliminates Harmonics
4 Flauta Variable - Elimina los armónicos

Standard chamfer
****Corner radii** (Available upon request)
Chafilán estándar de esquina
****Radios** (Disponible a petición)

Standard Sizes - Variable Flute and Helix
Tamaños estándar - Flauta variable y Helix

Exxtral Plus Coating - High speed operations, Semi-Dry or Dry Machining.
Revestimiento Exxtral Plus - Operaciones de mecanizado de alta velocidad, semi-seco o seco.

Extended Neck - Available for deep-pockets applications
Cuello extendido - Disponible para aplicaciones de bolsillos profundos

451 SERIES

4 Flute Variable End Mill, Primary & Secondary Difficult-to-Machine Materials

The 451 Series is engineered for improved chip evacuation and maximum speeds and feeds. Its design consists of primary and secondary relief angles, standard chamfer and a variable flute; ideal properties for operations of tough materials. In addition, our 451 Series leaves a superior finish on the part.

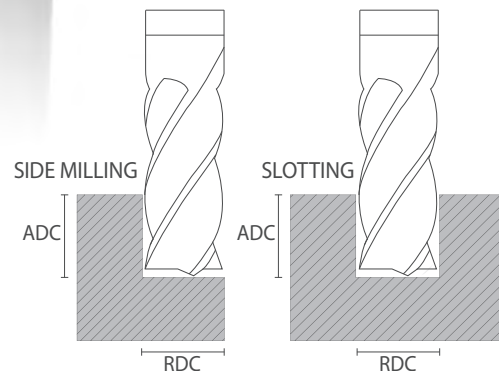
4 Flautas Variable, Ángulos Primarios Y Secundarios Materiales Difícil de Mecanizar

La Serie 451 está diseñada para mejorar la evacuación de la viruta durante operaciones de alta velocidad. Su diseño consiste de ángulos primarios y secundarios, chamfer estándar y una flauta variable; propiedades ideales para las operaciones de materiales endurecidos. Además, nuestra Serie 451 deja un acabado superior en la pieza.

Tolerance

Cutting Diameter (D1)	Shank Diameter (D2)	
1/8"-1/4": +.000"/-.0012"	1/8"-1/4": -.0001"/-.0003"	(D1) +0.00mm -0.013mm
1/4"-1/2": +.000"/-.0016"	1/4"-1/2": -.0001"/-.0003"	(D2) +0.00mm -0.013mm
1/2"-1": +.000"/-.0020"	1/2"-1": -.0001"/-.0004"	

Runout 0.0005"max (shank to cutting diameter)
 Back Taper 0.0005"max | Ball Nose Radius +.000"/-.001"



Speed & Feeds for High Performance Milling

	Material	SFM (Vc)	Chipload per Tooth Recommendations (CPT)							Profiling Radial (ADC) (RDC)	Slotting Axial (ADC)	
			1/4"	5/16"	3/8"	1/2"	5/8"	3/4"	1"			
M	Stainless Steel - 304, 316, 400 Series, Kovar, Invar	280	.002	.002	.002	.003	.003	.003	.003	1.5xD	.5xD	1xD
M	Stainless Steel - 304L, 316L, 17/4, 15/5, 13/8, PH Materials	200	.001	.002	.002	.002	.002	.002	.002	1.5xD	.5xD	1xD
P	Carbon Steels - 1000 Series	500	.002	.002	.002	.003	.003	.003	.004	1.5xD	.5xD	1xD
S	Titanium - 6Al4V, CP	170	.001	.001	.001	.002	.002	.002	.003	1.5xD	.5xD	1xD
K	Gray Cast Iron	500	.002	.002	.002	.003	.003	.003	.004	1.5xD	.5xD	1xD

Note: These are only recommended starting figures that depend on conditions such as machine and material rigidity, type of coating if any, etc. **TESTING IS RECOMMENDED**

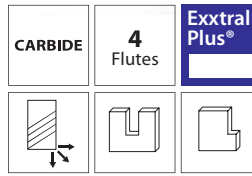


4 Flute Variable EndMill

- Tool comes with 45° chamfer
- Exxtral Plus (AlTiN) recommended (up to 25% faster than uncoated)
- Radii (available upon request)
- Left Hand (available upon request)
- Flats added within 24 hrs.
- Material Code Refer to Page 245 & 246.

P M K S H

Extended Neck



Exxtral Plus® is ideal for high performance machining of hard materials.

Speeds & Feeds Refer to Page 124.

Fractional * = 38° Helix

D1 Cutting Dia	D2 Shank Dia	L1 LOC	L2 OAL	Available Radius	AITiN Exxtral Plus Coated	AITiN Ball End Coated	AITiN Sharp Corner
1/8	1/8	1/2	1-1/2	.010	0451T402050015	0451T402050015B	0451T402050015S
3/16	3/16	5/8	2	.010	0451T40306252	0451T40306252B	0451T40306252S
1/4	1/4	3/8	2	.015 .020 .030 .045	0451T40403752	0451T40403752B	0451T40403752S
1/4	1/4	3/4	2-1/2	.015 .020 .030 .045	0451T404075025	0451T404075025B	0451T404075025S
1/4	1/4	1	3	.015 .020 .030 .045	0451T40410003	0451T40410003B	0451T40410003S
1/4	1/4	1-1/4	4	.015 .020 .030 .045	0451T40412504	0451T40412504B	0451T40412504S
1/4	1/4	1-3/4	4	.015 .020 .030 .045	0451T40417504	0451T40417504B	0451T40417504S
5/16	5/16	1/2	2	.015 .020 .030 .045	0451T40505002	0451T40505002B	0451T40505002S
5/16	5/16	7/8	2-1/2	.015 .020 .030 .045	0451T405087525	0451T405087525B	0451T405087525S
5/16	5/16	1	3	.015 .020 .030 .045	0451T40510003	0451T40510003B	0451T40510003S
5/16	5/16	1-1/4	4	.015 .020 .030 .045	0451T40512504	0451T40512504B	0451T40512504S
5/16	5/16	1-5/8	4	.015 .020 .030 .045	0451T40516254	0451T40516254B	0451T40516254S
3/8	3/8	1/2	2	.015 .020 .030 .045	0451T40605002	0451T40605002B	0451T40605002S
3/8	3/8	1	2-1/2	.015 .020 .030 .045	0451T406100025	0451T406100025B	0451T406100025S
3/8	3/8	1	3	.015 .020 .030 .045	0451T40610003	0451T40610003B	0451T40610003S
3/8	3/8	1-1/2	4	.015 .020 .030 .045	0451T40615004	0451T40615004B	0451T40615004S
3/8	3/8	2-1/2	5	.015 .020 .030 .045	0451T40625005	0451T40625005B	0451T40625005S
7/16	7/16	5/8	2-3/4	.015 .020 .030 .045	0451T407062527	0451T407062527B	0451T407062527S
7/16	7/16	1	2-3/4	.015 .020 .030 .045	0451T407100027	0451T407100027B	0451T407100027S
7/16	7/16	1-1/2	4	.015 .020 .030 .045	0451T40715004	0451T40715004B	0451T40715004S
7/16	7/16	3	6	.015 .020 .030 .045	0451T40730006	0451T40730006B	0451T40730006S
1/2	1/2	5/8	2-1/2	.015 .020 .030 .045 .060	0451T408062525	0451T408062525B	0451T408062525S
1/2	1/2	1	3	.015 .020 .030 .045 .060	0451T40810003	0451T40810003B	0451T40810003S
1/2	1/2	1-1/4	3	.015 .020 .030 .045 .060	0451T40812503	0451T40812503B	0451T40812503S
1/2	1/2	1-1/2	4	.015 .020 .030 .045 .060	0451T40815004	0451T40815004B	0451T40815004S
1/2	1/2	2	4	.015 .020 .030 .045 .060	0451T40820004	0451T40820004B	0451T40820004S
1/2	1/2	2-1/2	5	.015 .020 .030 .045 .060	0451T40825005	0451T40825005B	0451T40825005S
1/2	1/2	3	6	.015 .020 .030 .045 .060	0451T40830006	0451T40830006B	0451T40830006S
5/8	5/8	3/4	3	.015 .020 .030 .045 .060 .090	0451T41007503	0451T41007503B	0451T41007503S
5/8	5/8	1-1/4	3-1/2	.015 .020 .030 .045 .060 .090	0451T410125035	0451T410125035B	0451T410125035S
5/8	5/8	1-3/4	4	.015 .020 .030 .045 .060 .090	0451T41017504	0451T41017504B	0451T41017504S
5/8	5/8	2-1/4	5	.015 .020 .030 .045 .060 .090	0451T41022505	0451T41022505B	0451T41022505S
5/8	5/8	3	6	.015 .020 .030 .045 .060 .090	0451T41030006	0451T41030006B	0451T41030006S
3/4	3/4	7/8	3	.015 .020 .030 .045 .060 .090 .125	0451T41208753	0451T41208753B	0451T41208753S
3/4	3/4	1-1/2	4	.015 .020 .030 .045 .060 .090 .125	0451T41215004	0451T41215004B	0451T41215004S
3/4	3/4	1-5/8	4	.015 .020 .030 .045 .060 .090 .125	0451T41216254	0451T41216254B	0451T41216254S
3/4	3/4	2-1/4	5	.015 .020 .030 .045 .060 .090 .125	0451T41222505	0451T41222505B	0451T41222505S
3/4	3/4	3	6	.015 .020 .030 .045 .060 .090 .125	0451T41230006	0451T41230006B	0451T41230006S
3/4	3/4	4	7	.015 .020 .030 .045 .060 .090 .125	0451T41240007	0451T41240007B	0451T41240007S
1	1	1-1/2	4	.015 .020 .030 .045 .060 .090 .125	0451T41615004	0451T41615004B	0451T41615004S
1	1	2	4-1/2	.015 .020 .030 .045 .060 .090 .125	0451T416200045	0451T416200045B	0451T41615004S
1	1	2-1/4	5	.015 .020 .030 .045 .060 .090 .125	0451T41622505	0451T41622505B	0451T41622505S
1	1	3	6	.015 .020 .030 .045 .060 .090 .125	0451T41630006	0451T41630006B	0451T41630006S
1	1	4	7	.015 .020 .030 .045 .060 .090 .125	0451T41640007	0451T41640007B	0451T41640007S

Other Dimensions & Radii are Available Upon Request

Extended Neck

D1 Cutting Dia	D2 Shank Dia	L1 LOC	L3 REACH	L2 OAL	Available Radius	AITiN Exxtral Plus Coated	AITiN Ball End Coated
1/4	1/4	3/8	1-1/8	3	.015 .020 .030 .045	0451T40403753.1	0451T40403753.1B
1/4	1/4	3/8	2-1/8	4	.015 .020 .030 .045	0451T40403754.2	0451T40403754.2B
3/8	3/8	1/2	2-1/8	4	.015 .020 .030 .045	0451T406050004.2	0451T406050004.2B
3/8	3/8	1/2	3-3/8	6	.015 .020 .030 .045	0451T406050006.3	0451T406050006.3B
1/2	1/2	5/8	2-1/8	4	.015 .020 .030 .045 .060	0451T40806254.2	0451T40806254.2B
1/2	1/2	5/8	3-1/8	5	.015 .020 .030 .045 .060	0451T40806255.3	0451T40806255.3B
1/2	1/2	5/8	4-1/8	6	.015 .020 .030 .045 .060	0451T40806256.4	0451T40806256.4B
5/8	5/8	3/4	2-1/8	4	.015 .020 .030 .045 .060 .090	0451T41007504.2	0451T41007504.2B
5/8	5/8	3/4	3-1/8	5	.015 .020 .030 .045 .060 .090	0451T41007505.3	0451T41007505.3B
5/8	5/8	3/4	4-1/8	6	.015 .020 .030 .045 .060 .090	0451T41007506.4	0451T41007506.4B
3/4	3/4	1	2	4	.015 .020 .030 .045 .060 .090 .125	0451T41210004.2	0451T41210004.2B
3/4	3/4	1	3	5	.015 .020 .030 .045 .060 .090 .125	0451T41210005.3	0451T41210005.3B
3/4	3/4	1	4	7	.015 .020 .030 .045 .060 .090 .125	0451T41210007.4	0451T41210007.4B
1	1	1-1/4	2-5/8	5	.015 .020 .030 .045 .060 .090 .125	0451T41612505.2	0451T41612505.2B
1	1	1-1/4	3-1/8	6	.015 .020 .030 .045 .060 .090 .125	0451T41612506.3	0451T41612506.3B
1	1	1-1/4	4-1/8	7	.015 .020 .030 .045 .060 .090 .125	0451T41612507.4	0451T41612507.4B

Variable Helix Endmills
 HP/M+ Endmills
 High Performance Endmills
 Standard Endmills
 Carbide Endmills
 Solid Carbide Routers
 Solid Carbide Drill Mills
 Powder Metal Endmills (PM30)
 Powder Metal Endmills (PM4)
 Cobalt Endmills (M42)
 High Speed Steel Endmills (M7)

Variable Endmills

HIGH PERFORMANCE MILLING



4 Flute Variable - Eliminates Harmonics
4 Flauta Variable - Elimina los armónicos

4 Flute Variable Chip Breaker
 For Roughing Operations
Variable de 4 Flautas Rompe-chip
 Para operaciones de desbaste

Standard chamfer
****Corner radii** (Available upon request)

Chafán estándar de esquina
****Radios** (Disponibles a petición)

Exxtral Plus Coating - High speed operations, semi-dry or dry machining.

Revestimiento Exxtral Plus - Operaciones de mecanizado de alta velocidad, semi-seco o seco.

Standard Sizes - Variable Flute and Helix
Tamaños estándar - Flauta variable y Helix

453 SERIES

4 Flute Variable End Mill, Chip-Breakers Difficult-to-Machine Materials

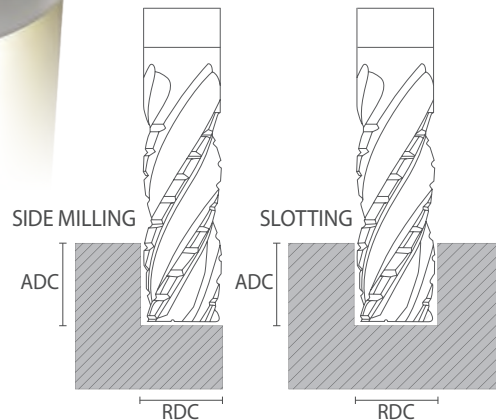
Inspired by our 451 Series, the 453 Series is designed with added chip-breakers for efficient chip removal. Its unique geometry allows for increased speeds and feeds and cutting depth. Our 451 Series is ideal for plunging, slotting, ramping and peripheral milling operations of Steels, Titanium and Cast Iron.

4 Flautas Variable, Rompe-Chip Materiales Difíciles de Mecanizar

Inspirada por nuestra Serie 451, la Serie 453 está diseñado con rompe-chips añadidos para una evacuación de viruta eficaz. Su geometría única permite altas velocidades y aumento de profundidad de corte. Nuestra Serie 451 es ideal para ranurado, rampa y operaciones periféricas de aceros, titanio y hierro fundido.

Extended Neck - Available for deep-pocket applications

Cuello extendido - Disponible para aplicaciones de bolsillos profundos



Tolerance

Cutting Diameter (D1)	Shank Diameter (D2)	
1/8"-1/4": +.000"/-.0012"	1/8"-1/4": -.0001"/-.0003"	(D1) +0.00mm -0.013mm
1/4"-1/2": +.000"/-.0016"	1/4"-1/2": -.0001"/-.0003"	(D2) +0.00mm -0.013mm
1/2"-1": +.000"/-.0020"	1/2"-1": -.0001"/-.0004"	

Runout 0.0005"max (shank to cutting diameter)
 Back Taper 0.0005"max | Ball Nose Radius +.000/-0.01"

Speed & Feeds for High Performance Milling

Material	SFM (Vc)	Chipload per Tooth Recommendations (CPT)								Profiling Radial (ADC) (RDC)	Slotting Axial (ADC)
		1/4"	5/16"	3/8"	1/2"	5/8"	3/4"	1"			
		1.5xD	.5xD	1xD							
M Stainless Steel - 304, 316, 400 Series, Kovar, Invar	280	.002	.002	.002	.003	.003	.003	.003	1.5xD	.5xD	1xD
M Stainless Steel - 304L, 316L, 17/4, 15/5, 13/8, PH Materials	200	.001	.002	.002	.002	.002	.002	.002	1.5xD	.5xD	1xD
P Carbon Steels - 1000 Series	500	.002	.002	.002	.003	.003	.003	.004	1.5xD	.5xD	1xD
S Titanium - 6Al4V, CP	170	.001	.001	.001	.002	.002	.002	.003	1.5xD	.5xD	1xD
K Gray Cast Iron	500	.002	.002	.002	.003	.003	.003	.004	1.5xD	.5xD	1xD

Note: These are only recommended starting figures that depend on conditions such as machine and material rigidity, type of coating if any, etc. **TESTING IS RECOMMENDED**

Variable Helix Endmills
 HP/M+ Endmills
 High Performance Endmills
 Standard Endmills
 Carbide Endmills
 Solid Carbide Routers
 Drill Mills
 Powder Metal Endmills (PM30)
 Powder Metal Endmills (PM4)
 Cobalt Endmills (M42)
 High Speed Steel Endmills (M7)



4 Flute Variable EndMill - Chip Breakers

- Tool comes with 45° chamfer
- Exxtral Plus (AlTiN) recommended (up to 25% faster than uncoated)
- Radii (available upon request)
- Left Hand (available upon request)
- Flats added within 24 hrs.
- Material Code Refer to Page 245 & 246.

P M K S H

CARBIDE	4 Flutes	38°	Roughing Finishing
			Exxtral Plus®

Extended Neck

Exxtral Plus® is ideal for high performance machining of hard materials.

Speeds & Feeds Refer to Page 126.

Fractional * = 38° Helix

	D1 Cutting Dia	D2 Shank Dia	L1 LOC	L2 OAL	Available Radius	AlTiN Exxtral Plus Coated	AlTiN Ball End Coated
*	1/4	1/4	3/8	2	.015 .020 .030 .045	0453T40403752	0453T40403752B
*	1/4	1/4	3/4	2-1/2	.015 .020 .030 .045	0453T404075025	0453T404075025B
*	1/4	1/4	1	3	.015 .020 .030 .045	0453T40410003	0453T40410003B
*	1/4	1/4	1-1/4	4	.015 .020 .030 .045	0453T40412504	0453T40412504B
*	1/4	1/4	1-3/4	4	.015 .020 .030 .045	0453T40417504	0453T40417504B
*	5/16	5/16	1/2	2	.015 .020 .030 .045	0453T40505002	0453T40505002B
*	5/16	5/16	7/8	2-1/2	.015 .020 .030 .045	0453T405087525	0453T405087525B
*	5/16	5/16	1	3	.015 .020 .030 .045	0453T40510003	0453T40510003B
*	5/16	5/16	1-1/4	4	.015 .020 .030 .045	0453T40512504	0453T40512504B
*	5/16	5/16	1-5/8	4	.015 .020 .030 .045	0453T40516254	0453T40516254B
*	3/8	3/8	1/2	2	.015 .020 .030 .045	0453T40605002	0453T40605002B
*	3/8	3/8	1	2-1/2	.015 .020 .030 .045	0453T406100025	0453T406100025B
*	3/8	3/8	1	3	.015 .020 .030 .045	0453T40610003	0453T40610003B
*	3/8	3/8	1-1/2	4	.015 .020 .030 .045	0453T40615004	0453T40615004B
*	3/8	3/8	2-1/2	5	.015 .020 .030 .045	0453T40625005	0453T40625005B
*	7/16	7/16	5/8	2-3/4	.015 .020 .030 .045	0453T407062527	0453T407062527B
*	7/16	7/16	1	2-3/4	.015 .020 .030 .045	0453T407100027	0453T407100027B
*	7/16	7/16	1-1/2	4	.015 .020 .030 .045	0453T40715004	0453T40715004B
*	7/16	7/16	3	6	.015 .020 .030 .045	0453T40730006	0453T40730006B
*	1/2	1/2	5/8	2-1/2	.015 .020 .030 .045 .060	0453T408062525	0453T408062525B
*	1/2	1/2	1	3	.015 .020 .030 .045 .060	0453T40810003	0453T40810003B
*	1/2	1/2	1-1/4	3	.015 .020 .030 .045 .060	0453T40812503	0453T40812503B
*	1/2	1/2	1-1/2	4	.015 .020 .030 .045 .060	0453T40815004	0453T40815004B
*	1/2	1/2	2	4	.015 .020 .030 .045 .060	0453T40820004	0453T40820004B
*	1/2	1/2	2-1/2	5	.015 .020 .030 .045 .060	0453T40825005	0453T40825005B
*	1/2	1/2	3	6	.015 .020 .030 .045 .060	0453T40830006	0453T40830006B
*	5/8	5/8	3/4	3	.015 .020 .030 .045 .060 .090	0453T41007503	0453T41007503B
*	5/8	5/8	1-1/4	3-1/2	.015 .020 .030 .045 .060 .090	0453T410125035	0453T410125035B
*	5/8	5/8	1-3/4	4	.015 .020 .030 .045 .060 .090	0453T41017504	0453T41017504B
*	5/8	5/8	2-1/4	5	.015 .020 .030 .045 .060 .090	0453T41022505	0453T41022505B
*	5/8	5/8	3	6	.015 .020 .030 .045 .060 .090	0453T41030006	0453T41030006B
*	3/4	3/4	7/8	3	.015 .020 .030 .045 .060 .090 .125	0453T41208753	0453T41208753B
*	3/4	3/4	1-1/2	4	.015 .020 .030 .045 .060 .090 .125	0453T41215004	0453T41215004B
*	3/4	3/4	1-5/8	4	.015 .020 .030 .045 .060 .090 .125	0453T41216254	0453T41216254B
*	3/4	3/4	2-1/4	5	.015 .020 .030 .045 .060 .090 .125	0453T41222505	0453T41222505B
*	3/4	3/4	3	6	.015 .020 .030 .045 .060 .090 .125	0453T41230006	0453T41230006B
*	3/4	3/4	4	7	.015 .020 .030 .045 .060 .090 .125	0453T41240007	0453T41240007B
*	1	1	1-1/2	4	.015 .020 .030 .045 .060 .090 .125	0453T41615004	0453T41615004B
*	1	1	2	4-1/2	.015 .020 .030 .045 .060 .090 .125	0453T416200045	0453T416200045B
*	1	1	2-1/4	5	.015 .020 .030 .045 .060 .090 .125	0453T41622505	0453T41622505B
*	1	1	3	6	.015 .020 .030 .045 .060 .090 .125	0453T41630006	0453T41630006B
*	1	1	4	7	.015 .020 .030 .045 .060 .090 .125	0453T41640007	0453T41640007B

Other Dimensions & Radii are Available Upon Request

NOTE: When ordering with radius, include the series and part number.
 Example: (.015(radius) + 0453(series) + T4 04 175 04(part) = .015-0453T40417504)

Extended Neck

	D1 Cutting Dia	D2 Shank Dia	L1 LOC	L3 REACH	L2 OAL	Available Radius	AlTiN Exxtral Plus Coated	AlTiN Ball End Coated
	1/4	1/4	3/8	1-1/8	3	.015 .020 .030 .045	0453T40403753.1	0453T40403753.1B
	1/4	1/4	3/8	2-1/8	4	.015 .020 .030 .045	0453T40403754.2	0453T40403754.2B
	3/8	3/8	1/2	2-1/8	4	.015 .020 .030 .045	0453T40605004.2	0453T40605004.2B
	3/8	3/8	1/2	3-3/8	6	.015 .020 .030 .045	0453T40605006.3	0453T40605006.3B
	1/2	1/2	5/8	2-1/8	4	.015 .020 .030 .045 .060	0453T40806254.2	0453T40806254.2B
	1/2	1/2	5/8	3-1/8	5	.015 .020 .030 .045 .060	0453T40806255.3	0453T40806255.3B
	1/2	1/2	5/8	4-1/8	6	.015 .020 .030 .045 .060	0453T40806256.4	0453T40806256.4B
	5/8	5/8	3/4	2-1/8	4	.015 .020 .030 .045 .060 .090	0453T41007504.2	0453T41007504.2B
	5/8	5/8	3/4	3-1/8	5	.015 .020 .030 .045 .060 .090	0453T41007505.3	0453T41007505.3B
	5/8	5/8	3/4	4-1/8	6	.015 .020 .030 .045 .060 .090	0453T41007506.4	0453T41007506.4B
	3/4	3/4	1	2	4	.015 .020 .030 .045 .060 .090 .125	0453T41210004.2	0453T41210004.2B
	3/4	3/4	1	3	5	.015 .020 .030 .045 .060 .090 .125	0453T41210005.3	0453T41210005.3B
	3/4	3/4	1	4	6	.015 .020 .030 .045 .060 .090 .125	0453T41210006.4	0453T41210006.4B
	1	1	1-1/4	2-5/8	5	.015 .020 .030 .045 .060 .090 .125	0453T41612505.2	0453T41612505.2B
	1	1	1-1/4	3-1/8	6	.015 .020 .030 .045 .060 .090 .125	0453T41612506.3	0453T41612506.3B
	1	1	1-1/4	4-1/8	7	.015 .020 .030 .045 .060 .090 .125	0453T41612507.4	0453T41612507.4B

Variable Endmills

HIGH PERFORMANCE MILLING



5 Flute Variable - Eliminates Harmonics
5 Variable Flauta - Elimina los armónicos

Primary & Secondary - Provides Sharper Cutting Edge
Angulo de Corte Mas Filoso - Para un borde de corte más resistente

Sharp Corner
**** Chamfer or Corner radii**
 (Available upon request)

Esquina Afilada
**** Chaflán estándar y Radios**
 (Disponibles a petición)

Exxtral Plus Coating - High speed operations, semi-dry or dry machining.

Revestimiento Exxtral Plus - Operaciones de mecanizado de alta velocidad, semi- seco o seco.

Extended Neck - Available for deep-pocket applications.

Cuello Extendido - Disponible para aplicaciones de bolsillos profundos.

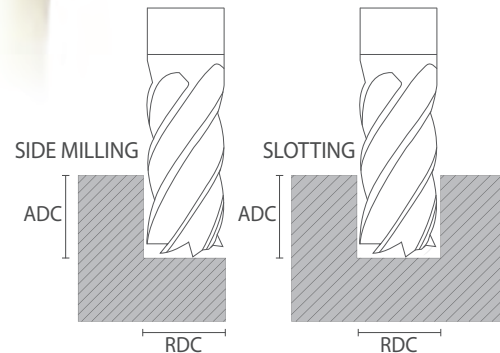
538 SERIES

5 Flute Variable End Mill, Primary & Secondary Difficult-to-Machine Materials

The 538 Series is engineered to provide you with increased metal removal rates and cutting depth. Its design consists of asymmetrical flutes, a 38° Helix and sharp corners; properties ideal for high speeds and feeds and a smooth finish on the part.

5 Flautas Variable, Ángulos Primarios y Secundarios Materiales Difícil de Mecanizar

La Serie 538 está diseñada para aumentar las tasas de eliminación de metal y profundidad de corte. Su diseño consiste en flautas asimétricas, una hélice de 38° y esquinas afiladas; propiedades ideales para altas velocidades y un acabado liso en la parte.



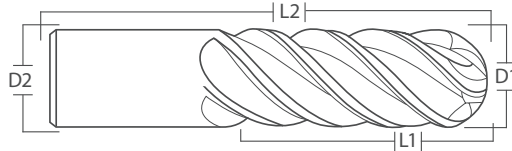
Tolerance

Cutting Diameter (D1)	Shank Diameter (D2)
1/8"-1/4": +.000"/-.0012"	1/8"-1/4": -.0001"/-.0003"
1/4"-1/2": +.000"/-.0016"	1/4"-1/2": -.0001"/-.0003"
1/2"-1": +.000"/-.0020"	1/2"-1": -.0001"/-.0004"
Runout 0.0005"max (shank to cutting diameter)	
Back Taper 0.0005"max Ball Nose Radius +.000"/-.001"	

Speed & Feeds for High Performance Milling

Material	SFM (Vc)	Chipload per Tooth Recommendations (CPT)								Profiling Radial (ADC) (RDC)	Slotting Axial (ADC)
		1/4"	5/16"	3/8"	1/2"	5/8"	3/4"	1"			
		1/4"	5/16"	3/8"	1/2"	5/8"	3/4"	1"			
P 1 Medium and High Carbon Steel > .3% C	520-650	.002	.002	.003	.003	.003	.004	.004	1.5xD	.5xD	1xD
P 3 Alloy Steels and Tool Steels <330 HB <35 HRC	520-590	.002	.002	.002	.003	.003	.003	.004	1.5xD	.5xD	1xD
P 4 Alloy Steel and Tool Steels 340-450 HB, 36-48 HRC	460-520	.002	.002	.002	.003	.003	.003	.004	1.5xD	.5xD	1xD
M 1 Austenitic Stainless Steel 302, 303, 304	290-370	.002	.002	.002	.003	.003	.003	.004	1.5xD	.5xD	1xD
M 2 Austenitic Stainless Steel 316, 316L	190-260	.001	.002	.002	.003	.003	.003	.003	1.5xD	.5xD	1xD
M 3 Austenitic Stainless Steel: Duplex	190-230	.001	.001	.002	.002	.002	.002	.003	1.5xD	.5xD	1xD
K 1 Grey Cast Iron (GG)	430-550	.002	.003	.003	.004	.004	.005	.005	1.5xD	.5xD	1xD
K 2 Ductile, CGI and Malleable Cast Iron <80 KSI	360-430	.001	.002	.002	.003	.003	.003	.004	1.5xD	.5xD	1xD
S 2 Nickel-Based / Heat-Resistant Alloys	80-130	.001	.001	.002	.002	.002	.002	.003	1.5xD	.5xD	1xD
S 4 Alpha-Beta Titanium Alloys (Ti6Al4V)	160-200	.001	.001	.002	.002	.002	.003	.004	1.5xD	.5xD	1xD

Note: These are only recommended starting figures that depend on conditions such as machine and material rigidity, type of coating if any, etc. **TESTING IS RECOMMENDED**



5 Flute Variable EndMill

- Sharp Corner
- Exxtral Plus (AlTiN) recommended (up to 25% faster than uncoated)
- Radii (available upon request)
- Left Hand (available upon request)
- Flats added within 24 hrs.
- Material Code Refer to Page 245 & 246.

P M K S H

CARBIDE

5 Flutes

38°

Exxtral Plus®

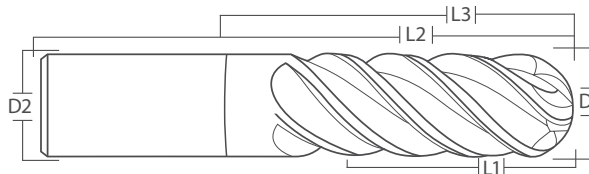
Exxtral Plus® is ideal for high performance machining of hard materials.

Speeds & Feeds Refer to Page 128.

Fractional

D1 Cutting Dia	D2 Shank Dia	L1 LOC	L2 OAL	Available Radius	AlTiN Exxtral Plus Coated	AlTiN Ball End Coated
1/4	1/4	1/2	2	.015 .020 .030 .045	0538T40405002	0538T40405002B
1/4	1/4	3/4	2-1/2	.015 .020 .030 .045	0538T404075025	0538T404075025B
1/4	1/4	1	3	.015 .020 .030 .045	0538T40410003	0538T40410003B
1/4	1/4	1-1/4	4	.015 .020 .030 .045	0538T40412504	0538T40412504B
5/16	5/16	1/2	2	.015 .020 .030 .045	0538T40505002	0538T40505002B
5/16	5/16	7/8	2-1/2	.015 .020 .030 .045	0538T405087525	0538T405087525B
5/16	5/16	1	3	.015 .020 .030 .045	0538T40510003	0538T40510003B
5/16	5/16	1-1/4	4	.015 .020 .030 .045	0538T40512504	0538T40512504B
3/8	3/8	1/2	2	.015 .020 .030 .045	0538T40605002	0538T40605002B
3/8	3/8	1	2-1/2	.015 .020 .030 .045	0538T406100025	0538T406100025B
3/8	3/8	1	3	.015 .020 .030 .045	0538T40610003	0538T40610003B
3/8	3/8	1-1/2	4	.015 .020 .030 .045	0538T40615004	0538T40615004B
7/16	7/16	1	2-3/4	.015 .020 .030 .045	0538T4071000275	0538T4071000275B
7/16	7/16	2	4	.015 .020 .030 .045	0538T40720004	0538T40720004B
1/2	1/2	5/8	2-1/2	.015 .020 .030 .045 .060	0538T408062525	0538T408062525B
1/2	1/2	1-1/4	3	.015 .020 .030 .045 .060	0538T40812503	0538T40812503B
1/2	1/2	2	4	.015 .020 .030 .045 .060	0538T40820004	0538T40820004B
1/2	1/2	2-1/2	5	.015 .020 .030 .045 .060	0538T40825005	0538T40825005B
1/2	1/2	3-1/8	6	.015 .020 .030 .045 .060	0538T40831256	0538T40831256B
5/8	5/8	3/4	3	.015 .020 .030 .045 .060 .090	0538T41007503	0538T41007503B
5/8	5/8	1-5/8	3-1/2	.015 .020 .030 .045 .060 .090	0538T410162535	0538T410162535B
5/8	5/8	2-1/2	5	.015 .020 .030 .045 .060 .090	0538T41025005	0538T41025005B
5/8	5/8	3	6	.015 .020 .030 .045 .060 .090	0538T41030006	0538T41030006B
3/4	3/4	1	3	.015 .020 .030 .045 .060 .090 .125	0538T41210003	0538T41210003B
3/4	3/4	1-5/8	4	.015 .020 .030 .045 .060 .090 .125	0538T41216254	0538T41216254B
3/4	3/4	2-1/4	5	.015 .020 .030 .045 .060 .090 .125	0538T41222505	0538T41222505B
3/4	3/4	3-1/4	6	.015 .020 .030 .045 .060 .090 .125	0538T41232506	0538T41232506B
3/4	3/4	4	7	.015 .020 .030 .045 .060 .090 .125	0538T41240007	0538T41240007B
1	1	1-1/4	4	.015 .020 .030 .045 .060 .090 .125	0538T41612504	0538T41612504B
1	1	2	4-1/2	.015 .020 .030 .045 .060 .090 .125	0538T416200045	0538T416200045B
1	1	2-1/4	5	.015 .020 .030 .045 .060 .090 .125	0538T41622505	0538T41622505B
1	1	2-5/8	6	.015 .020 .030 .045 .060 .090 .125	0538T41626256	0538T41626256B
1	1	3-1/4	6	.015 .020 .030 .045 .060 .090 .125	0538T41632506	0538T41632506B
1	1	4-1/8	7	.015 .020 .030 .045 .060 .090 .125	0538T41641257	0538T41641257B
1-1/4	1-1/4	2	4-1/2	.015 .020 .030 .045 .060 .090 .125	0538T420200045	0538T420200045B
1-1/4	1-1/4	3	6	.015 .020 .030 .045 .060 .090 .125	0538T42030006	0538T42030006B

Other Dimensions & Radii are Available Upon Request

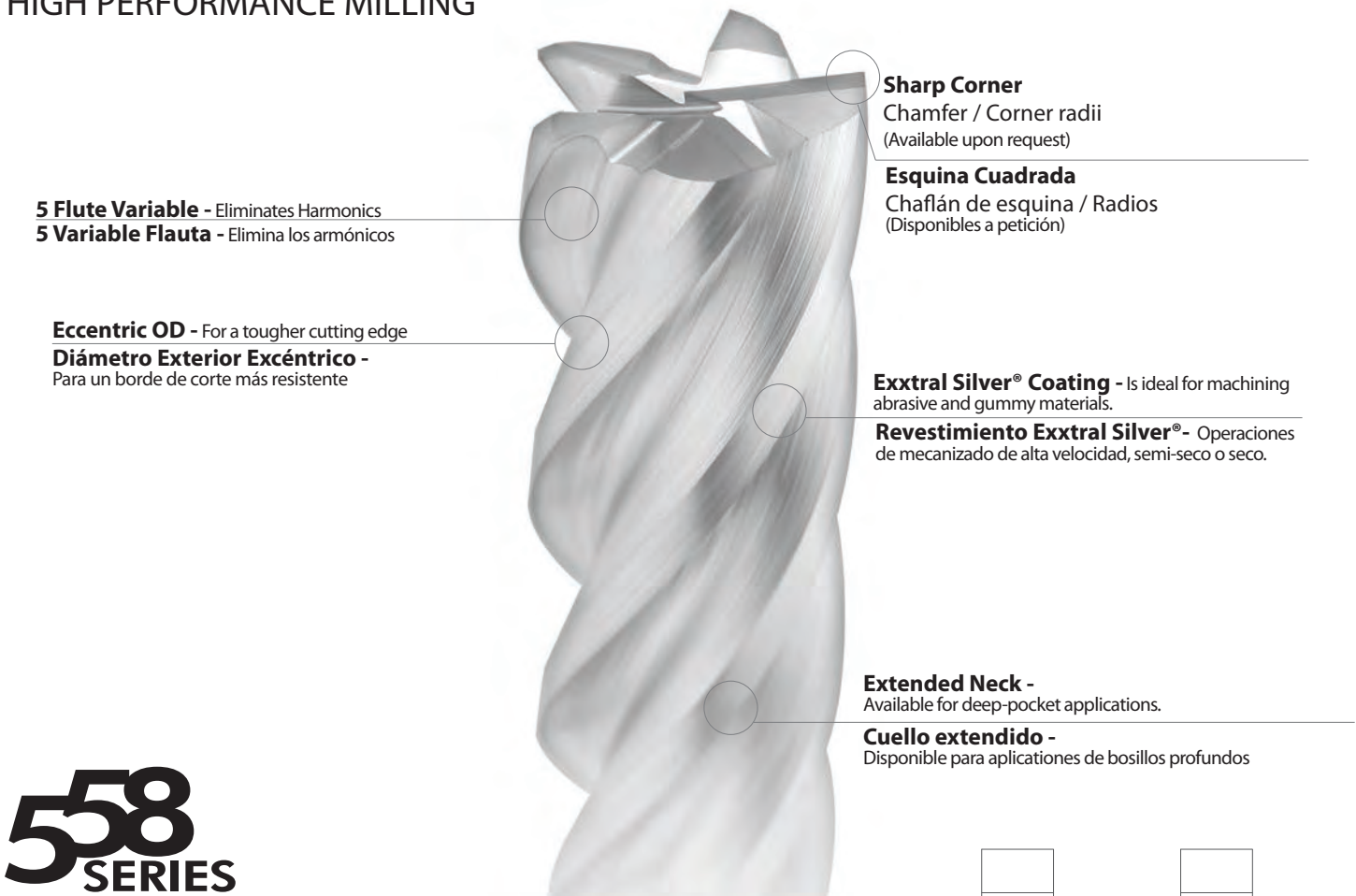


Extended Neck

D1 Cutting Dia	D2 Shank Dia	L1 LOC	L3 REACH	L2 OAL	Available Radius	AlTiN Exxtral Plus Coated	AlTiN Ball End Coated
1/4	1/4	3/8	1-1/8	3	.015 .020 .030 .045	0538T40403753.1	0538T40403753.1B
1/4	1/4	3/8	2-1/8	4	.015 .020 .030 .045	0538T40403754.2	0538T40403754.2B
3/8	3/8	1/2	1-1/8	3	.015 .020 .030 .045	0538T40605003.1	0538T40605003.1B
3/8	3/8	1/2	2-1/8	4	.015 .020 .030 .045	0538T40605004.2	0538T40605004.2B
1/2	1/2	5/8	1-3/8	3	.015 .020 .030 .045 .060	0538T40806253.1	0538T40806253.1B
1/2	1/2	5/8	2-1/8	4	.015 .020 .030 .045 .060	0538T40806254.2	0538T40806254.2B
1/2	1/2	5/8	3-3/8	6	.015 .020 .030 .045 .060	0538T40806256.3	0538T40806256.3B
5/8	5/8	3/4	1-5/8	4	.015 .020 .030 .045 .060 .090	0538T41007504.1	0538T41007504.1B
5/8	5/8	3/4	2-3/8	5	.015 .020 .030 .045 .060 .090	0538T41007505.2	0538T41007505.2B
5/8	5/8	3/4	3-3/8	6	.015 .020 .030 .045 .060 .090	0538T41007506.3	0538T41007506.3B
3/4	3/4	1	2	4	.015 .020 .030 .045 .060 .090 .125	0538T41210004.2	0538T41210004.2B
3/4	3/4	1	3	5	.015 .020 .030 .045 .060 .090 .125	0538T41210005.3	0538T41210005.3B
3/4	3/4	1	4	6	.015 .020 .030 .045 .060 .090 .125	0538T41210006.4	0538T41210006.4B
1	1	1-1/4	2	5	.015 .020 .030 .045 .060 .090 .125	0538T41612505.2	0538T41612505.2B
1	1	1-1/4	3-3/8	6	.015 .020 .030 .045 .060 .090 .125	0538T41612506.3	0538T41612506.3B
1	1	1-1/4	4-3/8	7	.015 .020 .030 .045 .060 .090 .125	0538T41612507.4	0538T41612507.4B

Variable Helix Endmills
 HP/PM+ Endmills
 High Performance Endmills
 Standard Endmills
 Metric Carbide Endmills
 Routers Solid Carbide Routers
 Drill Mills Solid Carbide Drill Mills
 Powder Metal Endmills (PM30) Endmills
 Powder Metal Endmills (PM4) Endmills
 Cobalt Endmills (M42) Endmills
 HSS Endmills (M7) Endmills

HIGH PERFORMANCE MILLING



5 Flute Variable - Eliminates Harmonics
5 Variable Flauta - Elimina los armónicos

Eccentric OD - For a tougher cutting edge
Diámetro Exterior Excéntrico - Para un borde de corte más resistente

Sharp Corner
 Chamfer / Corner radii
 (Available upon request)

Esquina Cuadrada
 Chaflán de esquina / Radios
 (Disponibles a petición)

Exxtral Silver® Coating - Is ideal for machining abrasive and gummy materials.

Revestimiento Exxtral Silver® - Operaciones de mecanizado de alta velocidad, semi-seco o seco.

Extended Neck - Available for deep-pocket applications.

Cuello extendido - Disponible para aplicaciones de bosillos profundos

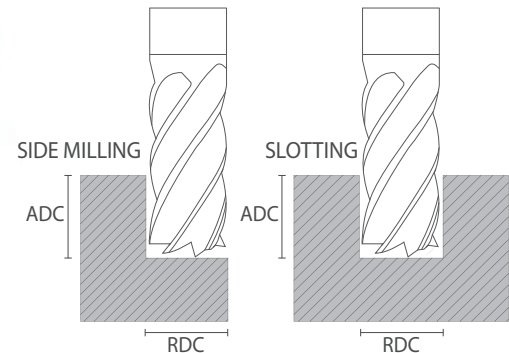
558 SERIES

5 Flute Variable End Mill, Eccentric OD Difficult-to-Machine Materials

The 558 Series is engineered to eliminate harmful harmonics at the point of contact, producing a smoother finish on difficult-to-machine materials. Its design consists of an eccentric OD, asymmetrical flutes and a variable; features ideal for increased metal removal rates and high speeds and feeds.

5 Flautas Variable, Diámetro Excéntrico Materiales Difícil de Mecanizar

La Serie 558 está diseñada para eliminar los armónicos perjudiciales al punto de contacto, produciendo un acabado superior en materiales difícil de mecanizar. Su diseño consiste en un diámetro excéntrico y flautas variables; características ideales para máxima eliminación de metal y altas velocidades.



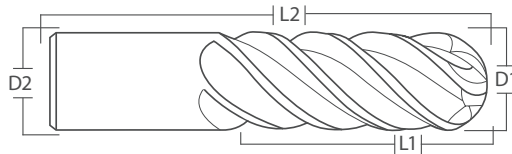
Tolerance

Cutting Diameter (D1)	Shank Diameter (D2)
1/8"-1/4": +.000"/-.0012"	1/8"-1/4": -.0001"/-.0003"
1/4"-1/2": +.000"/-.0016"	1/4"-1/2": -.0001"/-.0003"
1/2"-1": +.000"/-.0020"	1/2"-1": -.0001"/-.0004"

Runout 0.0005"max (shank to cutting diameter)
 Back Taper 0.0005"max | Ball Nose Radius +.000"/-.001"

Speed & Feeds for High Performance Milling

Material	SFM		Chipload per Tooth Recommendations (CPT)							Profiling Radial (ADC RDC)	Slotting Axial (RDC) (ADC)		
	SFM < 32Rc	SFM > 32Rc	1/4"	5/16"	3/8"	1/2"	5/8"	3/4"	1"				
P Carbon Steels - 1000 Series	225-425	125-225	.0018	.0019	.0023	.0035	.0048	.0050	.0059	1.5xD	.25xD	1xD	1xD
P Alloy Steel - 4000 Series	150-320	80-220	.0015	.0016	.0021	.0025	.0043	.0033	.0060	1.5xD	.25xD	1xD	1xD
P Precipitation Stainless Steel -17-4PH, 16-6PH, 15-5PH	100-250	100-135	.0016	.0017	.0019	.0025	.0038	.0033	.0055	1.5xD	.25xD	1xD	1xD
M Stainless Steels - 300 Series	150-325	100-200	.0018	.0018	.0021	.0028	.0049	.0045	.0053	1.5xD	.25xD	1xD	1xD
M Stainless Steels- 400 Series	220-425	100-245	.0019	.0020	.0023	.0028	.0050	.0047	.0055	1.5xD	.25xD	1xD	1xD
K Gray Cast Iron	260-455	130-300	.0010	.0014	.0019	.0022	.0036	.0047	.0036	1.5xD	.25xD	1xD	1xD
K Ductile Cast Iron	130-355	90-150	.0016	.0017	.0023	.0030	.0045	.0033	.0061	1.5xD	.25xD	1xD	1xD
S High Temp Alloys - Inconel 625/718, A 286, Haynes	80-125	40-100	.0013	.0015	.0018	.0026	.0038	.0043	.0046	1.5xD	.25xD	1xD	1xD
S Titanium Cast / Wrought- 6AL4V, ASTM 1,2,3, Alpha Beta	150-185	100-150	.0015	.0019	.0022	.0031	.0048	.0046	.0058	1.5xD	.25xD	1xD	1xD



5 Flute Variable EndMill, Eccentric OD

- Exxtral Plus (AlTiN) recommended (up to 25% faster than uncoated)
- Radii (available upon request)
- Left Hand (available upon request)
- Flats added within 24 hrs.
- Eccentric OD
- Material Code Refer to Page 245 & 246.

P M K S

CARBIDE

5 Flutes

35°

Exxtral Silver®

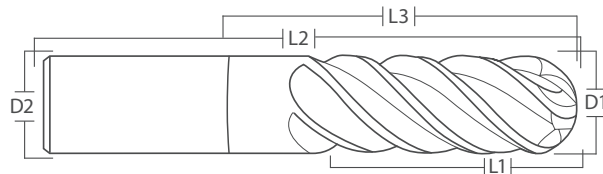
Exxtral Silver® is ideal for machining abrasive and gummy materials.

Speeds & Feeds Refer to Page 130.

Fractional

D1 Cutting Dia	D2 Shank Dia	L1 LOC	L2 OAL	Available Radius	AlTiCrN Exxtral Silver® Coated	AlTiCrN Ball End Coated
1/4	1/4	1/2	2	.015 .020 .030 .045	0558T80405002	0558T80405002B
1/4	1/4	3/4	2-1/2	.015 .020 .030 .045	0558T804075025	0558T804075025B
1/4	1/4	1	3	.015 .020 .030 .045	0558T80410003	0558T80410003B
1/4	1/4	1-1/4	4	.015 .020 .030 .045	0558T80412504	0558T80412504B
5/16	5/16	1/2	2	.015 .020 .030 .045	0558T80505002	0558T80505002B
5/16	5/16	7/8	2-1/2	.015 .020 .030 .045	0558T805087525	0558T805087525B
5/16	5/16	1	3	.015 .020 .030 .045	0558T80510003	0558T80510003B
5/16	5/16	1-1/4	4	.015 .020 .030 .045	0558T80512504	0558T80512504B
3/8	3/8	1/2	2	.015 .020 .030 .045	0558T80605002	0558T80605002B
3/8	3/8	1	2-1/2	.015 .020 .030 .045	0558T806100025	0558T806100025B
3/8	3/8	1	3	.015 .020 .030 .045	0558T80610003	0558T80610003B
3/8	3/8	1-1/2	4	.015 .020 .030 .045	0558T80615004	0558T80615004B
7/16	7/16	1	2-3/4	.015 .020 .030 .045	0558T8071000275	0558T8071000275B
7/16	7/16	2	4	.015 .020 .030 .045	0558T80720004	0558T80720004B
1/2	1/2	5/8	2-1/2	.015 .020 .030 .045 .060	0558T808062525	0558T808062525B
1/2	1/2	1-1/4	3	.015 .020 .030 .045 .060	0558T80812503	0558T80812503B
1/2	1/2	2	4	.015 .020 .030 .045 .060	0558T80820004	0558T80820004B
1/2	1/2	2-1/2	5	.015 .020 .030 .045 .060	0558T80825005	0558T80825005B
1/2	1/2	3-1/8	6	.015 .020 .030 .045 .060	0558T80831256	0558T80831256B
5/8	5/8	3/4	3	.015 .020 .030 .045 .060 .090	0558T81007503	0558T81007503B
5/8	5/8	1-5/8	3-1/2	.015 .020 .030 .045 .060 .090	0558T810162535	0558T810162535B
5/8	5/8	2-1/2	5	.015 .020 .030 .045 .060 .090	0558T81025005	0558T81025005B
5/8	5/8	3	6	.015 .020 .030 .045 .060 .090	0558T81030006	0558T81030006B
3/4	3/4	1	3	.015 .020 .030 .045 .060 .090 .125	0558T81210003	0558T81210003B
3/4	3/4	1-5/8	4	.015 .020 .030 .045 .060 .090 .125	0558T81216254	0558T81216254B
3/4	3/4	2-1/4	5	.015 .020 .030 .045 .060 .090 .125	0558T81222505	0558T81222505B
3/4	3/4	3-1/4	6	.015 .020 .030 .045 .060 .090 .125	0558T81232506	0558T81232506B
3/4	3/4	4	7	.015 .020 .030 .045 .060 .090 .125	0558T81240006	0558T81240006B
1	1	1-1/4	4	.015 .020 .030 .045 .060 .090 .125	0558T81612504	0558T81612504B
1	1	2	4-1/2	.015 .020 .030 .045 .060 .090 .125	0558T816200045	0558T816200045B
1	1	2-1/4	5	.015 .020 .030 .045 .060 .090 .125	0558T81622505	0558T81622505B
1	1	2-5/8	6	.015 .020 .030 .045 .060 .090 .125	0558T81626256	0558T81626256B
1	1	3-1/4	6	.015 .020 .030 .045 .060 .090 .125	0558T81632506	0558T81632506B
1	1	4 1/8	7	.015 .020 .030 .045 .060 .090 .125	0558T81641257	0558T81641257B
1-1/4	1-1/4	2	4-1/2	.015 .020 .030 .045 .060 .090 .125	0558T820200045	0558T820200045B
1-1/4	1-1/4	3	6	.015 .020 .030 .045 .060 .090 .125	0558T82030006	0558T82030006B

Other Dimensions & Radii are Available Upon Request



Extended Neck

D1 Cutting Dia	D2 Shank Dia	L1 LOC	L3 REACH	L2 OAL	Available Radius	AlTiCrN Exxtral Silver® Coated	AlTiCrN Ball End Coated
1/4	1/4	3/8	1-1/8	3	.015 .020 .030 .045	0558T80403753.1	0558T80403753.1B
1/4	1/4	3/8	2-1/8	4	.015 .020 .030 .045	0558T80403754.2	0558T80403754.2B
3/8	3/8	1/2	1-1/8	3	.015 .020 .030 .045	0558T80605003.1	0558T80605003.1B
3/8	3/8	1/2	2-1/8	4	.015 .020 .030 .045	0558T80605004.2	0558T80605004.2B
1/2	1/2	5/8	1-3/8	3	.015 .020 .030 .045 .060	0558T80806253.1	0558T80806253.1B
1/2	1/2	5/8	2-1/8	4	.015 .020 .030 .045 .060	0558T80806254.2	0558T80806254.2B
1/2	1/2	5/8	3-3/8	6	.015 .020 .030 .045 .060	0558T80806256.3	0558T80806256.3B
5/8	5/8	3/4	1-5/8	4	.015 .020 .030 .045 .060 .090	0558T81007504.1	0558T81007504.1B
5/8	5/8	3/4	2-3/8	5	.015 .020 .030 .045 .060 .090	0558T81007505.2	0558T81007505.2B
5/8	5/8	3/4	3-3/8	6	.015 .020 .030 .045 .060 .090	0558T81007506.3	0558T81007506.3B
3/4	3/4	1	2	4	.015 .020 .030 .045 .060 .090 .125	0558T81210004.2	0558T81210004.2B
3/4	3/4	1	3	5	.015 .020 .030 .045 .060 .090 .125	0558T81210005.3	0558T81210005.3B
3/4	3/4	1	4	6	.015 .020 .030 .045 .060 .090 .125	0558T81210006.4	0558T81210006.4B
1	1	1-1/4	2	5	.015 .020 .030 .045 .060 .090 .125	0558T81612505.2	0558T81612505.2B
1	1	1-1/4	3-3/8	6	.015 .020 .030 .045 .060 .090 .125	0558T81612506.3	0558T81612506.3B
1	1	1-1/4	4-3/8	7	.015 .020 .030 .045 .060 .090 .125	0558T81612507.4	0558T81612507.4B

Variable Helix Endmills | HP/M+ Endmills | High Performance Endmills | Standard Endmills | Solid Carbide Endmills | Metric Carbide Endmills | Routers Solid Carbide Routers | Drill Mills Solid Carbide Drill Mills | Powder Metal Endmills (PM30) Endmills | Powder Metal Endmills (PM4) Endmills | Cobalt Endmills (M42) Endmills | High Speed Steel Endmills (M7) Endmills

HIGH PERFORMANCE MILLING



6 Flute Variable - Eliminates Harmonics
6 Variable Flauta - Elimina los armónicos

Eccentric OD - For a tougher cutting edge
Diámetro Exterior Excéntrico
 Para un borde de corte más resistente

Sharp Corner
****Corner radii** (Available upon request)
Chafán estándar de esquina
****Radios** (Disponibles a petición)

Exxtral Plus Coating - High speed operations, semi-dry or dry machining.
Revestimiento Exxtral Plus - Mecanizado para aplicaciones de bolsillos profundos

Extended Neck - Available for deep-pocket applications.
Cuello Extendido - Disponible para aplicaciones de bolsillos profundos

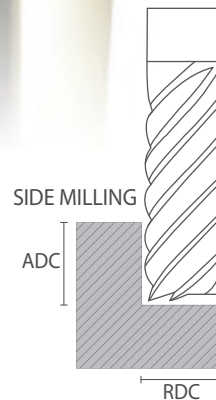
374 SERIES

6 Flute Variable End Mill, Eccentric OD Difficult-to-Machine Materials

The 374 Series is engineered for increased chip removal rates and chatter-free machining. Its design consists of 6 flutes and an eccentric OD; excellent features for roughing and finishing operations of tough materials.

6 Flautas Variable, Diámetro Excéntrico Materiales Difícil de Mecanizar

La Serie 374 está diseñada para aumentar la eliminación de viruta y para el mecanizado sin vibración. Su diseño consiste de 6 flautas y un diámetro excéntrico; excelentes características para operaciones de desbaste y acabado de materiales endurecidos.



Tolerance

Cutting Diameter (D1)	Shank Diameter (D2)
1/8"-1/4": +.000"/-.0012"	1/8"-1/4": -.0001"/-.0003"
1/4"-1/2": +.000"/-.0016"	1/4"-1/2": -.0001"/-.0003"
1/2"-1": +.000"/-.0020"	1/2"-1": -.0001"/-.0004"

Runout 0.0005"max (shank to cutting diameter)
 Back Taper 0.0005" max | Ball Nose Radius +.000/-0.001"

Speed & Feeds for High Performance Milling

Material	Hardness	Type of Cut Slot	SFM (Vc)	Chipload per Tooth Recommendations (CPT)						(ADC) (RDC)
				1/4"	3/8"	1/2"	5/8"	3/4"	1"	
H2 Hardened Steels Carbon and Alloy Steels, Tool & Die Steels	40 HRc to 54 HRc	Rough	175	.001	.002	.002	.003	.003	.005	1.5xD .2xD
		Finish	200	.002	.002	.003	.004	.004	.006	2xD .1xD
P6 Stainless Steel Difficult to Machine - 316L, 17-4 PH, 15-5 PH, 13-8 PH	Less than 38 HRc	Rough	180	.001	.003	.003	.004	.005	.007	1.5xD .2xD
		Finish	350	.002	.003	.004	.005	.006	.008	2xD .1xD
S2 High-Temperature Alloys Nimonic, Inconel, Monel, Hastelloy	Less than 38 HRc	Rough	100	.001	.001	.002	.002	.002	.003	1.5xD .2xD
		Finish	130	.001	.002	.002	.002	.002	.004	2xD .1xD
S4 Titanium Alloys 6Al-4V, 5Al-2.5 Sn, 6Al-2Sn-4Zr-6Mo, 3A-i8V-6Cr4Mo-4Zr, 10V-2Fe-3Al, 13V-11Cr-3Al	Less than 38 HRc	Rough	200	.001	.001	.002	.002	.002	.003	1.5xD .2xD
		Finish	350	.001	.002	.002	.002	.002	.004	2xD .1xD

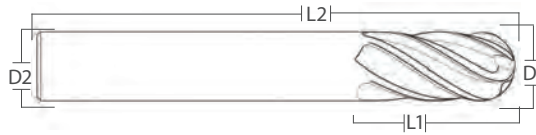
Note: These are only recommended starting figures that depend on conditions such as machine and material rigidity, type of coating if any, etc. **TESTING IS RECOMMENDED**



6 Flute Variable EndMill

- Exxtral Plus (AlTiN) recommended (up to 25% faster than uncoated)
- Radii (available upon request)
- Left Hand (available upon request)
- Flats added within 24 hrs.
- Eccentric OD
- Material Code Refer to Page 245 & 246.

P M K S H



CARBIDE **6 Flutes** **Exxtral Plus**

Exxtral Plus® is ideal for high performance machining of hard materials.

Speeds & Feeds Refer to Page 132.

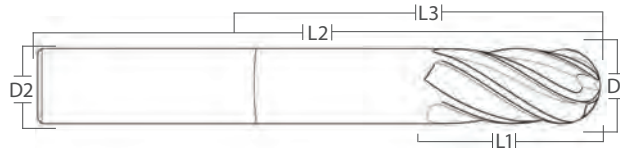
Fractional

D1 Cutting Dia	D2 Shank Dia	L1 LOC	L2 OAL	FLUTES	Available Radius	AITiN Exxtral Plus Coated	AITiN Ball End Coated
1/4	1/4	1/2	2	6	.015 .020 .030 .045	0374T40405002	0374T40405002B
1/4	1/4	3/4	2-1/2	6	.015 .020 .030 .045	0374T404075025	0374T404075025B
5/16	5/16	1/2	2	6	.015 .020 .030 .045	0374T40505002	0374T40505002B
5/16	5/16	3/4	2-1/2	6	.015 .020 .030 .045	0374T405075025	0374T405075025B
3/8	3/8	5/8	2	6	.015 .020 .030 .045	0374T40606252	0374T40606252B
3/8	3/8	1	2-1/2	6	.015 .020 .030 .045	0374T406100025	0374T406100025B
1/2	1/2	5/8	2-1/2	6	.015 .020 .030 .045 .060	0374T408062525	0374T408062525B
1/2	1/2	1	3	6	.015 .020 .030 .045 .060	0374T40810003	0374T40810003B
5/8	5/8	3/4	3	6	.015 .020 .030 .045 .060 .090	0374T41007503	0374T41007503B
5/8	5/8	1-5/8	3-1/2	6	.015 .020 .030 .045 .060 .090	0374T410162535	0374T410162535B
3/4	3/4	1	3	6	.015 .020 .030 .045 .060 .090 .125	0374T41210003	0374T41210003B
3/4	3/4	1-1/2	4	6	.015 .020 .030 .045 .060 .090 .125	0374T41215004	0374T41215004B
1	1	1-1/4	3	6	.015 .020 .030 .045 .060 .090 .125	0374T41612503	0374T41612503B
1	1	1-1/2	4	6	.015 .020 .030 .045 .060 .090 .125	0374T41615004	0374T41615004B

Other Dimensions & Radii are Available Upon Request

NOTE: When ordering with radius, include the series and part number.

Example: (.015(radius) + 0374(series) + T4 04 0750 25 (part#) = .015-0374T4 04 0750 25)



Extended Neck

D1 Cutting Dia	D2 Shank Dia	L1 LOC	L3 REACH	L2 OAL	FLUTES	Available Radius	AITiN Exxtral Plus Coated	AITiN Ball End Coated
1/4	1/4	3/8	1-1/8	3	6	.015 .020 .030 .045	0374T40403753.1	0374T40403753.1B
1/4	1/4	3/8	2-1/8	4	6	.015 .020 .030 .045	0374T40403754.2	0374T40403754.2B
3/8	3/8	1/2	1-1/8	3	6	.015 .020 .030 .045	0374T40605003.1	0374T40605003.1B
3/8	3/8	1/2	2-1/8	4	6	.015 .020 .030 .045	0374T40605004.2	0374T40605004.2B
3/8	3/8	1/2	3-1/8	6	6	.015 .020 .030 .045	0374T40605006.3	0374T40605006.3B
3/8	3/8	1/2	4-1/4	6	6	.015 .020 .030 .045	0374T40605006.4	0374T40605006.4B
1/2	1/2	5/8	1-1/8	3	6	.015 .020 .030 .045 .060	0374T40806253.1	0374T40806253.1B
1/2	1/2	5/8	2-1/8	4	6	.015 .020 .030 .045 .060	0374T40806254.2	0374T40806254.2B
1/2	1/2	5/8	3-1/8	6	6	.015 .020 .030 .045 .060	0374T40806256.3	0374T40806256.3B
1/2	1/2	5/8	4-1/4	6	6	.015 .020 .030 .045 .060	0374T40806256.4	0374T40806256.4B
5/8	5/8	3/4	1-3/4	4	6	.015 .020 .030 .045 .060 .090	0374T41007504.1	0374T41007504.1B
5/8	5/8	3/4	2-5/8	5	6	.015 .020 .030 .045 .060 .090	0374T41007505.2	0374T41007505.2B
5/8	5/8	3/4	3-3/8	6	6	.015 .020 .030 .045 .060 .090	0374T41007506.3	0374T41007506.3B
5/8	5/8	3/4	4-1/4	6	6	.015 .020 .030 .045 .060 .090	0374T41007506.4	0374T41007506.4B
3/4	3/4	1	1-3/4	4	6	.015 .020 .030 .045 .060 .090 .125	0374T41210004.1	0374T41210004.1B
3/4	3/4	1	2-5/8	5	6	.015 .020 .030 .045 .060 .090 .125	0374T41210005.2	0374T41210005.2B
3/4	3/4	1	3-3/8	6	6	.015 .020 .030 .045 .060 .090 .125	0374T41210006.3	0374T41210006.3B
3/4	3/4	1	4-1/4	6	6	.015 .020 .030 .045 .060 .090 .125	0374T41210006.4	0374T41210006.4B
1	1	1-1/4	1-3/4	4	6	.015 .020 .030 .045 .060 .090 .125	0374T41612504.1	0374T41612504.1B
1	1	1-1/4	2-5/8	5	6	.015 .020 .030 .045 .060 .090 .125	0374T41612505.2	0374T41612505.2B
1	1	1-1/4	3-3/8	6	6	.015 .020 .030 .045 .060 .090 .125	0374T41612506.3	0374T41612506.3B
1	1	1-1/4	4-1/4	7	6	.015 .020 .030 .045 .060 .090 .125	0374T41612507.4	0374T41612507.4B



PRECISION CUTTING TOOLS, INC.

HIGH PERFORMANCE MACHINING+

For Aluminum Applications on High-Speed Machines

HPM+ BENEFITS

Our new High-Performance Machining Plus+ End Mills, H235 and H337 Series, are engineered exclusively for high-speed milling centers. The H235 and H337 run at maximum spindle speed and power, achieving RPMs as high as 33,000. Furthermore, the H235 & H337 Series allow for increased productivity and reduced machining time, during operations of Aluminum applications.



Higher Speeds & Feeds



Reduced Machining Time



Increased Productivity



Coolant Holes
(Available upon request)



Improved Tool Balance

PERFORMANCE - ENDMILLS

TRY OUR **NEW** **HPM+**
HIGH PERFORMANCE
MACHINING-PLUS

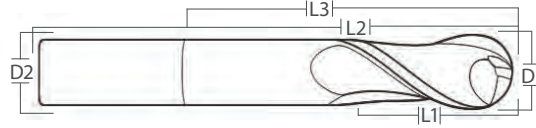
2 Flute

H235
SERIES

3 Flute

H337
SERIES





High - Speed Machining Centers

2 Flute End Mill, Aluminum Applications

- High-Speed Machining Centers
- Higher speeds & feeds (up to 33,000 RPMs)
- Increased productivity
- Reduced machining time
- Coolant holes (available upon request)
- Radii (available upon request)
- Material Code Refer to Page 245 & 246.

N

CARBIDE	2 Flutes	35°	Z Power®

Z-Power® has excellent corrosion and adhesion resistant properties.

Speeds and Feeds Refer to Page 136.

Extended Neck

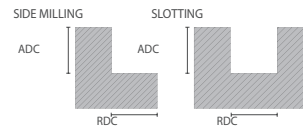
	D1	D2	L1	L3	L2	ZrN	
	Cutting Dia	Shank Dia	LOC	Reach	OAL	Uncoated	Z-Power Coated
Metric	3/8	3/8	1/2	1-1/8	3	H235T00605003.1	H235T60605003.1
	3/8	3/8	1/2	2-1/8	4	H235T00605004.2	H235T60605004.2
	1/2	1/2	5/8	1 3/8	3	H235T00806253.1	H235T60806253.1
	1/2	1/2	5/8	2-1/8	4	H235T00806254.2	H235T60806254.2
	1/2	1/2	5/8	3-3/8	6	H235T00806256.3	H235T60806256.3
Routers	5/8	5/8	3/4	1-5/8	4	H235T01007504.1	H235T61007504.1
	5/8	5/8	3/4	2-3/8	5	H235T01007505.2	H235T61007505.2
	5/8	5/8	3/4	3-3/8	6	H235T01007506.3	H235T61007506.3
	3/4	3/4	1	2	4	H235T01210004.2	H235T61210004.2
	3/4	3/4	1	2-1/2	5	H235T01210005.2	H235T61210005.2
	3/4	3/4	1	3-3/8	6	H235T01210006.3	H235T61210006.3
	1	1	1-1/4	2-5/8	5	H235T01612505.2	H235T61612505.2
	1	1	1-1/4	3-3/8	6	H235T01612506.3	H235T61612506.3
	1	1	1-1/4	4-3/8	7	H235T01612507.4	H235T61612507.4

Tolerance

Cutting Diameter (D1)	Shank Diameter (D2)	
1/8"-1/4": +.000"/-.0012"	1/8"-1/4": -.0001"/-.0003"	(D1) +0.00mm -0.013mm
1/4"-1/2": +.000"/-.0016"	1/4"-1/2": -.0001"/-.0003"	(D2) h6
1/2"-1": +.000"/-.0020"	1/2"-1": -.0001"/-.0004"	

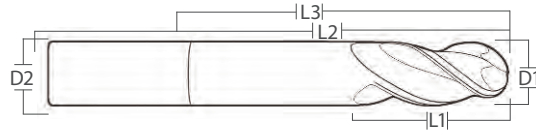
Runout 0.0005"max (shank to cutting diameter)
Back Taper 0.0005"max | Ball Nose Radius +.000"/-.001"

HPM+ Speeds and Feeds



Materials	Milling SFM(Vc)	Type of Cut	Chipload per Tooth(CPT)				
			3/8"	1/2"	5/8"	3/4"	1"
N1 Wrought Aluminum Alloys	260 - 610	Slotting	0.0050	0.0085	0.0090	0.0095	0.0148
		Light Peripheral	0.0091	0.0123	0.0132	0.0150	0.0220
N2 Low- Silicon Aluminum Alloys Si <12.2% - 6061, 7075	790 - Maximum	Slotting	0.0055	0.0085	0.0078	0.0088	0.0140
		Light Peripheral	0.0081	0.0123	0.0145	0.0165	0.0245
N3 High- Silicon Aluminum Alloys Si >12.2% - 6061, 7075	590 - 1010	Slotting	0.0038	0.068	0.0075	0.0072	0.0123
		Light Peripheral	0.0073	0.0105	0.0123	0.0138	0.0206
N4 Copper & Copper Alloys	690 - 1010	Slotting	0.0045	0.0068	0.0075	0.0072	0.0123
		Light Peripheral	0.0068	0.0105	0.0125	0.0138	0.0206

For high silicon materials we recommend Z-Power Coating



High - Speed Machining Centers

3 Flute End Mill, Aluminum Applications

- High-Speed Machining Centers
- Higher speeds & feeds (up to 33,000 RPMs)
- Increased productivity
- Reduced machining time
- Coolant holes (available upon request)
- Radii (available upon request)
- Material Code Refer to Page 245 & 246.

N

CARBIDE

3 Flutes

37°

Z Power®

Z-Power® has excellent corrosion and adhesion resistant properties.

Speeds and Feeds Refer to Page 137.

Extended Neck

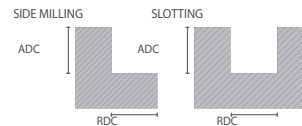
D1 Cutting Dia	D2 Shank Dia	L1 LOC	L3 Reach	L2 OAL	Uncoated	ZrN Z-Power Coated
3/8	3/8	1/2	1-1/8	3	H337T00605003.1	H337T60605003.1
3/8	3/8	1/2	2-1/8	4	H337T00605004.2	H337T60605004.2
1/2	1/2	5/8	1 3/8	3	H337T00806253.1	H337T60806253.1
1/2	1/2	5/8	2-1/8	4	H337T00806254.2	H337T60806254.2
1/2	1/2	5/8	3-3/8	6	H337T00806256.3	H337T60806256.3
5/8	5/8	3/4	1-5/8	4	H337T01007504.1	H337T61007504.1
5/8	5/8	3/4	2-3/8	5	H337T01007505.2	H337T61007505.2
5/8	5/8	3/4	3-3/8	6	H337T01007506.3	H337T61007506.3
3/4	3/4	1	2	4	H337T01210004.2	H337T61210004.2
3/4	3/4	1	3	5	H337T01210005.2	H337T61210005.2
3/4	3/4	1	4	6	H337T01210006.3	H337T61210006.3
1	1	1-1/4	2-1/4	5	H337T01612505.2	H337T61612505.2
1	1	1-1/4	3-1/2	6	H337T01612506.3	H337T61612506.3
1	1	1-1/4	4-1/4	7	H337T01612507.4	H337T61612507.4

Tolerance

Cutting Diameter (D1)	Shank Diameter (D2)	
1/8"-1/4": +.000"/-.0012"	1/8"-1/4": -.0001"/-.0003"	(D1) +0.00mm -0.013mm
1/4"-1/2": +.000"/-.0016"	1/4"-1/2": -.0001"/-.0003"	(D2) h6
1/2"-1": +.000"/-.0020"	1/2"-1": -.0001"/-.0004"	

Runout 0.0005"max (shank to cutting diameter)
Back Taper 0.0005"max | Ball Nose Radius +.000"/-.001"

HPM+ Speeds and Feeds



Materials	Milling SFM(Vc)	Type of Cut	Chipload per Tooth(CPT)				
			3/8"	1/2"	5/8"	3/4"	1"
N 1 Wrought Aluminum Alloys	260 - 610	Slotting	0.0050	0.0085	0.0090	0.0095	0.0148
		Light Peripheral	0.0091	0.0123	0.0132	0.0150	0.0220
N 2 Low-Silicon Aluminum Alloys Si <12.2% - 6061, 7075	790 - Maximum	Slotting	0.0055	0.0085	0.0078	0.0088	0.0140
		Light Peripheral	0.0081	0.0123	0.0145	0.0165	0.0245
N 3 High-Silicon Aluminum Alloys Si >12.2% - 6061, 7075	590 - 1010	Slotting	0.0038	0.068	0.0075	0.0072	0.0123
		Light Peripheral	0.0073	0.0105	0.0123	0.0138	0.0206
N 4 Copper & Copper Alloys	690 - 1010	Slotting	0.0045	0.0068	0.0075	0.0072	0.0123
		Light Peripheral	0.0068	0.0105	0.0125	0.0138	0.0206

For high silicon materials we recommend Z-Power Coating

Variable Helix Endmills	HPM+ Endmills	High Performance Endmills	Standard Endmills	Carbide Endmills	Solid Carbide Routers	Solid Carbide Drill Mills	Powder Metal Endmills (PM30)	Powder Metal Endmills (PM4)	Cobalt Endmills (M42)	High Speed Steel Endmills (M7)
Solid Carbide Endmills										
Metric										
Routers										
Drill Mills										
Powder Metal Endmills										
Cobalt Endmills										
HSS Endmills										



PRECISION CUTTING TOOLS, INC.

HIGH PERFORMING MILLING

Increased Productivity &
Long-Term Cost Savings

PERFORMANCE

NEW



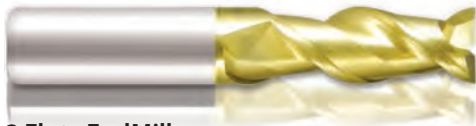
NEW



NEW



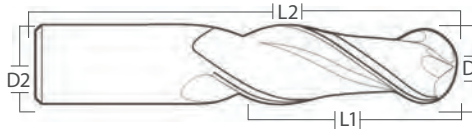
Left:
345 Series p.146
Center:
430 Series p.160
Right:
W345 Series p.148



2 Flute EndMill

- Z-Power (ZrN) recommended (up to 25% faster than uncoated)
- Radii (available upon request)
- Left Hand (available upon request)
- Flats added within 24 hrs.
- Material Code Refer to Page 245 & 246.

N



CARBIDE	2 Flutes	45°	Z Power®

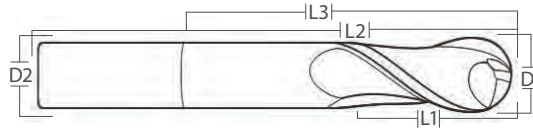
Z-Power® has excellent corrosion and adhesion resistant properties.

Speeds and Feeds Refer to Page 141.

Fractional

D1 Cutting Dia	D2 Shank Dia	L1 LOC	L2 OAL	Uncoated	ZrN Z-Power Coated	ZrN Ball End Coated
3/16	3/16	5/16	2	0224T00303122	0224T60303122	0224T60303122B
3/16	3/16	9/16	2	0224T00305622	0224T60305622	0224T60305622B
1/4	1/4	1/2	2	0224T00405002	0224T60405002	0224T60405002B
1/4	1/4	3/4	2-1/2	0224T004075025	0224T604075025	0224T604075025B
1/4	1/4	1	3	0224T00410003	0224T60410003	0224T60410003B
1/4	1/4	1-1/4	4	0224T00412504	0224T60412504	0224T60412504B
5/16	5/16	7/16	2	0224T00543752	0224T60543752	0224T60543752B
5/16	5/16	7/8	2-1/2	0224T005087525	0224T605087525	0224T605087525B
5/16	5/16	1-1/4	4	0224T00512504	0224T60512504	0224T60512504B
5/16	5/16	1-5/8	4	0224T00516254	0224T60516254	0224T60516254B
3/8	3/8	1/2	2	0224T00605002	0224T60605002	0224T60605002B
3/8	3/8	1	2-1/2	0224T006100025	0224T606100025	0224T606100025B
3/8	3/8	1-1/8	3	0224T00611253	0224T60611253	0224T60611253B
3/8	3/8	1-1/2	4	0224T00615004	0224T60615004	0224T60615004B
7/16	7/16	9/16	2-3/4	0224T0070562275	0224T6070562275	0224T6070562275B
7/16	7/16	1	2-3/4	0224T0071000275	0224T6071000275	0224T6071000275B
7/16	7/16	2	4	0224T00720004	0224T60720004	0224T60720004B
1/2	1/2	5/8	2-1/2	0224T008062525	0224T608062525	0224T608062525B
1/2	1/2	1-1/4	3	0224T00812503	0224T60812503	0224T60812503B
1/2	1/2	1-1/2	4	0224T00815004	0224T60815004	0224T60815004B
1/2	1/2	2	4	0224T00820004	0224T60820004	0224T60820004B
1/2	1/2	1-1/2	6	0224T00815006	0224T60815006	0224T60815006B
1/2	1/2	3-1/8	6	0224T00831256	0224T60831256	0224T60831256B
5/8	5/8	3/4	3	0224T01007503	0224T61007503	0224T61007503B
5/8	5/8	1-5/8	3-1/2	0224T010162535	0224T610162535	0224T610162535B
5/8	5/8	2	4	0224T01020004	0224T61020004	0224T61020004B
5/8	5/8	2-1/4	5	0224T01022505	0224T61022505	0224T61022505B
5/8	5/8	1-1/2	6	0224T01015006	0224T61015006	0224T61015006B
5/8	5/8	3	6	0224T01030006	0224T61030006	0224T61030006B
3/4	3/4	1	3	0224T01210003	0224T61210003	0224T61210003B
3/4	3/4	1-5/8	4	0224T01216254	0224T61216254	0224T61216254B
3/4	3/4	2-1/4	5	0224T01222505	0224T61222505	0224T61222505B
3/4	3/4	1-1/2	6	0224T01215006	0224T61215006	0224T61215006B
3/4	3/4	3-1/4	6	0224T01232506	0224T61232506	0224T61232506B
3/4	3/4	4	7	0224T01240007	0224T61240007	0224T61240007B
1	1	1-1/4	4	0224T01612504	0224T61612504	0224T61612504B
1	1	2	4-1/2	0224T016200045	0224T616200045	0224T616200045B
1	1	2-1/4	5	0224T01622505	0224T61622505	0224T61622505B
1	1	1-1/2	6	0224T01615006	0224T61615006	0224T61615006B
1	1	2-5/8	6	0224T01626256	0224T61626256	0224T61626256B
1	1	3-1/4	6	0224T01632506	0224T61632506	0224T61632506B
1	1	4 1/8	7	0224T01641257	0224T61641257	0224T61641257B

Other Dimensions are Available Upon Request



Tolerance

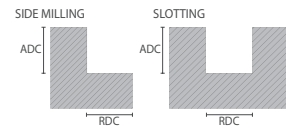
Cutting Diameter (D1)	Shank Diameter (D2)	(D1) +0.00mm -0.013mm
1/8"-1/4": +.000"/-.0012"	1/8"-1/4": -.0001"/-.0003"	(D2) h6
1/4"-1/2": +.000"/-.0016"	1/4"-1/2": -.0001"/-.0003"	
1/2"-1": +.000"/-.0020"	1/2"-1": -.0001"/-.0004"	

Runout 0.0005"max (shank to cutting diameter)
Back Taper 0.0005"max | Ball Nose Radius +.000"/-.001"

Extended Neck

D1	D2	L1	L3	L2	Uncoated	ZrN	ZrN
Cutting Dia	Shank Dia	LOC	Reach	OAL		Z-Power Coated	Ball End Coated
1/4	1/4	3/8	1-1/8	3	0224T00403753.1	0224T60403753.1	0224T60403753.1B
1/4	1/4	3/8	2-1/8	4	0224T00403754.2	0224T60403754.2	0224T60403754.2B
3/8	3/8	1/2	1-1/8	3	0224T00605003.1	0224T60605003.1	0224T60605003.1B
3/8	3/8	1/2	2-1/8	4	0224T00605004.2	0224T60605004.2	0224T60605004.2B
1/2	1/2	5/8	1-3/8	3	0224T00806253.1	0224T60806253.1	0224T60806253.1B
1/2	1/2	5/8	2-1/8	4	0224T00806254.2	0224T60806254.2	0224T60806254.2B
1/2	1/2	5/8	3-3/8	6	0224T00806256.3	0224T60806256.3	0224T60806256.3B
5/8	5/8	3/4	1-5/8	4	0224T01007504.1	0224T61007504.1	0224T61007504.1B
5/8	5/8	3/4	2-3/8	5	0224T01007505.2	0224T61007505.2	0224T61007505.2B
5/8	5/8	3/4	3-3/8	6	0224T01007506.3	0224T61007506.3	0224T61007506.3B
3/4	3/4	1	2	4	0224T01210004.2	0224T61210004.2	0224T61210004.2B
3/4	3/4	1	2-1/2	5	0224T01210005.2	0224T61210005.2	0224T61210005.2B
3/4	3/4	1	3-3/8	6	0224T01210006.3	0224T61210006.3	0224T61210006.3B
1	1	1-1/4	2-5/8	5	0224T01612505.2	0224T61612505.2	0224T61612505.2B
1	1	1-1/4	3-3/8	6	0224T01612506.3	0224T61612506.3	0224T61612506.3B
1	1	1-1/4	4-3/8	7	0224T01612507.4	0224T61612507.4	0224T61612507.4B

224 SERIES Speeds and Feeds

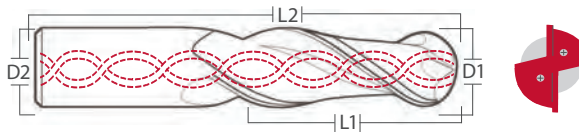


Materials	Milling SFM(Vc)		Chipload per Tooth Recommendations(CPT)										Profiling Radial		Slotting Axial
	Uncoated Min.-Max	ZrN Min.-Max	1/8"	3/16"	1/4"	5/16"	3/8"	7/16"	1/2"	5/8"	3/4"	1"	(ADC) RDC	(ADC)	
N1 Wrought Aluminum Alloys	1575 - 6500	1575 - 6550	.0008	.0015	.0025	.0029	.0033	.0040	.0055	.0067	.0082	.0096	1xD	.5xD	1xD
N2 Low-Silicon Aluminum Alloys Si <12.2% - 6061, 7075	1575 - 4500	1575 - 6550	.0013	.0014	.0022	.0025	.0028	.0037	.0052	.0063	.0073	.0090	1xD	.5xD	1xD

For high silicon materials we recommend Z-Power Coating

Variable Helix Endmills
HPM+ Endmills
High Performance Endmills
Standard Endmills
Carbide Endmills
Solid Carbide Routers
Solid Carbide Drill Mills
Powder Metal Endmills (PM30)
Powder Metal Endmills (PM4)
Cobalt Endmills (M42)
High Speed Steel Endmills (M7)

Solid Carbide Endmills
Metric
Routers
Drill Mills
Powder Metal Endmills
Cobalt Endmills
HSS Endmills



2 Flute EndMill Coolant Holes

- Z-Power (ZrN) recommended (up to 25% faster than uncoated)
- Radii (available upon request)
- Left Hand (available upon request)
- Flats added within 24 hrs.
- Material Code Refer to Page 245 & 246.

N

CARBIDE

2 Flutes

40°

Z Power®

Z-Power® has excellent corrosion and adhesion resistant properties.

Tolerance

Cutting Diameter (D1)	Shank Diameter (D2)
1/8"-1/4": +.000"/-.0012"	1/8"-1/4": -.0001"/-.0003"
1/4"-1/2": +.000"/-.0016"	1/4"-1/2": -.0001"/-.0003"
1/2"-1": +.000"/-.0020"	1/2"-1": -.0001"/-.0004"

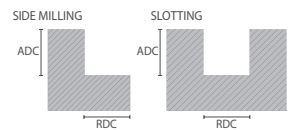
Runout 0.0005"max (shank to cutting diameter)
Back Taper 0.0005"max | Ball Nose Radius +.000"/-.001"

Speeds and Feeds Refer to Page 142.

Fractional

D1 Cutting Dia	D2 Shank Dia	L1 LOC	L2 OAL	Uncoated	ZrN Z-Power Coated	ZrN Ball End Coated
1/4	1/4	1/2	2	C224T00405002	C224T60405002	C224T60405002B
1/4	1/4	3/4	2-1/2	C224T004075025	C224T604075025	C224T604075025B
1/4	1/4	1	3	C224T00410003	C224T60410003	C224T60410003B
1/4	1/4	1-1/4	4	C224T00412504	C224T60412504	C224T60412504B
5/16	5/16	7/16	2	C224T00543752	C224T60543752	C224T60543752B
5/16	5/16	7/8	2-1/2	C224T005087525	C224T605087525	C224T605087525B
5/16	5/16	1-1/4	4	C224T00512504	C224T60512504	C224T60512504B
5/16	5/16	1-5/8	4	C224T00516254	C224T60516254	C224T60516254B
3/8	3/8	1/2	2	C224T00605002	C224T60605002	C224T60605002B
3/8	3/8	1	2-1/2	C224T006100025	C224T606100025	C224T606100025B
3/8	3/8	1-1/8	3	C224T00611253	C224T60611253	C224T60611253B
3/8	3/8	1-1/2	4	C224T00615004	C224T60615004	C224T60615004B
7/16	7/16	9/16	2-3/4	C224T0070562275	C224T6070562275	C224T6070562275B
7/16	7/16	1	2-3/4	C224T0071000275	C224T6071000275	C224T6071000275B
7/16	7/16	2	4	C224T00720004	C224T60720004	C224T60720004B
1/2	1/2	5/8	2-1/2	C224T008062525	C224T608062525	C224T608062525B
1/2	1/2	1-1/4	3	C224T00812503	C224T60812503	C224T60812503B
1/2	1/2	1-1/2	4	C224T00815004	C224T60815004	C224T60815004B
1/2	1/2	2	4	C224T00820004	C224T60820004	C224T60820004B
1/2	1/2	1-1/2	6	C224T00815006	C224T60815006	C224T60815006B
1/2	1/2	3-1/8	6	C224T00831256	C224T60831256	C224T60831256B
5/8	5/8	3/4	3	C224T01007503	C224T61007503	C224T61007503B
5/8	5/8	1-5/8	3-1/2	C224T010162535	C224T610162535	C224T610162535B
5/8	5/8	2	4	C224T01020004	C224T61020004	C224T61020004B
5/8	5/8	2-1/4	5	C224T01022505	C224T61022505	C224T61022505B
5/8	5/8	1-1/2	6	C224T01015006	C224T61015006	C224T61015006B
5/8	5/8	3	6	C224T01030006	C224T61030006	C224T61030006B
3/4	3/4	1	3	C224T01210003	C224T61210003	C224T61210003B
3/4	3/4	1-5/8	4	C224T01216254	C224T61216254	C224T61216254B
3/4	3/4	2-1/4	5	C224T01222505	C224T61222505	C224T61222505B
3/4	3/4	1-1/2	6	C224T01215006	C224T61215006	C224T61215006B
3/4	3/4	3-1/4	6	C224T01232506	C224T61232506	C224T61232506B
3/4	3/4	4	7	C224T01240007	C224T61240007	C224T61240007B
1	1	1-1/4	4	C224T01612504	C224T61612504	C224T61612504B
1	1	2	4-1/2	C224T016200045	C224T616200045	C224T616200045B
1	1	2-1/4	5	C224T01622505	C224T61622505	C224T61622505B
1	1	1-1/2	6	C224T01615006	C224T61615006	C224T61615006B
1	1	2-5/8	6	C224T01626256	C224T61626256	C224T61626256B
1	1	3-1/4	6	C224T01632506	C224T61632506	C224T61632506B
1	1	4 1/8	7	C224T01641257	C224T61641257	C224T61641257B

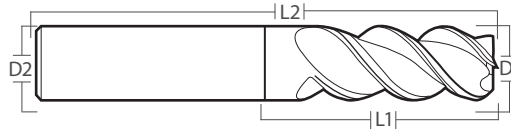
Other Dimensions are Available Upon Request



C224 SERIES Speeds and Feeds

Materials	Milling SFM(Vc)		Chipload per Tooth Recommendations(CPT)										Profiling Radial (ADC RDC)	Slotting Axial (ADC)	
	Uncoated Min.-Max	ZrN Min.-Max	1/8"	3/16"	1/4"	5/16"	3/8"	7/16"	1/2"	5/8"	3/4"	1"			
	N 1 Wrought Aluminum Alloys	1575 - 6500	1575 - 6550	.0008	.0015	.0025	.0029	.0033	.0040	.0055	.0067	.0082	.0096	1xD	.5xD
N 2 Low-Silicon Aluminum Alloys Si <12.2% - 6061, 7075	1575 - 4500	1575 - 6550	.0013	.0014	.0022	.0025	.0028	.0037	.0052	.0063	.0073	.0090	1xD	.5xD	1xD

For high silicon materials we recommend Z-Power Coating



3 Flute EndMill, General Purpose

- Exxtral Plus (AlTiN) recommended (up to 25% faster than uncoated)
- Radii (available upon request)
- Left Hand (available upon request)
- Flats added within 24 hrs.
- Material Code Refer to Page 245 & 246.

P M K S

CARBIDE

3
Flutes

60°

Exxtral Plus®

Exxtral Plus® is ideal for high performance machining of hard materials.

Speeds and Feeds Refer to Page 143.

Fractional

D1 Cutting Dia	D2 Shank Dia	L1 LOC	L2 OAL	Uncoated	AlTiN Exxtral Plus Coated
1/4	1/4	3/4	2-1/2	0603T004075025	0603T404075025
5/16	5/16	7/8	2-1/2	0603T005087525	0603T405087525
3/8	3/8	7/8	2-1/2	0603T006087525	0603T406087525
7/16	7/16	1	2-3/4	0603T007100027	0603T407100027
1/2	1/2	1	3	0603T00810003	0603T40810003
5/8	5/8	1-1/4	3-1/2	0603T010125035	0603T410125035
3/4	3/4	1-1/4	4	0603T01212504	0603T41212504
1	1	1-1/2	4	0603T01615004	0603T41615004

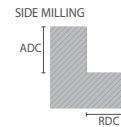
Tolerance

Cutting Diameter (D1)	Shank Diameter (D2)
1/8"-1/4": +.000"/-.0012"	1/8"-1/4": -.0001"/-.0003"
1/4"-1/2": +.000"/-.0016"	1/4"-1/2": -.0001"/-.0003"
1/2"-1": +.000"/-.0020"	1/2"-1": -.0001"/-.0004"
Runout 0.0005"max (shank to cutting diameter)	
Back Taper 0.0005"max Ball Nose Radius +.000"/-.001"	

Other Dimensions are Available Upon Request



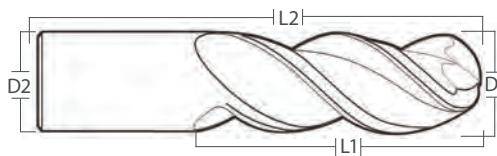
Speeds and Feeds



Materials	Milling SFM(Vc)		Chipload per Tooth Recommendations(CPT)									Profiling Radial	
	SFM <32Rc	SFM >32Rc	1/8"	1/4"	5/16"	3/8"	1/2"	5/8"	3/4"	1"	ADC	RDC	
P2 Low - Carbon Steel - 1000 Serie	200 - 440	100 - 225	.0008	.002	.002	.0026	.0034	.0041	.0049	.0089	1xD	.2xD	
P4 Alloy Tool Steel - 1300 , 2000,3000	150 -350	80 - 200	.0007	.0012	.002	.0020	.0032	.0037	.0042	.0080	1xD	.2xD	
M1 Austenitic Stainless Steel-Inox, 200 Series, 300 Series	150 - 325	80 - 225	.0006	.0014	.0019	.0022	.0028	.0037	.0042	.0081	1xD	.2xD	
M2 Austenitic Stainless Steel & Cast Stainless Steel -310 , 314 , 316	200 - 425	100 -275	.0007	.0015	.0019	.0022	.0028	.0037	.0042	.0081	1xD	.2xD	
M3 Duplex Steel (Austenitic & Ferritic)-323, 329, F55,2205	80 - 225	90 - 155	.0007	.0015	.0019	.0022	.003	.0037	.0042	.0081	1xD	.2xD	
K1 Gray Cast Iron	220 - 450	130 - 300	.0008	.0015	.0019	.0022	.003	.0036	.0042	.0081	1xD	.2xD	
K3 Ductile Iron- 32510, 35018	120 -350	80 - 150	.0007	.0015	.0018	.0022	.0028	.0036	.0042	.0081	1xD	.2xD	
S2 Nickel Based, Cobalt Based, Heat- Resistant Alloys- Haynes 188, Haynes 21, Hastelloy,Waspaloy, Inconel 625/718	70 -100	40 - 100	.0006	.001	.002	.0014	.002	.0022	.0028	.0058	1xD	.2xD	
S4 Titanium Alloys - Commercially Pure, 6Al-4V, Astm 1/2/3, Ti-6Al-2Sn-4Zr-2Mo	150 - 200	90 -150	.0007	.0015	.0018	.0022	.0028	.0035	.0042	.0081	1xD	.2xD	

For high performing milling we recommend Exxtral Plus Coating

Solid Carbide Endmills
 HPM+ Endmills
 High Performance Endmills
 Standard Endmills
 Carbide Endmills
Metric
 Solid Carbide Routers
Routers
 Solid Carbide Drill Mills
Drill Mills
 Powder Metal Endmills (PM30)
Powder Metal Endmills
 Powder Metal Endmills (PM4)
Powder Metal Endmills
 Cobalt Endmills (M42)
Cobalt Endmills
 High Speed Steel (M7)
HSS Endmills



3 Flute EndMill

- Exxtral Plus (AlTiN) up to 25% faster than uncoated
- Eccentric OD
- Radii (available upon request)
- Left Hand (available upon request)
- Flats added within 24 hrs.
- Material Code Refer to Page 245 & 246.



CARBIDE

3
Flutes

45°

Exxtral
Plus®

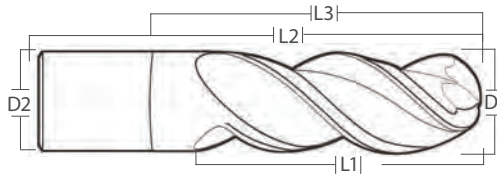
Exxtral Plus® is ideal for high performance machining of hard materials.

Speeds and Feeds Refer to Page 145.

Fractional

	D1 Cutting Dia	D2 Shank Dia	L1 LOC	L2 OAL	AlTiN		
					Uncoated	Exxtral Plus Coated	Ball End Uncoated
	1/8	1/8	1/4	1-1/2	0314T002025015	0314T402025015	0314T002025015B
	1/8	1/8	1/2	1-1/2	0314T002050015	0314T402050015	0314T002050015B
	3/16	3/16	5/16	2	0314T00331252	0314T40331252	0314T00331252B
	3/16	3/16	9/16	2	0314T00356252	0314T40356252	0314T00356252B
	1/4	1/4	3/8	2	0314T00403752	0314T40403752	0314T00403752B
	1/4	1/4	3/4	2-1/2	0314T004075025	0314T404075025	0314T004075025B
	1/4	1/4	1	3	0314T00410003	0314T40410003	0314T00410003B
	1/4	1/4	1-1/4	4	0314T00412504	0314T40412504	0314T00412504B
	5/16	5/16	1/2	2	0314T00505002	0314T40505002	0314T00505002B
	5/16	5/16	7/8	2-1/2	0314T005087525	0314T405087525	0314T005087525B
	5/16	5/16	1	3	0314T00510003	0314T40510003	0314T00510003B
	5/16	5/16	1-1/4	4	0314T00512504	0314T40512504	0314T00512504B
	3/8	3/8	1/2	2	0314T00605002	0314T40605002	0314T00605002B
	3/8	3/8	1	2-1/2	0314T006100025	0314T406100025	0314T006100025B
	3/8	3/8	1	3	0314T00610003	0314T40610003	0314T00610003B
	3/8	3/8	1-1/2	4	0314T00615004	0314T40615004	0314T00615004B
	7/16	7/16	1	2-3/4	0314T0071000275	0314T4071000275	0314T0071000275B
	7/16	7/16	1-1/2	4	0314T00715004	0314T40715004	0314T00715004B
	1/2	1/2	5/8	2-1/2	0314T008062525	0314T408062525	0314T008062525B
	1/2	1/2	1-1/4	3	0314T00812503	0314T40812503	0314T00812503B
	1/2	1/2	1-1/2	4	0314T00815004	0314T40815004	0314T00815004B
	1/2	1/2	2	4	0314T00820004	0314T40820004	0314T00820004B
	1/2	1/2	2-1/2	5	0314T00825005	0314T40825005	0314T00825005B
	1/2	1/2	1-1/2	6	0314T00815006	0314T40815006	0314T00815006B
	1/2	1/2	3-1/8	6	0314T00831256	0314T40831256	0314T00831256B
	5/8	5/8	3/4	3	0314T01007503	0314T41007503	0314T01007503B
	5/8	5/8	1-1/4	3-1/2	0314T010125035	0314T410125035	0314T010125035B
	5/8	5/8	2	4	0314T01020004	0314T41020004	0314T01020004B
	5/8	5/8	2-1/4	5	0314T01022505	0314T41022505	0314T01022505B
	5/8	5/8	3	6	0314T01030006	0314T41030006	0314T01030006B
	3/4	3/4	1	3	0314T01210003	0314T41210003	0314T01210003B
	3/4	3/4	1-5/8	4	0314T01216254	0314T41216254	0314T01216254B
	3/4	3/4	2-1/4	5	0314T01222505	0314T41222505	0314T01222505B
	3/4	3/4	3	6	0314T01230006	0314T41230006	0314T01230006B
	3/4	3/4	4	7	0314T01240007	0314T41240007	0314T01240007B
	1	1	1-1/2	4	0314T01615004	0314T41615004	0314T01615004B
	1	1	2-1/4	5	0314T01622505	0314T41622505	0314T01622505B
	1	1	2-5/8	6	0314T01626256	0314T41626256	0314T01626256B
	1	1	3	6	0314T01630006	0314T41630006	0314T01630006B
	1	1	4	7	0314T01640007	0314T41640007	0314T01640007B
	1-1/4	1-1/4	2	4-1/2	0314T020200045	0314T420200045	0314T020200045B
	1-1/4	1-1/4	3	6	0314T02030006	0314T42030006	0314T02030006B

Other Dimensions are Available Upon Request



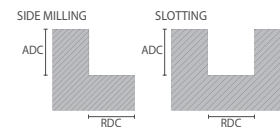
Tolerance

Cutting Diameter (D1)	Shank Diameter (D2)	(D1) +0.00mm -0.013mm
1/8"-1/4": +.000"/-.0012"	1/8"-1/4": -.0001"/-.0003"	(D2) h6
1/4"-1/2": +.000"/-.0016"	1/4"-1/2": -.0001"/-.0003"	
1/2"-1": +.000"/-.0020"	1/2"-1": -.0001"/-.0004"	

Runout 0.0005"max (shank to cutting diameter)
Back Taper 0.0005"max | Ball Nose Radius +.000/--.001"

Extended Neck

D1 Cutting Dia	D2 Shank Dia	L1 LOC	L3 Reach	L2 OAL	Uncoated	AITiN Extrtal Plus Coated	Ball End Uncoated
1/4	1/4	3/8	1-1/8	3	0314T00403753.1	0314T40403753.1	0314T00403753.1B
1/4	1/4	3/8	2-1/8	4	0314T00403754.2	0314T40403754.2	0314T00403754.2B
3/8	3/8	1/2	1-1/8	3	0314T00605003.1	0314T40605003.1	0314T00605003.1B
3/8	3/8	1/2	2-1/8	4	0314T00605004.2	0314T40605004.2	0314T00605004.2B
1/2	1/2	5/8	1 3/8	3	0314T00806253.1	0314T40806253.1	0314T00806253.1B
1/2	1/2	5/8	2-1/8	4	0314T00806254.2	0314T40806254.2	0314T00806254.2B
1/2	1/2	5/8	3-3/8	6	0314T00806256.3	0314T40806256.3	0314T00806256.3B
5/8	5/8	3/4	1-5/8	4	0314T01007504.1	0314T41007504.1	0314T01007504.1B
5/8	5/8	3/4	2-3/8	5	0314T01007505.2	0314T41007505.2	0314T01007505.2B
5/8	5/8	3/4	3-3/8	6	0314T01007506.3	0314T41007506.3	0314T01007506.3B
3/4	3/4	1	2	4	0314T01210004.2	0314T41210004.2	0314T01210004.2B
3/4	3/4	1	2-1/2	5	0314T01210005.2	0314T41210005.2	0314T01210005.2B
3/4	3/4	1	3-3/8	6	0314T01210006.3	0314T41210006.3	0314T01210006.3B
1	1	1-1/4	2-5/8	5	0314T01612505.2	0314T41612505.2	0314T01612505.2B
1	1	1-1/4	3-3/8	6	0314T01612506.3	0314T41612506.3	0314T01612506.3B
1	1	1-1/4	4-3/8	7	0314T01612507.4	0314T41612507.4	0314T01612507.4B

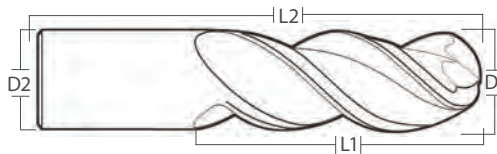


314 SERIES Speeds and Feeds

Materials	Milling SFM(Vc)		Chipload per Tooth Recommendations(CPT)										Profiling Radial		Slotting Axial	
	Uncoated Min.-Max	Extrtal Plus Min.-Max	1/8"	3/16"	1/4"	5/16"	3/8"	7/16"	1/2"	5/8"	3/4"	1"	1-1/4"	ADC	RDC	(ADC)
P1 Low-Carbon Steel- 1000 Series (>25 HRC)	220 - 260	500 - 630	.0008	.0014	.0018	.0023	.0025	.0028	.0035	.0039	.0043	.0050	.0062	1xD	.5xD	.5xD
P2 Low - Carbon Steels- 1000 Series (<25 HRC)	160 - 250	445 - 600	.0008	.0014	.0018	.0023	.0025	.0028	.0035	.0039	.0043	.0050	.0062	1xD	.5xD	.5xD
P3 Alloy Tool Steels - 1300, 2000, 3000 (≤ 35HRc)	160 - 200	400 - 500	.0007	.0013	.0015	.0020	.0023	.0026	.0029	.0034	.0038	.0046	.0057	1xD	.5xD	.5xD
P4 Alloy Tool Steels - 1300, 2000 , 3000 (36 - 48 HRC)		350 - 450	.0007	.0010	.0014	.0018	.0020	.0023	.0026	.0030	.0030	.0039	.0049	1xD	.5xD	.5xD
P5 Ferritic, Martensitic & pH Stainless Steels - 400's, pH Types (≤ 35 HRC)		200 - 325	.0006	.0008	.0012	.0016	.0018	.0021	.0023	.0025	.0030	.0035	.0046	1xD	.5xD	.5xD
P6 PH Stainless Steels 400's, pH Types (36-48) HRC		150 - 200	.0007	.0008	.0010	.0013	.0015	.0017	.0020	.0022	.0024	.0028	.0036	1xD	.5xD	.5xD
M1 Steel - Inox , 200 Series, 300 Series and 304L	120 - 130	250 - 325	.0007	.0013	.0015	.0020	.0023	.0026	.0029	.0034	.0038	.0046	.0057	1xD	.5xD	.5xD
M2 Steel & Cast Stainless Steel - 310, 314, 316		175 - 250	.0006	.0090	.0012	.0016	.0018	.0021	.0023	.0025	.0030	.0036	.0046	1xD	.5xD	.5xD
M3 Duplex Steel (Austenitic & Ferritic) - 323, 329, F55, 2205		200 - 250	.0007	.0008	.0010	.0013	.0015	.0017	.0020	.0022	.0024	.0028	.0037	1xD	.5xD	.5xD
K1 Gray Cast Iron	150 - 200	425 - 525	.0008	.0014	.0018	.0023	.0025	.0028	.0035	.0039	.0043	.0050	.0062	1xD	.5xD	.5xD
K2 Ductile Iron - 60 - 40 , 18, 65, 45-12 (<28HRc)		360 - 450	.0007	.0013	.0015	.0020	.0023	.0026	.0029	.0034	.0038	.0046	.0057	1xD	.5xD	.5xD
K3 Ductile Iron -32510, 35018 (38HRc)		330 - 440	.0006	.0008	.0012	.0016	.0018	.0021	.0023	.0025	.0030	.0036	.0046	1xD	.5xD	.5xD
S1 Iron - Based, Heat - Resistant alloys - Incoloy 800-802, A - 286 , N-155		160 - 275	.0007	.0013	.0015	.0020	.0023	.0026	.0029	.0034	.0038	.0046	.0057	1xD	.3xD	.5xD
S2 Nickel based, Cobalt Based, Heat-Resistant Alloys - Haynes 188, Haynes 21 , Hastelloy, Waspaloy, Inconel 625/ 718 (≤ 48 HRc)		65 - 100	.0004	.0006	.0008	.0010	.0012	.0014	.0016	.0018	.0020	.0025	.0028	1xD	.3xD	.5xD
S4 Titanium Alloys - Commercially Pure, 6Al- 4V, Astm 1/2/3, Ti-6Al-2SN - AZr-2Mo (≤ 48 HRc)		150 - 225	.0007	.0008	.0013	.0014	.0017	.0020	.0022	.0025	.0028	.0030	.0042	1xD	.5xD	.5xD

For high-performance milling, we recommend Extrtal Plus coating.

Variable Helix Endmills
HPM+ Endmills
High Performance Endmills
Standard Endmills
Metric Carbide Endmills
Solid Carbide Routers
Solid Carbide Drill Mills
Powder Metal Endmills (PM30)
Powder Metal Endmills (PM4)
Cobalt Endmills (M42)
High Speed Steel (M7) Endmills



3 Flute EndMill

- Z-Power (ZrN) up to 25% faster than uncoated
- Radii (available upon request)
- Left Hand (available upon request)
- Flats added within 24 hrs.
- Primary & Secondary
- Material Code Refer to Page 245 & 246.



CARBIDE

3
Flutes

45°

Z
Power®

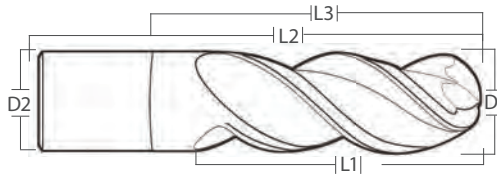
Z-Power® has excellent corrosion and adhesion resistant properties.

Speeds and Feeds Refer to Page 147.

Fractional

	D1 Cutting Dia	D2 Shank Dia	L1 LOC	L2 OAL	Uncoated	ZrN Z-Power Coated	ZrN Ball End Coated	
Metric	1/8	1/8	1/4	1-1/2	0345T002025015	0345T602025015	0345T602025015B	
	1/8	1/8	1/2	1-1/2	0345T002050015	0345T602050015	0345T602050015B	
	3/16	3/16	5/16	2	0345T00331252	0345T60331252	0345T60331252B	
	3/16	3/16	9/16	2	0345T00356252	0345T60356252	0345T60356252B	
	1/4	1/4	3/8	2	0345T00403752	0345T60403752	0345T60403752B	
	1/4	1/4	3/4	2-1/2	0345T004075025	0345T604075025	0345T604075025B	
	1/4	1/4	1	3	0345T00410003	0345T60410003	0345T60410003B	
	1/4	1/4	1-1/4	4	0345T00412504	0345T60412504	0345T60412504B	
	Routers	5/16	5/16	1/2	2	0345T00505002	0345T60505002	0345T60505002B
		5/16	5/16	7/8	2-1/2	0345T005087525	0345T605087525	0345T605087525B
5/16		5/16	1	3	0345T00510003	0345T60510003	0345T60510003B	
5/16		5/16	1-1/4	4	0345T00512504	0345T60512504	0345T60512504B	
3/8		3/8	1/2	2	0345T00605002	0345T60605002	0345T60605002B	
3/8		3/8	1	2-1/2	0345T006100025	0345T606100025	0345T606100025B	
3/8		3/8	1	3	0345T00610003	0345T60610003	0345T60610003B	
3/8		3/8	1-1/2	4	0345T00615004	0345T60615004	0345T60615004B	
Drill Mills		7/16	7/16	1	2-3/4	0345T0071000275	0345T6071000275	0345T6071000275B
		7/16	7/16	1-1/2	4	0345T00715004	0345T60715004	0345T60715004B
	7/16	7/16	2	4	0345T00720004	0345T60720004	0345T60720004B	
	1/2	1/2	5/8	2-1/2	0345T008062525	0345T608062525	0345T608062525B	
	1/2	1/2	1-1/4	3	0345T00812503	0345T60812503	0345T60812503B	
	1/2	1/2	1-1/2	4	0345T00815004	0345T60815004	0345T60815004B	
	1/2	1/2	2	4	0345T00820004	0345T60820004	0345T60820004B	
	1/2	1/2	2-1/2	5	0345T00825005	0345T60825005	0345T60825005B	
	1/2	1/2	1-1/2	6	0345T00815006	0345T60815006	0345T60815006B	
	1/2	1/2	3-1/8	6	0345T00831256	0345T60831256	0345T60831256B	
Powder Metal Endmills	5/8	5/8	3/4	3	0345T01007503	0345T61007503	0345T61007503B	
	5/8	5/8	1-1/4	3-1/2	0345T010125035	0345T610125035	0345T610125035B	
	5/8	5/8	2	4	0345T01020004	0345T61020004	0345T61020004B	
	5/8	5/8	2-1/4	5	0345T01022505	0345T61022505	0345T61022505B	
	5/8	5/8	1-1/2	6	0345T01015006	0345T61015006	0345T61015006B	
	5/8	5/8	3	6	0345T01030006	0345T61030006	0345T61030006B	
	3/4	3/4	1	3	0345T01210003	0345T61210003	0345T61210003B	
	3/4	3/4	1-5/8	4	0345T01216254	0345T61216254	0345T61216254B	
	3/4	3/4	2-1/4	5	0345T01222505	0345T61222505	0345T61222505B	
	3/4	3/4	1-1/2	6	0345T01615006	0345T61615006	0345T61615006B	
Cobalt Endmills	3/4	3/4	3	6	0345T01230006	0345T61230006	0345T601230006B	
	3/4	3/4	4	7	0345T01240007	0345T61240007	0345T61240007B	
	1	1	1-1/2	4	0345T01615004	0345T61615004	0345T61615004B	
	1	1	2	4-1/2	0345T016200045	0345T616200045	0345T616200045B	
	1	1	2-1/4	5	0345T01622505	0345T61622505	0345T61622505B	
	1	1	1-1/2	6	0345T01615006	0345T61615006	0345T01615006B	
	1	1	2-5/8	6	0345T01626256	0345T61626256	0345T01626256B	
	1	1	3	6	0345T01630006	0345T61630006	0345T01630006B	
	1	1	4	7	0345T01640007	0345T61640007	0345T01640007B	
	HSS Endmills	1-1/4	1-1/4	2	4-1/2	0345T020200045	0345T620200045	0345T020200045B
1-1/4		1-1/4	3	6	0345T02030006	0345T62030006	0345T02030006B	

Other Dimensions are Available Upon Request



Tolerance

Cutting Diameter (D1)	Shank Diameter (D2)	(D1) +0.00mm -0.013mm
1/8"-1/4": +.000"/-.0012"	1/8"-1/4": -.0001"/-.0003"	(D2) h6
1/4"-1/2": +.000"/-.0016"	1/4"-1/2": -.0001"/-.0003"	
1/2"-1": +.000"/-.0020"	1/2"-1": -.0001"/-.0004"	

Runout 0.0005"max (shank to cutting diameter)
Back Taper 0.0005"max | Ball Nose Radius +.000/--.001"

Extended Neck

D1 Cutting Dia	D2 Shank Dia	L1 LOC	L3 Reach	L2 OAL	Uncoated	ZrN Z-Power Coated	ZrN Ball End Coated
1/4	1/4	3/8	1-1/8	3	0345T00403753.1	0345T60403753.1	0345T60403753.1B
1/4	1/4	3/8	2-1/8	4	0345T00403754.2	0345T60403754.2	0345T60403754.2B
3/8	3/8	1/2	1-1/8	3	0345T00605003.1	0345T60605003.1	0345T60605003.1B
3/8	3/8	1/2	2-1/8	4	0345T00605004.2	0345T60605004.2	0345T60605004.2B
1/2	1/2	5/8	1-3/8	3	0345T00806253.1	0345T60806253.1	0345T60806253.1B
1/2	1/2	5/8	2-1/8	4	0345T00806254.2	0345T60806254.2	0345T60806254.2B
1/2	1/2	5/8	3-3/8	6	0345T00806256.3	0345T60806256.3	0345T60806256.3B
5/8	5/8	3/4	1-5/8	4	0345T01007504.1	0345T61007504.1	0345T61007504.1B
5/8	5/8	3/4	2-3/8	5	0345T01007505.2	0345T61007505.2	0345T61007505.2B
5/8	5/8	3/4	3-3/8	6	0345T01007506.3	0345T61007506.3	0345T61007506.3B
3/4	3/4	1	2	4	0345T01210004.2	0345T61210004.2	0345T61210004.2B
3/4	3/4	1	2-1/2	5	0345T01210005.2	0345T61210005.2	0345T61210005.2B
3/4	3/4	1	3-3/8	6	0345T01210006.3	0345T61210006.3	0345T61210006.3B
1	1	1-1/4	2-5/8	5	0345T01612505.2	0345T61612505.2	0345T61612505.2B
1	1	1-1/4	3-3/8	6	0345T01612506.3	0345T61612506.3	0345T61612506.3B
1	1	1-1/4	4-3/8	7	0345T01612507.4	0345T61612507.4	0345T61612507.4B

345 SERIES Speeds and Feeds

Materials	Milling SFM(Vc)	Operation	Feed Per Tooth (FPT)						
			1/8"	1/4"	3/8"	1/2"	5/8"	3/4"	1"
N1 Wrought Aluminum Alloys	1580 - 2410	Slotting	.0008 - .0013	.0017 - .0023	.0025 - .0036	.0034 - .0048	.0046 - .0060	.0051 - .0073	.0071 - .0096
		Heavy Roughing	.0011 - .0015	.0022 - .0031	.0034 - .0048	.0048 - .0062	.0057 - .0080	.0068 - .0095	.0091 - .0129
		Light Roughing	.0014 - .0021	.0029 - .0039	.0044 - .0060	.0059 - .0076	.0072 - .0099	.0086 - .0119	.0118 - .0159
K1 Gray Cast Iron	710 - 1060	Finishing	.0010 - .0012	.0019 - .0025	.0025 - .0037	.0034 - .0049	.0046 - .0061	.0055 - .0072	.0072 - .0097
		Slotting	.0006 - .0011	.0012 - .0018	.0022 - .0030	.0030 - .0038	.0034 - .0050	.0044 - .0059	.0058 - .0076
		Heavy Roughing	.0010 - .0014	.0016 - .0028	.0030 - .0041	.0039 - .0053	.0046 - .0067	.0058 - .0077	.0078 - .0106
		Light Roughing	.0012 - .0015	.0020 - .0029	.0032 - .0043	.0044 - .0059	.0053 - .0073	.0063 - .0087	.0089 - .0116
		Finishing	.0008 - .0009	.0014 - .0020	.0021 - .0030	.0030 - .0038	.0035 - .0049	.0044 - .0058	.0058 - .0079

For high-performance milling, we recommend Z - Power® coating.

Variable Helix Endmills | HPM+ Endmills | High Performance Endmills | Standard Endmills | Carbide Endmills | Solid Carbide Routers | Solid Carbide Drill Mills | Powder Metal Endmills (PM30) | Powder Metal Endmills (PM4) | Cobalt Endmills (M42) | High Speed Steel Endmills (M7)

Solid Carbide Endmills | Metric | Routers | Drill Mills | Powder Metal Endmills | Cobalt Endmills | HSS Endmills

Solid Carbide Endmills

Variable Helix Endmills

HPM+ Endmills

High Performance Endmills

Standard Endmills

Metric

Carbide Endmills

Routers

Solid Carbide Routers

Drill Mills

Solid Carbide Drill Mills

Powder Metal Endmills

Powder Metal (PM30) Endmills

Powder Metal (PM4) Endmills

Cobalt Endmills

Cobalt (M42) Endmills

HSS Endmills

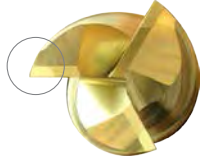
High Speed Steel (M7) Endmills



3 Flute EndMill

- Wiper flat on end face for improved finish
- Z-Power (ZrN) (up to 25% faster than uncoated)
- Radii available upon request
- Left Hand available upon request
- Flats added within 24 hrs.
- Primary & Secondary
- Material Code Refer to Page 245 & 246.

N



End face -Wiper Flatt



CARBIDE	3 Flutes	45°	Z Power®

Z-Power® has excellent corrosion and adhesion resistant properties.

Speeds and Feeds Refer to Page 149.

Fractional

D1 Cutting Dia	D2 Shank Dia	L1 LOC	L2 OAL	Uncoated	ZrN Z-Power Coated
1/4	1/4	3/8	2	W345T00403752	W345T60403752
1/4	1/4	3/4	2-1/2	W345T004075025	W345T604075025
5/16	5/16	1/2	2	W345T005050002	W345T605050002
5/16	5/16	7/8	2-1/2	W345T005087525	W345T605087525
3/8	3/8	1/2	2	W345T006050002	W345T606050002
3/8	3/8	1	2-1/2	W345T006100025	W345T606100025
3/8	3/8	1	3	W345T006100003	W345T606100003
7/16	7/16	1	2-3/4	W345T0071000275	W345T6071000275
7/16	7/16	1-1/2	4	W345T00715004	W345T60715004
1/2	1/2	5/8	2-1/2	W345T008062525	W345T608062525
1/2	1/2	1-1/4	3	W345T00812503	W345T60812503
5/8	5/8	3/4	3	W345T01007503	W345T61007503
5/8	5/8	1-1/4	3-1/2	W345T010125035	W345T610125035
3/4	3/4	1	3	W345T01210003	W345T61210003
3/4	3/4	1-1/2	4	W345T01215004	W345T61215004
1	1	1-1/2	4	W345T01615004	W345T61615004
1	1	2	4-1/2	W345T01620045	W345T61620045

Other Sizes & Characteristics are Available Upon Request



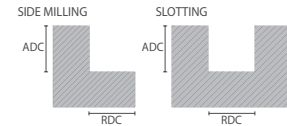
Tolerance

Cutting Diameter (D1) 1/8"-1/4": +.000"/-.0012" 1/4"-1/2": +.000"/-.0016" 1/2"-1": +.000"/-.0020"	Shank Diameter (D2) 1/8"-1/4": -.0001"/-.0003" 1/4"-1/2": -.0001"/-.0003" 1/2"-1": -.0001"/-.0004"	(D1) +0.00mm -0.013mm (D2) h6
---	--	--

Runout 0.0005"max (shank to cutting diameter)
Back Taper 0.0005"max | Ball Nose Radius +.000/-0.001"

Extended Neck

D1 Cutting Dia	D2 Shank Dia	L1 LOC	L3 Reach	L2 OAL	Uncoated	ZrN Z-Power Coated
1/4	1/4	3/8	1-1/8	3	W345T00403753.1	W345T60403753.1
1/4	1/4	3/8	2-1/8	4	W345T00403754.2	W345T60403754.2
3/8	3/8	1/2	1-1/8	3	W345T00605003.1	W345T60605003.1
3/8	3/8	1/2	2-1/8	4	W345T00605004.2	W345T60605004.2
1/2	1/2	5/8	1 3/8	3	W345T00806253.1	W345T60806253.1
1/2	1/2	5/8	2-1/8	4	W345T00806254.2	W345T60806254.2
1/2	1/2	5/8	3-3/8	6	W345T00806256.3	W345T60806256.3
5/8	5/8	3/4	1-5/8	4	W345T01007504.1	W345T61007504.1
5/8	5/8	3/4	2-3/8	5	W345T01007505.2	W345T61007505.2
5/8	5/8	3/4	3-3/8	6	W345T01007506.3	W345T61007506.3
3/4	3/4	1	2	4	W345T01210004.2	W345T61210004.2
3/4	3/4	1	2-1/2	5	W345T01210005.2	W345T61210005.2
3/4	3/4	1	3-3/8	6	W345T01210006.3	W345T61210006.3
1	1	1-1/4	2-5/8	5	W345T01612505.2	W345T61612505.2
1	1	1-1/4	3-3/8	6	W345T01612506.3	W345T61612506.3
1	1	1-1/4	4-3/8	7	W345T01612507.4	W345T61612507.4



W345 Speeds and Feeds

Materials	Milling SFM(Vc)		Chipload per Tooth Recommendations(CPT)										Profiling Radial		Slotting Axial	
	Uncoated Min.-Max	ZrN Min.-Max	1/8"	3/16"	1/4"	5/16"	3/8"	7/16"	1/2"	5/8"	3/4"	1"	(ADC) RDC		(ADC)	
													1xD	.5xD	1xD	1xD
N 1 Wrought Aluminum Alloys	1575 - 6500	1575 - 6550	.0008	.0015	.0025	.0029	.0033	.0040	.0055	.0067	.0082	.0096	1xD	.5xD	1xD	1xD
N 2 Low-Silicon Aluminum Alloys Si <12.2% - 6061, 7075	1575 - 4500	1575 - 6550	.0013	.0014	.0022	.0025	.0028	.0037	.0052	.0063	.0073	.0090	1xD	.5xD	1xD	1xD

For high silicon materials we recommend Z-Power Coating

Variable Helix
Endmills

HPM+
Endmills

High Performance
Endmills

Standard
Endmills

Carbide
Endmills

Solid Carbide
Routers

Solid Carbide
Drill Mills

Powder Metal
(PM30) Endmills

Powder Metal
(PM4) Endmills

Cobalt
(M42) Endmills

High Speed Steel
(M7) Endmills

Solid Carbide Endmills

Metric

Routers

Drill Mills

Powder Metal Endmills

Cobalt Endmills

HSS Endmills

Variable Helix Endmills

HPM+ Endmills

High Performance Endmills

Standard Endmills

Metric

Carbide Endmills

Routers

Solid Carbide Routers

Drill Mills

Solid Carbide Drill Mills

Powder Metal Endmills

Powder Metal (PM30) Endmills

Powder Metal (PM4) Endmills

Powder Metal (M42) Endmills

HSS Endmills

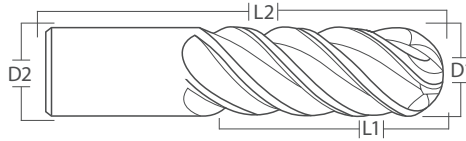
High Speed Steel (M7) Endmills



5-7 Flute EndMill

- Exxtral Plus (AlTiN) recommended (up to 25% faster than uncoated)
- Radii (available upon request)
- Left Hand (available upon request)
- Flats added within 24 hrs.
- Material Code Refer to Page 245 & 246.

P M K S H



CARBIDE

5-7 Flutes

45°

Exxtral Plus®

Exxtral Plus® is ideal for high performance machining of hard materials.

Speeds and Feeds Refer to Page 151.

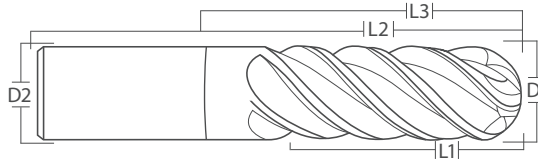
Fractional

D1 Cutting Dia	D2 Shank Dia	L1 LOC	L2 OAL	Flutes	Uncoated	AlTiN Exxtral Plus Coated	AlTiN Ball End Coated
1/4	1/4	1/2	2	5	0545T00405002	0545T40405002	0545T40405002B
1/4	1/4	3/4	2-1/2	5	0545T004075025	0545T404075025	0545T404075025B
1/4	1/4	1	3	5	0545T00410003	0545T40410003	0545T40410003B
1/4	1/4	1-1/4	4	5	0545T00412504	0545T40412504	0545T40412504B
5/16	5/16	1/2	2	5	0545T00505002	0545T40505002	0545T40505002B
5/16	5/16	7/8	2-1/2	5	0545T005087525	0545T405087525	0545T405087525B
5/16	5/16	1	3	5	0545T00510003	0545T40510003	0545T40510003B
5/16	5/16	1-1/4	4	5	0545T00512504	0545T40512504	0545T40512504B
3/8	3/8	1/2	2	5	0545T00605002	0545T40605002	0545T40605002B
3/8	3/8	1	2-1/2	5	0545T006100025	0545T406100025	0545T406100025B
3/8	3/8	1	3	5	0545T00610003	0545T40610003	0545T40610003B
3/8	3/8	1-1/2	4	5	0545T00615004	0545T40615004	0545T40615004B
7/16	7/16	1	2-3/4	5	0545T0071000275	0545T4071000275	0545T4071000275B
7/16	7/16	2	4	5	0545T00720004	0545T40720004	0545T40720004B
1/2	1/2	5/8	2-1/2	5	0545T008062525	0545T408062525	0545T408062525B
1/2	1/2	1-1/4	3	5	0545T00812503	0545T40812503	0545T40812503B
1/2	1/2	2	4	5	0545T00820004	0545T40820004	0545T40820004B
1/2	1/2	2-1/2	5	5	0545T00825005	0545T40825005	0545T40825005B
1/2	1/2	3-1/8	6	5	0545T00831256	0545T40831256	0545T40831256B
5/8	5/8	3/4	3	5	0545T01007503	0545T41007503	0545T41007503B
5/8	5/8	1-5/8	3-1/2	5	0545T010162535	0545T410162535	0545T410162535B
5/8	5/8	2-1/2	5	5	0545T01025005	0545T41025005	0545T41025005B
5/8	5/8	3	6	5	0545T01030006	0545T41030006	0545T41030006B
3/4	3/4	1	3	5	0545T01210003	0545T41210003	0545T41210003B
3/4	3/4	1-5/8	4	5	0545T01216254	0545T41216254	0545T41216254B
3/4	3/4	2-1/4	5	5	0545T01222505	0545T41222505	0545T41222505B
3/4	3/4	3-1/4	6	5	0545T01232506	0545T41232506	0545T41232506B
3/4	3/4	4	6	5	0545T01240006	0545T41240006	0545T41240006B
1	1	1-1/4	4	5	0545T01612504	0545T41612504	0545T41612504B
1	1	2	4-1/2	5	0545T016200045	0545T416200045	0545T416200045B
1	1	2-5/8	6	5	0545T01626256	0545T41626256	0545T41626256B
1	1	3-1/4	6	5	0545T01632506	0545T41632506	0545T41632506B
1	1	4 1/8	7	5	0545T01641257	0545T41641257	0545T41641257B
1-1/4	1-1/4	2	4-1/2	7	0545T020200045	0545T420200045	0545T420200045B
1-1/4	1-1/4	3	6	7	0545T02030006	0545T42030006	0545T42030006B
1-1/4	1-1/4	4	7	7	0545T02040007	0545T42040007	0545T42040007B
1-1/4	1-1/4	5	8	7	0545T02050008	0545T42050008	0545T42050008B

Other Dimensions are Available Upon Request

Tolerance

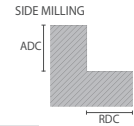
Cutting Diameter (D1)	Shank Diameter (D2)
1/8"-1/4": +.000/-0.012"	1/8"-1/4": -.0001"/-.0003"
1/4"-1/2": +.000/-0.016"	1/4"-1/2": -.0001"/-.0003"
1/2"-1": +.000/-0.020"	1/2"-1": -.0001"/-.0004"
Runout 0.0005"max (shank to cutting diameter)	
Back Taper 0.0005"max Ball Nose Radius +.000/-0.001"	



Extended Neck

D1 Cutting Dia	D2 Shank Dia	L1 LOC	L3 Reach	L2 OAL	Flutes	Uncoated	AlTiN Extral Plus Coated	AlTiN Ball End Coated
1/4	1/4	3/8	1-1/8	3	5	0545T00403753.1	0545T40403753.1	0545T40403753.1B
1/4	1/4	3/8	2-1/8	4	5	0545T00403754.2	0545T40403754.2	0545T40403754.2B
3/8	3/8	1/2	1-1/8	3	5	0545T00605003.1	0545T40605003.1	0545T40605003.1B
3/8	3/8	1/2	2-1/8	4	5	0545T00605004.2	0545T40605004.2	0545T40605004.2B
1/2	1/2	5/8	1 3/8	3	5	0545T00806253.1	0545T40806253.1	0545T40806253.1B
1/2	1/2	5/8	2-1/8	4	5	0545T00806254.2	0545T40806254.2	0545T40806254.2B
1/2	1/2	5/8	3-3/8	6	5	0545T00806256.3	0545T40806256.3	0545T40806256.3B
5/8	5/8	3/4	1-5/8	4	5	0545T01007504.1	0545T41007504.1	0545T41007504.1B
5/8	5/8	3/4	2-3/8	5	5	0545T01007505.2	0545T41007505.2	0545T41007505.2B
5/8	5/8	3/4	3-3/8	6	5	0545T01007506.3	0545T41007506.3	0545T41007506.3B
3/4	3/4	1	2	4	5	0545T01210004.2	0545T41210004.2	0545T41210004.2B
3/4	3/4	1	2-1/2	5	5	0545T01210005.2	0545T41210005.2	0545T41210005.2B
3/4	3/4	1	3-3/8	6	5	0545T01210006.3	0545T41210006.3	0545T41210006.3B
1	1	1-1/4	2	5	5	0545T01612505.2	0545T41612505.2	0545T41612505.2B
1	1	1-1/4	3-3/8	6	5	0545T01612506.3	0545T41612506.3	0545T41612506.3B
1	1	1-1/4	4-3/8	7	5	0545T01612507.4	0545T41612507.4	0545T41612507.4B

545 SERIES Speeds and Feeds



Materials	Milling SFM(Vc)		Chipload per Tooth Recommendations(CPT)											Profiling Radial	
	Uncoated Min.-Max	AlTiN Min.-Max	1/8"	3/16"	1/4"	5/16"	3/8"	7/16"	1/2"	5/8"	3/4"	1"	1-1/4"	ADC	RDC
P 1 Low-Carbon Steel- 1000 Series (>25 HRC)	200 - 250	500 - 640	.001	.0014	.0019	.0024	.0028	.0031	.0035	.0039	.0043	.0050	.0062	1xD	.4xD
P 2 Low - Carbon Steels- 1000 Series (<25 HRC)	180 - 240	440 - 625	.001	.0014	.0019	.0024	.0028	.0031	.0035	.0039	.0043	.0050	.0062	1xD	.4xD
P 3 Alloy Tool Steels - 1300, 2000, 3000 (≤ 35HRC)	150 - 200	400 - 500	.0007	.0013	.0015	.0020	.0024	.0026	.0029	.0034	.0039	.0046	.0057	1xD	.4xD
P 4 Alloy Tool Steels - 1300, 2000 , 3000 (36 - 48 HRC)		320 - 475	.0007	.001	.0014	.0019	.0020	.0024	.0026	.0030	.0032	.0039	.0049	1xD	.4xD
P 5 Ferritic, Martensitic & PH Stainless Steels - 400's pH Types≤35HRC		200 - 300	.0007	.001	.0012	.0016	.0019	.0021	.0024	.0028	.0030	.0036	.0046	1xD	.2xD
P 6 Ferritic, Martensitic & PH Stainless Steels - 400's pH Types(36-48 HRC)		150 - 230	.0005	.0008	.002	.0013	.0015	.0017	.0019	.0022	.0024	.0028	.0036	1xD	.4xD
M 1 Austenitic Stainless Steel - Inox, 200 Series,300 Series and 304 L		260 - 320	.0007	.0013	.0015	.0020	.0024	.0026	.0029	.0034	.0039	.0046	.0057	1xD	.4xD
M 2 Austenitic Stainless Steel & Cast Stainless Steel - 310,314,316 (<25HRC)	100 - 130	225 - 270	.0007	.0001	.0012	.0016	.0019	.0021	.0024	.0028	.0030	.0036	.0046	1xD	.4xD
M 3 Duplex Steel (Austenitic & Ferritic) - 323,329,F55,2205		200 - 260	.0005	.0008	.001	.0013	.0015	.0017	.0019	.0022	.0024	.0028	.0036	1xD	.4xD
K 1 Gray Cast Iron	150 - 200	390 - 500	.0010	.0014	.0019	.0024	.0028	.0031	.0035	.0039	.0043	.0050	.0062	1xD	.4xD
K 2 Ductile Iron - 60-40-18, 65-45-12 (<28 HRC)		360 - 450	.0007	.0013	.0015	.0020	.0024	.0026	.0029	.0034	.0039	.0046	.0057	1xD	.4xD
K 3 Ductile Iron - 60-40-18, 65-45-12 (<38 HRC)		330 - 420	.0007	.001	.0012	.0016	.0019	.0021	.0024	.0028	.0030	.0036	.0046	1xD	.4xD
S 1 Iron-Based, Heat-Resitant Alloys-Incoloy 800-802, A-286, N-155		150 - 255	.0007	.0013	.0015	.0020	.0024	.0026	.0029	.0034	.0039	.0046	.0057	1xD	.4xD
S 2 Nickel Based, Cobalt based, Heat-Resistant Alloys - Haynes 188 Haynes 21, Hastelloy,Waspaloy, Inconel 625/718 (≤48 HRC)		70 - 150	.0004	.0007	.0008	.001	.0012	.0014	.0016	.0019	.0020	.0025	.0031	1xD	.2xD
S 4 Titanium Alloys - Commercially Pure, 6Al-4V, Astm 1/2/3, Ti-6Al-2SN-4Zr-2Mo,≤48 HRC		150 - 210	.0005	.0008	.0013	.0014	.0017	.0019	.0022	.0003	.0028	.0032	.0042	1xD	.3xD
H 1 Hardened Tool Steels - H10, H11, H13,D2,D3,4320, P20 (≤48 HRC)		260 - 420	.0007	.0010	.0014	.0019	.002	.0024	.0028	.0003	.0032	.0039	.0049	1xD	.2xD

For high-performance milling, we recommend Extral Plus coating.

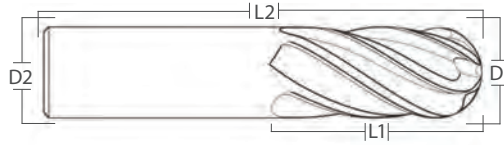
Variable Helix Endmills
 HPM+ Endmills
 High Performance Endmills
 Standard Endmills
 Carbide Endmills
 Solid Carbide Routers
 Drill Mills
 Powder Metal Endmills (PM30)
 Powder Metal Endmills (PM4)
 Cobalt Endmills (M42)
 High Speed Steel Endmills (M7)



6 Flute EndMill

- Exxtral Plus (AlTiN) recommended (up to 25% faster than uncoated)
- Radii (available upon request)
- Left Hand (available upon request)
- Flats added within 24 hrs.
- Material Code Refer to Page 245 & 246.

P M K S H



CARBIDE	6 Flutes	40°	Exxtral Plus®

Exxtral Plus® is ideal for high performance machining of hard materials.

Speeds and Feeds Refer to Page 153.

Fractional

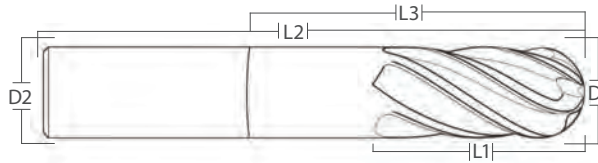
D1 Cutting Dia	D2 Shank Dia	L1 LOC	L2 OAL	Uncoated	AlTiN Exxtral Plus Coated	AlTiN Ball End Coated
1/4	1/4	3/8	2	0640T00403752	0640T40403752	0640T40403752B
1/4	1/4	3/4	2-1/2	0640T004075025	0640T404075025	0640T404075025B
1/4	1/4	1-1/8	3	0640T00411253	0640T40411253	0640T40411253B
1/4	1/4	1-1/4	4	0640T00412504	0640T40412504	0640T40412504B
5/16	5/16	1/2	2	0640T00505002	0640T40505002	0640T40505002B
5/16	5/16	7/8	2-1/2	0640T005087525	0640T405087525	0640T405087525B
5/16	5/16	1-1/8	3	0640T00511253	0640T40511253	0640T40511253B
5/16	5/16	1-1/4	4	0640T00512504	0640T40512504	0640T40512504B
3/8	3/8	1/2	2	0640T00605002	0640T40605002	0640T40605002B
3/8	3/8	1	2-1/2	0640T006100025	0640T406100025	0640T406100025B
3/8	3/8	1-1/8	3	0640T00611253	0640T40611253	0640T40611253B
3/8	3/8	1-1/2	4	0640T00615004	0640T40615004	0640T40615004B
7/16	7/16	1	2-3/4	0640T0071000275	0640T4071000275	0640T4071000275B
7/16	7/16	2	4	0640T00720004	0640T40720004	0640T40720004B
1/2	1/2	5/8	2-1/2	0640T008062525	0640T408062525	0640T408062525B
1/2	1/2	1-1/4	3	0640T00812503	0640T40812503	0640T40812503B
1/2	1/2	1-1/2	4	0640T00815004	0640T40815004	0640T40815004B
1/2	1/2	3	6	0640T00830006	0640T40830006	0640T40830006B
5/8	5/8	3/4	3	0640T01007503	0640T41007503	0640T41007503B
5/8	5/8	1-1/4	3-1/2	0640T010125035	0640T410125035	0640T410125035B
5/8	5/8	2-1/4	5	0640T01022505	0640T41022505	0640T41022505B
5/8	5/8	3	6	0640T01030006	0640T41030006	0640T41030006B
3/4	3/4	1	3	0640T01210003	0640T41210003	0640T41210003B
3/4	3/4	1-1/2	4	0640T01215004	0640T41215004	0640T41215004B
3/4	3/4	2-1/4	5	0640T01222505	0640T41222505	0640T41222505B
3/4	3/4	3-1/4	6	0640T01232506	0640T41232506	0640T41232506B
1	1	1-1/2	4	0640T01615004	0640T41615004	0640T41615004B
1	1	2-1/4	5	0640T01622505	0640T41622505	0640T41622505B
1	1	2	6	0640T01620006	0640T41620006	0640T41620006B
1	1	3	6	0640T01630006	0640T41630006	0640T41630006B

Other Dimensions are Available Upon Request

Tolerance

Cutting Diameter (D1)	Shank Diameter (D2)
1/8"-1/4": +.000"/-.0012"	1/8"-1/4": -.0001"/-.0003"
1/4"-1/2": +.000"/-.0016"	1/4"-1/2": -.0001"/-.0003"
1/2"-1": +.000"/-.0020"	1/2"-1": -.0001"/-.0004"

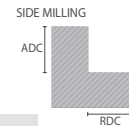
Runout 0.0005"max (shank to cutting diameter)
Back Taper 0.0005"max | Ball Nose Radius +0.00/-0.001"



Extended Neck

D1 Cutting Dia	D2 Shank Dia	L1 LOC	L3 Reach	L2 OAL	Coating		
					Uncoated	AITiN Exxtral Plus Coated	AITiN Ball End Coated
1/4	1/4	3/8	1-1/8	3	0640T00403753.1	0640T40403753.1	0640T40403753.1B
1/4	1/4	3/8	2-1/8	4	0640T00403754.2	0640T40403754.2	0640T40403754.2B
3/8	3/8	1/2	1-1/8	3	0640T00605003.1	0640T40605003.1	0640T40605003.1B
3/8	3/8	1/2	2-1/8	4	0640T00605004.2	0640T40605004.2	0640T40605004.2B
1/2	1/2	5/8	1 3/8	3	0640T00806253.1	0640T40806253.1	0640T40806253.1B
1/2	1/2	5/8	2-1/8	4	0640T00806254.2	0640T40806254.2	0640T40806254.2B
1/2	1/2	5/8	3-3/8	6	0640T00806256.3	0640T40806256.3	0640T40806256.3B
5/8	5/8	3/4	1-5/8	4	0640T01007504.1	0640T41007504.1	0640T41007504.1B
5/8	5/8	3/4	2-3/8	5	0640T01007505.2	0640T41007505.2	0640T41007505.2B
5/8	5/8	3/4	3-3/8	6	0640T01007506.3	0640T41007506.3	0640T41007506.3B
3/4	3/4	1	2	4	0640T01210004.2	0640T41210004.2	0640T41210004.2B
3/4	3/4	1	2-1/2	5	0640T01210005.2	0640T41210005.2	0640T41210005.2B
3/4	3/4	1	3-3/8	6	0640T01210006.3	0640T41210006.3	0640T41210006.3B
1	1	1-1/4	2	5	0640T01612505.2	0640T41612505.2	0640T41612505.2B
1	1	1-1/4	3-3/8	6	0640T01612506.3	0640T41612506.3	0640T41612506.3B
1	1	1-1/4	4-3/8	7	0640T01612507.4	0640T41612507.4	0640T41612507.4B

640 SERIES Speeds and Feeds



Materials	Milling SFM(Vc)		Chipload per Tooth Recommendations(CPT)								Profiling Radial	
	Uncoated Min.-Max	Exxtral Plus Min.-Max	1/4"	5/16"	3/8"	7/16"	1/2"	5/8"	3/4"	1"	ADC	RDC
P1 Low - Carbon Steel - 1000 Series (> 25HRC)	200 - 440	580 - 710	.0020	.0023	.0027	.0031	.0035	.0039	.0043	.0048	1xD	.2xD
P2 Low - Carbon Steels - 1000 Series (< 25HRC)	180 - 240	530 - 670	.0020	.0023	.0027	.0032	.0035	.0039	.0043	.0048	1xD	.2xD
P3 Alloy Tool Steels - 300,2000,3000 (≤ 35HRC)	150 - 350	530 - 590	.0015	.0020	.0023	.0027	.0029	.0034	.0038	.0046	1xD	.1xD
P4 Alloy Tool Steels - 300,2000,3000 (36-48 HRC)		450 - 510	.0014	.0021	.002	.0024	.0030	.0030	.0031	.0039	1xD	.1xD
P5 Ferritic, Martensitic & PH Stainless Steels - 400's, pH Type (≤ 35HRC)		210 - 320	.0013	.0016	.0002	.0021	.0023	.0027	.0030	.0036	1xD	.1xD
M1 Ferritic, Martensitic & PH Stainless Steels - 400's, pH Type ≤ (36-48)HRC		160 - 260	.0010	.0013	.0023	.0020	.0019	.0022	.0024	.0028	1xD	.1xD
M2 Austenitic Stainless Steels Inox, 200 Series, 300 Series and 304L	100 - 150	260 - 320	.0015	.0020	.0020	.0027	.0029	.0034	.0038	.0046	1xD	.1xD
M3 Austenitic Stainless Steel & Cast Stainless Steel - 310, 314,316 (<25HRC)		200 - 250	.0013	.0016	.0015	.0021	.0023	.0027	.0030	.0036	1xD	.1xD
Duplex Steel (Austenitic & Ferritic)- 323,329, F55 , 2205		200 - 250	.0010	.0013	.0027	.0020	.0019	.0022	.0024	.0028	1xD	.1xD
K1 Gray Cast Iron	150 - 200	390 - 520	.0020	.0023	.0023	.0031	.0035	.0039	.0043	.0048	1xD	.1xD
K2 Ductile Iron - 60-40-18, 65-45-12 (< 28HRC)		360 - 450	.0015	.0020	.0020	.0027	.0029	.0027	.0030	.0046	1xD	.1xD
K3 Ductile Iron-2510,35018(<38HRC)		320 - 420	.0016	.0020	.0023	.0023	.0023	.0034	.0038	.0036	1xD	.1xD
S1 Iron-Based, Heat-Resistant Alloys- Incoloy 800-802, A -286, N-155		310 - 390	.0015	.0010	.0013	.0025	.0029	.0034	.0038	.0046	1xD	.1xD
S2 Nickel based, cobalt based, Heat-Resistant Alloys- Haynes 188, Haynes 21, Hastelloy, Waspaloy, Inconel 625/718 (≤48 HRC)		70 - 130	.0008	.0016	.0020	.0020	.0016	.0019	.0019	.0025	1xD	.1xD
S4 Titanium Alloys - Commercially Pure, 6Al-4V, Astm 1/2/3, Ti-6Al-2Sn-4Zr-2Mo, (≤ 48 HRC)		140 - 200	.0013	.0020	.0020	.0021	.0022	.0025	.0028	.0031	1xD	.15xD
H1 Hardened Tool Steels - H10, H11, H13, D2, D3, 4320, P20 (≤48 HRC)		320 - 450	.0014	.0021	.0021	.0024	.0027	.0030	.0031	.0039	1xD	.1xD

For high-performance milling, we recommend Exxtral Plus coating.

Variable Helix Endmills
HPM+ Endmills
High Performance Endmills
Standard Endmills
Metric Carbide Endmills
Routers
Solid Carbide Routers
Drill Mills
Solid Carbide Drill Mills
Powder Metal Endmills
Powder Metal Endmills (PM30)
Powder Metal Endmills (PM4)
Cobalt Endmills
Cobalt Endmills (M42)
HSS Endmills
High Speed Steel (M7) Endmills



7-14 Flute EndMill

- Exxtral Plus (AlTiN) recommended (up to 25% faster than uncoated)
- Radii (available upon request)
- Uncoated (available upon request)
- Flats added within 24 hrs.
- Material Code Refer to Page 245 & 246.



CARBIDE

7-14
Flutes

45°

Exxtral
Plus®

Exxtral Plus® is ideal for high performance machining of hard materials.

Speeds and Feeds Refer to Page 154.

Fractional

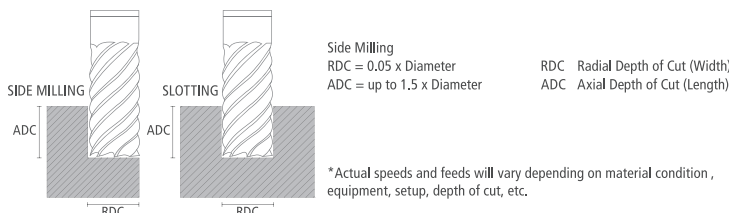
D1 Cutting Dia	D2 Shank Dia	L1 LOC	L2 OAL	Flutes	Radius	AlTiN Exxtral Plus Coated
1/4	1/4	3/8	2-1/2	7	.020	0781T404037525
1/4	1/4	3/4	2-1/2	7	.020	0781T404075025
3/8	3/8	1/2	2-1/2	7	.020	0781T406050025
3/8	3/8	1	2-1/2	7	.020	0781T406100025
1/2	1/2	5/8	3	8	.030	0781T40806253
1/2	1/2	1-1/4	3	8	.030	0781T40812503
5/8	5/8	3/4	3	10	.060	0781T41007503
5/8	5/8	1-5/8	3-1/2	10	.060	0781T410162535
3/4	3/4	1	3	12	.060	0781T41210003
3/4	3/4	1-1/2	4	12	.060	0781T41215004
1	1	1-1/4	3	14	.060	0781T41612503
1	1	1-1/2	4	14	.060	0781T41615004

Other Dimensions are Available Upon Request

Speeds & Feeds Recommendations

Material	1/4"		3/8"		1/2"		5/8"		3/4"		1"		
	SFM	RPM	IPM	RPM	IPM	RPM	IPM	RPM	IPM	RPM	IPM		
STAINLESS STEELS													
Precipitation	80	1222	11	815	9	611	10	489	12	407	15	306	17
13/8, 15/5, am-350/355	200	3056	28	2037	23	1528	24	1222	31	1019	37	764	43
Austenitic	80	1222	11	815	9	611	10	489	12	407	15	306	17
200 Series, 302, 303, 304L, 316L	200	3056	28	2037	23	1528	24	1222	31	1019	37	764	43
Martensitic	200	3056	28	2037	23	1528	24	1222	31	1019	37	764	43
403, 410, 416	250	3820	35	2547	29	1910	31	1528	38	1273	46	955	53
HIGH TEMP. ALLOYS													
Cobalt Base	60	917	4	611	3	458	4	367	6	306	7	229	8
Stellite, HS-21, Haynes 25/188, X-40, L-605	100	1528	6	1019	6	764	7	611	9	509	12	382	13
Nickel Base	80	1222	7	815	6	611	10	489	12	407	15	306	17
Inconel 600/625, Nickel 200-270, Invar	100	1528	9	1019	7	764	12	611	15	509	18	382	21
Monel 400-405, K-Monel, PermaNickel 300													
Incoly 600-800, Mar-M-246/247													
Iron Base	70	1070	7	713	7	535	9	428	11	357	13	267	15
Incoly 800-802, Multimet N-155, Timken 16-26-6	125	1910	13	1273	13	955	15	764	19	637	23	478	27
STEELS													
High Strength Steels	300	4584	32	3056	32	2292	37	1834	46	1528	55	1146	64
4140, 4340, 6150, 52100, H-11, H-13	550	8404	59	5603	59	4202	67	3362	84	2801	101	2101	118
High Alloy Steels - Mold & Die	300	4584	32	3056	32	2292	28	1834	46	1528	55	1146	64
A-2/6/10, P20, 01, 02, 06, D2, H-13	550	8404	59	5603	59	4202	50	3362	84	2801	101	2101	118
Medium Alloy Steels	500	7640	64	5093	71	3820	76	3056	107	2547	122	1910	134
200, 250, 300	600	9168	77	6112	86	4584	92	3667	128	3056	147	2292	160
Low Alloy Steels - Maraging	500	7640	80	5093	71	3820	92	3056	122	2547	153	1910	160
10XX, 11XX, 13XX	600	9168	96	6112	86	4584	138	3667	147	3056	183	2292	193
CAST IRONS													
Ductile Iron	120	1834	19	1222	19	917	22	733	29	611	37	458	39
Ductile Cast Iron	400	6112	64	4075	63	3056	73	2445	98	2037	122	1528	128
Cast Iron	150	2292	24	1528	24	1146	28	917	37	764	46	573	48
Grey Cast Iron	400	6112	64	4075	63	3056	73	2445	98	2037	122	1528	128
TITANIUM													
Titanium Alloys	120	1834	13	1222	15	917	18	733	23	611	29	458	32
Commercially Pure, 6AL-4V, ASTM 1/2/3	400	6112	43	4075	48	3056	61	2445	78	2037	98	1528	107
6AL-2SN-4Zr-2Mo-Si													

For Over 32 HRC (Hard Grade Materials): Decrease RPM and IPM 25% - 50%





Speeds and Feeds Refer to Page 155.

Tolerance

Cutting Diameter (D1)	Shank Diameter (D2)	(D1) +0.00mm -0.013mm
1/8"-1/4": +.000"/-.0012"	1/8"-1/4": -.0001"/-.0003"	(D2) h6
1/4"-1/2": +.000"/-.0016"	1/4"-1/2": -.0001"/-.0003"	
1/2"-1": +.000"/-.0020"	1/2"-1": -.0001"/-.0004"	

Runout 0.0005"max (shank to cutting diameter)
Back Taper 0.0005"max | Ball Nose Radius +.000/-0.001"

Extended Neck

D1 Cutting Dia	D2 Shank Dia	L1 LOC	L3 Reach	L2 OAL	Flutes	Radius	AlTiN Extrnal Plus Coated
1/4	1/4	3/8	1-1/8	3	7	.020	0781T40403753.1
1/4	1/4	3/8	2-1/8	4	7	.020	0781T40403754.2
3/8	3/8	1/2	1-1/8	3	7	.020	0781T40605003.1
3/8	3/8	1/2	2-1/8	4	7	.020	0781T40605004.2
3/8	3/8	1/2	3-1/8	6	7	.020	0781T40605006.3
3/8	3/8	1/2	4-1/4	6	7	.020	0781T40605006.4
1/2	1/2	5/8	1-1/8	4	8	.030	0781T40806254.1
1/2	1/2	5/8	2-1/8	4	8	.030	0781T40806254.2
1/2	1/2	5/8	3-1/8	6	8	.030	0781T40806256.3
1/2	1/2	5/8	4-1/4	6	8	.030	0781T40806256.4
5/8	5/8	3/4	1-3/4	4	10	.060	0781T41007504.1
5/8	5/8	3/4	2-5/8	5	10	.060	0781T41007505.2
5/8	5/8	3/4	3-3/8	6	10	.060	0781T41007506.3
5/8	5/8	3/4	4-1/4	6	10	.060	0781T41007506.4
3/4	3/4	1	1-3/4	4	12	.060	0781T41210004.1
3/4	3/4	1	2-5/8	5	12	.060	0781T41210005.2
3/4	3/4	1	3-3/8	6	12	.060	0781T41210006.3
3/4	3/4	1	4-1/4	6	12	.060	0781T41210006.4
1	1	1-1/4	1-3/4	4	14	.060	0781T41612504.1
1	1	1-1/4	2-5/8	5	14	.060	0781T41612505.2
1	1	1-1/4	3-3/8	6	14	.060	0781T41612506.3
1	1	1-1/4	4-1/4	6	14	.060	0781T41612506.4

Speeds & Feeds Recommendations

Material	SFM	1/4"		3/8"		1/2"		5/8"		3/4"		1"	
		RPM	IPM	RPM	IPM	RPM	IPM	RPM	IPM	RPM	IPM	RPM	IPM
STAINLESS STEELS													
Precipitation	80	1222	13	815	11	611	12	489	15	407	18	306	21
13/8, 15/5, am-350/355	200	3056	33	2037	27	1528	29	1222	37	1019	44	764	51
Austenitic	80	1222	13	815	11	611	12	489	15	407	18	306	21
200 Series, 302, 303, 304L, 316L	200	3056	33	2037	27	1528	29	1222	37	1019	44	764	51
Martensitic	200	3056	33	2037	27	1528	29	1222	37	1019	44	764	51
403, 410, 416	250	3820	42	2547	34	1910	37	1528	46	1273	55	955	64
HIGH TEMP. ALLOYS													
Cobalt Base	60	917	5	611	4	458	5	367	7	306	9	229	10
Stellite, HS-21, Haynes 25/188, X-40, L-605	100	1528	8	1019	7	764	9	611	11	509	15	382	16
Nickel Base	80	1222	8	815	7	611	12	489	15	407	18	306	21
Inconel 600/625, Nickel 200-270, Invar	100	1528	10	1019	9	764	15	611	18	509	22	382	26
Monel 400-405, K-Monel, PermaNickel 300													
Incoly 600-800, Mar-M-246/247													
Iron Base	70	1070	9	713	9	535	10	428	13	357	15	267	18
Incoly 800-802, Multimet N-155, Timken 16-26-6	125	1910	16	1273	16	955	18	764	23	637	28	478	32
STEELS													
High Strength Steels	300	4584	39	3056	39	2292	44	1834	55	1528	66	1146	77
4140, 4340, 6150, 52100, H-11, H-13	550	8404	71	5603	71	4202	81	3362	101	2801	121	2101	141
High Alloy Steels - Mold & Die	300	4584	39	3056	39	2292	33	1834	55	1528	66	1146	77
A-2/6/10, P20, 01, 02, 06, D2, H-13	550	8404	71	5603	71	4202	61	3362	101	2801	121	2101	141
Medium Alloy Steels	500	7640	77	5093	86	3820	92	3056	128	2547	147	1910	160
200, 250, 300	600	9168	92	6112	103	4584	110	3667	154	3056	176	2292	193
Low Alloy Steels - Maraging	500	7640	96	5093	86	3820	110	3056	147	2547	183	1910	193
10XX, 11XX, 13XX	600	9168	116	6112	103	4584	165	3667	176	3056	220	2292	231
CAST IRONS													
Ductile Iron	120	1834	23	1222	23	917	26	733	35	611	44	458	46
Ductile Cast Iron	400	6112	77	4075	75	3056	88	2445	117	2037	147	1528	154
Cast Iron	150	2292	29	1528	28	1146	33	917	44	764	55	573	58
Grey Cast Iron	400	6112	77	4075	75	3056	88	2445	117	2037	147	1528	154
TITANIUM													
Titanium Alloys	120	1834	15	1222	17	917	22	733	28	611	35	458	39
Commercially Pure, 6AL-4V, ASTM 1/2/3	400	6112	51	4075	58	3056	73	2445	94	2037	117	1528	128
6AL-2SN-4Zr-2Mo-Si													

or Over 32 HRC (Hard Grade Materials): Decrease RPM and IPM 25% - 50%

Variable Helix Endmills
HPM+ Endmills
High Performance Endmills
Standard Endmills
Carbide Endmills
Solid Carbide Routers
Solid Carbide Drill Mills
Powder Metal Endmills (PM30)
Powder Metal Endmills (PM4)
Cobalt Endmills (M42)
High Speed Steel Endmills (M7)

Solid Carbide Endmills
Metric
Routers
Drill Mills
Powder Metal Endmills
Cobalt Endmills
HSS Endmills

Solid Carbide Endmills

Variable Helix Endmills

HPM+ Endmills

High Performance Endmills

Standard Endmills

Metric

Carbide Endmills

Routers

Solid Carbide Routers

Drill Mills

Solid Carbide Drill Mills

Powder Metal Endmills

Powder Metal (PM30) Endmills

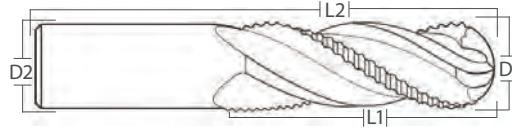
Powder Metal (PM4) Endmills

Cobalt Endmills

Cobalt (M42) Endmills

HSS Endmills

High Speed Steel (M7) Endmills



4 Flute EndMill Rougher & Finisher

- Exxtral Plus (AlTiN) recommended (up to 25% faster than uncoated)
- Combination Coarse Pitch & Eccentric Relief
- Radii (available upon request)
- Left Hand (available upon request)
- Flats added within 24 hrs.
- Material Code Refer to Page 245 & 246.

P M K S H

CARBIDE	4 Flutes	45°	Exxtral Plus®

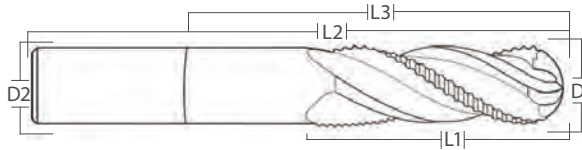
Exxtral Plus® is ideal for high performance machining of hard materials.

Speeds and Feeds Refer to Page 157.

Fractional

D1 Cutting Dia	D2 Shank Dia	L1 LOC	L2 OAL	AlTiN Exxtral Plus Coated	AlTiN Ball End Coated
3/8	3/8	1/2	2	0428T40605002	0428T40605002B
3/8	3/8	1	2-1/2	0428T406100025	0428T406100025B
7/16	7/16	9/16	2-1/2	0428T407056225	0428T407056225B
7/16	7/16	1	2-3/4	0428T407100027	0428T407100027B
1/2	1/2	5/8	2-1/2	0428T408062525	0428T408062525B
1/2	1/2	1-1/4	3	0428T40812503	0428T40812503B
5/8	5/8	3/4	3	0428T41007503	0428T41007503B
5/8	5/8	1-5/8	3-1/2	0428T410162535	0428T410162535B
3/4	3/4	1	3	0428T41210003	0428T41210003B
3/4	3/4	1-5/8	4	0428T41216254	0428T41216254B
1	1	1-1/4	4	0428T41612504	0428T01612504B
1	1	2	4-1/2	0428T416200045	0428T416200045B

Other Dimensions are Available Upon Request



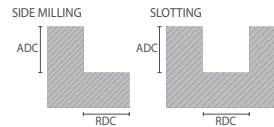
Tolerance

Cutting Diameter (D1)	Shank Diameter (D2)	(D1)	(D2)
1/8"-1/4": +.000"/-.0012"	1/8"-1/4": -.0001"/-.0003"	+0.00mm	-0.013mm
1/4"-1/2": +.000"/-.0016"	1/4"-1/2": -.0001"/-.0003"		h6
1/2"-1": +.000"/-.0020"	1/2"-1": -.0001"/-.0004"		

Runout 0.0005"max (shank to cutting diameter)
Back Taper 0.0005"max | Ball Nose Radius +.000/--.001"

Extended Neck

D1 Cutting Dia	D2 Shank Dia	L1 LOC	L3 REACH	L2 OAL	AlTiN Exxtral Plus Coated	AlTiN Ball End Coated
1/2	1/2	5/8	1-3/8	3	0428T40806253.1	0428T40806253.1B
1/2	1/2	5/8	2-1/8	4	0428T40806254.2	0428T40806254.2B
1/2	1/2	5/8	3-3/8	6	0428T40806256.3	0428T40806256.3B
5/8	5/8	3/4	1-5/8	4	0428T41007504.1	0428T41007504.1B
5/8	5/8	3/4	2-3/8	5	0428T41007505.2	0428T41007505.2B
5/8	5/8	3/4	3-3/8	6	0428T41007506.3	0428T41007506.3B
3/4	3/4	1	2	4	0428T41210004.2	0428T41210004.2B
3/4	3/4	1	2-1/2	5	0428T41210005.2	0428T41210005.2B
3/4	3/4	1	3-3/8	6	0428T41210006.3	0428T41210006.3B
1	1	1 1/4	2	5	0428T41612505.2	0428T41612505.2B
1	1	1 1/4	3-3/8	6	0428T41612506.3	0428T41612506.3B
1	1	1 1/4	4-3/8	7	0428T41612507.4	0428T41612507.4B



428 SERIES Speeds and Feeds

Materials	Milling SFM(Vc)		Chipload per Tooth(CPT)					Profiling Radial	Slotting Axial	
	SFM < 32 Rc	SFM > 32 Rc	3/8"	1/2"	5/8"	3/4"	1"	(ADC) RDC	(ADC)	
P 2 Low - Carbon Steels - 1000 Series	225 - 450	125 - 260	.0027	.0035	.0046	.0053	.0070	.5xD	.5xD	.5xD
P 3 Alloy Tool steels - 1330, 2000, 3000	150 - 320	80 - 220	.0019	.0032	.0038	.0045	.0063	.5xD	.5xD	.5xD
P 5 Ferritic, Martensitic & PH Stainless Steels - 400's, pH Types (15-5, 3-8, 17-4)	220 - 450	125 - 250	.0019	.0035	.0046	.0053	.0070	.5xD	.5xD	.5xD
M 1 Austenitic Stainless Steel - Inox, 200 Series, 300 Series and 304L	150 - 325	80 - 210	.0027	.0035	.0046	.0053	.0070	.5xD	.5xD	.5xD
K 1 Gray Cast Iron	225 - 450	80 - 120	.0019	.0032	.0038	.0045	.0063	.5xD	.5xD	.5xD
K 3 Ductile Iron - 32510, 35018	120 - 360	120 - 310	.0019	.0032	.0038	.0045	.0063	.5xD	.5xD	.5xD
S 2 Nickel Based, Cobalt Based, Heat-Resistant Alloys - Haynes 188, haynes 21, Hastelloy, Waspaloy, Inconel 625/718	70 - 135	50 - 90	.0018	.0027	.0031	.0038	.0050	.5xD	.5xD	.5xD
S 4 Titanium Alloys- Commercially Pure, 6Al- 4V, Astm1/2/3, Ti-6Al-2Sn-4 Zr-2Mo	140 - 225	90 - 170	.0019	.0030	.0038	.0045	.0070	.5xD	.5xD	.5xD

For high-performance milling, we recommend Exxtral Plus coating.

Variable Helix Endmills
HPM+ Endmills
High Performance Endmills
Standard Endmills
Carbide Endmills
Solid Carbide Routers
Solid Carbide Drill Mills
Powder Metal Endmills (PM30) Endmills
Powder Metal Endmills (PM4) Endmills
Cobalt Endmills (M42) Endmills
HSS Endmills (M7) Endmills

Solid Carbide Endmills
Metric
Routers
Drill Mills
Powder Metal Endmills
Cobalt Endmills
HSS Endmills

Solid Carbide Endmills

Variable Helix Endmills

HPM+ Endmills

High Performance Endmills

Standard Endmills

Metric

Carbide Endmills

Routers

Solid Carbide Routers

Drill Mills

Solid Carbide Drill Mills

Powder Metal Endmills

Powder Metal (PM30) Endmills

Powder Metal (PM4) Endmills

Cobalt Endmills

Cobalt (M42) Endmills

HSS Endmills

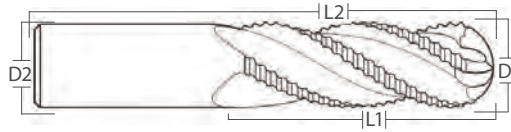
High Speed Steel (M7) Endmills



5-7 Flute EndMill Rougher

- Exxtral Plus (AlTiN) recommended (up to 25% faster than uncoated)
- Radii (available upon request)
- Left Hand (available upon request)
- Flats added within 24 hrs.
- Material Code Refer to Page 245 & 246.

P M S



CARBIDE	5-7 Flutes	45°	Exxtral Plus®

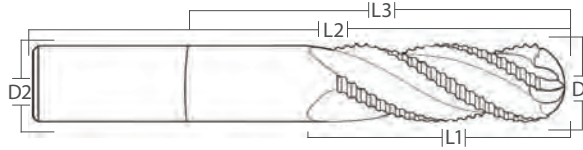
Exxtral Plus® is ideal for high performance machining of hard materials.

Speeds and Feeds Refer to Page 159.

Fractional

D1 Cutting Dia	D2 Shank Dia	L1 LOC	L2 OAL	Flute	AlTiN Exxtral Plus Coated	AlTiN Ball End Coated
3/8	3/8	1/2	2	5	0429T40605002	0429T40605002B
3/8	3/8	1	2-1/2	5	0429T406100025	0429T406100025B
7/16	7/16	9/16	2-1/2	5	0429T407056225	0429T407056225B
7/16	7/16	1	2-3/4	5	0429T407100027	0429T407100027B
1/2	1/2	5/8	2-1/2	5	0429T408062525	0429T408062525B
1/2	1/2	1-1/4	3	5	0429T40812503	0429T40812503B
5/8	5/8	3/4	3	5	0429T41007503	0429T41007503B
5/8	5/8	1-5/8	3-1/2	5	0429T410162535	0429T410162535B
3/4	3/4	1	3	5	0429T41210003	0429T41210003B
3/4	3/4	1-5/8	4	5	0429T41216254	0429T41216254B
1	1	1-1/4	3	5	0429T41612503	0429T41612503B
1	1	2	4-1/2	5	0429T416200045	0429T416200045B
1-1/4	1-1/4	2	4-1/2	7	0429T420200045	0429T420200045B
1-1/4	1-1/4	3	6	7	0429T42030006	0429T42030006B

Other Dimensions are Available Upon Request



Tolerance

Cutting Diameter (D1)	Shank Diameter (D2)	(D1) +0.00mm -0.013mm
1/8"-1/4": +.000"/-.0012"	1/8"-1/4": -.0001"/-.0003"	(D2) h6
1/4"-1/2": +.000"/-.0016"	1/4"-1/2": -.0001"/-.0003"	
1/2"-1": +.000"/-.0020"	1/2"-1": -.0001"/-.0004"	

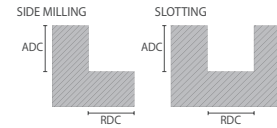
Runout 0.0005"max (shank to cutting diameter)
Back Taper 0.0005"max | Ball Nose Radius +.000/--.001"

Extended Neck

D1 Cutting Dia	D2 Shank Dia	L1 LOC	L3 REACH	L2 OAL	Flute	AITiN Exxtral Plus Coated	AITiN Ball End Coated
1/2	1/2	5/8	1-3/8	3	5	0429T40806253.1	0429T40806253.1B
1/2	1/2	5/8	2-1/8	4	5	0429T40806254.2	0429T40806254.2B
1/2	1/2	5/8	3-3/8	6	5	0429T40806256.3	0429T40806256.3B
5/8	5/8	3/4	1-5/8	4	5	0429T41007504.1	0429T41007504.1B
5/8	5/8	3/4	2-3/8	5	5	0429T41007505.2	0429T41007505.2B
5/8	5/8	3/4	3-3/8	6	5	0429T41007506.3	0429T41007506.3B
3/4	3/4	1	2	4	5	0429T41210004.2	0429T41210004.2B
3/4	3/4	1	2-1/2	5	5	0429T41210005.2	0429T41210005.2B
3/4	3/4	1	3-3/8	6	5	0429T41210006.3	0429T41210006.3B
1	1	1-1/4	2	5	5	0429T41612505.2	0429T41612505.2B
1	1	1-1/4	3-3/8	6	5	0429T41612506.3	0429T41612506.3B
1	1	1-1/4	4-3/8	7	5	0429T41612507.4	0429T41612507.4B

Variable Helix Endmills
HPM+ Endmills
High Performance Endmills
Standard Endmills
Carbide Endmills
Solid Carbide Routers
Solid Carbide Drill Mills
Powder Metal Endmills (PM30)
Powder Metal Endmills (PM4)
Cobalt Endmills (M42)
High Speed Steel (M7) Endmills

Solid Carbide Endmills
Metric
Routers
Drill Mills
Powder Metal Endmills
Cobalt Endmills
HSS Endmills



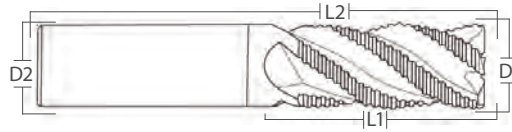
429 SERIES Speeds and Feeds

Materials	Milling SFM(Vc)		Chipload per Tooth(CPT)					Profiling Radial		Slotting Axial
	SFM < 32 Rc	SFM > 32 Rc	3/8"	1/2"	5/8"	3/4"	1"	ADC RDC	(ADC)	
P 2 Low - Carbon Steels - 1000 Series	225 - 450	125 - 260	.0027	.0035	.0046	.0053	0.070	.5xD .5xD	.5xD	
P 3 Alloy Tool steels - 1330, 2000, 3000	150 - 320	80 - 220	.0019	.0032	.0038	.0045	.0063	.5xD .5xD	.5xD	
P 5 Ferritic, Martensitic & PH Stainless Steels - 400's, pH Types (15-5, 3-8, 17-4)	220 - 450	125 - 250	.0019	.0035	.0046	.0053	.0070	.5xD .5xD	.5xD	
M 1 Austenitic Stainless Steel - Innox, 200 Series, 300 Series and 304L	150 - 325	80 - 210	.0027	.0035	.0046	.0053	.0070	.5xD .5xD	.5xD	
S 2 Nickel Based, Cobalt Based, Heat-Resistant Alloys - Haynes 188, haynes 21, Hastelloy, Waspaloy, Inconel 625/718	70 - 135	50 - 90	.0018	.0027	.0031	.0038	.0050	.5xD .5xD	.5xD	
S 4 Titanium Alloys- Commercially Pure, 6Al- 4V, Astm1/2/3, Ti-6Al-2Sn-4 Zr-2Mo	140 - 225	90 - 170	.0019	.0030	.0038	.0045	.0070	.5xD .5xD	.5xD	

For high-performance milling, we recommend Exxtral Plus coating.

Variable Helix Endmills
HPM+ Endmills
High Performance Endmills
Standard Endmills
Metric Carbide Endmills
Routers Solid Carbide Routers
Drill Mills Solid Carbide Drill Mills
Powder Metal Endmills (PM30) Endmills (PM4)
Cobalt Endmills (M42)
HSS Endmills (M7)

Negative Rake



High-Performance 4-6 Flute/40° Helix Carbide Rougher

- Exxtral Plus (AlTiN) recommended (up to 25% faster than uncoated)
- Negative Rake
- Standard Radii
- Left Hand (available upon request)
- Flats added within 24 hrs.
- Material Code Refer to Page 245 & 246.

P M K S H

CARBIDE

4-6 Flutes

40°

Exxtral Plus®

Exxtral Plus® is ideal for high performance machining of hard materials.

Coarse Rougher

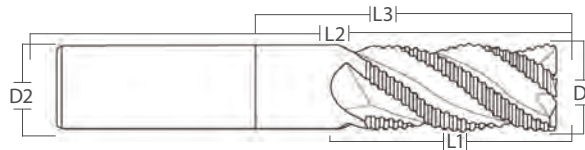
Speeds and Feeds Refer to Page 161.

Fractional

D1 Cutting Dia	D2 Shank Dia	L1 LOC	L2 OAL	Flute	Radius	AITiN Exxtral Plus Coated
3/8	3/8	1/2	2	4	.030	0430T40605002
3/8	3/8	7/8	2-1/2	4	.030	0430T406087525
1/2	1/2	5/8	2-1/2	4	.040	0430T408062525
1/2	1/2	1-1/4	3	4	.040	0430T40812503
5/8	5/8	3/4	3	4	.040	0430T41007503
5/8	5/8	1-1/4	3-1/2	4	.040	0430T410125035
5/8	5/8	1-1/4	3-1/2	6	.040	0430T4101250356
3/4	3/4	1	3	4	.050	0430T41210003
3/4	3/4	1-1/2	4	4	.050	0430T41215004
3/4	3/4	1-1/2	4	6	.050	0430T412150046
3/4	3/4	2-1/4	5	6	.050	0430T41222505
1	1	1-1/2	4	4	.050	0430T41615004
1	1	1-1/2	4	6	.050	0430T416150046
1	1	2-1/4	5	6	.050	0430T41622505

Other Dimensions are Available Upon Request

Negative Rake



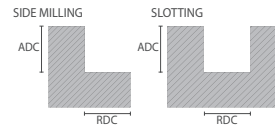
Tolerance

Cutting Diameter (D1)	Shank Diameter (D2)	(D1) +0.00mm -0.013mm (D2) h6
1/8"-1/4": +.000"/-.0012"	1/8"-1/4": -.0001"/-.0003"	
1/4"-1/2": +.000"/-.0016"	1/4"-1/2": -.0001"/-.0003"	
1/2"-1": +.000"/-.0020"	1/2"-1": -.0001"/-.0004"	
Runout 0.0005"max (shank to cutting diameter) Back Taper 0.0005"max Ball Nose Radius +.000"/-.001"		

Extended Neck

D1 Cutting Dia	D2 Shank Dia	L1 LOC	L3 REACH	L2 OAL	Flute	Radius	AITiN Exxtral Plus Coated
1/2	1/2	5/8	1-3/8	3	4	.040	0430T40806253.1
1/2	1/2	5/8	2-1/8	4	4	.040	0430T40806254.2
1/2	1/2	5/8	3-3/8	6	4	.040	0430T40806256.3
5/8	5/8	3/4	1-5/8	4	4	.040	0430T41007504.1
5/8	5/8	3/4	2-3/8	5	4	.040	0430T41007505.2
5/8	5/8	3/4	3-3/8	6	4	.040	0430T41007506.3
3/4	3/4	1	2	4	6	.050	0430T41210004.2
3/4	3/4	1	2-1/2	5	6	.050	0430T41210005.2
3/4	3/4	1	3-3/8	6	6	.050	0430T41210006.3
1	1	1-1/4	2	5	6	.050	0430T41612505.2
1	1	1-1/4	3-3/8	6	6	.050	0430T41612506.3
1	1	1-1/4	4-3/8	7	6	.050	0430T41612507.4

430 SERIES Speeds and Feeds

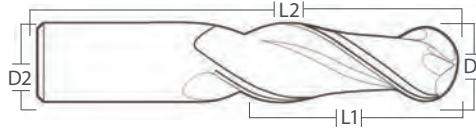


Materials	SFM(Vc) (T4) Exxtral Min.-Max.	Chipload per Tooth Recommendations(CPT)						Profiling Radial (ADC RDC)	Slotting Axial (ADC)	
		1/4"	3/8"	1/2"	5/8"	3/4"	1"			
P3 Alloy Tool Steels - 1300, 2000, 3000 (≤ 35HRC)	380-530	.0017	.0020	.0028	.0031	.0038	.0046	1xD	.5xD	.5xD
P4 Alloy Tool Steels - 1300, 2000, 3000 (36 - 48 HRC)	370 - 500	.0012	.0020	.0023	.0027	.0035	.0039	1xD	.5xD	.4xD
P5 Ferritic, Martensitic & PH Stainless Steels-400's, pH Types (≤ 35 HRC)	200 - 320	.0010	.0015	.0020	.0025	.0036	.0036	1.5xD	.5xD	.5xD
P6 Ferritic, Martensitic & PH Stainless Steels-400's, pH Types (36- 48 HRC)	160-250	.0010	.0017	.0020	.0020	.0025	.0028	1xD	.3xD	.4xD
M1 Austenitic Stainless Steel - Inox, 200 Series,300 Series and 304L	260 - 330	.0015	.0019	.0028	.0031	.0038	.0046	1xD	.5xD	.5xD
M2 Austenitic Stainless Steel & Cast Stainless Steel- 310,314,316 (<25HRC)	200-260	.0010	.0015	.0021	.0025	.0031	.0036	1xD	1.5xD	.5xD
M3 Duplex Steel (Austenitic & Ferritic) - 323,329,F55,2205Low - Silicon	200-260	.0010	.0015	.0020	.0020	.0025	.0028	1xD	1xD	1xD
K1 Gray Cast Iron	390-520	.0016	.0023	.0031	.0035	.0043	.0050	1xD	1.5xD	.5xD
K2 Ductile Iron- 60-40-18, 65-45-12 (<28HRC)	360 - 460	.0015	.0021	.0028	.0031	.0038	.0046	1xD	.5xD	1xD
K3 Ductile Iron- 32510, 3518(<38HRC)	330 - 430	.0010	.0015	.0020	.0025	.0031	.0036	1.5xD	.5xD	1xD
S1 Iron-Based, Heat-Resistant Alloys-Incoloy 800-802, A-286, N155	160 - 300	.0015	.0020	.0026	.0031	.0038	.0046	1xD	.3xD	.3xD
S2 Nickel Based, Cobalt based, Heat-Resistant Alloys- Haynes 188, Haynes 21, Hastelloy, Waspaloy, inconel 625/718(≤48 HRC)	70 - 130	.0007	.0010	.0020	.0016	.0020	.0025	1.5xD	.5xD	.3xD
S4 Titanium Alloys- Commercially Pure, 6Al-4V, Astm 1/2/3, Ti-6Al-2Sn-4Zr-2Mo, (≤ 48)	150 - 210	.0011	.0014	.0020	.0023	.0029	.0033	1xD	.4xD	.4xD
H1 Hardened Tool Steels - H10, H11, H13,D2,D3,4320,P20 (≤48 HRC)	260 - 460	.0013	.0020	.0023	.0028	.0031	.0040	1xD	.3xD	.3xD
H2 Hardened Tool Steels - H10, H11, H13,D2,D3,4320,P20 (48 -55 HRC)	230 - 390	.0010	.0015	.0019	.0019	.0025	.0029	1xD	.2xD	.2xD
H3 Hardened Tool Steels - H10, H11, H13,D2,D3,4320,P20 (56-60 HRC)	200 - 300	.0004	.0005	.0007	.0010	.0010	.0014	.8xD	.2xD	.2xD

For high performance milling we recommend Exxtral Plus Coating

Variable Helix Endmills
HPM+ Endmills
High Performance Endmills
Standard Endmills
Carbide Endmills
Solid Carbide Routers
Solid Carbide Drill Mills
Powder Metal Endmills (PM30)
Powder Metal Endmills (PM4)
Cobalt Endmills (M42)
High Speed Steel (M7) Endmills

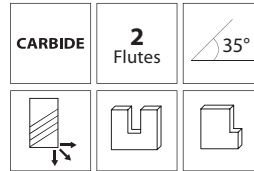
Solid Carbide Endmills
Metric
Routers
Drill Mills
Powder Metal Endmills
Cobalt Endmills
HSS Endmills



2 Flute End Mill, General Purpose

- TiCN recommended (up to 25% faster than uncoated)
- Radii (available upon request)
- Left Hand (available upon request)
- Flats added within 24 hrs.
- Material Code Refer to Page 245 & 246.

P M K N



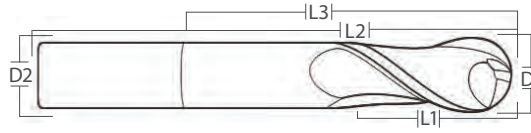
Speeds and Feeds Refer to Page 163.

TiCN TiCN features high hardness and a low coefficient of friction; excellent for general purpose machining.

Fractional

	D1 Cutting Dia	D2 Shank Dia	L1 LOC	L2 OAL	Uncoated	TiCN Square Coated	TiCN Ball End Coated
	1/8	1/8	1/2	1-1/2	0235T002050015	0235T202050015	0235T202050015B
	1/8	1/8	3/4	2-1/2	0235T002075025	0235T202075025	0235T202075025B
	1/8	1/8	1	3	0235T00210003	0235T20210003	0235T20210003B
	3/16	3/16	5/8	2	0235T00306252	0235T20306252	0235T20306252B
	3/16	3/16	3/4	2-1/2	0235T003075025	0235T203075025	0235T203075025B
	3/16	3/16	1-1/8	3	0235T00311253	0235T20311253	0235T20311253B
	3/16	3/16	1	4	0235T00310004	0235T20310004	0235T20310004B
	1/4	1/4	1/2	2	0235T00405002	0235T20405002	0235T20405002B
	1/4	1/4	3/4	2-1/2	0235T004075025	0235T204075025	0235T204075025B
	1/4	1/4	1	3	0235T00410003	0235T20410003	0235T20410003B
	1/4	1/4	1	4	0235T00410004	0235T20410004	0235T20410004B
	1/4	1/4	1-1/2	4	0235T00415004	0235T20415004	0235T20415004B
	1/4	1/4	1-1/2	6	0235T00415006	0235T20415006	0235T20415006B
	5/16	5/16	1/2	2	0235T00505002	0235T20505002	0235T20505002B
	5/16	5/16	7/8	2-1/2	0235T005087525	0235T205087525	0235T205087525B
	5/16	5/16	1	3	0235T00510003	0235T20510003	0235T20510003B
	5/16	5/16	1	4	0235T00510004	0235T20510004	0235T20510004B
	5/16	5/16	1-5/8	4	0235T00516254	0235T20516254	0235T20516254B
	5/16	5/16	1-1/2	6	0235T00515006	0235T20515006	0235T20515006B
	3/8	3/8	1/2	2	0235T00605002	0235T20605002	0235T20605002B
	3/8	3/8	1	2-1/2	0235T006100025	0235T206100025	0235T206100025B
	3/8	3/8	1	3	0235T00610003	0235T20610003	0235T20610003B
	3/8	3/8	1	4	0235T00610004	0235T20610004	0235T20610004B
	3/8	3/8	2	4	0235T00620004	0235T20620004	0235T20620004B
	3/8	3/8	1-1/2	6	0235T00615006	0235T20615006	0235T20615006B
	3/8	3/8	3	6	0235T00630006	0235T20630006	0235T20630006B
	7/16	7/16	5/8	2-3/4	0235T007062527	0235T207062527	0235T207062527B
	7/16	7/16	1	2-3/4	0235T007100027	0235T207100027	0235T207100027B
	7/16	7/16	1-1/2	4	0235T00715004	0235T20715004	0235T20715004B
	7/16	7/16	1-1/2	6	0235T00715006	0235T20715006	0235T20715006B
	1/2	1/2	5/8	2-1/2	0235T008062525	0235T208062525	0235T208062525B
	1/2	1/2	1	3	0235T00810003	0235T20810003	0235T20810003B
	1/2	1/2	1	4	0235T00810004	0235T20810004	0235T20810004B
	1/2	1/2	1-1/2	4	0235T00815004	0235T20815004	0235T20815004B
	1/2	1/2	2	4	0235T00820004	0235T20820004	0235T20820004B
	1/2	1/2	1-1/2	6	0235T00815006	0235T20815006	0235T20815006B
	1/2	1/2	3	6	0235T00830006	0235T20830006	0235T20830006B
	5/8	5/8	3/4	3	0235T01007503	0235T21007503	0235T21007503B
	5/8	5/8	1-1/4	3-1/2	0235T010125035	0235T210125035	0235T210125035B
	5/8	5/8	2	6	0235T01020006	0235T21020006	0235T21020006B
	5/8	5/8	2-1/4	5	0235T01022505	0235T21022505	0235T21022505B
	5/8	5/8	3	6	0235T01030006	0235T21030006	0235T21030006B
	3/4	3/4	1	3	0235T01210003	0235T21210003	0235T21210003B
	3/4	3/4	1-1/2	4	0235T01215004	0235T21215004	0235T21215004B
	3/4	3/4	2	6	0235T01220006	0235T21220006	0235T21220006B
	3/4	3/4	2-1/4	5	0235T01222505	0235T21222505	0235T21222505B
	3/4	3/4	3	6	0235T01230006	0235T21230006	0235T21230006B
	3/4	3/4	4	7	0235T01240007	0235T21240007	0235T21240007B
	7/8	7/8	1-1/2	4	0235T01415004	0235T21415004	0235T21415004B
	1	1	1	3	0235T01610003	0235T21610003	0235T21610003B
	1	1	1-1/2	3	0235T01615003	0235T21615003	0235T21615003B
	1	1	1-1/2	4	0235T01615004	0235T21615004	0235T21615004B
	1	1	2	6	0235T01620006	0235T21620006	0235T21620006B
	1	1	2-1/4	5	0235T01622505	0235T21622505	0235T21622505B
	1	1	3	6	0235T01630006	0235T21630006	0235T21630006B
	1	1	4	7	0235T01640007	0235T21640007	0235T21640007B

Other Dimensions are Available Upon Request



Tolerance

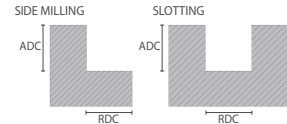
Cutting Diameter (D1)	Shank Diameter (D2)	(D1)	(D2)
1/8"-1/4": +.000"/-.0012"	1/8"-1/4": -.0001"/-.0003"	+0.00mm	-0.013mm
1/4"-1/2": +.000"/-.0016"	1/4"-1/2": -.0001"/-.0003"		h6
1/2"-1": +.000"/-.0020"	1/2"-1": -.0001"/-.0004"		

Runout 0.0005"max (shank to cutting diameter)
Back Taper 0.0005"max | Ball Nose Radius +.000/-.001"

Extended Neck

D1 Cutting Dia	D2 Shank Dia	L1 LOC	L3 Reach	L2 OAL	Uncoated	TiCN Square Coated	TiCN Ball End Coated
1/4	1/4	3/8	1-1/8	3	0235T00403753.1	0235T20403753.1	0235T20403753.1B
1/4	1/4	3/8	2-1/8	4	0235T00403754.2	0235T20403754.2	0235T20403754.2B
3/8	3/8	1/2	1-1/8	3	0235T00605003.1	0235T20605003.1	0235T20605003.1B
3/8	3/8	1/2	2-1/8	4	0235T00605004.2	0235T20605004.2	0235T20605004.2B
1/2	1/2	5/8	1 3/8	3	0235T00806253.1	0235T20806253.1	0235T20806253.1B
1/2	1/2	5/8	2-1/8	4	0235T00806254.2	0235T20806254.2	0235T20806254.2B
1/2	1/2	5/8	3-3/8	6	0235T00806256.3	0235T20806256.3	0235T20806256.3B
5/8	5/8	3/4	1-5/8	4	0235T01007504.1	0235T21007504.1	0235T21007504.1B
5/8	5/8	3/4	2-3/8	5	0235T01007505.2	0235T21007505.2	0235T21007505.2B
5/8	5/8	3/4	3-3/8	6	0235T01007506.3	0235T21007506.3	0235T21007506.3B
3/4	3/4	1	2	4	0235T01210004.2	0235T21210004.2	0235T21210004.2B
3/4	3/4	1	2-1/2	5	0235T01210005.2	0235T21210005.2	0235T21210005.2B
3/4	3/4	1	3-3/8	6	0235T01210006.3	0235T21210006.3	0235T21210006.3B
1	1	1-1/4	2-5/8	5	0235T01612505.2	0235T21612505.2	0235T21612505.2B
1	1	1-1/4	3-3/8	6	0235T01612506.3	0235T21612506.3	0235T21612506.3B
1	1	1-1/4	4-3/8	7	0235T01612507.4	0235T21612507.4	0235T21612507.4B

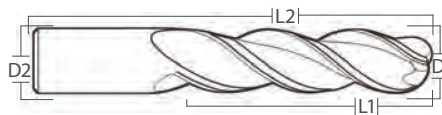
235 SERIES Speeds and Feeds



Materials	Milling SFM(Vc)		Chipload per Tooth Recommendations(CPT)											Profiling Radial		Slotting Axial
	Uncoated Min.-Max	TiCN Min.-Max	1/8"	3/16"	1/4"	5/16"	3/8"	7/16"	1/2"	5/8"	3/4"	7/8"	1"	(ADC) (RDC)	(ADC)	
P 1 Low-Carbon Steel- 1000 Series (>25 HRC)	180-250	380 - 500	.0006	.0013	.0015	.0020	.0023	.0026	.0029	.0031	.0033	.0038	.0043	1xD 1xD	1xD	.25xD
P 2 Low - Carbon Steels- 1000 Series (<25 HRC)	190 - 240	350 - 500	.0007	.0014	.0015	.0019	.0023	.0026	.0029	.0031	.0033	.0038	.0043	1xD 1xD	1xD	.25xD
P 3 Alloy Tool Steels - 1300, 2000, 3000 (≤ 35HRc)		300 - 400	.0006	.001	.0014	.0017	.0019	.0022	.0025	.0028	.0031	.0033	.0035	1xD 1xD	1xD	.25xD
P 4 Alloy Tool Steels - 1300, 2000 , 3000 (36 - 48 HRc)		250 - 400	.0006	.0009	.0011	.0015	.0017	.0019	.0022	.0023	.0026	.0028	.0033	1xD 1xD	1xD	.25xD
M 1 Autenitic Stainless Steel- Inox 200 Series,300 Series and 304L	125- 135	200 - 250	.0007	.0009	.0013	.0014	.0017	.0019	.0021	.0025	.0026	.0028	.0033	1xD 1xD	1xD	.25xD
M 2 Autenitic Stainless Steel & Cast Stainless Steel - 310, 314, 316 (>25HRc)		150 - 225	.0005	.001	.0013	.0015	.0017	.0022	.0025	.0027	.0031	.0033	.0035	1xD 1xD	1xD	.25xD
K 1 Gray Cast Iron	160 -200	320 -425	.0005	.0008	.0010	.0013	.0015	.0017	.0021	.0022	.0025	.0026	.0030	1xD 1xD	1xD	.25xD
K 2 Ductile Iron - 60 -40- 18, 65-45-12 (<28HRc)		300- 350	.0008	.0011	.0016	.0020	.0023	.0025	.0029	.0031	.0033	.0036	.0041	1xD 1xD	1xD	.25xD
N 1 Wrought Aluminum Alloys	1630-6500	1630-6500	.0008	.0011	.0015	.0019	.0023	.0025	.0028	.0031	.0033	.0038	.0042	1xD 1xD	1xD	.25xD
N 2 Low - Silicon Aluminum Alloys Si < 12.2% -6061,7075	1600-4875	1600-4880	.0008	.0012	.0015	.0019	.0022	.0025	.0029	.0030	.0034	.0036	.0040	1xD 1xD	1xD	.25xD
N 5 Copper & Copper alloys	800- 2430	800-2430	.0005	.0007	.0011	.0014	.0016	.0017	.0019	.0021	.0023	.0025	.0030	1xD 1xD	1xD	.25xD
N 6 Carbon & Graphite Composites	300- 1600	300- 1600	.0015	.002	.0025	.0028	.0035	.0039	.0043	.0048	.0053	.0060	.0067	1xD 1xD	1xD	.25xD

Variable Helix Endmills
HPM+ Endmills
High Performance Endmills
Standard Endmills
Carbide Endmills
Solid Carbide Routers
Solid Carbide Drill Mills
Powder Metal Endmills (PM30)
Powder Metal Endmills (PM4)
Cobalt Endmills (M42)
High Speed Steel Endmills (M7)

Solid Carbide Endmills
Metric
Routers
Drill Mills
Powder Metal Endmills
Cobalt Endmills
HSS Endmills



3 Flute End Mill, Aluminum Applications

- E-Cut form and cylindrical land provide chatter-free machining
- Z-Power (ZrN) recommended (up to 25% faster than uncoated)
- Radii (available upon request)
- Left Hand (available upon request)
- Flats added within 24 hrs.
- Material Code Refer to Page 245 & 246.

N

CARBIDE	3 Flutes	37°	Z Power®

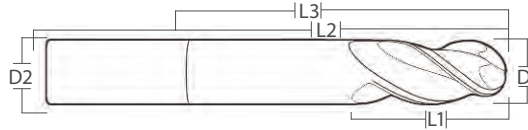
Z-Power® has excellent corrosion and adhesion resistant properties.

Speeds and Feeds Refer to Page 165.

Fractional

	D1 Cutting Dia	D2 Shank Dia	L1 LOC	L2 OAL	Uncoated	ZrN Z-Power Coated	ZrN Ball End Coated
	1/8	1/8	1/4	1-1/2	0337T002025015	0337T602025015	0337T602025015B
	1/8	1/8	1/2	1-1/2	0337T0020250015	0337T6020250015	0337T6020250015B
	3/16	3/16	5/16	2	0337T00331252	0337T60331252	0337T60331252B
	3/16	3/16	9/16	2	0337T00356252	0337T60356252	0337T60356252B
	1/4	1/4	3/8	2	0337T00403752	0337T60403752	0337T60403752B
	1/4	1/4	3/4	2-1/2	0337T004075025	0337T604075025	0337T604075025B
	1/4	1/4	1	3	0337T00410003	0337T60410003	0337T60410003B
	1/4	1/4	1-1/4	4	0337T00412504	0337T60412504	0337T60412504B
	5/16	5/16	1/2	2	0337T00505002	0337T60505002	0337T60505002B
	5/16	5/16	7/8	2-1/2	0337T005087525	0337T605087525	0337T605087525B
	5/16	5/16	1	3	0337T00510003	0337T60510003	0337T60510003B
	5/16	5/16	1-1/4	4	0337T00512504	0337T60512504	0337T60512504B
	3/8	3/8	1/2	2	0337T00605002	0337T60605002	0337T60605002B
	3/8	3/8	1	2-1/2	0337T006100025	0337T606100025	0337T606100025B
	3/8	3/8	1	3	0337T00610003	0337T60610003	0337T60610003B
	3/8	3/8	1-1/2	4	0337T00615004	0337T60615004	0337T60615004B
	7/16	7/16	1	2-3/4	0337T0071000275	0337T6071000275	0337T6071000275B
	7/16	7/16	1-1/2	4	0337T00715004	0337T60720004	0337T60720004B
	7/16	7/16	2	4	0337T00720004	0337T60720004	0337T60720004B
	1/2	1/2	5/8	2-1/2	0337T008062525	0337T608062525	0337T608062525B
	1/2	1/2	1-1/4	3	0337T00812503	0337T60812503	0337T60812503B
	1/2	1/2	1-1/2	4	0337T00815004	0337T60815004	0337T60815004B
	1/2	1/2	2	4	0337T00820004	0337T60820004	0337T60820004B
	1/2	1/2	2-1/2	5	0337T00825005	0337T60825005	0337T60825005B
	1/2	1/2	1-1/2	6	0337T00815006	0337T60815006	0337T60815006B
	1/2	1/2	3-1/8	6	0337T00831256	0337T60831256	0337T60831256B
	5/8	5/8	3/4	3	0337T01007503	0337T61007503	0337T61007503B
	5/8	5/8	1-1/4	3-1/2	0337T010125035	0337T610125035	0337T610125035B
	5/8	5/8	2	4	0337T01020004	0337T61020004	0337T61020004B
	5/8	5/8	2-1/4	5	0337T01022505	0337T61022505	0337T61022505B
	5/8	5/8	1-1/2	6	0337T01015006	0337T61015006	0337T61015006B
	5/8	5/8	3	6	0337T01030006	0337T61030006	0337T61030006B
	3/4	3/4	1	3	0337T01210003	0337T61210003	0337T61210003B
	3/4	3/4	1-1/2	4	0337T01215004	0337T61215004	0337T61215004B
	3/4	3/4	2-1/4	5	0337T01222505	0337T61222505	0337T61222505B
	3/4	3/4	1-1/2	6	0337T01215006	0337T61215006	0337T61215006B
	3/4	3/4	3	6	0337T01230006	0337T61230006	0337T61230006B
	3/4	3/4	4	7	0337T01240007	0337T61240007	0337T61240007B
	1	1	1-1/2	4	0337T01615004	0337T61615004	0337T61615004B
	1	1	1-1/2	4-1/2	0337T016200045	0337T616200045	0337T616200045B
	1	1	2-1/4	5	0337T01622505	0337T61622505	0337T61622505B
	1	1	1-1/2	6	0337T01615006	0337T61615006	0337T61615006B
	1	1	3	6	0337T01630006	0337T61630006	0337T61630006B
	1	1	4	7	0337T01640007	0337T61640007	0337T61640007B
	1-1/4	1-1/4	2	4-1/2	0337T020200045	0337T620200045	0337T620200045B
	1-1/4	1-1/4	3	6	0337T02030006	0337T62030006	0337T62030006B

Other Dimensions are Available Upon Request



Tolerance

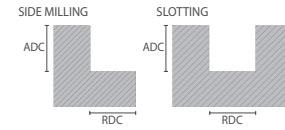
Cutting Diameter (D1)	Shank Diameter (D2)
1/8"-1/4": +.000"/-.0012"	1/8"-1/4": -.0001"/-.0003"
1/4"-1/2": +.000"/-.0016"	1/4"-1/2": -.0001"/-.0003"
1/2"-1": +.000"/-.0020"	1/2"-1": -.0001"/-.0004"

Runout 0.0005"max (shank to cutting diameter)
Back Taper 0.0005"max | Ball Nose Radius +.000/--.001"

Extended Neck

D1 Cutting Dia	D2 Shank Dia	L1 LOC	L3 Reach	L2 OAL	Uncoated	ZrN Z-Power Coated	ZrN Ball End Coated
1/4	1/4	3/8	1-1/8	3	0337T00403753.1	0337T60403753.1	0337T60403753.1B
1/4	1/4	3/8	2-1/8	4	0337T00403754.2	0337T60403754.2	0337T60403754.2B
3/8	3/8	1/2	1-1/8	3	0337T00605003.1	0337T60605003.1	0337T60605003.1B
3/8	3/8	1/2	2-1/8	4	0337T00605004.2	0337T60605004.2	0337T60605004.2B
1/2	1/2	5/8	1 3/8	3	0337T00806253.1	0337T60806253.1	0337T60806253.1B
1/2	1/2	5/8	2-1/8	4	0337T00806254.2	0337T60806254.2	0337T60806254.2B
1/2	1/2	5/8	3-3/8	6	0337T00806256.3	0337T60806256.3	0337T60806256.3B
5/8	5/8	3/4	1-5/8	4	0337T01007504.1	0337T61007504.1	0337T61007504.1B
5/8	5/8	3/4	2-3/8	5	0337T01007505.2	0337T61007505.2	0337T61007505.2B
5/8	5/8	3/4	3-3/8	6	0337T01007506.3	0337T61007506.3	0337T61007506.3B
3/4	3/4	1	2	4	0337T01210004.2	0337T61210004.2	0337T61210004.2B
3/4	3/4	1	2-1/2	5	0337T01210005.2	0337T61210005.2	0337T61210005.2B
3/4	3/4	1	3-3/8	6	0337T01210006.3	0337T61210006.3	0337T61210006.3B
1	1	1-1/4	2-5/8	5	0337T01612505.2	0337T61612505.2	0337T61612505.2B
1	1	1-1/4	3-3/8	6	0337T01612506.3	0337T61612506.3	0337T61612506.3B
1	1	1-1/4	4-3/8	7	0337T01612507.4	0337T61612507.4	0337T61612507.4B

337 SERIES Speeds and Feeds



Materials	Milling SFM(Vc)		Chipload per Tooth Recommendations(CPT)										Profiling Radial		Slotting Axial	
	Uncoated Min.-Max	ZrN Min.-Max	1/8"	3/16"	1/4"	5/16"	3/8"	7/16"	1/2"	5/8"	3/4"	1"	ADC RDC	ADC		
N1 Wrought Aluminum Alloys	1575 - 6500	1575 - 6550	.0008	.0015	.0025	.0029	.0033	.0040	.0055	.0067	.0082	.0096	1xD	.5xD	1xD	
N2 Low- Silicon Aluminum Alloys Si <12.2% - 6061, 7075	1575 - 4500	1575 - 6550	.0013	.0014	.0022	.0025	.0028	.0037	.0052	.0063	.0073	.0090	1xD	.5xD	1xD	

For high silicon materials we recommend Z-Power Coating

Solid Carbide Endmills

Variable Helix Endmills | HPM+ Endmills | High Performance Endmills | Standard Endmills | Carbide Endmills | Solid Carbide Routers | Solid Carbide Drill Mills | Powder Metal Endmills (PM30) | Powder Metal Endmills (PM4) | Cobalt Endmills (M42) | High Speed Steel (M7) Endmills

Metric

Routers

Drill Mills

Powder Metal Endmills

Cobalt Endmills

HSS Endmills

Solid Carbide Endmills

Variable Helix Endmills

HPM+ Endmills

High Performance Endmills

Standard Endmills

Metric

Carbide Endmills

Routers

Solid Carbide Routers

Drill Mills

Solid Carbide Drill Mills

Powder Metal Endmills

Powder Metal (PM30) Endmills

Powder Metal (PM4) Endmills

Cobalt Endmills

Cobalt (M42) Endmills

HSS Endmills

High Speed Steel (M7) Endmills



3 Flute End Mill, Aluminum Applications

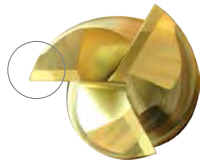
- E-Cut form and cylindrical land provide chatter-free machining
- Z-Power (ZrN) recommended (up to 25% faster than uncoated)
- Radii (available upon request)
- Left Hand (available upon request)
- Flats added within 24 hrs.
- Material Code Refer to Page 245 & 246.

N

CARBIDE	3 Flutes	37°	Z Power®

Z-Power® has excellent corrosion and adhesion resistant properties.

Speeds and Feeds Refer to Page 167.



End face -Wiper Flatt



Fractional

D1 Cutting Dia	D2 Shank Dia	L1 LOC	L2 OAL	Uncoated	ZrN Z-Power Coated
1/4	1/4	3/8	2	W337T00403752	W337T60403752
1/4	1/4	3/4	2-1/2	W337T004075025	W337T604075025
5/16	5/16	1/2	2	W337T00505002	W337T60505002
5/16	5/16	7/8	2-1/2	W337T005087525	W337T605087525
3/8	3/8	1/2	2	W337T00605002	W337T60605002
3/8	3/8	1	2-1/2	W337T006100025	W337T606100025
3/8	3/8	1	3	W337T00610003	W337T60610003
7/16	7/16	1	2-3/4	W337T0071000275	W337T6071000275
7/16	7/16	1-1/2	4	W337T00715004	W337T60715004
1/2	1/2	5/8	2-1/2	W337T008062525	W337T608062525
1/2	1/2	1-1/4	3	W337T00812503	W337T60812503
5/8	5/8	3/4	3	W337T01007503	W337T61007503
5/8	5/8	1-1/4	3-1/2	W337T010125035	W337T610125035
3/4	3/4	1	3	W337T01210003	W337T61210003
3/4	3/4	1-1/2	4	W337T01215004	W337T61215004
1	1	1-1/2	4	W337T01615004	W337T61615004
1	1	1-1/2	4-1/2	W337T01620045	W337T61620045

Other Sizes & Characteristics are Available Upon Request



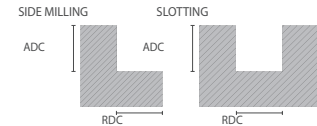
Tolerance

Cutting Diameter (D1)	Shank Diameter (D2)
1/8"-1/4": +.000"/-.0012"	1/8"-1/4": -.0001"/-.0003"
1/4"-1/2": +.000"/-.0016"	1/4"-1/2": -.0001"/-.0003"
1/2"-1": +.000"/-.0020"	1/2"-1": -.0001"/-.0004"

Runout 0.0005"max (shank to cutting diameter)
Back Taper 0.0005"max | Ball Nose Radius +.000"/-.001"

Extended Neck

D1 Cutting Dia	D2 Shank Dia	L1 LOC	L3 Reach	L2 OAL	Uncoated	ZrN Z-Power Coated
1/4	1/4	3/8	1-1/8	3	W337T00403753.1	W337T60403753.1
1/4	1/4	3/8	2-1/8	4	W337T00403754.2	W337T60403754.2
3/8	3/8	1/2	1-1/8	3	W337T00605003.1	W337T60605003.1
3/8	3/8	1/2	2-1/8	4	W337T00605004.2	W337T60605004.2
1/2	1/2	5/8	1 3/8	3	W337T00806253.1	W337T60806253.1
1/2	1/2	5/8	2-1/8	4	W337T00806254.2	W337T60806254.2
1/2	1/2	5/8	3-3/8	6	W337T00806256.3	W337T60806256.3
5/8	5/8	3/4	1-5/8	4	W337T01007504.1	W337T61007504.1
5/8	5/8	3/4	2-3/8	5	W337T01007505.2	W337T61007505.2
5/8	5/8	3/4	3-3/8	6	W337T01007506.3	W337T61007506.3
3/4	3/4	1	2	4	W337T01210004.2	W337T61210004.2
3/4	3/4	1	2-1/2	5	W337T01210005.2	W337T61210005.2
3/4	3/4	1	3-3/8	6	W337T01210006.3	W337T61210006.3
1	1	1-1/4	2-5/8	5	W337T01612505.2	W337T61612505.2
1	1	1-1/4	3-3/8	6	W337T01612506.3	W337T61612506.3
1	1	1-1/4	4-3/8	7	W337T01612507.4	W337T61612507.4



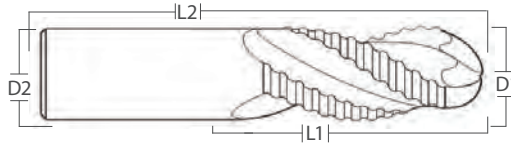
W337 SPEEDS AND FEEDS

Materials	Milling SFM(Vc)		Chipload per Tooth Recommendations(CPT)										Profiling Radial		Slotting Axial
	Uncoated Min.-Max	ZrN Min.-Max	1/8"	3/16"	1/4"	5/16"	3/8"	7/16"	1/2"	5/8"	3/4"	1"	(ADC) RDC	(ADC)	(ADC)
N1 Wrought Aluminum Alloys	1575 - 6500	1575 - 6550	.0008	.0015	.0025	.0029	.0033	.0040	.0055	.0067	.0082	.0096	1xD	.5xD	1xD
N2 Low-Silicon Aluminum Alloys Si <12.2% - 6061, 7075	1575 - 4500	1575 - 6550	.0013	.0014	.0022	.0025	.0028	.0037	.0052	.0063	.0073	.0090	1xD	.5xD	1xD

For high silicon materials we recommend Z-Power Coating

Variable Helix Endmills
HPM+ Endmills
High Performance Endmills
Standard Endmills
Carbide Endmills
Solid Carbide Routers
Solid Carbide Drill Mills
Powder Metal Endmills (PM30)
Powder Metal Endmills (PM4)
Cobalt Endmills (M42)
High Speed Steel (M7) Endmills

Solid Carbide Endmills
Metric
Routers
Drill Mills
Powder Metal Endmills
Cobalt Endmills
HSS Endmills



3 Flute EndMill, Coarse Pitch

- Z-Power (ZrN) recommended (up to 25% faster than uncoated)
- Radii (available upon request)
- Left Hand (available upon request)
- Flats added within 24 hrs.
- Material Code Refer to Page 245 & 246.



CARBIDE	3 Flutes	37°	Z Power®
			Coarse Rougher

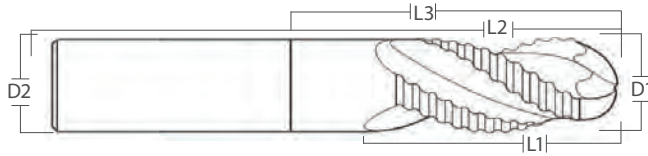
Z-Power® has excellent corrosion and adhesion resistant properties.

Speeds and Feeds Refer to Page 169.

Fractional

D1 Cutting Dia	D2 Shank Dia	L1 LOC	L2 OAL	Uncoated	ZrN Z-Power Coated	ZrN Ball End Coated
1/4	1/4	3/8	2	0338T00403752	0338T60403752	0338T60403752B
1/4	1/4	3/4	2-1/2	0338T004075025	0338T604075025	0338T604075025B
1/4	1/4	1	3	0338T00410003	0338T60410003	0338T60410003B
1/4	1/4	1-1/4	4	0338T00412504	0338T60412504	0338T60412504B
5/16	5/16	1/2	2	0338T00505002	0338T60505002	0338T60505002B
5/16	5/16	7/8	2-1/2	0338T005087525	0338T605087525	0338T605087525B
5/16	5/16	1	3	0338T00510003	0338T60510003	0338T60510003B
5/16	5/16	1-1/4	4	0338T00512504	0338T60512504	0338T60512504B
3/8	3/8	1/2	2	0338T00605002	0338T60605002	0338T60605002B
3/8	3/8	1	2-1/2	0338T006100025	0338T606100025	0338T606100025B
3/8	3/8	1	3	0338T00610003	0338T60610003	0338T60610003B
3/8	3/8	1-1/2	4	0338T00615004	0338T60615004	0338T60615004B
7/16	7/16	1	2-3/4	0338T007100027	0338T607100027	0338T607100027B
7/16	7/16	2	4	0338T00720004	0338T60720004	0338T60720004B
1/2	1/2	5/8	2-1/2	0338T008062525	0338T608062525	0338T608062525B
1/2	1/2	1-1/4	3	0338T00812503	0338T60812503	0338T60812503B
1/2	1/2	1-1/2	4	0338T00815004	0338T60815004	0338T60815004B
1/2	1/2	2	4	0338T00820004	0338T60820004	0338T60820004B
1/2	1/2	2-1/2	5	0338T00825005	0338T60825005	0338T60825005B
1/2	1/2	1-1/2	6	0338T00815006	0338T60815006	0338T60815006B
1/2	1/2	3-1/8	6	0338T00831256	0338T60831256	0338T60831256B
5/8	5/8	3/4	3	0338T01007503	0338T61007503	0338T61007503B
5/8	5/8	1-1/4	3-1/2	0338T010125035	0338T610125035	0338T610125035B
5/8	5/8	2	4	0338T01020004	0338T61020004	0338T61020004B
5/8	5/8	2-1/4	5	0338T01022505	0338T61022505	0338T61022505B
5/8	5/8	1-1/2	6	0338T01015006	0338T61015006	0338T61015006B
5/8	5/8	3	6	0338T01030006	0338T61030006	0338T61030006B
3/4	3/4	1	3	0338T01210003	0338T61210003	0338T61210003B
3/4	3/4	1-1/2	4	0338T01215004	0338T61215004	0338T61215004B
3/4	3/4	2-1/4	5	0338T01222505	0338T61222505	0338T61222505B
3/4	3/4	1-1/2	6	0338T01215006	0338T61215006	0338T61215006B
3/4	3/4	3	6	0338T01230006	0338T61230006	0338T61230006B
3/4	3/4	4	7	0338T01240007	0338T61240007	0338T61240007B
1	1	1-1/2	4	0338T01615004	0338T61615004	0338T61615004B
1	1	2-1/4	5	0338T01622505	0338T61622505	0338T61622505B
1	1	1-1/2	6	0338T01615006	0338T61615006	0338T61615006B
1	1	3	6	0338T01630006	0338T61630006	0338T61630006B
1	1	4	7	0338T01640007	0338T61640007	0338T61640007B
1-1/4	1-1/4	2	4-1/2	0338T020200045	0338T620200045	0338T620200045B
1-1/4	1-1/4	3	6	0338T02030006	0338T62030006	0338T62030006B

Other Dimensions are Available Upon Request



Tolerance

Cutting Diameter (D1)	Shank Diameter (D2)
1/8"-1/4": +.000"/-.0012"	1/8"-1/4": -.0001"/-.0003"
1/4"-1/2": +.000"/-.0016"	1/4"-1/2": -.0001"/-.0003"
1/2"-1": +.000"/-.0020"	1/2"-1": -.0001"/-.0004"

Runout 0.0005"max (shank to cutting diameter)
Back Taper 0.0005"max | Ball Nose Radius +.000/--.001"

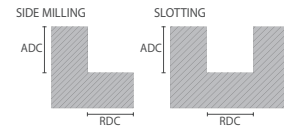
Extended Neck

D1 Cutting Dia	D2 Shank Dia	L1 LOC	L3 Reach	L2 OAL	Uncoated	ZrN Z-Power Coated	ZrN Ball End Coated
1/4	1/4	3/8	1-1/8	3	0338T00403753.1	0338T60403753.1	0338T60403753.1B
1/4	1/4	3/8	2-1/8	4	0338T00403754.2	0338T60403754.2	0338T60403754.2B
3/8	3/8	1/2	1-1/8	3	0338T00605003.1	0338T60605003.1	0338T60605003.1B
3/8	3/8	1/2	2-1/8	4	0338T00605004.2	0338T60605004.2	0338T60605004.2B
1/2	1/2	5/8	1-3/8	3	0338T00806253.1	0338T60806253.1	0338T60806253.1B
1/2	1/2	5/8	2-1/8	4	0338T00806254.2	0338T60806254.2	0338T60806254.2B
1/2	1/2	5/8	3-3/8	6	0338T00806256.3	0338T60806256.3	0338T60806256.3B
5/8	5/8	3/4	1-5/8	4	0338T01007504.1	0338T61007504.1	0338T61007504.1B
5/8	5/8	3/4	2-3/8	5	0338T01007505.2	0338T61007505.2	0338T61007505.2B
5/8	5/8	3/4	3-3/8	6	0338T01007506.3	0338T61007506.3	0338T61007506.3B
3/4	3/4	1	2	4	0338T01210004.2	0338T61210004.2	0338T61210004.2B
3/4	3/4	1	2-1/2	5	0338T01210005.2	0338T61210005.2	0338T61210005.2B
3/4	3/4	1	3-3/8	6	0338T01210006.3	0338T61210006.3	0338T61210006.3B
1	1	1-1/4	2-5/8	5	0338T01612505.2	0338T61612505.2	0338T61612505.2B
1	1	1-1/4	3-3/8	6	0338T01612506.3	0338T61612506.3	0338T61612506.3B
1	1	1-1/4	4-3/8	7	0338T01612507.4	0338T61612507.4	0338T61612507.4B

338 SERIES Speeds and Feeds

Materials	Milling SFM(Vc) Min.-Max	Chipload per Tooth Recommendations(CPT)						Profiling Radial (ADC RDC)	Slotting Axial (ADC)
		1/4"	3/8"	1/2"	5/8"	3/4"	1"		
N1 Wrought Aluminum Alloys	1625 - 6475	0.0026	0.004	0.0054	0.007	0.0084	0.011	1.25xD .5xD	1xD
N2 Low- Silicon Aluminum Alloys Si <12.2% - 6061, 7075	1625 - 5000	0.0024	0.0036	0.005	0.006	0.0074	0.001	1.25xD .5xD	1xD

For high silicon materials we recommend Z-Power Coating



Solid Carbide Endmills

Variable Helix Endmills | HPM+ Endmills | High Performance Endmills | Standard Endmills | Carbide Endmills | Solid Carbide Routers | Solid Carbide Drill Mills | Powder Metal Endmills (PM30) | Powder Metal Endmills (PM4) | Cobalt Endmills (M42) | High Speed Steel (M7) Endmills

Metric

Routers

Drill Mills

Powder Metal Endmills

Cobalt Endmills

HSS Endmills

Variable Helix
Endmills

HPM+
Endmills

High Performance
Endmills

Standard
Endmills

Carbide
Endmills

Solid Carbide
Routers

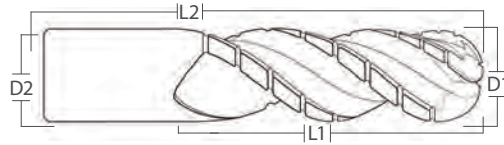
Solid Carbide
Drill Mills

Powder Metal
(PM30) Endmills

Powder Metal
(PM4) Endmills

Cobalt
(M42) Endmills

High Speed Steel
(M7) Endmills



3 Flute EndMill, Truncated Rougher

- Z-Power (ZrN) recommended (up to 25% faster than uncoated)
- Radii (available upon request)
- Left Hand (available upon request)
- Flats added within 24 hrs.
- Material Code Refer to Page 245 & 246.



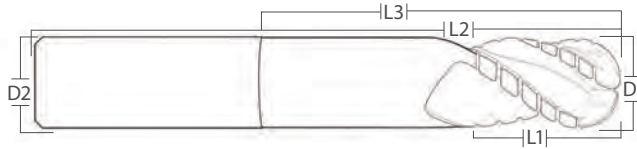
CARBIDE	3 Flutes	37°	Z Power®
			Truncated Rougher

Z-Power® has excellent corrosion and adhesion resistant properties for machining Aluminum.

Fractional

D1 Cutting Dia	D2 Shank Dia	L1 LOC	L2 OAL	Uncoated	ZrN Z-Power Coated	ZrN Ball End Coated
1/4	1/4	3/8	2	0339T00403752	0339T60403752	0339T60403752B
1/4	1/4	3/4	2-1/2	0339T004075025	0339T604075025	0339T604075025B
1/4	1/4	1	3	0339T00410003	0339T60410003	0339T60410003B
1/4	1/4	1-1/4	4	0339T00412504	0339T60412504	0339T60412504B
5/16	5/16	1/2	2	0339T00505002	0339T60505002	0339T60505002B
5/16	5/16	7/8	2-1/2	0339T005087525	0339T605087525	0339T605087525B
5/16	5/16	1	3	0339T00510003	0339T60510003	0339T60510003B
5/16	5/16	1-1/4	4	0339T00512504	0339T60512504	0339T60512504B
3/8	3/8	1/2	2	0339T00605002	0339T60605002	0339T60605002B
3/8	3/8	1	2-1/2	0339T006100025	0339T606100025	0339T606100025B
3/8	3/8	1	3	0339T00610003	0339T60610003	0339T60610003B
3/8	3/8	1-1/2	4	0339T00615004	0339T60615004	0339T60615004B
7/16	7/16	1	2-3/4	0339T007100027	0339T607100027	0339T607100027B
7/16	7/16	2	4	0339T00720004	0339T60720004	0339T60720004B
1/2	1/2	5/8	2-1/2	0339T008062525	0339T608062525	0339T608062525B
1/2	1/2	1-1/4	3	0339T00812503	0339T60812503	0339T60812503B
1/2	1/2	1-1/2	4	0339T00815004	0339T60815004	0339T60815004B
1/2	1/2	2	4	0339T00820004	0339T60820004	0339T60820004B
1/2	1/2	2-1/2	5	0339T00825005	0339T60825005	0339T60825005B
1/2	1/2	1-1/2	6	0339T00815006	0339T60815006	0339T60815006B
1/2	1/2	3-1/8	6	0339T00831256	0339T60831256	0339T60831256B
5/8	5/8	3/4	3	0339T01007503	0339T61007503	0339T61007503B
5/8	5/8	1-1/4	3-1/2	0339T010125035	0339T610125035	0339T610125035B
5/8	5/8	2	4	0339T01020004	0339T61020004	0339T61020004B
5/8	5/8	2-1/4	5	0339T01022505	0339T61022505	0339T61022505B
5/8	5/8	1-1/2	6	0339T01015006	0339T61015006	0339T61015006B
5/8	5/8	3	6	0339T01030006	0339T61030006	0339T61030006B
3/4	3/4	1	3	0339T01210003	0339T61210003	0339T61210003B
3/4	3/4	1-1/2	4	0339T01215004	0339T61215004	0339T61215004B
3/4	3/4	2-1/4	5	0339T01222505	0339T61222505	0339T61222505B
3/4	3/4	1-1/2	6	0339T01215006	0339T61215006	0339T61215006B
3/4	3/4	3	6	0339T01230006	0339T61230006	0339T61230006B
3/4	3/4	4	7	0339T01240007	0339T61240007	0339T61240007B
1	1	1-1/2	4	0339T01615004	0339T61615004	0339T61615004B
1	1	2-1/4	5	0339T01622505	0339T61622505	0339T61622505B
1	1	1-1/2	6	0339T01615006	0339T61615006	0339T61615006B
1	1	3	6	0339T01630006	0339T61630006	0339T61630006B
1	1	4	7	0339T01640007	0339T61640007	0339T61640007B
1-1/4	1-1/4	2	4-1/2	0339T020200045	0339T620200045	0339T620200045B
1-1/4	1-1/4	3	6	0339T02030006	0339T62030006	0339T62030006B

Other Dimensions are Available Upon Request



Tolerance

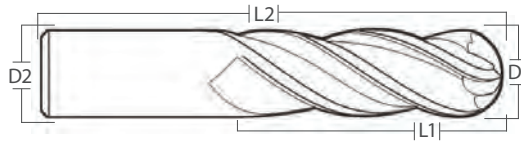
Cutting Diameter (D1)	Shank Diameter (D2)
1/8"-1/4": +.000"/-.0012"	1/8"-1/4": -.0001"/-.0003"
1/4"-1/2": +.000"/-.0016"	1/4"-1/2": -.0001"/-.0003"
1/2"-1": +.000"/-.0020"	1/2"-1": -.0001"/-.0004"

Runout 0.0005"max (shank to cutting diameter)
Back Taper 0.0005"max | Ball Nose Radius +.000"/-.001"

Extended Neck

D1 Cutting Dia	D2 Shank Dia	L1 LOC	L3 Reach	L2 OAL	Uncoated	ZrN Z-Power Coated	ZrN Ball End Coated
1/4	1/4	3/8	1-1/8	3	0339T00403753.1	0339T60403753.1	0339T60403753.1B
1/4	1/4	3/8	2-1/8	4	0339T00403754.2	0339T60403754.2	0339T60403754.2B
3/8	3/8	1/2	1-1/8	3	0339T00605003.1	0339T60605003.1	0339T60605003.1B
3/8	3/8	1/2	2-1/8	4	0339T00605004.2	0339T60605004.2	0339T60605004.2B
1/2	1/2	5/8	1-3/8	3	0339T00806253.1	0339T60806253.1	0339T60806253.1B
1/2	1/2	5/8	2-1/8	4	0339T00806254.2	0339T60806254.2	0339T60806254.2B
1/2	1/2	5/8	3-3/8	6	0339T00806256.3	0339T60806256.3	0339T60806256.3B
5/8	5/8	3/4	1-5/8	4	0339T01007504.1	0339T61007504.1	0339T61007504.1B
5/8	5/8	3/4	2-3/8	5	0339T01007505.2	0339T61007505.2	0339T61007505.2B
5/8	5/8	3/4	3-3/8	6	0339T01007506.3	0339T61007506.3	0339T61007506.3B
3/4	3/4	1	2	4	0339T01210004.2	0339T61210004.2	0339T61210004.2B
3/4	3/4	1	2-1/2	5	0339T01210005.2	0339T61210005.2	0339T61210005.2B
3/4	3/4	1	3-3/8	6	0339T01210006.3	0339T61210006.3	0339T61210006.3B
1	1	1-1/4	2-5/8	5	0339T01612505.2	0339T61612505.2	0339T61612505.2B
1	1	1-1/4	3-3/8	6	0339T01612506.3	0339T61612506.3	0339T61612506.3B
1	1	1-1/4	4-3/8	7	0339T01612507.4	0339T61612507.4	0339T61612507.4B

Variable Helix Endmills	HPM+ Endmills	High Performance Endmills	Standard Endmills	Carbide Endmills	Solid Carbide Routers	Solid Carbide Drill Mills	Powder Metal (PM30) Endmills	Powder Metal (PM4) Endmills	Cobalt (M42) Endmills	High Speed Steel (M7) Endmills					
Solid Carbide Endmills				Metric		Routers		Drill Mills		Powder Metal Endmills		Cobalt Endmills		HSS Endmills	



4 Flute End Mill, General Purpose

- Exxtral Plus (AlTiN) recommended (up to 25% faster than uncoated)
- Radii (available upon request)
- Left Hand (available upon request)
- Flats added within 24 hrs.
- Material Code Refer to Page 245 & 246.



CARBIDE

4 Flutes

30°

Exxtral Plus®

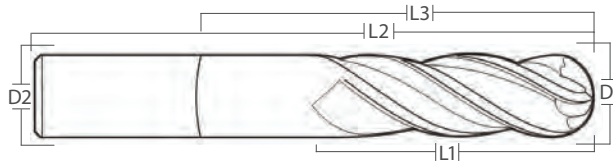
Exxtral Plus® is ideal for high performance machining of hard materials.

Speeds and Feeds Refer to Page 173.

Fractional

	D1 Cutting Dia	D2 Shank Dia	L1 LOC	L2 OAL	Uncoated	AlTiN Exxtral Plus Coated	AlTiN Ball End Coated
	1/8	1/8	1/2	1-1/2	0406T002050015	0406T402050015	0406T402050015B
	1/8	1/8	3/4	2-1/2	0406T002075025	0406T402075025	0406T402075025B
	1/8	1/8	1	3	0406T00210003	0406T40210003	0406T40210003B
	3/16	3/16	5/8	2	0406T00306252	0406T40306252	0406T40306252B
	3/16	3/16	3/4	2-1/2	0406T003075025	0406T403075025	0406T403075025B
	3/16	3/16	1-1/8	3	0406T00311253	0406T40311253	0406T40311253B
	3/16	3/16	1	4	0406T00310004	0406T40310004	0406T40310004B
	1/4	1/4	1/2	2	0406T00405002	0406T40405002	0406T40405002B
	1/4	1/4	3/4	2-1/2	0406T004075025	0406T404075025	0406T404075025B
	1/4	1/4	1	3	0406T00410003	0406T40410003	0406T40410003B
	1/4	1/4	1	4	0406T00410004	0406T40410004	0406T40410004B
	1/4	1/4	1-1/8	3	0406T00411253	0406T40411253	0406T40411253B
	1/4	1/4	1-1/2	4	0406T00415004	0406T40415004	0406T40415004B
	1/4	1/4	1-1/2	6	0406T00415006	0406T40415006	0406T40415006B
	5/16	5/16	1/2	2	0406T00505002	0406T40505002	0406T40505002B
	5/16	5/16	7/8	2-1/2	0406T005087525	0406T405087525	0406T405087525B
	5/16	5/16	1	3	0406T00510003	0406T40510003	0406T40510003B
	5/16	5/16	1	4	0406T00510004	0406T40510004	0406T40510004B
	5/16	5/16	1-5/8	4	0406T00516254	0406T40516254	0406T40516254B
	5/16	5/16	1-1/2	6	0406T00515006	0406T40515006	0406T40515006B
	3/8	3/8	1/2	2	0406T00605002	0406T40605002	0406T40605002B
	3/8	3/8	1	2-1/2	0406T006100025	0406T406100025	0406T406100025B
	3/8	3/8	1	3	0406T00610003	0406T40610003	0406T40610003B
	3/8	3/8	1	4	0406T00610004	0406T40610004	0406T40610004B
	3/8	3/8	2	4	0406T00620004	0406T40620004	0406T40620004B
	3/8	3/8	1-1/8	3	0406T00611253	0406T40611253	0406T40611253B
	3/8	3/8	1-1/2	6	0406T00615006	0406T40615006	0406T40615006B
	3/8	3/8	1-3/4	4	0406T00617504	0406T40617504	0406T40617504B
	3/8	3/8	3	6	0406T00630006	0406T40630006	0406T40630006B
	7/16	7/16	5/8	2-3/4	0406T007062527	0406T407062527	0406T407062527B
	7/16	7/16	1	2-3/4	0406T007100027	0406T407100027	0406T407100027B
	7/16	7/16	1-1/2	4	0406T00715004	0406T40715004	0406T40715004B
	7/16	7/16	1-1/2	6	0406T00715006	0406T40715006	0406T40715006B
	1/2	1/2	5/8	2-1/2	0406T008062525	0406T408062525	0406T408062525B
	1/2	1/2	1	3	0406T00810003	0406T40810003	0406T40810003B
	1/2	1/2	1	4	0406T00810004	0406T40810004	0406T40810004B
	1/2	1/2	1-1/2	4	0406T00815004	0406T40815004	0406T40815004B
	1/2	1/2	2	4	0406T00820004	0406T40820004	0406T40820004B
	1/2	1/2	1-1/2	6	0406T00815006	0406T40815006	0406T40815006B
	1/2	1/2	3	6	0406T00830006	0406T40830006	0406T40830006B
	5/8	5/8	3/4	3	0406T01007503	0406T41007503	0406T41007503B
	5/8	5/8	1-1/4	3-1/2	0406T010125035	0406T410125035	0406T410125035B
	5/8	5/8	2-1/4	5	0406T01022505	0406T41022505	0406T41022505B
	5/8	5/8	2	6	0406T01020006	0406T41020006	0406T41020006B
	5/8	5/8	3	6	0406T01030006	0406T41030006	0406T41030006B
	3/4	3/4	1	3	0406T01210003	0406T41210003	0406T41210003B
	3/4	3/4	1-1/2	4	0406T01215004	0406T41215004	0406T41215004B
	3/4	3/4	2	6	0406T01220006	0406T41220006	0406T41220006B
	3/4	3/4	2-1/4	5	0406T01222505	0406T41222505	0406T41222505B
	3/4	3/4	3	6	0406T01230006	0406T41230006	0406T41230006B
	3/4	3/4	4	7	0406T01240007	0406T41240007	0406T41240007B
	7/8	7/8	1-1/2	4	0406T01415004	0406T41415004	0406T41415004B
	1	1	1	3	0406T01610003	0406T41610003	0406T41610003B
	1	1	1-1/2	4	0406T01615004	0406T41615004	0406T41615004B
	1	1	2	6	0406T01620006	0406T41620006	0406T41620006B
	1	1	2-1/4	5	0406T01622505	0406T41622505	0406T41622505B
	1	1	3	6	0406T01630006	0406T41630006	0406T41630006B
	1	1	4	7	0406T01640007	0406T41640007	0406T41640007B
	1-1/4	1-1/4	2	4-1/2	0406T020200045	0406T420200045	0406T420200045B
	1-1/4	1-1/4	3	6	0406T02030006	0406T42030006	0406T42030006B

Other Dimensions are Available Upon Request



Tolerance

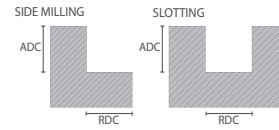
Cutting Diameter (D1)	Shank Diameter (D2)	(D1) +0.00mm -0.013mm
1/8"-1/4": +.000"/-.0012"	1/8"-1/4": -.0001"/-.0003"	(D2) h6
1/4"-1/2": +.000"/-.0016"	1/4"-1/2": -.0001"/-.0003"	
1/2"-1": +.000"/-.0020"	1/2"-1": -.0001"/-.0004"	

Runout 0.0005*max (shank to cutting diameter)
Back Taper 0.0005*max | Ball Nose Radius +.000/--.001"

Extended Neck

D1 Cutting Dia	D2 Shank Dia	L1 LOC	L3 Reach	L2 OAL	Uncoated	AlTiN Exxtral Plus Coated	AlTiN Ball End Coated
1/4	1/4	3/8	1-1/8	3	0406T00403753.1	0406T40403753.1	0406T40403753.1B
1/4	1/4	3/8	2-1/8	4	0406T00403754.2	0406T40403754.2	0406T40403754.2B
3/8	3/8	1/2	1-1/8	3	0406T00605003.1	0406T40605003.1	0406T40605003.1B
3/8	3/8	1/2	2-1/8	4	0406T00605004.2	0406T40605004.2	0406T40605004.2B
1/2	1/2	5/8	1-3/8	3	0406T00806253.1	0406T40806253.1	0406T40806253.1B
1/2	1/2	5/8	2-1/8	4	0406T00806254.2	0406T40806254.2	0406T40806254.2B
1/2	1/2	5/8	3-1/8	6	0406T00806256.3	0406T40806256.3	0406T40806256.3B
5/8	5/8	3/4	1-5/8	4	0406T01007504.1	0406T41007504.1	0406T41007504.1B
5/8	5/8	3/4	2-1/8	5	0406T01007505.2	0406T41007505.2	0406T41007505.2B
5/8	5/8	3/4	3-1/8	6	0406T01007506.3	0406T41007506.3	0406T41007506.3B
3/4	3/4	1	2	4	0406T01210004.2	0406T41210004.2	0406T41210004.2B
3/4	3/4	1	2-1/8	5	0406T01210005.2	0406T41210005.2	0406T41210005.2B
3/4	3/4	1	3-1/8	6	0406T01210006.3	0406T41210006.3	0406T41210006.3B
1	1	1-1/4	2-5/8	5	0406T01612505.2	0406T41612505.2	0406T41612505.2B
1	1	1-1/4	3-1/8	6	0406T01612506.3	0406T41612506.3	0406T41612506.3B
1	1	1-1/4	4-1/8	7	0406T01612507.4	0406T41612507.4	0406T41612507.4B

406 SERIES Speeds and Feeds



Materials	Milling SFM(Vc)		Chipload per Tooth Recommendations(CPT)												Profiling Radial (ADC/RDC)		Slotting Axial (ADC)
	Uncoated Min.-Max	AlTiN Min.-Max	1/8"	3/16"	1/4"	5/16"	3/8"	7/16"	1/2"	5/8"	3/4"	7/8"	1"	1-1/4"	1xD	.1xD	.25xD
P1 Low-Carbon Steel- 1000 Series (>25 HRC)	200 - 250	390 - 500	.0009	.0012	.0014	.0021	.0022	.0023	.0026	.0030	.0034	.0037	.0040	.0041	1xD	.1xD	.25xD
P2 Low - Carbon Steels- 1000 Series (<25 HRC)	185 - 230	350 - 475	.0008	.0013	.0015	.0020	.0022	.0023	.0026	.0030	.0034	.0037	.0040	.0041	1xD	.1xD	.25xD
P3 Alloy Tool Steels - 1300, 2000, 3000 (≤ 35HRC)		310 - 420	.0005	.0009	.0013	.0015	.0019	.0020	.0023	.0027	.0030	.0033	.0036	.0040	1xD	.1xD	.25xD
P4 Alloy Tool Steels - 1300, 2000, 3000 (36 - 48 HRC)		250 - 375	.0006	.0008	.0012	.0014	.0017	.0021	.0024	.0025	.0028	.0030	.0031	.0032	1xD	.1xD	.25xD
M1 Autenitic Stainless Steel- Inox 200 Series, 300 Series and 304L	100- 125	200 - 240	.0008	.0010	.0013	.0017	.0018	.0021	.0023	.0028	.0030	.0033	.0036	.0038	1xD	.1xD	.25xD
M2 Autenitic Stainless Steel & Cast Stainless Steel - 310, 314, 316 (>25HRC)		160 - 200	.0006	.0007	.0012	.0013	.0015	.0017	.0019	.0022	.0024	.0026	.0029	.0033	1xD	.1xD	.25xD
K1 Gray Cast Iron	150 - 200	300-410	.0007	.0011	.0010	.0019	.0022	.0025	.0028	.0033	.0034	.0036	.0040	.0041	1xD	.1xD	.25xD
K2 Ductile Iron - 60 -40- 18, 65-45-12 (<28HRC)		275 - 350	.0007	.0009	.0015	.0016	.0018	.0021	.0023	.0027	.0030	.0033	.0036	.0037	1xD	.1xD	.25xD
N5 Copper & Copper Alloys	800 - 2300	800 - 2375	.0006	.0007	.0012	.0014	.0015	.0017	.0019	.0020	.0024	.0026	.0029	.0030	1xD	.1xD	.25xD
N6 Carbon & Graphite Composites	325 - 1600	330 - 1575	.0007	.0017	.0010	.0025	.0030	.0035	.0040	.0050	.0060	.0067	.0081	.0082	1xD	1xD	.25xD
S1 Iron- Based, Heat-Resistant Alloys- Incoloy 800-802, A-286, N-155	160 - 275	160 - 275	.0005	.0008	.0007	.0009	.0012	.0013	.0015	.0019	.0023	.0030	.0035	.0038	1xD	1xD	.25xD
S2 Nickel based, Cobalt Based, Heat - Resistant Alloys - Haynes 188, Haynes 21, Hastelloy, Waspaloy, Inconel 625/ 718 (≤ 48 HRC)	70-120	70 -120	.0007	.0008	.0008	.0009	.0013	.0014	.0015	.0020	.0023	.0031	.0035	.0038	1xD	1xD	.25xD

For general purpose milling, we recommend Exxtral Plus coating.

Variable Helix Endmills | HPM+ Endmills | High Performance Endmills | Standard Endmills | Carbide Endmills | Solid Carbide Routers | Solid Carbide Drill Mills | Powder Metal Endmills (PM30) | Powder Metal Endmills (PM4) | Cobalt Endmills (M42) | High Speed Steel (M7) Endmills

Solid Carbide Endmills | Metric | Routers | Drill Mills | Powder Metal Endmills | Cobalt Endmills | HSS Endmills

Variable Helix Endmills

HPM+ Endmills

High Performance Endmills

Standard Endmills

Carbide Endmills

Solid Carbide Routers

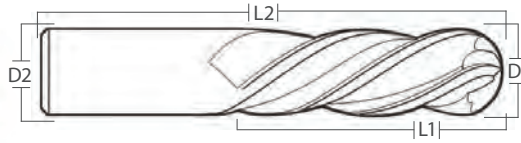
Solid Carbide Drill Mills

Powder Metal Endmills (PM30)

Powder Metal Endmills (PM4)

Cobalt Endmills (M42)

High Speed Steel Endmills (M7)



4 Flute EndMill, Right Hand Cut - Left Hand Spiral

- Exxtral Plus (AlTiN) recommended (up to 25% faster than uncoated)
- Radii (available upon request)
- Flats added within 24 hrs.
- Material Code Refer to Page 245 & 246.

P M K S

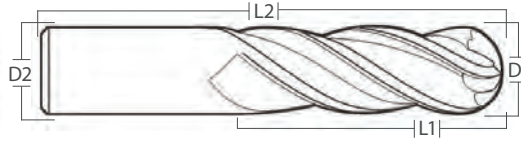
CARBIDE	4 Flutes	30°	Exxtral Plus®

Exxtral Plus® is ideal for high performance machining of hard materials.

Fractional

D1 Cutting Dia	D2 Shank Dia	L1 LOC	L2 OAL	Uncoated	AlTiN Exxtral Plus Coated	AlTiN Ball End Coated
1/4	1/4	3/4	2-1/2	0408T004075025	0408T404075025	0408T404075025B
5/16	5/16	7/8	2-1/2	0408T005087525	0408T405087525	0408T405087525B
3/8	3/8	1	2-1/2	0408T006100025	0408T406100025	0408T406100025B
1/2	1/2	1	3	0408T00810003	0408T40810003	0408T40810003B
5/8	5/8	1-1/4	3-1/2	0408T010125035	0408T410125035	0408T410125035B
3/4	3/4	1-1/2	4	0408T01215004	0408T41215004	0408T41215004B
1	1	1-1/2	4	0408T01615004	0408T41615004	0408T41615004B

Other Dimensions are Available Upon Request



4 Flute EndMill, Left Hand Cut - Right Hand Spiral

- Exxtral Plus (AlTiN) recommended (up to 25% faster than uncoated)
- Radii (available upon request)
- Flats added within 24 hrs.
- Material Code Refer to Page 245 & 246.

P M K S

CARBIDE	4 Flutes	30°	Exxtral Plus®

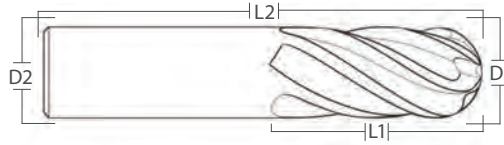
Exxtral Plus® is ideal for high performance machining of hard materials.

Fractional

D1 Cutting Dia	D2 Shank Dia	L1 LOC	L2 OAL	Uncoated	AlTiN Exxtral Plus Coated	AlTiN Ball End Coated
1/4	1/4	3/4	2-1/2	0410T004075025	0410T404075025	0410T404075025B
5/16	5/16	7/8	2-1/2	0410T005087525	0410T405087525	0410T405087525B
3/8	3/8	1	2-1/2	0410T006100025	0410T406100025	0410T406100025B
1/2	1/2	1	3	0410T00810003	0410T40810003	0410T40810003B
5/8	5/8	1-1/4	3-1/2	0410T010125035	0410T410125035	0410T410125035B
3/4	3/4	1-1/2	4	0410T01215004	0410T41215004	0410T41215004B
1	1	1-1/2	4	0410T01615004	0410T41615004	0410T41615004B

Other Dimensions are Available Upon Request

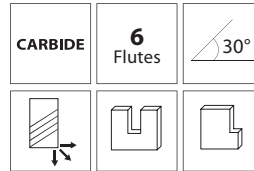
Variable Helix Endmills	HPM+ Endmills	High Performance Endmills	Standard Endmills	Carbide Endmills	Solid Carbide Routers	Solid Carbide Drill Mills	Powder Metal (PM30) Endmills	Powder Metal (PM4) Endmills	Cobalt (M42) Endmills	High Speed Steel (M7) Endmills					
Solid Carbide Endmills				Metric		Routers		Drill Mills		Powder Metal Endmills		Cobalt Endmills		HSS Endmills	



6 Flute EndMill, Eccentric OD

- Exxtral Plus (AlTiN) recommended (up to 25% faster than uncoated)
- Radii (available upon request)
- Flats added within 24 hrs.
- Eccentric OD
- Material Code Refer to Page 245 & 246.

P M K S



Exxtral Plus® is ideal for high performance machining of hard materials.

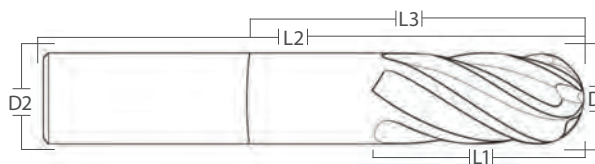
Speeds and Feeds Refer to Page 177.

Fractional

D1 Cutting Dia	D2 Shank Dia	L1 LOC	L2 OAL	Uncoated	AlTiN Exxtral Plus Coated	AlTiN Ball End Coated
1/4	1/4	3/4	2-1/2	0630T004075025	0630T404075025	0630T404075025B
5/16	5/16	7/8	2-1/2	0630T005087525	0630T405087525	0630T405087525B
3/8	3/8	1	2-1/2	0630T006100025	0630T406100025	0630T406100025B
3/8	3/8	1-1/8	3	0630T00611253	0630T40611253	0630T40611253B
7/16	7/16	1	2-3/4	0630T0071000275	0630T4071000275	0630T4071000275B
7/16	7/16	2	4	0630T00720004	0630T40720004	0630T40720004B
1/2	1/2	1-1/4	3	0630T00812503	0630T40812503	0630T40812503B
1/2	1/2	1-1/2	4	0630T00815004	0630T40815004	0630T40815004B
5/8	5/8	1-1/4	3-1/2	0630T010125035	0630T410125035	0630T410125035B
5/8	5/8	2-1/4	5	0630T01022505	0630T41022505	0630T41022505B
3/4	3/4	1-1/2	4	0630T01215004	0630T41215004	0630T41215004B
3/4	3/4	2-1/4	5	0630T01222505	0630T41222505	0630T41222505B
3/4	3/4	3-1/4	6	0630T01232506	0630T41232506	0630T41232506B
1	1	1-1/2	4	0630T01615004	0630T41615004	0630T41615004B
1	1	2-1/4	5	0630T01622505	0630T41622505	0630T41622505B
1	1	2	6	0630T01620006	0630T41620006	0630T41620006B
1	1	3	6	0630T01630006	0630T41630006	0630T41630006B

Other Dimensions are Available Upon Request

Variable Helix Endmills
HPM+ Endmills
High Performance Endmills
Standard Endmills
Metric Carbide Endmills
Routers Solid Carbide Routers
Drill Mills Solid Carbide Drill Mills
Powder Metal Endmills (PM30) Endmills (PM4) Endmills
Cobalt Endmills (M42) Endmills
HSS Endmills High Speed Steel (M7) Endmills



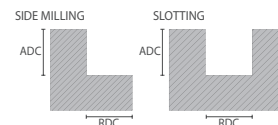
Tolerance

Cutting Diameter (D1)	Shank Diameter (D2)	(D1) +0.00mm -0.013mm
1/8"-1/4": +.000"/-.0012"	1/8"-1/4": -.0001"/-.0003"	(D2) h6
1/4"-1/2": +.000"/-.0016"	1/4"-1/2": -.0001"/-.0003"	
1/2"-1": +.000"/-.0020"	1/2"-1": -.0001"/-.0004"	

Runout 0.0005"max (shank to cutting diameter)
Back Taper 0.0005"max | Ball Nose Radius +.000/--.001"

Extended Neck

D1 Cutting Dia	D2 Shank Dia	L1 LOC	L3 Reach	L2 OAL	AlTiN Exxtral Plus Coated	AlTiN Ball End Coated
1/4	1/4	3/8	1-1/8	3	0630T40403753.1	0630T40403753.1B
1/4	1/4	3/8	2-1/8	4	0630T40403754.2	0630T40403754.2B
3/8	3/8	1/2	1-1/8	3	0630T40605003.1	0630T40605003.1B
3/8	3/8	1/2	2-1/8	4	0630T40605004.2	0630T40605004.2B
1/2	1/2	5/8	1-3/8	3	0630T40806253.1	0630T40806253.1B
1/2	1/2	5/8	2-1/8	4	0630T40806254.2	0630T40806254.2B
1/2	1/2	5/8	3-3/8	6	0630T40806256.3	0630T40806256.3B
5/8	5/8	3/4	1-5/8	4	0630T41007504.1	0630T41007504.1B
5/8	5/8	3/4	2-3/8	5	0630T41007505.2	0630T41007505.2B
5/8	5/8	3/4	3-3/8	6	0630T41007506.3	0630T41007506.3B
3/4	3/4	1	2	4	0630T41210004.2	0630T41210004.2B
3/4	3/4	1	2-1/2	5	0630T41210005.2	0630T41210005.2B
3/4	3/4	1	3-3/8	6	0630T41210006.3	0630T41210006.3B
1	1	1-1/4	2	5	0630T41612505.2	0630T41612505.2B
1	1	1-1/4	3-3/8	6	0630T41612506.3	0630T41612506.3B
1	1	1-1/4	4-3/8	7	0630T41612507.4	0630T41612507.4B



630 SERIES Speeds and Feeds

Materials	Milling SFM(Vc)		Chipload per Tooth Recommendations(CPT)												Profiling Radial		Slotting Axial
	Uncoated Min.-Max	AlTiN Min.-Max	1/8"	3/16"	1/4"	5/16"	3/8"	7/16"	1/2"	5/8"	3/4"	7/8"	1"	1-1/4"	(ADC) RDC	(ADC)	
P 1 Low-Carbon Steel- 1000 Series (>25 HRC)	200 - 250	390 - 500	.0009	.0012	.0014	.0021	.0022	.0023	.0026	.0030	.0034	.0037	.0040	.0041	1xD	.1xD	.25xD
P 2 Low - Carbon Steels- 1000 Series (<25 HRC)	185 - 230	350 - 475	.0008	.0013	.0015	.0020	.0022	.0023	.0026	.0030	.0034	.0037	.0040	.0041	1xD	.1xD	.25xD
P 3 Alloy Tool Steels - 1300,2000, 3000 (≤ 35HRC)		310 - 420	.0005	.0009	.0013	.0015	.0019	.0020	.0023	.0027	.0030	.0033	.0036	.0040	1xD	.1xD	.25xD
P 4 Alloy Tool Steels - 1300, 2000 , 3000 (36 - 48 HRC)		250 - 375	.0006	.0008	.0012	.0014	.0017	.0021	.0024	.0025	.0028	.0030	.0031	.0032	1xD	.1xD	.25xD
M 1 Autenitic Stainless Steel- Inox 200 Series,300 Series and 304L	100- 125	200 - 240	.0008	.0010	.0013	.0017	.0018	.0021	.0023	.0028	.0030	.0033	.0036	.0038	1xD	.1xD	.25xD
M 2 Autenitic Stainless Steel & Cast Stainless Steel - 310, 314, 316 (>25HRC)		160 - 200	.0006	.0007	.0012	.0013	.0015	.0017	.0019	.0022	.0024	.0026	.0029	.0033	1xD	.1xD	.25xD
K 1 Gray Cast Iron	150 - 200	300-410	.0007	.0011	.0010	.0019	.0022	.0025	.0028	.0033	.0034	.0036	.0040	.0041	1xD	.1xD	.25xD
K 2 Ductile Iron - 60 -40- 18, 65-45-12 (<28HRC)		275 - 350	.0007	.0009	.0015	.0016	.0018	.0021	.0023	.0027	.0030	.0033	.0036	.0037	1xD	.1xD	.25xD
N 5 Copper & Copper Alloys	800 - 2300	800 - 2375	.0006	.0007	.0012	.0014	.0015	.0017	.0019	.0020	.0024	.0026	.0029	.0030	1xD	.1xD	.25xD
N 6 Carbon & Graphite Composites	325 - 1600	330 - 1575	.0007	.0017	.0010	.0025	.0030	.0035	.0040	.0050	.0060	.0067	.0081	.0082	1xD	1xD	.25xD
S 1 Iron - Based, Heat-Resistant Alloys- Incoloy 800-802, A-286, N-155	160 - 275	160 - 275	.0005	.0008	.0007	.0009	.0012	.0013	.0015	.0019	.0023	.0030	.0035	.0038	1xD	1xD	.25xD
S 2 Nickel based, Cobalt Based, Heat - Resistant Alloys - Haynes 188, Haynes 21 , Hastelloy, Waspaloy,Inconel 625/ 718 (≤ 48 HRC)	70-120	70 -120	.0007	.0008	.0008	.0009	.0013	.0014	.0015	.0020	.0023	.0031	.0035	.0038	1xD	1xD	.25xD

For general purpose milling, we recommend Exxtral Plus coating.

Variable Helix Endmills
HPM+ Endmills
High Performance Endmills
Standard Endmills
Carbide Endmills
Solid Carbide Routers
Solid Carbide Drill Mills
Powder Metal Endmills (PM30) Endmills
Powder Metal Endmills (PM4)
Cobalt Endmills (M42) Endmills
High Speed Steel (M7) Endmills

Solid Carbide Endmills
Metric
Routers
Drill Mills
Powder Metal Endmills
Cobalt Endmills
HSS Endmills

Solid Carbide Endmills

Variable Helix Endmills

HPM+ Endmills

High Performance Endmills

Standard Endmills

Carbide Endmills

Metric

Solid Carbide Routers

Solid Carbide Drill Mills

Powder Metal Endmills (PM30)

Powder Metal Endmills (PM4)

Cobalt Endmills (M42)

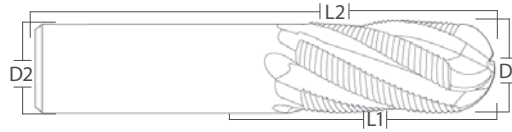
High Speed Steel Endmills (M7)



4 Flute Fine Pitch EndMill Rougher

- Exxtral Plus (AlTiN) recommended (up to 25% faster than uncoated)
- Radii (available upon request)
- Left Hand (available upon request)
- Uncoated (available upon request)
- Flats added within 24 hrs.
- Material Code Refer to Page 245 & 246.

P M S H



CARBIDE	4 Flutes	20°	Exxtral Plus®
			Fine Rough

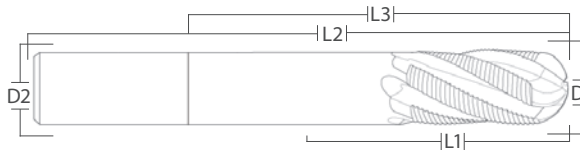
Exxtral Plus® is ideal for high performance machining of hard materials.

Speeds and Feeds Refer to Page 179.

Fractional

D1 Cutting Dia	D2 Shank Dia	L1 LOC	L2 OAL	AlTiN Exxtral Plus Coated	AlTiN Ball End Coated
1/4	1/4	1/2	2	0423T40405002	0423T40405002B
1/4	1/4	3/4	2-1/2	0423T404075025	0423T404075025B
5/16	5/16	1/2	2	0423T405050002	0423T405050002B
5/16	5/16	7/8	2-1/2	0423T405087525	0423T405087525B
3/8	3/8	1/2	2	0423T406050002	0423T406050002B
3/8	3/8	1	2-1/2	0423T406100025	0423T406100025B
1/2	1/2	5/8	2-1/2	0423T408062525	0423T408062525B
1/2	1/2	1	3	0423T40810003	0423T40810003B
5/8	5/8	3/4	3	0423T41007503	0423T41007503B
5/8	5/8	1-1/4	3-1/2	0423T410125035	0423T410125035B
5/8	5/8	1-5/8	4	0423T41016254	0423T41016254B
3/4	3/4	1	3	0423T41210003	0423T41210003B
3/4	3/4	1-5/8	4	0423T41216254	0423T41216254B
1	1	1-1/4	3	0423T41612503	0423T41612503B
1	1	1-1/2	4	0423T41615004	0423T41615004B
1	1	2	4-1/2	0423T416200045	0423T416200045B

Other Dimensions are Available Upon Request

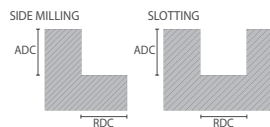


Tolerance

Cutting Diameter (D1)	Shank Diameter (D2)	(D1) +0.00mm -0.013mm
1/8"-1/4": +.000"/-.0012"	1/8"-1/4": -.0001"/-.0003"	(D2) h6
1/4"-1/2": +.000"/-.0016"	1/4"-1/2": -.0001"/-.0003"	
1/2"-1": +.000"/-.0020"	1/2"-1": -.0001"/-.0004"	
Runout 0.0005"max (shank to cutting diameter) Back Taper 0.0005"max Ball Nose Radius +.000"/-.001"		

Extended Neck

D1 Cutting Dia	D2 Shank Dia	L1 LOC	L3 Reach	L2 OAL	AlTiN Exxtral Plus Coated	AlTiN Ball End Coated
1/4	1/4	3/8	1-1/8	3	0423T40403753.1	0423T40403753.1B
1/4	1/4	3/8	2-1/8	4	0423T40403754.2	0423T40403754.2B
3/8	3/8	1/2	1-1/8	3	0423T40605003.1	0423T40605003.1B
3/8	3/8	1/2	2-1/8	4	0423T40605004.2	0423T40605004.2B
1/2	1/2	5/8	1-3/8	3	0423T40806253.1	0423T40806253.1B
1/2	1/2	5/8	2-1/8	4	0423T40806254.2	0423T40806254.2B
1/2	1/2	5/8	3-3/8	6	0423T40806256.3	0423T40806256.3B
5/8	5/8	3/4	1-5/8	4	0423T41007504.1	0423T41007504.1B
5/8	5/8	3/4	2-3/8	5	0423T41007505.2	0423T41007505.2B
5/8	5/8	3/4	3-3/8	6	0423T41007506.3	0423T41007506.3B
3/4	3/4	1	2	4	0423T41210004.2	0423T41210004.2B
3/4	3/4	1	2-1/2	5	0423T41210005.2	0423T41210005.2B
3/4	3/4	1	3-3/8	6	0423T41210006.3	0423T41210006.3B
1	1	1-1/4	2	5	0423T41610005.2	0423T41610005.2B
1	1	1-1/4	3-3/8	6	0423T41610006.3	0423T41610006.3B
1	1	1-1/4	4-3/8	7	0423T41610007.4	0423T41610007.4B



423 SERIES Speeds and Feeds

Materials	SFM(Vc) Exxtral Plus Min.-Max.	Chipload per Tooth Recommendations(CPT)							Profiling Radial		Slotting Axial
		1/4"	5/16"	3/8"	1/2"	5/8"	3/4"	1"	(ADC) RDC	(ADC)	
P1 Low - Carbon Steel - 1000 Series (>25HRc)	450 - 600	.0013	.0018	.0021	.0026	.0030	.0033	.0038	1xD	.5xD	.5xD
P2 Low - Carbon Steel - 1000 Series (<25HRc)	425 - 600	.0011	.0018	.0021	.0026	.0032	.0032	.0036	1xD	.5xD	.5xD
P3 Alloy Tool Steels - 1300, 2000, 3000 (≤ 35 HRc)	375 - 500	.0010	.0014	.0016	.0024	.0025	.0030	.0036	1xD	.4xD	.5xD
P4 Alloy Tool Steels - 1300, 2000, 3000 (36-48 HRc)	350 - 450	.0008	.0016	.0018	.0021	.0022	.0025	.0033	1xD	.3xD	.4xD
P5 Ferritic, Martensitic & Cast Stainless Steel - 400's, pH Types (15-5, 13-8, 17-4)(≤ 35 HRc)	225 - 320	.0012	.0014	.0016	.0020	.0021	.0023	.0028	1xD	.4xD	.5xD
M1 Austenitic Stainless Steel - Inox, 200 Series, 300 Series and 304L	225 - 320	.0008	.0015	.0020	.0022	.0026	.0028	.0034	1xD	.4xD	.5xD
M2 Austenitic Stainless Steel & Cast Stainless Steel - 310, 314, 316 (<25 HRc)	200 - 250	.0009	.0012	.0016	.0020	.0021	.0025	.0028	1xD	.4xD	.5xD
M3 Duplex Steel (Austenitic & Ferritic) - 323, 329, F55, 220	225 - 250	.0010	.0011	.0014	.0015	.0016	.0020	.0022	1xD	.5xD	.5xD
K1 Gray Cast Iron	375 - 500	.0017	.0020	.0022	.0025	.0028	.0033	.0036	1xD	.4xD	.5xD
K2 Ductile Iron- 60-40-18, 65-45-12 (<28HRc)	350 - 450	.0013	.0015	.0018	.0025	.0026	.0030	.0033	1xD	.4xD	.5xD
K3 Ductile Iron- 32510, 3518(<38HRc)	330 - 425	.0010	.0012	.0016	.0020	.0021	.0024	.0026	1xD	.4xD	.5xD
S1 Iron - Based, Heat - Resistant Alloys - Incoloy 800 - 802, A286, N-155	160 - 280	.0015	.0014	.0016	.0021	.0024	.0026	.0028	1xD	.4xD	.5xD
S4 Titanium Alloys - Commercially Pure, 6Al-4V, Astm 1/2/3, Ti - 6Al-2Sn - 4Zr-2Mo (≤48 HRc)	170 - 300	.0012	.0012	.0015	.0020	.0022	.0024	.0026	1xD	.4xD	.5xD
H1 Hardened Tool Steels - HSeries (10,11,13), D Series (2,3), 4340, P20(≤48 HRc)	250 - 450	.0009	.0013	.0015	.0021	.0024	.0027	.0030	1xD	.4xD	.5xD

For general purpose milling, we recommend Exxtral Plus coating.

Variable Helix Endmills
HPM+ Endmills
High Performance Endmills
Standard Endmills
Carbide Endmills
Solid Carbide Routers
Solid Carbide Drill Mills
Powder Metal Endmills (PM30)
Powder Metal Endmills (PM4)
Cobalt Endmills (M42)
High Speed Steel (M7) Endmills

Solid Carbide Endmills
Metric
Routers
Drill Mills
Powder Metal Endmills
Cobalt Endmills
HSS Endmills

Solid Carbide Endmills

Variable Helix Endmills

HPM+ Endmills

High Performance Endmills

Standard Endmills

Carbide Endmills

Solid Carbide Routers

Solid Carbide Drill Mills

Powder Metal Endmills (PM30) Endmills (PM4)

Cobalt Endmills (M42)

High Speed Steel Endmills (M7)



4 Flute Variable EndMill

- Exxtral Plus (AlTiN) recommended (up to 25% faster than uncoated)
- Radii (available upon request)
- Left Hand (available upon request)
- Flats added within 24 hrs.
- Material Code Refer to Page 245 & 246.

P M K S H

CARBIDE	4 Flutes	38°	Exxtral Plus®

Exxtral Plus® is ideal for high performance machining of hard materials.

Metric 451 SERIES

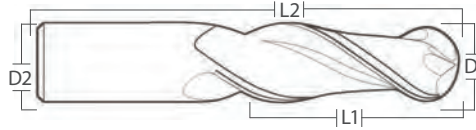
D1 Cutting Dia	D2 Shank Dia	L1 LOC	L2 OAL	Uncoated	AlTiN Exxtral Plus Coated
3	6	5	50	0451030200	0451030240
3	6	8	57	0451030300	0451030340
4	6	8	54	0451040200	0451040240
4	6	11	57	0451040300	0451040340
5	6	9	54	0451050200	0451050240
5	6	13	57	0451050300	0451050340
6	6	10	54	0451060200	0451060240
6	6	13	57	0451060300	0451060340
8	8	12	58	0451080200	0451080240
8	8	21	63	0451080300	0451080340
9	10	14	66	0451090200	0451090240
9	10	22	72	0451090300	0451090340
10	10	14	66	0451100200	0451100240
10	10	22	72	0451100300	0451100340
12	12	16	73	0451120200	0451120240
12	12	26	83	0451120300	0451120340
14	14	16	73	0451140200	0451140240
14	14	26	83	0451140300	0451140340
16	16	22	82	0451160200	0451160240
16	16	36	92	0451160300	0451160340
18	18	22	82	0451180200	0451180240
18	18	36	92	0451180300	0451180340
20	20	26	92	0451200200	0451200240
20	20	41	104	0451200300	0451200340



2 Flute High Performance EndMill

- Z-Power (ZrN) recommended (up to 25% faster than uncoated)
- Radii (available upon request)
- Left Hand (available upon request)
- Flats added within 24 hrs.
- Material Code Refer to Page 245 & 246.

N



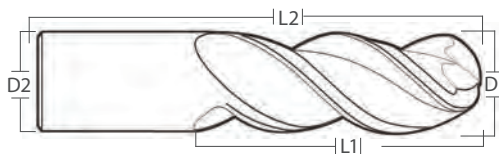
CARBIDE	2 Flutes	45°	Z Power®

Z-Power® has excellent corrosion and adhesion resistant properties.

Metric 224
SERIES

D1 Cutting Dia	D2 Shank Dia	L1 LOC	L2 OAL	Uncoated	ZrN Z-Power Coated
3	6	8	57	0224030300	0224030340
4	6	11	57	0224040300	0224040340
5	6	13	57	0224050300	0224050340
6	6	13	57	0224060300	0224060340
8	8	19	63	0224080300	0224080340
10	10	22	72	0224100300	0224100340
12	12	26	83	0224120300	0224120340
14	14	26	83	0224140300	0224140340
16	16	32	92	0224160300	0224160340
18	18	32	92	0224180300	0224180340
20	20	38	104	0224200300	0224200340

Variable Helix Endmills	Solid Carbide Endmills
HPM+ Endmills	Solid Carbide Endmills
High Performance Endmills	Solid Carbide Endmills
Standard Endmills	Solid Carbide Endmills
Carbide Endmills	Metric
Solid Carbide Routers	Routers
Solid Carbide Drill Mills	Drill Mills
Powder Metal (PM30) Endmills	Powder Metal Endmills
Powder Metal (PM4) Endmills	Powder Metal Endmills
Cobalt (M42) Endmills	Cobalt Endmills
High Speed Steel (M7) Endmills	HSS Endmills



3 Flute High Performance EndMill

- Z-Power (ZrN) (up to 25% faster than uncoated)
- Eccentric OD
- Radii (available upon request)
- Left Hand (available upon request)
- Flats added within 24 hrs.
- Material Code Refer to Page 245 & 246.

P M K S

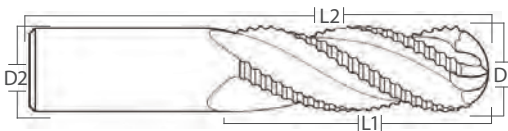
CARBIDE	3 Flutes	45°	Exxtral Plus®

Exxtral Plus® is ideal for high performance machining of hard materials.

Metric 314
SERIES

D1 Cutting Dia	D2 Shank Dia	L1 LOC	L2 OAL	AlTiN	
				Uncoated	Exxtral Plus Coated
3	6	8	57	0314030300	0314030340
4	6	11	57	0314040300	0314040340
5	6	13	57	0314050300	0314050340
6	6	13	57	0314060300	0314060340
8	8	19	63	0314080300	0314080340
10	10	22	72	0314100300	0314100340
12	12	26	83	0314120300	0314120340
14	14	26	83	0314140300	0314140340
16	16	32	92	0314160300	0314160340
18	18	32	92	0314180300	0314180340
20	20	38	104	0314200300	0314200340

- Variable Helix Endmills
- HPM+ Endmills
- High Performance Endmills
- Standard Endmills
- Carbide Endmills
- Solid Carbide Routers
- Solid Carbide Drill Mills
- Powder Metal (PM30) Endmills
- Powder Metal (PM4) Endmills
- Cobalt (M42) Endmills
- High Speed Steel (M7) Endmills



5 Flute High Performance EndMill Rougher

- Exxtral Plus (AlTiN) recommended (up to 25% faster than uncoated)
- Radii (available upon request)
- Left Hand (available upon request)
- Flats added within 24 hrs.
- Material Code Refer to Page 245 & 246.

P M S

CARBIDE	5 Flutes	45°	Exxtral Plus®

Exxtral Plus® is ideal for high performance machining of hard materials.

Metric 429 SERIES

D1	D2	L1	L2	AlTiN	
Cutting Dia	Shank Dia	LOC	OAL	Uncoated	Exxtral Plus Coated
6	6	13	57	0429060300	0429060340
8	8	19	63	0429080300	0429080340
10	10	22	72	0429100300	0429100340
12	12	26	83	0429120300	0429120340
14	14	26	83	0429140300	0429140340
16	16	32	92	0429160300	0429160340
18	18	32	92	0429180300	0429180340
20	20	38	104	0429200300	0429200340

Variable Helix Endmills

HPM+ Endmills

High Performance Endmills

Standard Endmills

Carbide Endmills

Solid Carbide Routers

Solid Carbide Drill Mills

Powder Metal (PM30) Endmills

Powder Metal (PM4) Endmills

Cobalt (M42) Endmills

High Speed Steel (M7) Endmills

Solid Carbide Endmills

Metric

Routers

Drill Mills

Powder Metal Endmills

Cobalt Endmills

HSS Endmills

Solid Carbide Endmills

Variable Helix
Endmills

HPM+
Endmills

High Performance
Endmills

Standard
Endmills

Carbide
Endmills

Solid Carbide
Routers

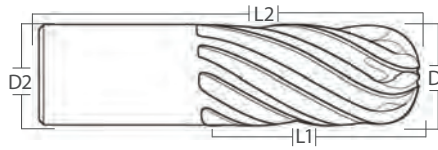
Solid Carbide
Drill Mills

Powder Metal
(PM30) Endmills

Powder Metal
(PM4) Endmills

Cobalt
(M42) Endmills

High Speed Steel
(M7) Endmills



6-8 Flute High Performance EndMill

- Exxtral Plus (AlTiN) recommended (up to 25% faster than uncoated)
- Radii (available upon request)
- Flats added within 24 hrs.
- Material Code Refer to Page 245 & 246.

P M K S H

CARBIDE

6-8
Flutes

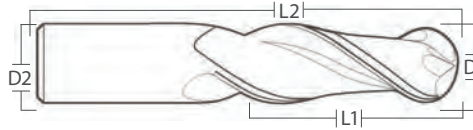
50°

Exxtral Plus®

Exxtral Plus® is ideal for high performance machining of hard materials.

Metric **781**
SERIES

D1 Cutting Dia	D2 Shank Dia	L1 LOC	L2 OAL	Flutes	Uncoated	AlTiN Exxtral Plus Coated
4	6	11	57	6	0781040300	0781040340
5	6	13	57	6	0781050300	0781050340
6	6	13	57	6	0781060300	0781060340
6	6	18	62	6	0781060400	0781060440
8	8	19	63	6	0781080300	0781080340
8	8	24	68	6	0781080400	0781080440
10	10	22	72	6	0781100300	0781100340
10	10	30	80	6	0781100400	0781100440
12	12	26	83	6	0781120300	0781120340
12	12	36	93	6	0781120400	0781120440
14	14	26	83	6	0781140300	0781140340
14	14	42	99	6	0781140400	0781140440
16	16	32	92	8	0781160300	0781160340
16	16	48	108	8	0781160400	0781160440
18	18	32	92	8	0781180300	0781180340
18	18	54	114	8	0781180400	0781180440
20	20	38	104	8	0781200300	0781200340
20	20	60	126	8	0781200400	0781200440
25	25	95	160	8	0781250400	0781250440



2 Flute End Mill, General Purpose

- TiCN recommended (up to 25% faster than uncoated)
- Radii (available upon request)
- Left Hand (available upon request)
- Flats added within 24 hrs.
- Material Code Refer to Page 245 & 246.

P M K N

CARBIDE	2 Flutes	30°	TiCN

TiCN features high hardness and a low coefficient of friction; excellent for general purpose machining.

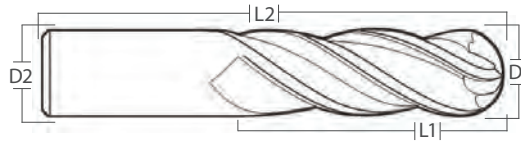
Variable Helix Endmills	Solid Carbide Endmills
HPM+ Endmills	Solid Carbide Endmills
High Performance Endmills	Solid Carbide Endmills
Standard Endmills	Solid Carbide Endmills
Carbide Endmills	Metric
Solid Carbide Routers	Routers
Solid Carbide Drill Mills	Drill Mills
Powder Metal (PM30) Endmills	Powder Metal Endmills
Powder Metal (PM4) Endmills	Powder Metal Endmills
Cobalt (M42) Endmills	Cobalt Endmills
High Speed Steel (M7) Endmills	HSS Endmills

Metric **235** SERIES

D1 Cutting Dia	D2 Shank Dia	L1 LOC	L2 OAL	Uncoated	TiCN TiCN Coated
3	6	8	57	0235030300	0235030340
4	6	11	57	0235040300	0235040340
5	6	13	57	0235050300	0235050340
6	6	13	57	0235060300	0235060340
8	8	19	63	0235080300	0235080340
10	10	22	72	0235100300	0235100340
12	12	26	83	0235120300	0235120340
14	14	26	83	0235140300	0235140340
16	16	32	92	0235160300	0235160340
18	18	32	92	0235180300	0235180340
20	20	38	104	0235200300	0235200340

Solid Carbide Endmills

Variable Helix Endmills
HPM+ Endmills
High Performance Endmills
Standard Endmills



4 Flute End Mill, General Purpose

- Exxtral Plus (AlTiN) recommended (up to 25% faster than uncoated)
- Radii (available upon request)
- Left Hand (available upon request)
- Flats added within 24 hrs.
- Material Code Refer to Page 245 & 246.

P M K N S

CARBIDE	4 Flutes	30°	Exxtral Plus®

Exxtral Plus® is ideal for high performance machining of hard materials.

Metric 406
SERIES

D1 Cutting Dia	D2 Shank Dia	L1 LOC	L2 OAL	Uncoated	AlTiN Exxtral Plus Coated
3	3	12	32	0406030200	0406030240
3	3	12	38	0406030300	0406030340
4	4	12	40	0406040300	0406040340
5	5	14	50	0406050200	0406050240
5	5	15	50	0406050300	0406050340
5	5	35	75	0406050400	0406050440
6	6	16	50	0406060200	0406060240
6	6	16	58	0406060300	0406060340
6	6	40	100	0406060400	0406060440
7	7	20	60	0406070200	0406070240
8	8	20	60	0406080200	0406080240
8	8	22	70	0406080300	0406080340
8	8	40	100	0406080400	0406080440
9	9	20	60	0406090200	0406090240
10	10	22	70	0406100200	0406100240
10	10	45	95	0406100400	0406100440
11	11	22	70	0406110200	0406110240
12	12	22	70	0406120200	0406120240
12	12	28	84	0406120300	0406120340
12	12	53	110	0406120400	0406120440
13	13	25	75	0406130200	0406130240
14	14	25	75	0406140200	0406140240
14	14	45	100	0406140400	0406140440
15	15	25	75	0406150200	0406150240
16	16	25	75	0406160200	0406160240
16	16	35	93	0406160300	0406160340
16	16	75	150	0406160400	0406160440
18	18	32	100	0406180200	0406180240
20	20	32	100	0406200200	0406200240
20	20	40	100	0406200300	0406200340
20	20	75	150	0406200400	0406200440

Routers

Drill Mills

Powder Metal Endmills

Cobalt Endmills

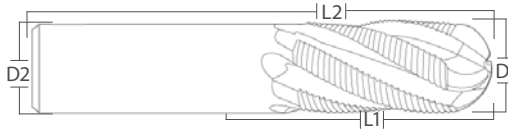
HSS Endmills



4 Flute Fine Pitch Rougher EndMill

- Exxtral Plus (AlTiN) recommended (up to 25% faster than uncoated)
- Radii (available upon request)
- Left Hand (available upon request)
- Flats added within 24 hrs.
- Material Code Refer to Page 245 & 246.

P M S H



CARBIDE	4 Flutes	20°	Exxtral Plus®
			Fine Rough

Exxtral Plus® is ideal for high performance machining of hard materials.

Metric **423**
SERIES

D1 Cutting Dia	D2 Shank Dia	L1 LOC	L2 OAL	Uncoated	AlTiN Exxtral Plus Coated
6	6	8	54	0423060200	0423060240
6	6	13	57	0423060300	0423060340
8	8	11	58	0423080200	0423080240
8	8	19	63	0423080300	0423080340
10	10	13	66	0423100200	0423100240
10	10	22	72	0423100300	0423100340
12	12	16	73	0423120200	0423120240
12	12	26	83	0423120300	0423120340
16	16	19	82	0423160200	0423160240
16	16	32	92	0423160300	0423160340
18	18	32	92	0423180300	0423180340
20	20	19	92	0423200200	0423200240
20	20	38	104	0423200300	0423200340

Variable Helix Endmills	Solid Carbide Endmills
HPM+ Endmills	Metric Carbide Endmills
High Performance Endmills	
Standard Endmills	
Solid Carbide Routers	Routers
Solid Carbide Drill Mills	Drill Mills
Powder Metal (PM30) Endmills	Powder Metal Endmills
Powder Metal (PM4) Endmills	
(M42) Cobalt Endmills	Cobalt Endmills
High Speed Steel (M7) Endmills	HSS Endmills

Solid Carbide Endmills

Variable Helix
Endmills

HPM+
Endmills

High Performance
Endmills

Standard
Endmills

Metric

Carbide
Endmills

Routers

Solid Carbide
Routers

Drill Mills

Solid Carbide
Drill Mills

Powder Metal Endmills

Powder Metal
(PM30) Endmills

Powder Metal
(PM4) Endmills

Cobalt Endmills

Cobalt
(M42) Endmills

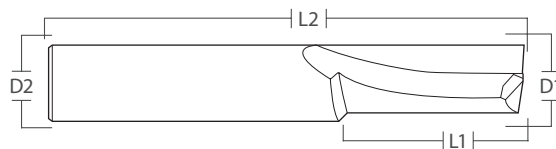
HSS Endmills

High Speed Steel
(M7) Endmills



Single Flute EndMill Router

- Z-Power (ZrN) recommended (up to 25% faster than uncoated)
- Left Hand (available upon request)
- Flats added within 24 hrs.
- Material Code Refer to Page 245 & 246.



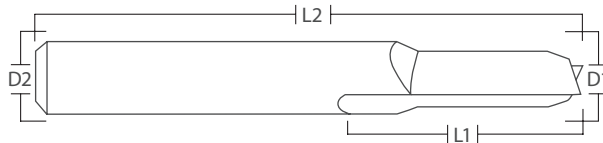
CARBIDE	1 Flute	0°	Z Power®

Z-Power® has excellent corrosion and adhesion resistant properties.

Fractional

D1 Cutting Dia	D2 Shank Dia	L1 LOC	L2 OAL	Uncoated	ZrN Z-Power Coated
1/4	1/4	3/4	2-1/2	0219T004075025	0219T604075025
5/16	5/16	7/8	2-1/2	0219T005087525	0219T605087525
3/8	3/8	1	2-1/2	0219T006100025	0219T606100025
7/16	7/16	1	2-3/4	0219T007100027	0219T607100027
1/2	1/2	1	3	0219T00810003	0219T60810003
5/8	5/8	1-1/4	3-1/2	0219T010125035	0219T610125035
3/4	3/4	1-1/2	4	0219T01215004	0219T61215004
1	1	1-1/2	4	0219T01615004	0219T61615004

Other Dimensions are Available Upon Request



2 Flute EndMill Router

- Z-Power (ZrN) recommended (up to 25% faster than uncoated)
- Radii (available upon request)
- Left Hand (available upon request)
- Flats added within 24 hrs.
- Material Code Refer to Page 245 & 246.



CARBIDE	2 Flutes	0°	Z Power®

Z-Power® has excellent corrosion and adhesion resistant properties.

Fractional

D1 Cutting Dia	D2 Shank Dia	L1 LOC	L2 OAL	Uncoated	ZrN Z-Power Coated
1/4	1/4	3/4	2-1/2	0220T004075025	0220T604075025
5/16	5/16	7/8	2-1/2	0220T005087525	0220T605087525
3/8	3/8	1	2-1/2	0220T006100025	0220T606100025
7/16	7/16	1	2-3/4	0220T007100027	0220T607100027
1/2	1/2	1	3	0220T00810003	0220T60810003
5/8	5/8	1-1/4	3-1/2	0220T010125035	0220T610125035
3/4	3/4	1-1/2	4	0220T01215004	0220T61215004
1	1	1-1/2	4	0220T01615004	0220T61615004

Other Dimensions are Available Upon Request

Variable Helix Endmills	Solid Carbide Endmills
HPM+ Endmills	Metric
High Performance Endmills	
Standard Endmills	Carbide Endmills
	Routers
	Drill Mills
	Powder Metal Endmills
	Powder Metal Endmills
	Cobalt Endmills
	HSS Endmills

Solid Carbide Endmills

Variable Helix Endmills

HPM+ Endmills

High Performance Endmills

Standard Endmills

Metric

Carbide Endmills

Routers

Solid Carbide Routers

Drill Mills

Solid Carbide Drill Mills

Powder Metal Endmills

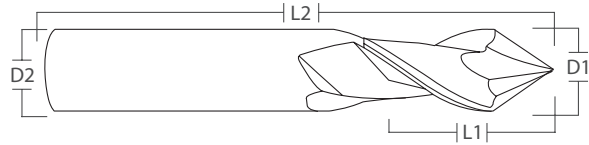
Powder Metal (PM30) Endmills
Powder Metal (PM4) Endmills

Cobalt Endmills

Cobalt (M42) Endmills

HSS Endmills

High Speed Steel (M7) Endmills



2 Flute Drill Mill, 60°

- Available in Exxtral Plus (AlTiN) Coating
- Engineered for drilling & chamfering in small passages.
- Uniform finish on the part
- Material Code Refer to Page 245 & 246.

P M K N S

CARBIDE	2 Flutes	Exxtral Plus®

Exxtral Plus® is ideal for high performance machining of hard materials.

Speeds and Feeds Refer to Page 190.

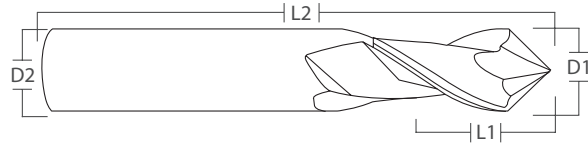
Fractional

D1 Cutting Dia	D2 Shank Dia	L1 LOC	L2 OAL	AlTiN	
				Uncoated	Exxtral Plus Coated
1/8	1/8	1/2	1-1/2	2060T002050015	2060T402050015
3/16	3/16	5/8	2	2060T00306252	2060T40306252
1/4	1/4	3/4	2-1/2	2060T004075025	2060T404075025
5/16	5/16	7/8	2-1/2	2060T005087525	2060T405087525
3/8	3/8	1	2-1/2	2060T006100025	2060T406100025
7/16	7/16	1	2-3/4	2060T007100027	2060T407100027
1/2	1/2	1	3	2060T00810003	2060T40810003
5/8	5/8	1-1/4	3-1/2	2060T010125035	2060T410125035
3/4	3/4	1-1/2	4	2060T01215004	2060T41215004

Other Dimensions are Available Upon Request

2060 SERIES Speeds and Feeds

Materials	Type of Cut	SFM <32HRc	SFM >32HRc	Chipload per Tooth(CPT)								
				1/8"	1/4"	5/16"	3/8"	1/2"	5/8"	3/4"	1"	
P 2 Low - Carbon Steels - 1000 Series	Slotting	190	90	.0005	.0010	.0013	.0019	.0022	.0028	.0036	.0008	
	Profiling	440	245	.0005	.0013	.0019	.0020	.0028	.0039	.0044	.0008	
P 4 Alloy Tool steels - 1330, 2000, 3000 (36-48 HRc)	Slotting	140	70	.0003	.0008	.0004	.0014	.0020	.0027	.0033	.0044	
	Profiling	260	175	.0005	.0008	.0004	.0019	.0031	.0035	.0042	.0058	
P 5 Ferritic, Martensitic & PH Stainless Steels (≤35 HRc)	Slotting	140	70	.0006	.0008	.0010	.0016	.0018	.0023	.0029	.0040	
	Profiling	290	175	.0006	.0008	.0010	.0017	.0022	.0029	.0036	.0047	
P 6 Ferritic, Martensitic & PH Stainless Steels (36-48 HRc)	Slotting	140	70	.0006	.0008	.0010	.0016	.0018	.0023	.0029	.0040	
	Profiling	290	175	.0006	.0008	.0010	.0017	.0022	.0029	.0036	.0047	
M 2 Austenitic Stainless Steel - Inox, 200 Series, 300 Series and 304L	Slotting	140	70	.0004	.0010	.0016	.0016	.0021	.0028	.0032	.0044	
	Profiling	260	175	.0006	.0013	.0020	.0021	.0028	.0037	.0042	.0056	
K 1 Gray Cast Iron	Slotting	240	115	.0006	.0008	.0010	.0016	.0018	.0023	.0029	.0040	
	Profiling	415	275	.0006	.0008	.0010	.0017	.0022	.0029	.0036	.0047	
K 2 Ductile Iron- 32510 , 35018	Slotting	240	115	.0006	.0008	.0010	.0016	.0018	.0023	.0029	.0040	
	Profiling	415	275	.0006	.0008	.0010	.0017	.0022	.0029	.0036	.0047	
N 1 Aluminum Alloys	Slotting	645	N/A	.0005	.0011	.0015	.0016	.0031	.0050	.0063	.0076	
	Profiling	760	N/A	.0005	.0013	.0020	.0022	.0033	.0055	.0067	.0097	
S 1 Iron-Based Alloys	Slotting	50	50	.0006	.0009	.0011	.0012	.0016	.0020	.0020	.0028	
	Profiling	115	115	.0006	.0009	.0012	.0012	.0021	.0026	.0028	.0038	
S 2 Nickel Based, Cobalt Based, Heat-Resistant Alloys	Slotting	50	50	.0006	.0009	.0011	.0012	.0016	.0020	.0020	.0028	
	Profiling	115	115	.0006	.0009	.0012	.0012	.0021	.0026	.0028	.0038	
S 4 Titanium Alloys	Slotting	130	90	.0006	.0012	.0013	.0020	.0026	.0046	.0057	.0077	
	Profiling	210	135	.0006	.0013	.0017	.0023	.0033	.0058	.0067	.0097	



2 Flute Drill Mill, 90°

- Available in Exxtral Plus (AlTiN) Coating
- Engineered for drilling & chamfering in small passages.
- Uniform finish on the part
- Material Code Refer to Page 245 & 246.

P M K N S

CARBIDE

2
Flutes

Exxtral Plus®

30°

90°

Exxtral Plus® is ideal for high performance machining of hard materials.

Speeds and Feeds Refer to Page 191.

Fractional

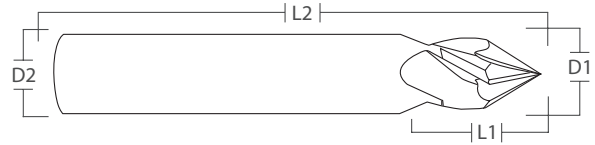
D1 Cutting Dia	D2 Shank Dia	L1 LOC	L2 OAL	Uncoated	AlTiN Exxtral Plus Coated
1/8	1/8	1/2	1-1/2	2090T002050015	2090T402050015
3/16	3/16	5/8	2	2090T00306252	2090T40306252
1/4	1/4	3/4	2-1/2	2090T004075025	2090T404075025
5/16	5/16	7/8	2-1/2	2090T005087525	2090T405087525
3/8	3/8	1	2-1/2	2090T006100025	2090T406100025
7/16	7/16	1	2-3/4	2090T007100027	2090T407100027
1/2	1/2	1	3	2090T00810003	2090T40810003
5/8	5/8	1-1/4	3-1/2	2090T010125035	2090T410125035
3/4	3/4	1-1/2	4	2090T01215004	2090T41215004

Other Dimensions are Available Upon Request

2090 SERIES Speeds and Feeds

Materials	Type of Cut	SFM <32HRc	SFM >32HRc	Chipload per Tooth(CPT)								
				1/8"	1/4"	5/16"	3/8"	1/2"	5/8"	3/4"	1"	
P 2 Low - Carbon Steels - 1000 Series	Slotting	190	90	.0005	.0010	.0013	.0019	.0022	.0028	.0036	.0008	
	Profiling	440	245	.0005	.0013	.0019	.0020	.0028	.0039	.0044	.0008	
P 4 Alloy Tool steels - 1330, 2000, 3000 (36-48 HRc)	Slotting	140	70	.0003	.0008	.0004	.0014	.0020	.0027	.0033	.0044	
	Profiling	260	175	.0005	.0008	.0004	.0019	.0031	.0035	.0042	.0058	
P 5 Ferritic, Martensitic & PH Stainless Steels (≤35 HRc)	Slotting	140	70	.0006	.0008	.0010	.0016	.0018	.0023	.0029	.0040	
	Profiling	290	175	.0006	.0008	.0010	.0017	.0022	.0029	.0036	.0047	
P 6 Ferritic, Martensitic & PH Stainless Steels (36-48 HRc)	Slotting	140	70	.0006	.0008	.0010	.0016	.0018	.0023	.0029	.0040	
	Profiling	290	175	.0006	.0008	.0010	.0017	.0022	.0029	.0036	.0047	
M 2 Austenitic Stainless Steel - Inox, 200 Series, 300 Series and 304L	Slotting	140	70	.0004	.0010	.0016	.0016	.0021	.0028	.0032	.0044	
	Profiling	260	175	.0006	.0013	.0020	.0021	.0028	.0037	.0042	.0056	
K 1 Gray Cast Iron	Slotting	240	115	.0006	.0008	.0010	.0016	.0018	.0023	.0029	.0040	
	Profiling	415	275	.0006	.0008	.0010	.0017	.0022	.0029	.0036	.0047	
K 2 Ductile Iron- 32510 , 35018	Slotting	240	115	.0006	.0008	.0010	.0016	.0018	.0023	.0029	.0040	
	Profiling	415	275	.0006	.0008	.0010	.0017	.0022	.0029	.0036	.0047	
N 1 Aluminum Alloys	Slotting	645	N/A	.0005	.0011	.0015	.0016	.0031	.0050	.0063	.0076	
	Profiling	760	N/A	.0005	.0013	.0020	.0022	.0033	.0055	.0067	.0097	
S 1 Iron-Based Alloys	Slotting	50	50	.0006	.0009	.0011	.0012	.0016	.0020	.0020	.0028	
	Profiling	115	115	.0006	.0009	.0012	.0012	.0021	.0026	.0028	.0038	
S 2 Nickel Based, Cobalt Based, Heat-Resistant Alloys	Slotting	50	50	.0006	.0009	.0011	.0012	.0016	.0020	.0020	.0028	
	Profiling	115	115	.0006	.0009	.0012	.0012	.0021	.0026	.0028	.0038	
S 4 Titanium Alloys	Slotting	130	90	.0006	.0012	.0013	.0020	.0026	.0046	.0057	.0077	
	Profiling	210	135	.0006	.0013	.0017	.0023	.0033	.0058	.0067	.0097	

Variable Helix Endmills
 HPW+ Endmills
 High Performance Endmills
 Standard Endmills
 Solid Carbide Endmills
 Carbide Endmills
 Solid Carbide Routers
 Drill Mills
 Solid Carbide Drill Mills
 Powder Metal Endmills (PM30) Endmills
 Powder Metal Endmills (PM4) Endmills
 Cobalt Endmills (M42) Endmills
 Cobalt Endmills
 High Speed Steel (M7) Endmills



4 Flute Drill Mill, 60°

- Available in Exxtral Plus (AlTiN) Coating
- Engineered for drilling & chamfering in small passages.
- Uniform finish on the part
- Material Code Refer to Page 247 & 248.

P M K N S

CARBIDE	4 Flutes	Exxtral Plus®

Exxtral Plus® is ideal for high performance machining of hard materials.

Speeds and Feeds Refer to Page 192.

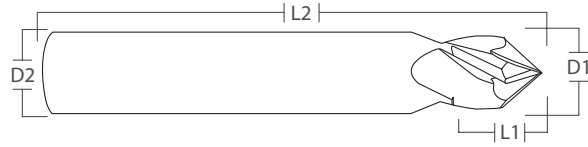
Fractional

D1 Cutting Dia	D2 Shank Dia	L1 LOC	L2 OAL	Uncoated	AlTiN Exxtral Plus Coated
1/8	1/8	1/2	1-1/2	4060T002050015	4060T402050015
3/16	3/16	5/8	2	4060T00306252	4060T40306252
1/4	1/4	3/4	2-1/2	4060T004075025	4060T404075025
5/16	5/16	7/8	2-1/2	4060T005087525	4060T405087525
3/8	3/8	1	2-1/2	4060T006100025	4060T406100025
7/16	7/16	1	2-3/4	4060T007100027	4060T407100027
1/2	1/2	1	3	4060T00810003	4060T40810003
5/8	5/8	1-1/4	3-1/2	4060T010125035	4060T410125035
3/4	3/4	1-1/2	4	4060T01215004	4060T41215004

Other Dimensions are Available Upon Request

4060 SERIES Speeds and Feeds

Materials	Type of Cut	SFM <32HRc	SFM >32HRc	Chipload per Tooth(CPT)								
				1/8"	1/4"	5/16"	3/8"	1/2"	5/8"	3/4"	1"	
P 2 Low - Carbon Steels - 1000 Series	Slotting	190	90	.0005	.0010	.0013	.0019	.0022	.0028	.0036	.0008	
	Profiling	440	245	.0005	.0013	.0019	.0020	.0028	.0039	.0044	.0008	
P 4 Alloy Tool steels - 1330, 2000, 3000 (36-48 HRc)	Slotting	140	70	.0003	.0008	.0004	.0014	.0020	.0027	.0033	.0044	
	Profiling	260	175	.0005	.0008	.0004	.0019	.0031	.0035	.0042	.0058	
P 5 Ferritic, Martensitic & PH Stainless Steels (≤35 HRc)	Slotting	140	70	.0006	.0008	.0010	.0016	.0018	.0023	.0029	.0040	
	Profiling	290	175	.0006	.0008	.0010	.0017	.0022	.0029	.0036	.0047	
P 6 Ferritic, Martensitic & PH Stainless Steels (36-48 HRc)	Slotting	140	70	.0006	.0008	.0010	.0016	.0018	.0023	.0029	.0040	
	Profiling	290	175	.0006	.0008	.0010	.0017	.0022	.0029	.0036	.0047	
M 2 Austenitic Stainless Steel - Inox, 200 Series, 300 Series and 304L	Slotting	140	70	.0004	.0010	.0016	.0016	.0021	.0028	.0032	.0044	
	Profiling	260	175	.0006	.0013	.0020	.0021	.0028	.0037	.0042	.0056	
K 1 Gray Cast Iron	Slotting	240	115	.0006	.0008	.0010	.0016	.0018	.0023	.0029	.0040	
	Profiling	415	275	.0006	.0008	.0010	.0017	.0022	.0029	.0036	.0047	
K 2 Ductile Iron- 32510 , 35018	Slotting	240	115	.0006	.0008	.0010	.0016	.0018	.0023	.0029	.0040	
	Profiling	415	275	.0006	.0008	.0010	.0017	.0022	.0029	.0036	.0047	
N 1 Aluminum Alloys	Slotting	645	N/A	.0005	.0011	.0015	.0016	.0031	.0050	.0063	.0076	
	Profiling	760	N/A	.0005	.0013	.0020	.0022	.0033	.0055	.0067	.0097	
S 1 Iron-Based Alloys	Slotting	50	50	.0006	.0009	.0011	.0012	.0016	.0020	.0020	.0028	
	Profiling	115	115	.0006	.0009	.0012	.0012	.0021	.0026	.0028	.0038	
S 2 Nickel Based, Cobalt Based, Heat-Resistant Alloys	Slotting	50	50	.0006	.0009	.0011	.0012	.0016	.0020	.0020	.0028	
	Profiling	115	115	.0006	.0009	.0012	.0012	.0021	.0026	.0028	.0038	
S 4 Titanium Alloys	Slotting	130	90	.0006	.0012	.0013	.0020	.0026	.0046	.0057	.0077	
	Profiling	210	135	.0006	.0013	.0017	.0023	.0033	.0058	.0067	.0097	



4 Flute Drill Mill, 90°

- Available in Exxtral Plus (AlTiN) Coating
- Engineered for drilling & chamfering in small passages.
- Uniform finish on the part
- Material Code Refer to Page 247 & 248.

P M K N S

CARBIDE

4 Flutes

Exxtral Plus®

Exxtral Plus® is ideal for high performance machining of hard materials.

Speeds and Feeds Refer to Page 193.

Fractional

D1 Cutting Dia	D2 Shank Dia	L1 LOC	L2 OAL	Uncoated	AlTiN Exxtral Plus Coated
1/8	1/8	1/2	1-1/2	4090T002050015	4090T402050015
3/16	3/16	5/8	2	4090T00306252	4090T40306252
1/4	1/4	3/4	2-1/2	4090T004075025	4090T404075025
5/16	5/16	7/8	2-1/2	4090T005087525	4090T405087525
3/8	3/8	1	2-1/2	4090T006100025	4090T406100025
7/16	7/16	1	2-3/4	4090T007100027	4090T407100027
1/2	1/2	1	3	4090T00810003	4090T40810003
5/8	5/8	1-1/4	3-1/2	4090T010125035	4090T410125035
3/4	3/4	1-1/2	4	4090T01215004	4090T41215004

Other Dimensions are Available Upon Request

4090 SERIES Speeds and Feeds

Materials	Type of Cut	Chipload per Tooth(CPT)									
		SFM<32HRc	SFM >32HRc	1/8"	1/4"	5/16"	3/8"	1/2"	5/8"	3/4"	1"
P 2 Low - Carbon Steels - 1000 Series	Slotting	190	90	.0005	.0010	.0013	.0019	.0022	.0028	.0036	.0008
	Profiling	440	245	.0005	.0013	.0019	.0020	.0028	.0039	.0044	.0008
P 4 Alloy Tool steels - 1330, 2000, 3000 (36-48 HRC)	Slotting	140	70	.0003	.0008	.0004	.0014	.0020	.0027	.0033	.0044
	Profiling	260	175	.0005	.0008	.0004	.0019	.0031	.0035	.0042	.0058
P 5 Ferritic, Martensitic & PH Stainless Steels (≤35 HRc)	Slotting	140	70	.0006	.0008	.0010	.0016	.0018	.0023	.0029	.0040
	Profiling	290	175	.0006	.0008	.0010	.0017	.0022	.0029	.0036	.0047
P 6 Ferritic, Martensitic & PH Stainless Steels (36-48 HRc)	Slotting	140	70	.0006	.0008	.0010	.0016	.0018	.0023	.0029	.0040
	Profiling	290	175	.0006	.0008	.0010	.0017	.0022	.0029	.0036	.0047
M 2 Austenitic Stainless Steel - Inox, 200 Series, 300 Series and 304L	Slotting	140	70	.0004	.0010	.0016	.0016	.0021	.0028	.0032	.0044
	Profiling	260	175	.0006	.0013	.0020	.0021	.0028	.0037	.0042	.0056
K 1 Gray Cast Iron	Slotting	240	115	.0006	.0008	.0010	.0016	.0018	.0023	.0029	.0040
	Profiling	415	275	.0006	.0008	.0010	.0017	.0022	.0029	.0036	.0047
K 2 Ductile Iron- 32510 , 35018	Slotting	240	115	.0006	.0008	.0010	.0016	.0018	.0023	.0029	.0040
	Profiling	415	275	.0006	.0008	.0010	.0017	.0022	.0029	.0036	.0047
N 1 Aluminum Alloys	Slotting	645	N/A	.0005	.0011	.0015	.0016	.0031	.0050	.0063	.0076
	Profiling	760	N/A	.0005	.0013	.0020	.0022	.0033	.0055	.0067	.0097
S 1 Iron-Based Alloys	Slotting	50	50	.0006	.0009	.0011	.0012	.0016	.0020	.0020	.0028
	Profiling	115	115	.0006	.0009	.0012	.0012	.0021	.0026	.0028	.0038
S 2 Nickel Based, Cobalt Based, Heat-Resistant Alloys	Slotting	50	50	.0006	.0009	.0011	.0012	.0016	.0020	.0020	.0028
	Profiling	115	115	.0006	.0009	.0012	.0012	.0021	.0026	.0028	.0038
S 4 Titanium Alloys	Slotting	130	90	.0006	.0012	.0013	.0020	.0026	.0046	.0057	.0077
	Profiling	210	135	.0006	.0013	.0017	.0023	.0033	.0058	.0067	.0097

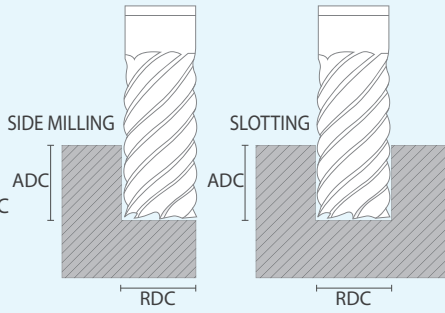
Variable Helix Endmills
 HPM+ Endmills
 High Performance Endmills
 Standard Endmills
 Solid Carbide Endmills
 Carbide Endmills
 Solid Carbide Routers
 Drill Mills
 Solid Carbide Drill Mills
 Powder Metal Endmills (PM30) Endmills
 Powder Metal Endmills (PM4) Endmills
 Cobalt Endmills (M42) Endmills
 Cobalt Endmills
 High Speed Steel (M7) Endmills

Formula

D = Tool Diameter

Example: 2% of Dia., when D = 1"(.02 x 1") = .020" per pass

SFM = RPM / 3.82 X Dia
 RPM = SFM X 3.82 / Dia
 FPM = RPM X FPT X #FI
 FPT = FPM / RPM x #FI
 IPR/FR = FPM / RPM
 MR = ADC X RDC X FPM
 HP = FPM X RDC X ADC X PC



Description:
 Dia. Diameter of End Mill
 RPM Revolutions per Minute
 FPM Feed per Minute
 FR Feed per Revolution
 RDC Radial Depth of Cut (Width)
 MR Metal Removal Rate (Cubic Inches per Minute)
 SFM Surface Feet per Minute
 CPT Chipload per Tooth
 IPR Inch per Revolution
 ADC Axial Depth of Cut (Length)
 #FI # of Effective Cutting Flutes
 HP Actual Horsepower Available at running RPM
 PC Power Constants for HP / CL - MR

Milling Cutting data formula

$$SFM = \frac{\pi \cdot D \cdot n}{1000} \quad (m/min)$$

$$n = \frac{1000 \cdot vc}{\pi \cdot D} \quad (rev/min)$$

$$vf = fz \cdot z \cdot n = f \cdot n \quad (mm/min)$$

$$h_m = f_z \cdot \sqrt{\frac{ae}{D}} \quad (mm) \quad \frac{ae}{D} < 0,3$$

$$Q = \frac{a_p \cdot ae \cdot vf}{1000} \quad (cm^3/min)$$

Legend

v_c Cutting Speed (m/min)
 n Spindle speed (rev/min)
 v_f Feed Speed (mm/min)
 a_p Axial Depth of cut (mm)
 a_e Radial Depth of cut (mm)
 f Feed per tooth (mm/tooth)
 z Number of teeth
 f_z Feed per tooth (mm/tooth)
 D Cutter diameter (mm)
 h_m Average chip thickness (mm)
 Q Material removal rate (cm³/min)

Drilling Cutting data formula

$$\text{Cutting speed, } v_c = \frac{\pi \cdot D \cdot n}{1000} \quad (m/min)$$

$$\text{Spindle speed, } n = \frac{1000 \cdot vc}{\pi \cdot D} \quad (rev/min)$$

$$\text{Feed speed, } vf = f \cdot n \quad (mm/min)$$

$$\text{Feed per rev, } f = \frac{vf}{n} \quad (mm/rev)$$

Legend

v_c = Cutting Speed (m/min)
 n = Spindle speed (rev/min)
 v_f = Feed Speed (mm/min)
 D = Drill diameter (mm)
 f = Feed per rev (mm/rev)

RE-USE. REDUCE.

RE-SHARPEN.



RE-SHARPENING SERVICES

At PCT we offer re-sharpening services for all your cutting tools. The re-sharpening process is completed in our manufacturing plant located in Santa Fe Springs, California. When sending your cutting tools in for re-sharpening, we give you two options; re-sharpen the face only or re-sharpen the overall diameter. For your convenience, re-coating for re-sharpened tools is available through our in-house coating facility, PCT Coating Solutions. Furthermore, this cost-saving service takes an average of only 3-5 days.

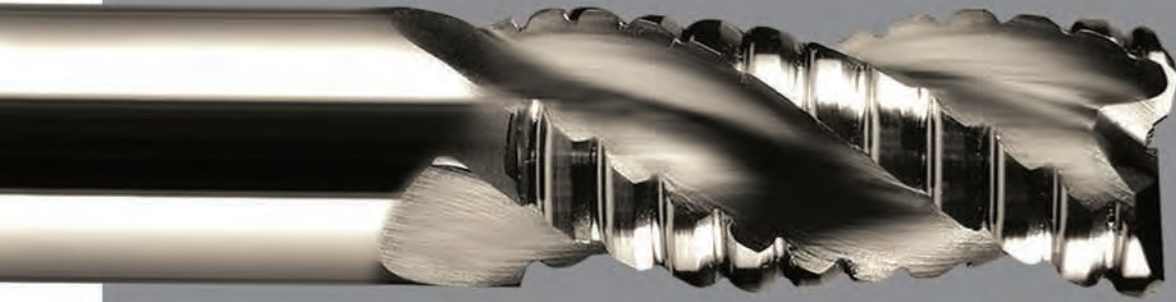
PCT assures that your cutting tools are reliable and perform like-new after the re-sharpening process. Please note that as an extended service, PCT will offer local pick-up and delivery for your re-sharpened cutting tools.

To receive a quote for cutting tool re-sharpening, please give us a call at (562) 921-7898 or email us at sales@pctcutters.com.





PRECISION CUTTING TOOLS, INC.



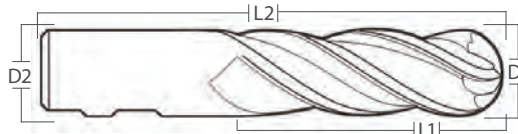
Top:
3 Flute Truncated Rougher/Finisher p.208

Center:
CurveCut M-(Milled) Cobalt p.231

Bottom:
2 Flute Finisher p.234

POWDERMETAL COBALT HIGH SPEED STEEL ENDMILLS

Manufacturing in dimensions of 1/4"- 3" Cutting Diameter
and up to 12" of length of cut



4 Flute Finisher EndMill - Center Cut

- Available in Exxtral Plus Coating - T4
- Ideal for Titanium & Stainless Steel Alloys
- Right Hand Spiral & Cut
- Weldon Flats
- Square & Ballnose End
- Material Code Refer to Page 245 & 246.



PM30 **4** Flutes **35°**

Exxtral Plus® Exxtral Plus® is ideal for high performance machining of hard materials.

RIGHT HAND - 4 Flute

Cutting Dia	Shank Dia	LOC	OAL	AITiN		
				Uncoated	Exxtral Plus Coated	Ball End Uncoated
1/2	1/2	1-1/4	3-1/4	PM3-54008	T4-PM3-54008	PM3-54108
1/2	1/2	2	4	PM3-54208	T4-PM3-54208	PM3-54308
1/2	1/2	3	5	PM3-54408	T4-PM3-54408	PM3-54508
1/2	1/2	4	6	PM3-54608	T4-PM3-54608	PM3-54708
5/8	5/8	1-5/8	3-3/4	PM3-54010	T4-PM3-54010	PM3-54110
5/8	5/8	2-1/2	4-5/8	PM3-54210	T4-PM3-54210	PM3-54310
5/8	5/8	3	5-1/8	PM3-54410	T4-PM3-54410	PM3-54510
5/8	5/8	4	6-1/8	PM3-54610	T4-PM3-54610	PM3-54710
3/4	3/4	1-5/8	3-7/8	PM3-54012	T4-PM3-54012	PM3-54112
3/4	3/4	2	4-1/4	PM3-54212	T4-PM3-54212	PM3-54312
3/4	3/4	2-1/4	4-1/2	PM3-54212S	T4-PM3-54212S	PM3-54312S
3/4	3/4	3	5-1/4	PM3-54412	T4-PM3-54412	PM3-54512
3/4	3/4	4	6-1/4	PM3-54612	T4-PM3-54612	PM3-54712
3/4	3/4	5	7-1/4	PM3-54612S	T4-PM3-54612S	PM3-54712S
1	1	2	4-1/2	PM3-54016	T4-PM3-54016	PM3-54116
1	1	3	5-1/2	PM3-54216	T4-PM3-54216	PM3-54316
1	1	4	6-1/2	PM3-54416	T4-PM3-54416	PM3-54516
1	1	5	7-1/2	PM3-54416S	T4-PM3-54416S	PM3-54516S
1-1/4	1-1/4	2	4-1/2	PM3-54020	T4-PM3-54020	PM3-54120
1-1/4	1-1/4	3	5-1/2	PM3-54220	T4-PM3-54220	PM3-54320
1-1/4	1-1/4	4	6-1/2	PM3-54420	T4-PM3-54420	PM3-54520
1-1/4	1-1/4	5	7-1/2	PM3-54420S	T4-PM3-54420S	PM3-54520S
1-1/4	1-1/4	6	8-1/2	PM3-54620	T4-PM3-54620	PM3-54720
1-1/2	1-1/4	2	4-1/2	PM3-54024	T4-PM3-54024	PM3-54124
1-1/2	1-1/4	3	5-1/2	PM3-54224	T4-PM3-54224	PM3-54324
1-1/2	1-1/4	4	6-1/2	PM3-54424	T4-PM3-54424	PM3-54524
1-1/2	1-1/4	6	8-1/2	PM3-54624	T4-PM3-54624	PM3-54724

Solid Carbide Endmills

Metric

Routers

Drill Mills

Powder Metal Endmills

Cobalt Endmills

HSS Endmills

Variable Helix Endmills

HPM+ Endmills

High Performance Endmills

Standard Endmills

Carbide Endmills

Solid Carbide Routers

Solid Carbide Drill Mills

Powder Metal Endmills (PM30)

Powder Metal Endmills (PM4)

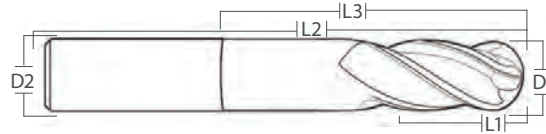
Cobalt Endmills (M42)

High Speed Steel Endmills (M7)



5,6,8 Flute Extended Neck EndMill - Center Cut

- Available in Exxtral Plus Coating - T4
- Ideal for Titanium & Stainless Steel Alloys
- Right Hand Spiral & Cut
- Weldon Flats (upon request)
- Square & Ballnose End
- Material Code Refer to Page 245 & 246.



PM30	5,6,8 Flutes		Exxtral Plus®	Exxtral Plus® is ideal for high performance machining of hard materials.
-------------	------------------------	--	----------------------	--

RIGHT HAND - Extended Neck - 5 Flute

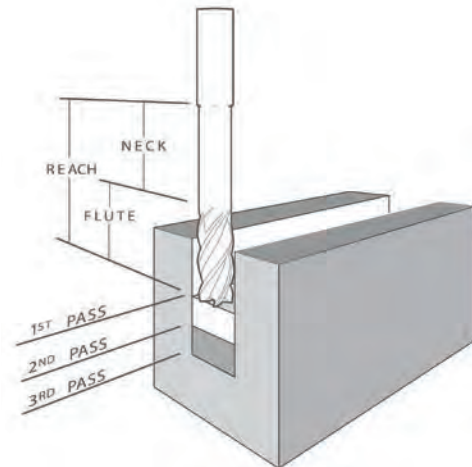
D1 Cutting Dia	D2 Shank Dia	L1 LOC	L3 REACH	L2 OAL	Uncoated	AITiN Exxtral Plus Coated	Ball End Uncoated
1/2	1/2	1-1/4	4	6	PM3-54A08S.4Y	T4-PM3-54A08S.4Y	PM3-54B08S.4Y
5/8	5/8	1-1/2	5	7-1/8	PM3-54A10S.5Y	T4-PM3-54A10S.5Y	PM3-54B10S.5Y
3/4	3/4	1-1/2	4	6-1/4	PM3-54A12S.4Y	T4-PM3-54A12S.4Y	PM3-54B12S.4Y
3/4	3/4	1-3/4	5	7-1/4	PM3-54A12S.5Y	T4-PM3-54A12S.5Y	PM3-54B12S.5Y
3/4	3/4	2	6	8-1/4	PM3-54A12S.6Y	T4-PM3-54A12S.6Y	PM3-54B12S.6Y
1	1	2	4	6-1/2	PM3-54A16S.4Y	T4-PM3-54A16S.4Y	PM3-54B16S.4Y
1	1	2-1/2	6	8-1/2	PM3-54A16S.6Y	T4-PM3-54A16S.6Y	PM3-54B16S.6Y
1	1	3	8	10-1/2	PM3-54A16S.8Y	T4-PM3-54A16S.8Y	PM3-54B16S.8Y
1	1	3-1/2	10	12-1/2	PM3-54A16S.10Y	T4-PM3-54A16S.10Y	PM3-54B16S.10Y

RIGHT HAND - Extended Neck - 6 Flute

D1 Cutting Dia	D2 Shank Dia	L1 LOC	L3 REACH	L2 OAL	Uncoated	AITiN Exxtral Plus Coated	Ball End Uncoated
1-1/4	1-1/4	2	4	6-1/2	PM3-54A20S.04X	T4-PM3-54A20S.04X	PM3-54B20S.04X
1-1/4	1-1/4	2-1/2	6	8-1/2	PM3-54A20S.06X	T4-PM3-54A20S.06X	PM3-54B20S.06X
1-1/4	1-1/4	3	8	10-1/2	PM3-54A20S.08X	T4-PM3-54A20S.08X	PM3-54B20S.08X
1-1/4	1-1/4	3-1/2	10	12-1/2	PM3-54A20S.10X	T4-PM3-54A20S.10X	PM3-54B20S.10X
2	2	2	4	7-3/4	PM3-68A32S.4	T4-PM3-68A32S.4	PM3-68B32S.4
2	2	2-1/2	6	9-3/4	PM3-68A32S.6	T4-PM3-68A32S.6	PM3-68B32S.6
2	2	3	8	11-3/4	PM3-68A32S.8	T4-PM3-68A32S.8	PM3-68B32S.8

RIGHT HAND - Extended Neck - 8 Flute

D1 Cutting Dia	D2 Shank Dia	L1 LOC	L3 REACH	L2 OAL	Uncoated	AITiN Exxtral Plus Coated	Ball End Uncoated
2	2	2	4	7-3/4	PM3-88A32S.4	T4-PM3-88A32S.4	PM3-88B32S.4
2	2	2-1/2	6	9-3/4	PM3-88A32S.6	T4-PM3-88A32S.6	PM3-88B32S.6
2	2	3	8	11-3/4	PM3-88A32S.8	T4-PM3-88A32S.8	PM3-88B32S.8



Variable Helix Endmills

HPM+ Endmills

High Performance Endmills

Standard Endmills

Carbide Endmills

Solid Carbide Routers

Solid Carbide Drill Mills

Powder Metal (PM30) Endmills

Powder Metal (PM4) Endmills

Cobalt (M42) Endmills

High Speed Steel (M7) Endmills

Solid Carbide Endmills

Metric

Routers

Drill Mills

Powder Metal Endmills

Cobalt Endmills

HSS Endmills

Solid Carbide Endmills

Variable Helix Endmills

HPM+ Endmills

High Performance Endmills

Standard Endmills

Metric

Carbide Endmills

Routers

Solid Carbide Routers

Drill Mills

Solid Carbide Drill Mills

Powder Metal Endmills

Powder Metal (PM30) Endmills

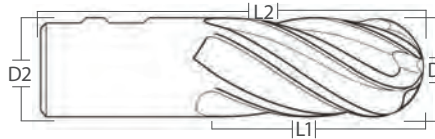
Powder Metal (PM4) Endmills

Cobalt Endmills

Cobalt (M42) Endmills

HSS Endmills

High Speed Steel (M7) Endmills



6 Flute Finisher EndMill - Center Cut

- Available in Exxtral Plus Coating - T4
- Ideal for Titanium & Stainless Steel Alloys
- Right Hand Spiral & Cut
- Weldon Flats
- Square & Ballnose End
- Material Code Refer to Page 245 & 246.



PM30

6
Flutes

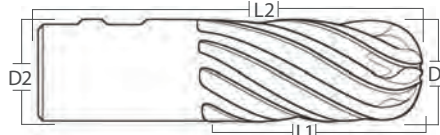
35°

Exxtral Plus®

Exxtral Plus® is ideal for high performance machining of hard materials.

RIGHT HAND

D1	D2	L1	L2		AlTiN	
Cutting Dia	Shank Dia	LOC	OAL	Uncoated	Exxtral Plus Coated	Ball End Uncoated
1/2	1/2	1-1/4	3-1/4	PM3-54008X	T4-PM3-54008X	PM3-54108X
1/2	1/2	2	4	PM3-54208X	T4-PM3-54208X	PM3-54308X
1/2	1/2	3	5	PM3-54408X	T4-PM3-54408X	PM3-54508X
3/4	3/4	1-5/8	3-7/8	PM3-54012X	T4-PM3-54012X	PM3-54112X
3/4	3/4	2	4-1/4	PM3-54212X	T4-PM3-54212X	PM3-54312X
3/4	3/4	3	5-1/4	PM3-54412X	T4-PM3-54412X	PM3-54512X
3/4	3/4	4	6-1/4	PM3-54612X	T4-PM3-54612X	PM3-54712X
1	1	2	4-1/2	PM3-54016X	T4-PM3-54016X	PM3-54116X
1	1	3	5-1/2	PM3-54216X	T4-PM3-54216X	PM3-54316X
1	1	4	6-1/2	PM3-54416X	T4-PM3-54416X	PM3-54516X
1	1	5	7-1/2	PM3-54416SX	T4-PM3-54416SX	PM3-54516SX
1	1	6	8-1/2	PM3-54616X	T4-PM3-54616X	PM3-54716X
1-1/4	1-1/4	2	4-1/2	PM3-54020X	T4-PM3-54020X	PM3-54120X
1-1/4	1-1/4	3	5-1/2	PM3-54220X	T4-PM3-54220X	PM3-54320X
1-1/4	1-1/4	4	6-1/2	PM3-54420X	T4-PM3-54420X	PM3-54520X
1-1/4	1-1/4	5	7-1/2	PM3-54420SX	T4-PM3-54420SX	PM3-54520SX
1-1/4	1-1/4	6	8-1/2	PM3-54620X	T4-PM3-54620X	PM3-54720X
1-1/2	1-1/4	2	4-1/2	PM3-54024X	T4-PM3-54024X	PM3-54124X
1-1/2	1-1/4	3	5-1/2	PM3-54224X	T4-PM3-54224X	PM3-54324X
1-1/2	1-1/4	4	6-1/2	PM3-54424X	T4-PM3-54424X	PM3-54524X
1-1/2	1-1/4	6	8-1/2	PM3-54624X	T4-PM3-54624X	PM3-54724X
2	1-1/4	2	4-1/2	PM3-54032X	T4-PM3-54032X	PM3-54132X
2	1-1/4	3	5-1/2	PM3-54232X	T4-PM3-54232X	PM3-54332X
2	1-1/4	4	6-1/2	PM3-54432X	T4-PM3-54432X	PM3-54532X
2	2	4	7-3/4	PM3-68004A	T4-PM3-68004A	T4-PM3-68104A
2	2	6	9-3/4	PM3-68006A	T4-PM3-68006A	T4-PM3-68106A
2	2	8	11-3/4	PM3-68008A	T4-PM3-68008A	T4-PM3-68108A
2	2	10	13-3/4	PM3-68010A	T4-PM3-68010A	T4-PM3-68110A
2	2	12	15-3/4	PM3-68012A	T4-PM3-68012A	T4-PM3-68112A



8 Flute Finisher EndMill - Center Cut

- Available in Exxtral Plus Coating - T4
- Ideal for Titanium & Stainless Steel Alloys
- Right Hand Spiral & Cut
- Weldon Flats
- Square & Ballnose End
- Material Code Refer to Page 245 & 246.

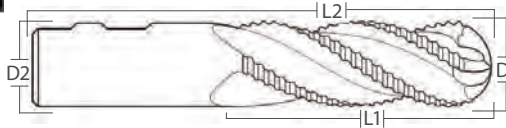
P M K S H

PM30	8 Flutes		Exxtral Plus®	Exxtral Plus® is ideal for high performance machining of hard materials.
-------------	--------------------	--	----------------------	--

RIGHT HAND

D1	D2	L1	L2	AlTiN		
Cutting Dia	Shank Dia	LOC	OAL	Uncoated	Exxtral Plus Coated	Ball End Uncoated
2	2	4	7-3/4	PM3-88004A	T4-PM3-88004A	PM3-88104A
2	2	6	9-3/4	PM3-88006A	T4-PM3-88006A	PM3-88106A
2	2	8	11-3/4	PM3-88008A	T4-PM3-88008A	PM3-88108A
2	2	10	13-3/4	PM3-88010A	T4-PM3-88010A	PM3-88110A
2	2	12	15-3/4	PM3-88012A	T4-PM3-88012A	PM3-88112A

Variable Helix Endmills	Solid Carbide Endmills
HPM+ Endmills	
High Performance Endmills	
Standard Endmills	
Carbide Endmills	Metric
Solid Carbide Routers	Routers
Solid Carbide Drill Mills	Drill Mills
Powder Metal (PM30) Endmills	Powder Metal Endmills
Powder Metal (PM4) Endmills	
Cobalt (M42) Endmills	Cobalt Endmills
High Speed Steel (M7) Endmills	HSS Endmills



Multi Flute Coarse Pitch Rougher - Center Cut

- Available in Exxtral Plus Coating - T4
- Ideal for Titanium & Stainless Steel Alloys
- Right Hand Spiral & Cut
- Weldon Flats
- Square & Ballnose End
- Material Code Refer to Page 245 & 246.

P M K S H

PM30

4,5,6,8
Flutes

30°

Rougher

Exxtral Plus®

Exxtral Plus® is ideal for high performance machining of hard materials.

RIGHT HAND - 4 Flute

	D1 Cutting Dia	D2 Shank Dia	L1 LOC	L2 OAL	AITiN		
					Uncoated	Exxtral Plus Coated	Ball End Uncoated
Metric	1/2	1/2	1/2	2-9/16	PM3-R554008	T4-PM3-R554008	PM3-R554108
	1/2	1/2	1-1/4	3-1/4	PM3-R54008	T4-PM3-R54008	PM3-R54108
	1/2	1/2	2	4	PM3-R54208	T4-PM3-R54208	PM3-R54308
	1/2	1/2	3	5	PM3-R54408	T4-PM3-R54408	PM3-R54508
	5/8	5/8	1-5/8	3-3/4	PM3-R54010	T4-PM3-R54010	PM3-R54110
	5/8	5/8	2-1/2	4-5/8	PM3-R54210	T4-PM3-R54210	PM3-R54310
	3/4	3/4	3/4	3	PM3-R554012	T4-PM3-R554012	PM3-R554112
	3/4	3/4	1-5/8	3-7/8	PM3-R54012	T4-PM3-R54012	PM3-R54112
Routers	3/4	3/4	2-1/4	4-1/2	PM3-R54212S	T4-PM3-R54212S	PM3-R54312S
	3/4	3/4	3	5-1/4	PM3-R54412	T4-PM3-R54412	PM3-R54512
	3/4	3/4	4	6-1/4	PM3-R54612	T4-PM3-R54612	PM3-R54712
	3/4	3/4	4	6-1/4	PM3-R54612	T4-PM3-R54612	PM3-R54712

RIGHT HAND - 5 Flute

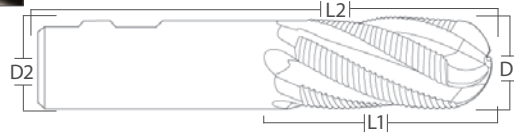
	D1 Cutting Dia	D2 Shank Dia	L1 LOC	L2 OAL	AITiN		
					Uncoated	Exxtral Plus Coated	Ball End Uncoated
Drill Mills	1	1	1	3-7/8	PM3-R554016Y	T4-PM3-R554016Y	PM3-R554116Y
	1	1	2	4-1/2	PM3-R54016Y	T4-PM3-R54016Y	PM3-R54116Y
	1	1	3	5-1/2	PM3-R54216Y	T4-PM3-R54216Y	PM3-R54316Y
	1	1	4	6-1/2	PM3-R54416Y	T4-PM3-R54416Y	PM3-R54516Y
	1	1	5	7-1/2	PM3-R54416SY	T4-PM3-R54416SY	PM3-R54516SY
	1	1	6	8-1/2	PM3-R54616Y	T4-PM3-R54616Y	PM3-R54716Y

RIGHT HAND - 6 Flute

	D1 Cutting Dia	D2 Shank Dia	L1 LOC	L2 OAL	AITiN		
					Uncoated	Exxtral Plus Coated	Ball End Uncoated
Powder Metal Endmills	1-1/4	1-1/4	2	4-1/2	PM3-R54020X	T4-PM3-R54020X	PM3-R54120X
	1-1/4	1-1/4	3	5-1/2	PM3-R54220X	T4-PM3-R54220X	PM3-R54320X
	1-1/4	1-1/4	4	6-1/2	PM3-R54420X	T4-PM3-R54420X	PM3-R54520X
	1-1/4	1-1/4	5	7-1/2	PM3-R54420SX	T4-PM3-R54420SX	PM3-R54520SX
	1-1/4	1-1/4	6	8-1/2	PM3-R54620X	T4-PM3-R54620X	PM3-R54720X
	1-1/2	1-1/4	2	4-1/2	PM3-R54024X	T4-PM3-R54024X	PM3-R54124X
	1-1/2	1-1/4	3	5-1/2	PM3-R54224X	T4-PM3-R54224X	PM3-R54324X
	1-1/2	1-1/4	4	6-1/2	PM3-R54424X	T4-PM3-R54424X	PM3-R54524X
	1-1/2	1-1/4	6	8-1/2	PM3-R54624X	T4-PM3-R54624X	PM3-R54724X

RIGHT HAND - 8 Flute

	D1 Cutting Dia	D2 Shank Dia	L1 LOC	L2 OAL	AITiN		
					Uncoated	Exxtral Plus Coated	Ball End Uncoated
HSS Endmills	2	1-1/4	2	4-1/2	PM3-R54032Z	T4-PM3-R54032Z	PM3-R54132Z
	2	2	4	7-3/4	PM3-R88004A	T4-PM3-R88004A	PM3-R88104A
	2	2	6	9-3/4	PM3-R88006A	T4-PM3-R88006A	PM3-R88106A
	2	2	8	11-3/4	PM3-R88008A	T4-PM3-R88008A	PM3-R88108A
	2	2	10	13-3/4	PM3-R88010A	T4-PM3-R88010A	PM3-R88110A
	2	2	12	15-3/4	PM3-R88012A	T4-PM3-R88012A	PM3-R88112A



Multi Flute Fine Pitch Rougher - Center Cut

- Available in Exxtral Plus Coating - T4
- Ideal for Titanium & Stainless Steel Alloys
- Right Hand Spiral & Cut
- Weldon Flats
- Square & Ballnose End
- Material Code Refer to Page 245 & 246.



PM30	4,5,6,8 Flutes	30°	Rougher	Exxtral Plus®
-------------	--------------------------	-----	---------	----------------------

Exxtral Plus® is ideal for high performance machining of hard materials.

RIGHT HAND - 4 Flute

D1 Cutting Dia	D2 Shank Dia	L1 LOC	L2 OAL	Uncoated	AITiN Exxtral Plus Coated	Ball End Uncoated
1/2	1/2	1/2	2-9/16	PM3-F554008	T4-PM3-F554008	PM3-F554108
1/2	1/2	1-1/4	3-1/4	PM3-F54008	T4-PM3-F54008	PM3-F54108
1/2	1/2	2	4	PM3-F54208	T4-PM3-F54208	PM3-F54308
1/2	1/2	3	5	PM3-F54408	T4-PM3-F54408	PM3-F54508
5/8	5/8	1-5/8	3-3/4	PM3-F54010	T4-PM3-F54010	PM3-F54110
5/8	5/8	2-1/2	4-5/8	PM3-F54210	T4-PM3-F54210	PM3-F54310
3/4	3/4	3/4	3	PM3-F554012	T4-PM3-F554012	PM3-F554112
3/4	3/4	1-5/8	3-7/8	PM3-F54012	T4-PM3-F54012	PM3-F54112
3/4	3/4	2-1/4	4-1/2	PM3-F54212S	T4-PM3-F54212S	PM3-F54312S
3/4	3/4	3	5-1/4	PM3-F54412	T4-PM3-F54412	PM3-F54512
3/4	3/4	4	6-1/4	PM3-F54612	T4-PM3-F54612	PM3-F54712

RIGHT HAND - 5 Flute

D1 Cutting Dia	D2 Shank Dia	L1 LOC	L2 OAL	Uncoated	AITiN Exxtral Plus Coated	Ball End Uncoated
1	1	1	3-7/8	PM3-F554016Y	T4-PM3-F554016Y	PM3-F554116Y
1	1	2	4-1/2	PM3-F54016Y	T4-PM3-F54016Y	PM3-F54116Y
1	1	3	5-1/2	PM3-F54216Y	T4-PM3-F54216Y	PM3-F54316Y
1	1	4	6-1/2	PM3-F54416Y	T4-PM3-F54416Y	PM3-F54516Y
1	1	5	7-1/2	PM3-F54416SY	T4-PM3-F54416SY	PM3-F54516SY
1	1	6	8-1/2	PM3-F54616Y	T4-PM3-F54616Y	PM3-F54716Y

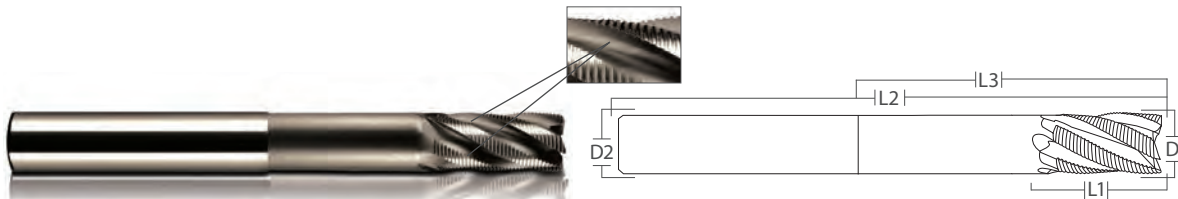
RIGHT HAND - 6 Flute

D1 Cutting Dia	D2 Shank Dia	L1 LOC	L2 OAL	Uncoated	AITiN Exxtral Plus Coated	Ball End Uncoated
1-1/4	1-1/4	2	4-1/2	PM3-F54020X	T4-PM3-F54020X	PM3-F54120X
1-1/4	1-1/4	3	5-1/2	PM3-F54220X	T4-PM3-F54220X	PM3-F54320X
1-1/4	1-1/4	4	6-1/2	PM3-F54420X	T4-PM3-F54420X	PM3-F54520X
1-1/4	1-1/4	5	7-1/2	PM3-F54420SX	T4-PM3-F54420SX	PM3-F54520SX
1-1/4	1-1/4	6	8-1/2	PM3-F54620X	T4-PM3-F54620X	PM3-F54720X
1-1/2	1-1/4	2	4-1/2	PM3-F54024X	T4-PM3-F54024X	PM3-F54124X
1-1/2	1-1/4	3	5-1/2	PM3-F54224X	T4-PM3-F54224X	PM3-F54324X
1-1/2	1-1/4	4	6-1/2	PM3-F54424X	T4-PM3-F54424X	PM3-F54524X
1-1/2	1-1/4	6	8-1/2	PM3-F54624X	T4-PM3-F54624X	PM3-F54724X

RIGHT HAND - 8 Flute

D1 Cutting Dia	D2 Shank Dia	L1 LOC	L2 OAL	Uncoated	AITiN Exxtral Plus Coated	Ball End Uncoated
2	1-1/4	2	4-1/2	PM3-F54032Z	T4-PM3-F54032Z	PM3-F54132Z
2	2	4	7-3/4	PM3-F88004A	T4-PM3-F88004A	PM3-F88104A
2	2	6	9-3/4	PM3-F88006A	T4-PM3-F88006A	PM3-F88106A
2	2	8	11-3/4	PM3-F88008A	T4-PM3-F88008A	PM3-F88108A
2	2	10	13-3/4	PM3-F88010A	T4-PM3-F88010A	PM3-F88110A
2	2	12	15-3/4	PM3-F88012A	T4-PM3-F88012A	PM3-F88112A

Variable Helix Endmills	HPM+ Endmills	High Performance Endmills	Standard Endmills	Solid Carbide Endmills
Endmills	Endmills	Endmills	Endmills	
				Metric Carbide Endmills
				Routers Solid Carbide Routers
				Drill Mills Solid Carbide Drill Mills
				Powder Metal Endmills (PM30) Endmills
				Powder Metal Endmills (PM4) Endmills
				Cobalt Endmills (M42) Endmills
				HSS Endmills High Speed Steel (M7) Endmills



Multi Flute EndMill Extended Neck Fine Pitch

- Available in Exxtral Plus Coating - T4
- Ideal for Titanium & Stainless Steel Alloys
- Right Hand Spiral & Cut
- Weldon Flats (upon request)
- Square & Ballnose End
- Material Code Refer to Page 245 & 246.

P M K S H

PM30	5,6,8 Flutes	30°	Rougher	Exxtral Plus®
-------------	------------------------	-----	---------	----------------------

Exxtral Plus® is ideal for high performance machining of hard materials.

RIGHT HAND - Extended Neck - 5 Flute

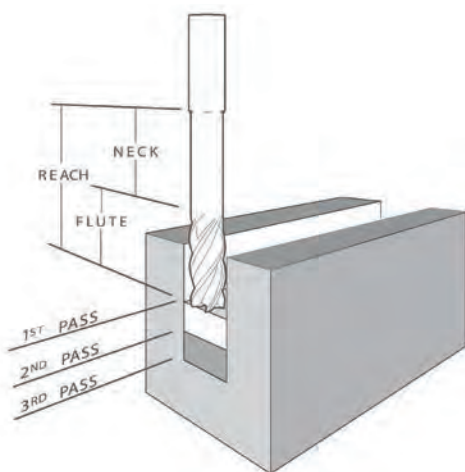
D1 Cutting Dia	D2 Shank Dia	L1 LOC	L3 REACH	L2 OAL	Uncoated	AITIN Exxtral Plus Coated	Ball End Uncoated
3/4	3/4	1-1/2	4	6-1/4	PM3-F54A12S.4Y	T4-PM3-F54A12S.4Y	PM3-F54B12S.4Y
3/4	3/4	1-3/4	5	7-1/4	PM3-F54A12S.5Y	T4-PM3-F54A12S.5Y	PM3-F54B12S.5Y
3/4	3/4	2	6	8-1/4	PM3-F54A12S.6Y	T4-PM3-F54A12S.6Y	PM3-F54B12S.6Y
1	1	2	4	6-1/2	PM3-F54A16S.4Y	T4-PM3-F54A16S.4Y	PM3-F54B16S.4Y
1	1	2-1/2	6	8-1/2	PM3-F54A16S.6Y	T4-PM3-F54A16S.6Y	PM3-F54B16S.6Y
1	1	3	8	10-1/2	PM3-F54A16S.8Y	T4-PM3-F54A16S.8Y	PM3-F54B16S.8Y
1	1	3	10	12-1/2	PM3-F54A16S.10Y	T4-PM3-F54A16S.10Y	PM3-F54B16S.10Y

Right Hand - Extended Neck - 6 Flute

D1 Cutting Dia	D2 Shank Dia	L1 LOC	L3 REACH	L2 OAL	Uncoated	AITIN Exxtral Plus Coated	Ball End Uncoated
1-1/4	1-1/4	2	4	6-1/2	PM3-F54A20S.4X	T4-PM3-F54A20S.4X	PM3-F54B20S.4X
1-1/4	1-1/4	2-1/2	6	8-1/2	PM3-F54A20S.6X	T4-PM3-F54A20S.6X	PM3-F54B20S.6X
1-1/2	1-1/4	2	4	6-1/2	PM3-F54A24S.4X	T4-PM3-F54A24S.4X	PM3-F54B24S.4X
1-1/2	1-1/4	2-1/2	6	8-1/2	PM3-F54A24S.6X	T4-PM3-F54A24S.6X	PM3-F54B24S.6X
1-1/2	1-1/4	3	8	10-1/2	PM3-F54A24S.8X	T4-PM3-F54A24S.8X	PM3-F54B24S.8X
2	2	2	4	7-3/4	PM3-F68A32S.4	T4-PM3-F68A32S.4	PM3-F68B32S.4
2	2	2-1/2	6	9-3/4	PM3-F68A32S.6	T4-PM3-F68A32S.6	PM3-F68B32S.6
2	2	3	8	11-3/4	PM3-F68A32S.8	T4-PM3-F68A32S.8	PM3-F68B32S.8

RIGHT HAND - Extended Neck - 8 Flute

D1 Cutting Dia	D2 Shank Dia	L1 LOC	L3 REACH	L2 OAL	Uncoated	AITIN Exxtral Plus Coated	Ball End Uncoated
2	2	2	4	7-3/4	PM3-F88A32S.4	T4-PM3-F88A32S.4	PM3-F88B32S.4
2	2	2-1/2	6	9-3/4	PM3-F88A32S.6	T4-PM3-F88A32S.6	PM3-F88B32S.6
2	2	3	8	11-3/4	PM3-F88A32S.8	T4-PM3-F88A32S.8	PM3-F88B32S.8



Solid Carbide Endmills

Metric

Routers

Drill Mills

Powder Metal Endmills

Cobalt Endmills

HSS Endmills

Variable Helix Endmills
HPM+ Endmills
High Performance Endmills
Standard Endmills

Carbide Endmills

Solid Carbide Routers

Solid Carbide Drill Mills

Powder Metal Endmills (PM30)

Powder Metal Endmills (PM4)

Cobalt Endmills (M42)

High Speed Steel Endmills (M7)

POWDERMETAL

POLVOMETÁLICO

ADVANTAGES OF POWDER METAL

Powder Metal allows for close tolerances, net shaping and high production rates. It also gives the user considerable higher-cutting edge stability, because of its ability to eliminate pocket holes. This increases the possibilities of a longer tool life and the use of higher speeds and feeds, which results in lower production costs in the long-run.

- Higher feeds and speeds
- Longer tool life
- Higher-cutting edge stability
- Best substrate for PVD-coating

Español

VENTAJAS DE POLVO METÁLICO

El Polvo Metálico permite tolerancias estrechas, alta tasas de producción y formación. También le da al usuario mayor estabilidad en los bordes de corte debido a su capacidad de eliminar orificios de bolsillo. Esto aumenta las posibilidades de una vida mas larga de la herramienta lo cual resulta en costos reducidos de producción en el largo plazo

- Velocidades y avances superior
- Herramienta de mayor duración
- Mayor filo y estabilidad
- El mejor sustrato para el recubrimiento de PVD

Powder Metal is made with many small particles that are pressured at up to 10-50 tons per square inch, to eliminate pocket holes. This process removes air and space between the particles which creates a high wear-resistance tool.

Español

Polvo Metálico se realiza con muchas partículas pequeñas que son presionados con hasta 10-50 toneladas por pulgada cuadrada para eliminar orificios de bolsillo. Este proceso elimina aire y el espacio entre las partículas lo que crea una alta resistencia al desgaste de la herramienta.

Powder Metal has superior toughness, high wear-resistance and hot hardness.

Español

Polvo Metálico tiene tenacidad superior, alta resistencia al desgaste y dureza en caliente.



Microstructure Differences

Microestructura Diferencias



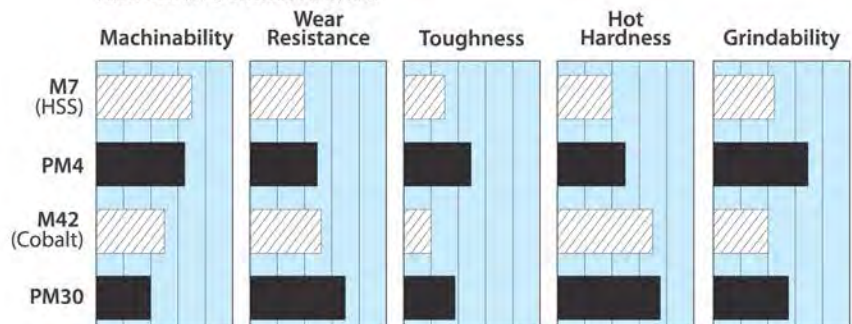
Conventional
Convencional

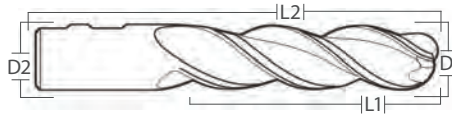


Powder Metal
Polvo de Metálico

COMPARATIVE PROPERTIES

PROPIEDADES COMPARATIVAS





3 Flute Finishing EndMill - Center Cut

- Z-Power (ZrN) recommended (up to 25% faster)
- Ideal for Aluminum Alloys
- Right Hand Spiral & Cut
- Weldon Flats
- Square & Ballnose End
- Material Code Refer to Page 245 & 246.



PM4

3
Flutes

37°

Z
Power®

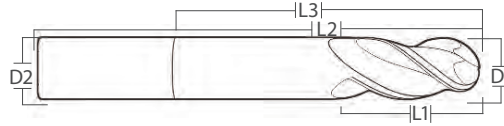
Z-Power® has excellent corrosion and adhesion resistant properties.

Speeds and Feeds Refer to Page 207.

RIGHT HAND

	D1	D2	L1	L2		ZrN		
	Cutting Dia	Shank Dia	LOC	OAL	Uncoated	Z-Power Coated	Ball End Uncoated	
Variable Helix Endmills	1/2	1/2	1-1/4	3-1/4	PM-33008	T6-PM-33008	PM-33108	
	1/2	1/2	2	4	PM-33208	T6-PM-33208	PM-33308	
	1/2	1/2	3	5	PM-33408	T6-PM-33408	PM-33508	
	1/2	1/2	4	6	PM-33608	T6-PM-33608	PM-33708	
HPM+ Endmill	5/8	5/8	1-5/8	3-3/4	PM-33010	T6-PM-33010	PM-33110	
	5/8	5/8	2-1/2	4-5/8	PM-33210	T6-PM-33210	PM-33310	
	5/8	5/8	3	5-1/8	PM-33410	T6-PM-33410	PM-33510	
	5/8	5/8	4	6-1/8	PM-33610	T6-PM-33610	PM-33710	
	5/8	5/8	6	8-1/8	PM-33610S	T6-PM-33610S	PM-33710S	
	High Performance Endmills	3/4	3/4	1-5/8	3-7/8	PM-33012	T6-PM-33012	PM-33112
3/4		3/4	2	4-1/4	PM-33212	T6-PM-33212	PM-33312	
3/4		3/4	2-1/4	4-1/2	PM-33212S	T6-PM-33212S	PM-33312S	
3/4		3/4	3	5-1/4	PM-33412	T6-PM-33412	PM-33512	
3/4		3/4	4	6-1/4	PM-33612	T6-PM-33612	PM-33712	
3/4		3/4	6	8-1/4	PM-33612S	T6-PM-33612S	PM-33712S	
3/4		3/4	8	10-1/4	PM-33812	T6-PM-33812	PM-33912	
Standard Endmills		1	1	2	4-1/2	PM-33016	T6-PM-33016	PM-33116
	1	1	3	5-1/2	PM-33216	T6-PM-33216	PM-33316	
	1	1	4	6-1/2	PM-33416	T6-PM-33416	PM-33516	
	1	1	5	7-1/2	PM-33416S	T6-PM-33416S	PM-33516S	
	1	1	6	8-1/2	PM-33616	T6-PM-33616	PM-33716	
	1	1	7	9-1/2	PM-33616S	T6-PM-33616S	PM-33716S	
	1	1	8	10-1/2	PM-33816	T6-PM-33816	PM-33916	
	1	1	10	12-1/2	PM-33816S	T6-PM-33816S	PM-33916S	
	Carbide Endmills	1-1/4	1-1/4	2	4-1/2	PM-33020	T6-PM-33020	PM-33120
		1-1/4	1-1/4	3	5-1/2	PM-33220	T6-PM-33220	PM-33320
1-1/4		1-1/4	4	6-1/2	PM-33420	T6-PM-33420	PM-33520	
1-1/4		1-1/4	5	7-1/2	PM-33420S	T6-PM-33420S	PM-33520S	
1-1/4		1-1/4	6	8-1/2	PM-33620	T6-PM-33620	PM-33720	
1-1/4		1-1/4	7	9-1/2	PM-33620S	T6-PM-33620S	PM-33720S	
1-1/4		1-1/4	8	10-1/2	PM-33820	T6-PM-33820	PM-33920	
1-1/4		1-1/4	10	12-1/2	PM-33820S	T6-PM-33820S	PM-33920S	
Metric Endmills		1-1/2	1-1/4	2	4-1/2	PM-33024	T6-PM-33024	PM-33124
		1-1/2	1-1/4	3	5-1/2	PM-33224	T6-PM-33224	PM-33324
		1-1/2	1-1/4	4	6-1/2	PM-33424	T6-PM-33424	PM-33524
		1-1/2	1-1/4	5	7-1/2	PM-33424S	T6-PM-33424S	PM-33524S
		1-1/2	1-1/4	6	8-1/2	PM-33624	T6-PM-33624	PM-33724
		1-1/2	1-1/4	7	9-1/2	PM-33624S	T6-PM-33624S	PM-33724S
	1-1/2	1-1/4	8	10-1/2	PM-33824	T6-PM-33824	PM-33924	
	Routers	2	1-1/4	2	4-1/2	PM-33032	T6-PM-33032	PM-33132
2		1-1/4	3	5-1/2	PM-33232	T6-PM-33232	PM-33332	
2		1-1/4	4	6-1/2	PM-33432	T6-PM-33432	PM-33532	
2		1-1/4	5	7-1/2	PM-33432S	T6-PM-33432S	PM-33532S	
2		1-1/4	6	8-1/2	PM-33632	T6-PM-33632	PM-33732	
2		1-1/4	7	9-1/2	PM-33632S	T6-PM-33632S	PM-33732S	
2		1-1/4	8	10-1/2	PM-33832	T6-PM-33832	PM-33932	
Solid Carbide Routers		2	2	2	5-3/4	PM-37002A	T6-PM-37002A	PM-37102A
		2	2	3	6-3/4	PM-37003A	T6-PM-37003A	PM-37103A
		2	2	4	7-3/4	PM-37004A	T6-PM-37004A	PM-37104A
	2	2	5	8-3/4	PM-37005A	T6-PM-37005A	PM-37105A	
	2	2	6	9-3/4	PM-37006A	T6-PM-37006A	PM-37106A	
	2	2	8	11-3/4	PM-37008A	T6-PM-37008A	PM-37108A	
	2	2	10	13-3/4	PM-37010A	T6-PM-37010A	PM-37110A	
	2	2	12	15-3/4	PM-37012A	T6-PM-37012A	PM-37112A	
Powder Metal Endmills (PM30)	2	2	2	5-3/4	PM-37002A	T6-PM-37002A	PM-37102A	
	2	2	3	6-3/4	PM-37003A	T6-PM-37003A	PM-37103A	
	2	2	4	7-3/4	PM-37004A	T6-PM-37004A	PM-37104A	
	2	2	5	8-3/4	PM-37005A	T6-PM-37005A	PM-37105A	
	2	2	6	9-3/4	PM-37006A	T6-PM-37006A	PM-37106A	
	2	2	8	11-3/4	PM-37008A	T6-PM-37008A	PM-37108A	
	2	2	10	13-3/4	PM-37010A	T6-PM-37010A	PM-37110A	
	2	2	12	15-3/4	PM-37012A	T6-PM-37012A	PM-37112A	
	Powder Metal Endmills (PM4)	2	2	2	5-3/4	PM-37002A	T6-PM-37002A	PM-37102A
		2	2	3	6-3/4	PM-37003A	T6-PM-37003A	PM-37103A
2		2	4	7-3/4	PM-37004A	T6-PM-37004A	PM-37104A	
2		2	5	8-3/4	PM-37005A	T6-PM-37005A	PM-37105A	
2		2	6	9-3/4	PM-37006A	T6-PM-37006A	PM-37106A	
2		2	8	11-3/4	PM-37008A	T6-PM-37008A	PM-37108A	
Cobalt Endmills (M42)	2	2	10	13-3/4	PM-37010A	T6-PM-37010A	PM-37110A	
	2	2	12	15-3/4	PM-37012A	T6-PM-37012A	PM-37112A	
	High Speed Steel Endmills (M7)	2	2	2	5-3/4	PM-37002A	T6-PM-37002A	PM-37102A
		2	2	3	6-3/4	PM-37003A	T6-PM-37003A	PM-37103A
2		2	4	7-3/4	PM-37004A	T6-PM-37004A	PM-37104A	
2		2	5	8-3/4	PM-37005A	T6-PM-37005A	PM-37105A	
2		2	6	9-3/4	PM-37006A	T6-PM-37006A	PM-37106A	
2		2	8	11-3/4	PM-37008A	T6-PM-37008A	PM-37108A	

*Available 2-1/2" & 3" Sizes Upon Request



3 Flute Finishing EndMill - Aluminum Alloys

- Z-Power (ZrN) recommended (up to 25% faster)
- Ideal for Aluminum Alloys
- Right Hand Spiral & Cut
- Weldon Flats (upon request)
- Square & Ballnose End
- Material Code Refer to Page 245 & 246.

N

PM4

3
Flutes

37°

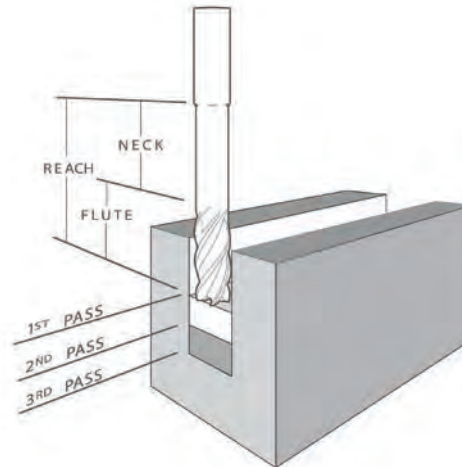
Z Power®

Z-Power® has excellent corrosion and adhesion resistant properties.

Speeds and Feeds Refer to Page 207.

RIGHT HAND - Extended Neck

D1 Cutting Dia	D2 Shank Dia	L1 LOC	L3 REACH	L2 OAL	Uncoated	ZrN Z-Power Coated	Ball End Uncoated
1/2	1/2	1-1/4	4	6	PM-39A08S	T6-PM-39A08S	PM-39B08S
5/8	5/8	1-1/2	5	7-1/8	PM-39A10S	T6-PM-39A10S	PM-39B10S
3/4	3/4	1-1/2	4	6-1/4	PM-39A12S.4	T6-PM-39A12S.4	PM-39B12S.4
3/4	3/4	1-3/4	5	7-1/4	PM-39A12S.5	T6-PM-39A12S.5	PM-39B12S.5
3/4	3/4	2	6	8-1/4	PM-39A12S	T6-PM-39A12S	PM-39B12S
1	1	1	2	4-1/2	PM-39A16S.2	T6-PM-39A16S.2	PM-39B16S.2
1	1	1-1/2	3	5-1/2	PM-39A16S.3	T6-PM-39A16S.3	PM-39B16S.3
1	1	2	4	6-1/2	PM-39A16S.4	T6-PM-39A16S.4	PM-39B16S.4
1	1	2-1/2	6	8-1/2	PM-39A16S.6	T6-PM-39A16S.6	PM-39B16S.6
1	1	2-3/4	7	9-1/2	PM-39A16S.7	T6-PM-39A16S.7	PM-39B16S.7
1	1	3	8	10-1/2	PM-39A16S	T6-PM-39A16S	PM-39B16S
1-1/4	1-1/4	1-1/2	3	5-1/2	PM-39A20S.3	T6-PM-39A20S.3	PM-39B20S.3
1-1/4	1-1/4	2	4	6-1/2	PM-39A20S.4	T6-PM-39A20S.4	PM-39B20S.4
1-1/4	1-1/4	2-1/2	6	8-1/2	PM-39A20S.6	T6-PM-39A20S.6	PM-39B20S.6
1-1/4	1-1/4	2-3/4	7	9-1/2	PM-39A20S.7	T6-PM-39A20S.7	PM-39B20S.7
1-1/4	1-1/4	3	8	10-1/2	PM-39A20S.8	T6-PM-39A20S.8	PM-39B20S.8
1-1/4	1-1/4	3-1/2	10	12-1/2	PM-39A20S	T6-PM-39A20S	PM-39B20S



	3 Flute PM4 EndMills for Aluminum - Speed & Feed Data					
	Uncoated - SFM Surface Feet per Minute			Feed / Tooth From 1/2" to 2"		
	Finish	Rough	Truncated	Finish	Rough	Truncated
Aluminum Alloys Wrought, Solution Treated, Aged as Cast	300 - 500	300 - 500	350 - 750	.007" - .010"	.008" - .012"	.005" - .015"
Non Ferrous Alloys (Magnesium, Copper)	300 - 500	300 - 500	350 - 750	.007" - .010"	.008" - .012"	.005" - .015"

Variable Helix Endmills

HPM+ Endmills

High Performance Endmills

Standard Endmills

Carbide Endmills

Solid Carbide Routers

Solid Carbide Drill Mills

Powder Metal (PM30) Endmills

Powder Metal (PM4) Endmills

Cobalt Endmills (M42) Endmills

High Speed Steel (M7) Endmills

Solid Carbide Endmills

Metric

Routers

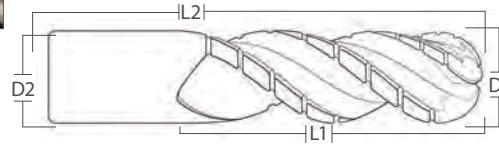
Drill Mills

Powder Metal Endmills

Cobalt Endmills

HSS Endmills

Solid Carbide Endmills



3 Flute Truncated EndMill - Aluminum Alloys

- Z-Power (ZrN) recommended (up to 25% faster)
- Ideal for Aluminum Alloys
- Right Hand Spiral & Cut
- Weldon Flats (upon Request)
- Square & Ballnose End
- Material Code Refer to Page 245 & 246.

N

PM4

3
Flutes

37°

Truncated
Rougher

Z Power®

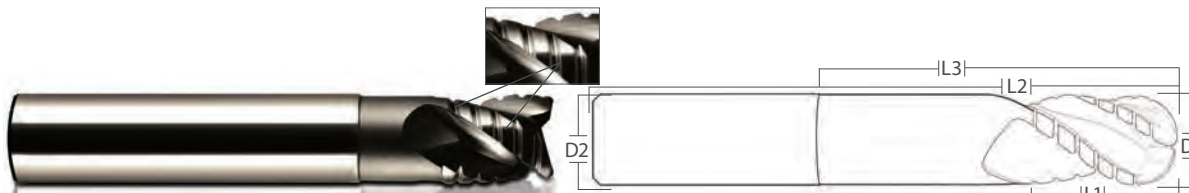
Z-Power® has excellent corrosion and adhesion resistant properties.

Speeds and Feeds Refer to Page 209.

RIGHT HAND

D1	D2	L1	L2		ZrN	
Cutting Dia	Shank Dia	LOC	OAL	Uncoated	Z-Power Coated	Ball End Uncoated
1/2	1/2	1-1/4	3-1/4	PM-TRF33008	T6-PM-TRF33008	PM-TRF33108
1/2	1/2	2	4	PM-TRF33208	T6-PM-TRF33208	PM-TRF33308
1/2	1/2	3	5	PM-TRF33408	T6-PM-TRF33408	PM-TRF33508
1/2	1/2	4	6	PM-TRF33608	T6-PM-TRF33608	PM-TRF33708
5/8	5/8	1-5/8	3-3/4	PM-TRF33010	T6-PM-TRF33010	PM-TRF33110
5/8	5/8	2-1/2	4-5/8	PM-TRF33210	T6-PM-TRF33210	PM-TRF33310
5/8	5/8	3	5-1/8	PM-TRF33410	T6-PM-TRF33410	PM-TRF33510
5/8	5/8	4	6-1/8	PM-TRF33610	T6-PM-TRF33610	PM-TRF33710
3/4	3/4	1-5/8	3-7/8	PM-TRF33012	T6-PM-TRF33012	PM-TRF33112
3/4	3/4	2	4-1/4	PM-TRF33212	T6-PM-TRF33212	PM-TRF33312
3/4	3/4	2-1/4	4-1/2	PM-TRF33212S	T6-PM-TRF33212S	PM-TRF33312S
3/4	3/4	3	5-1/4	PM-TRF33412	T6-PM-TRF33412	PM-TRF33512
3/4	3/4	4	6-1/4	PM-TRF33612	T6-PM-TRF33612	PM-TRF33712
1	1	2	4-1/2	PM-TRF33016	T6-PM-TRF33016	PM-TRF33116
1	1	3	5-1/2	PM-TRF33216	T6-PM-TRF33216	PM-TRF33316
1	1	4	6-1/2	PM-TRF33416	T6-PM-TRF33416	PM-TRF33516
1	1	6	8-1/2	PM-TRF33616	T6-PM-TRF33616	PM-TRF33716
1-1/4	1-1/4	2	4-1/2	PM-TRF33020	T6-PM-TRF33020	PM-TRF33120
1-1/4	1-1/4	3	5-1/2	PM-TRF33220	T6-PM-TRF33220	PM-TRF33320
1-1/4	1-1/4	4	6-1/2	PM-TRF33420	T6-PM-TRF33420	PM-TRF33520
1-1/4	1-1/4	6	8-1/2	PM-TRF33620	T6-PM-TRF33620	PM-TRF33720
1-1/2	1-1/4	2	4-1/2	PM-TRF33024	T6-PM-TRF33024	PM-TRF33124
1-1/2	1-1/4	3	5-1/2	PM-TRF33224	T6-PM-TRF33224	PM-TRF33324
1-1/2	1-1/4	4	6-1/2	PM-TRF33424	T6-PM-TRF33424	PM-TRF33524
1-1/2	1-1/4	6	8-1/2	PM-TRF33624	T6-PM-TRF33624	PM-TRF33724
2	1-1/4	2	4-1/2	PM-TRF33032	T6-PM-TRF33032	PM-TRF33132
2	1-1/4	3	5-1/2	PM-TRF33232	T6-PM-TRF33232	PM-TRF33332
2	1-1/4	4	6-1/2	PM-TRF33432	T6-PM-TRF33432	PM-TRF33532
2	1-1/4	6	8-1/2	PM-TRF33632	T6-PM-TRF33632	PM-TRF33732
2	2	2	5-3/4	PM-TRF37002A	T6-PM-TRF37002A	PM-TRF37102A
2	2	3	6-3/4	PM-TRF37003A	T6-PM-TRF37003A	PM-TRF37103A
2	2	4	7-3/4	PM-TRF37004A	T6-PM-TRF37004A	PM-TRF37104A
2	2	6	9-3/4	PM-TRF37006A	T6-PM-TRF37006A	PM-TRF37106A
2	2	8	11-3/4	PM-TRF37008A	T6-PM-TRF37008A	PM-TRF37108A
2	2	10	13-3/4	PM-TRF37010A	T6-PM-TRF37010A	PM-TRF37110A

Cobalt Endmills (M42) Endmills High Speed Steel (M7) Endmills



3 Flute Truncated EndMill - Aluminum Alloys

- Z-Power (ZrN) recommended (up to 25% faster)
- Ideal for Aluminum Alloys
- Right Hand Spiral & Cut
- Weldon Flats (upon Request)
- Square & Ballnose End
- Material Code Refer to Page 245 & 246.

PM4

3
Flutes

37°

Truncated
Rougher

Z Power®

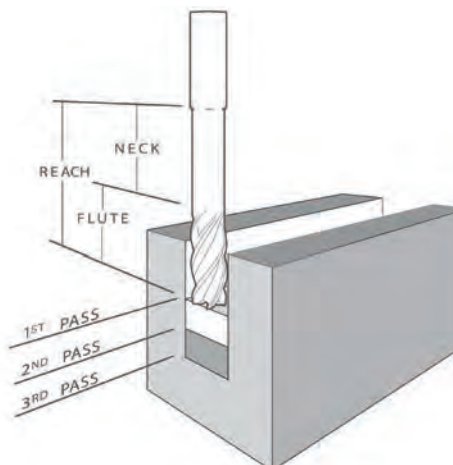
Z-Power® has excellent corrosion and adhesion resistant properties.

Speeds and Feeds Refer to Page 209.

N

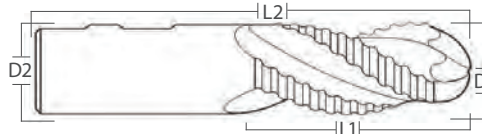
RIGHT HAND - Extended Neck

D1	D2	L1	L3	L2		ZrN	
Cutting Dia	Shank Dia	LOC	REACH	OAL	Uncoated	Z-Power Coated	Ball End Uncoated
1/2	1/2	1-1/4	4	6	PM-TRF39A08S	T6-PM-TRF39A08S	PM-TRF39B08S
5/8	5/8	1-1/2	5	7-1/8	PM-TRF39A10S	T6-PM-TRF39A10S	PM-TRF39B10S
3/4	3/4	1-1/2	4	6-1/4	PM-TRF39A12S.4	T6-PM-TRF39A12S.4	PM-TRF39B12S.4
3/4	3/4	1-3/4	5	7-1/4	PM-TRF39A12S.5	T6-PM-TRF39A12S.5	PM-TRF39B12S.5
3/4	3/4	2	6	8-1/4	PM-TRF39A12S	T6-PM-TRF39A12S	PM-TRF39B12S
1	1	1	2	4-1/2	PM-TRF39A16S.2	T6-PM-TRF39A16S.2	PM-TRF39B16S.2
1	1	1-1/2	3	5-1/2	PM-TRF39A16S.3	T6-PM-TRF39A16S.3	PM-TRF39B16S.3
1	1	2	4	6-1/2	PM-TRF39A16S.4	T6-PM-TRF39A16S.4	PM-TRF39B16S.4
1	1	2-1/2	6	8-1/2	PM-TRF39A16S.6	T6-PM-TRF39A16S.6	PM-TRF39B16S.6
1	1	2-3/4	7	9-1/2	PM-TRF39A16S.7	T6-PM-TRF39A16S.7	PM-TRF39B16S.7
1	1	3	8	10-1/2	PM-TRF39A16S	T6-PM-TRF39A16S	PM-TRF39B16S
1-1/4	1-1/4	1-1/2	3	5-1/2	PM-TRF39A20S.3	T6-PM-TRF39A20S.3	PM-TRF39B20S.3
1-1/4	1-1/4	2	4	6-1/2	PM-TRF39A20S.4	T6-PM-TRF39A20S.4	PM-TRF39B20S.4
1-1/4	1-1/4	2-1/2	6	8-1/2	PM-TRF39A20S.6	T6-PM-TRF39A20S.6	PM-TRF39B20S.6
1-1/4	1-1/4	2-3/4	7	9-1/2	PM-TRF39A20S.7	T6-PM-TRF39A20S.7	PM-TRF39B20S.7
1-1/4	1-1/4	3	8	10-1/2	PM-TRF39A20S.8	T6-PM-TRF39A20S.8	PM-TRF39B20S.8
1-1/4	1-1/4	3-1/2	10	12-1/2	PM-TRF39A20S	T6-PM-TRF39A20S	PM-TRF39B20S



	3 Flute PM4 EndMills for Aluminum - Speed & Feed Data					
	Uncoated - SFM Surface Feet per Minute			Feed / Tooth From 1/2" to 2"		
	Finish	Rough	Truncated	Finish	Rough	Truncated
Aluminum Alloys Wrought, Solution Treated, Aged as Cast	300 - 500	300 - 500	350 - 750	.007" - .010"	.008" - .012"	.005" - .015"
Non Ferrous Alloys (Magnesium, Copper)	300 - 500	300 - 500	350 - 750	.007" - .010"	.008" - .012"	.005" - .015"

Variable Helix Endmills
 HPM+ Endmills
 High Performance Endmills
 Standard Endmills
 Solid Carbide Endmills
 Metric Carbide Endmills
 Solid Carbide Routers
 Solid Carbide Drill Mills
 Powder Metal (PM30) Endmills
 Powder Metal (PM4) Endmills
 Cobalt Endmills (M42)
 High Speed Steel (M7) Endmills



3 Flute Coarse Tooth Rougher - Aluminum Alloys

- Z-Power (ZrN) recommended (up to 25% faster)
- Ideal for Aluminum Alloys
- Right Hand Spiral & Cut
- Weldon Flats
- Square & Ballnose End
- Material Code Refer to Page 245 & 246.

N

PM4

3
Flutes

37°

Rougher

Z Power®

Z-Power® has excellent corrosion and adhesion resistant properties.

Speeds and Feeds Refer to Page 210.

RIGHT HAND

	D1	D2	L1	L2	Uncoated	ZrN	
	Cutting Dia	Shank Dia	LOC	OAL		Z-Power Coated	Ball End Uncoated
	1/2	1/2	1-1/4	3-1/4	PM-R33008	T6-PM-R33008	PM-R33108
	1/2	1/2	2	4	PM-R33208	T6-PM-R33208	PM-R33308
	1/2	1/2	3	5	PM-R33408	T6-PM-R33408	PM-R33508
	1/2	1/2	4	6	PM-R33608	T6-PM-R33608	PM-R33708
	5/8	5/8	1-5/8	3-3/4	PM-R33010	T6-PM-R33010	PM-R33110
	5/8	5/8	2-1/2	4-5/8	PM-R33210	T6-PM-R33210	PM-R33310
	5/8	5/8	3	5-1/8	PM-R33410	T6-PM-R33410	PM-R33510
	5/8	5/8	4	6-1/8	PM-R33610	T6-PM-R33610	PM-R33710
	3/4	3/4	1-5/8	3-7/8	PM-R33012	T6-PM-R33012	PM-R33112
	3/4	3/4	2-1/4	4-1/2	PM-R33212S	T6-PM-R33212S	PM-R33312S
	3/4	3/4	3	5-1/4	PM-R33412	T6-PM-R33412	PM-R33512
	3/4	3/4	4	6-1/4	PM-R33612	T6-PM-R33612	PM-R33712
	3/4	3/4	6	8-1/4	PM-R33612S	T6-PM-R33612S	PM-R33712S
	1	1	2	4-1/2	PM-R33016	T6-PM-R33016	PM-R33116
	1	1	3	5-1/2	PM-R33216	T6-PM-R33216	PM-R33316
	1	1	4	6-1/2	PM-R33416	T6-PM-R33416	PM-R33516
	1	1	6	8-1/2	PM-R33616	T6-PM-R33616	PM-R33716
	1-1/4	1-1/4	2	4-1/2	PM-R33020	T6-PM-R33020	PM-R33120
	1-1/4	1-1/4	3	5-1/2	PM-R33220	T6-PM-R33220	PM-R33320
	1-1/4	1-1/4	4	6-1/2	PM-R33420	T6-PM-R33420	PM-R33520
	1-1/4	1-1/4	6	8-1/2	PM-R33620	T6-PM-R33620	PM-R33720
	1-1/4	1-1/4	8	10-1/2	PM-R33820	T6-PM-R33820	PM-R33920
	1-1/2	1-1/4	2	4-1/2	PM-R33024	T6-PM-R33024	PM-R33124
	1-1/2	1-1/4	3	5-1/2	PM-R33224	T6-PM-R33224	PM-R33324
	1-1/2	1-1/4	4	6-1/2	PM-R33424	T6-PM-R33424	PM-R33524
	1-1/2	1-1/4	6	8-1/2	PM-R33624	T6-PM-R33624	PM-R33724
	1-1/2	1-1/4	8	10-1/2	PM-R33824	T6-PM-R33824	PM-R33924
	2	1-1/4	2	4-1/2	PM-R33032	T6-PM-R33032	PM-R33132
	2	1-1/4	3	5-1/2	PM-R33232	T6-PM-R33232	PM-R33332
	2	1-1/4	4	6-1/2	PM-R33432	T6-PM-R33432	PM-R33532
	2	1-1/4	6	8-1/2	PM-R33632	T6-PM-R33632	PM-R33732
	2	2	2	5-3/4	PM-R37002A	T6-PM-R37002A	PM-R37102A
	2	2	3	6-3/4	PM-R37003A	T6-PM-R37003A	PM-R37103A
	2	2	4	7-3/4	PM-R37004A	T6-PM-R37004A	PM-R37104A
	2	2	5	8-3/4	PM-R37005A	T6-PM-R37005A	PM-R37105A
	2	2	6	9-3/4	PM-R37006A	T6-PM-R37006A	PM-R37106A
	2	2	8	11-3/4	PM-R37008A	T6-PM-R37008A	PM-R37108A
	2	2	10	13-3/4	PM-R37010A	T6-PM-R37010A	PM-R37110A
	2	2	12	15-3/4	PM-R37012A	T6-PM-R37012A	PM-R37112A

	3 Flute PM4 EndMills for Aluminum - Speed & Feed Data					
	Uncoated - SFM Surface Feet per Minute			Feed / Tooth From 1/2" to 2"		
	Finish	Rough	Truncated	Finish	Rough	Truncated
Aluminum Alloys Wrought, Solution Treated, Aged as Cast	300 - 500	300 - 500	350 - 750	.007" - .010"	.008" - .012"	.005" - .015"
Non Ferrous Alloys (Magnesium, Copper)	300 - 500	300 - 500	350 - 750	.007" - .010"	.008" - .012"	.005" - .015"

NEW

CurveCut[™]

CURVE CUT ROUGH AND FINISH DESIGN END MILLS
PROVIDE EXCELLENT RESULTS IN

TITANIUM, STAINLESS STEEL AND THEIR ALLOYS

(Excelentes Resultados en Titanio, Acero Inoxidable y sus Aleaciones)



CurveCut[™] **M-MILLED**

- Lower speeds and feeds
- Vapor honed / constant rake
- Easy resharpen

CurveCut[™] **G-GROUND**

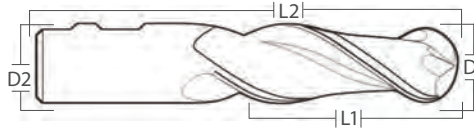
- Higher speeds and feeds
- Polished variable rake

Additional Features

- Center cut for plunging and machining floor surfaces
- Sinusoidal profile on Radial cutting edge
- Available with chamfer or optional radii to maintain stability
- Available in Cobalt
- Available in 4-6-8 Flutes
- Exxtral plus coating recommended for optimum performance

COBALT PAGE 230





2 Flute EndMill Center Cut - General Purpose

- General Purpose
- Right Hand Spiral & Cut
- Weldon Flats
- Square & Ballnose End
- Material Code Refer to Page 245 & 246.



RIGHT HAND

D1	D2	L1	L2	Part #		D1	D2	L1	L2	Part #	
				Cutting Dia	Shank Dia					LOC	OAL
1/4	3/8	1/2	2-5/16	24004	24104	15/16	7/8	1-1/2	3-3/4	24015.D	24115.D
1/4	3/8	1	2-13/16	24204	24304	1	5/8	1-1/2	3-5/8	24016.1	24116.1
1/4	3/8	1-1/2	3-5/16	24404	24504	1	1	1-5/8	4-1/8	24016	24116
1/4	3/8	2	3-3/4	24604	24704	1	1	2	4-1/2	24016S	24116S
5/16	3/8	9/16	2-5/16	24005	24105	1	1	2-1/4	4-3/4	24216	24316
5/16	3/8	1	2-3/4	24205	24305	1	1	3	5-1/2	24416	24516
5/16	3/8	1-1/2	3-1/4	24405	24505	1	1	4	6-1/2	24616	24716
5/16	3/8	2	3-3/4	24605	24705	1	1	6	8-1/2	24616S	24716S
3/8	3/8	9/16	2-5/16	24006	24106	1-1/8	1	1-5/8	4-1/8	24018	24118
3/8	3/8	1	2-3/4	24206	24306	1-1/8	7/8	1-5/8	3-7/8	24018.D	24118.D
3/8	3/8	1-1/2	3-1/4	24406	24506	1-1/8	1	2-1/4	4-3/4	24218	24318
3/8	3/8	3	4-3/4	24606	24706	1-1/8	1	3	5-1/2	24418	24518
7/16	3/8	13/16	2-1/2	24007	24107	1-1/4	1-1/4	1-5/8	4-1/8	24020	24120
1/2	1/2	1	3	24008	24108	1-1/4	1	1-5/8	4-1/8	24020.F	24120.F
1/2	1/2	1-1/4	3-1/4	24008S	24108S	1-1/4	1-1/4	2-1/4	4-3/4	24220	24320
1/2	1/2	1-1/2	3-1/2	24208	24308	1-1/4	1-1/4	3	5-1/2	24420	24520
1/2	1/2	2	4	24408	24508	1-1/4	1-1/4	4	6-1/2	24620	24720
1/2	1/2	3	5	24608	24708	1-1/4	1-1/4	6	8-1/2	24620S	24720S
1/2	1/2	4	6	24608S	24708S	1-3/8	1-1/4	1-5/8	4-1/8	24022	24122
5/8	5/8	1-5/16	3-7/16	24010	24110	1-3/8	1-1/4	2-1/4	4-3/4	24222	24322
5/8	5/8	1-5/8	3-3/4	24210	24310	1-3/8	1-1/4	3	5-1/2	24422	24522
5/8	5/8	2	4-1/8	24410	24510	1-1/2	1-1/4	1-5/8	4-1/8	24024	24124
5/8	5/8	3	5-1/8	24610	24710	1-1/2	1	1-5/8	4-1/8	24024.F	24124.F
5/8	5/8	4	6-1/8	24610S	24710S	1-1/2	1-1/4	2-1/4	4-3/4	24224	24324
11/16	5/8	1-5/16	3-7/16	24011	24111	1-1/2	1-1/4	3	5-1/2	24424	24524
3/4	3/4	1-5/16	3-9/16	24012	24112	1-1/2	1-1/4	4	6-1/2	24624	24724
3/4	5/8	1-5/16	3-7/16	24012.1	24112.1	1-1/2	1-1/4	6	8-1/2	24624S	24724S
3/4	3/4	1-5/8	3-7/8	24012S	24112S	1-1/2	1-1/4	8	10-1/2	24824	24924
3/4	3/4	1-3/4	4	24212	24312	1-5/8	1-1/4	1-5/8	4-1/8	24026	24126
3/4	3/4	2-1/4	4-1/2	24412	24512	1-5/8	1-1/4	2-1/4	4-3/4	24226	24326
3/4	3/4	3	5-1/4	24612	24712	1-5/8	1-1/4	3	5-1/2	24426	24526
3/4	3/4	4	6-1/4	24612S	24712S	1-3/4	1-1/4	1-5/8	4-1/8	24028	24128
3/4	3/4	6	8-1/4	24812	24912	1-3/4	1-1/4	2-1/4	4-3/4	24228	24328
7/8	7/8	1-1/2	3-3/4	24014	24114	1-3/4	1-1/4	3	5-1/2	24428	24528
7/8	5/8	1-1/2	3-5/8	24014.1	24114.1	1-3/4	1-1/4	4	6-1/2	24628	24728
7/8	7/8	2	4-1/4	24214	24314	1-7/8	1-1/4	1-5/8	4-1/8	24030	24130
7/8	7/8	2-1/2	4-3/4	24414	24514	1-7/8	1-1/4	3	5-1/2	24430	24530
7/8	7/8	3-1/2	5-3/4	24614	24714	2	1-1/4	1-5/8	4-1/8	24032	24132
7/8	7/8	5	7-1/4	24614S	24714S	2	1-1/4	2-1/4	4-3/4	24232	24332
15/16	5/8	1-1/2	3-5/8	24015.1	24115.1	2	1-1/4	3	5-1/2	24432	24532
15/16	3/4	1-1/2	3-3/4	24015.B	24115.B	2	1-1/4	4	6-1/2	24632	24732

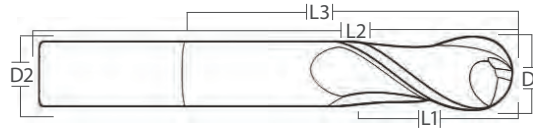
*Available 2-1/2" & 3" Sizes Upon Request



2 Flute EndMill Center Cut - General Purpose

- General Purpose
- Right Hand Spiral & Cut
- Weldon Flats
- Square & Ballnose End
- Material Code Refer to Page 245 & 246.

P M K S



Cobalt (M42) 2 Flutes 35°

RIGHT HAND COBALT ENDMILLS

RIGHT HAND - Extended Neck

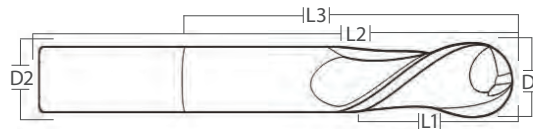
D1	D2	L1	L3	L2	Part #	Part #
Cutting Dia	Shank Dia	LOC	REACH	OAL	Square	Ball
1/4	3/8	5/8	1-1/2	3-1/16	24A04	24B04
5/16	3/8	3/4	1-3/4	3-5/16	24A05	24B05
3/8	3/8	3/4	1-3/4	3-5/16	24A06	24B06
1/2	1/2	1	2-1/4	4	24A08	24B08
5/8	5/8	1-3/8	2-3/4	4-3/4	24A10	24B10
3/4	3/4	1-5/8	3-1/8	5-3/8	24A12	24B12
7/8	7/8	2	4	6	24A14	24B14
1	1	2-1/2	5	7-1/4	24A16	24B16
1-1/4	1-1/4	3	5	7-1/4	24A20	24B20



2 Flute EndMill Center Cut - General Purpose

- General Purpose
- Left Hand Spiral & Cut
- Weldon Flats
- Square & Ballnose End
- Material Code Refer to Page 245 & 246.

P M K S

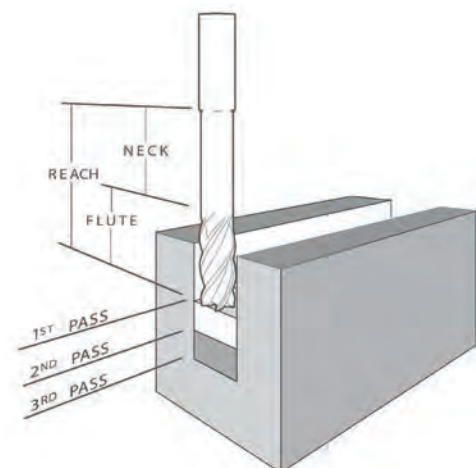


Cobalt (M42) 2 Flutes 35°

LEFT HAND COBALT ENDMILLS

LEFT HAND - Extended Neck

D1	D2	L1	L3	L2	Part #	Part #
Cutting Dia	Shank Dia	LOC	REACH	OAL	Square	Ball
1/4	3/8	5/8	1-1/2	3-1/16	26A04	26B04
5/16	3/8	3/4	1-3/4	3-5/16	26A05	26B05
3/8	3/8	3/4	1-3/4	3-5/16	26A06	26B06
1/2	1/2	1	2-1/4	4	26A08	26B08
5/8	5/8	1-3/8	2-3/4	4-3/4	26A10	26B10
3/4	3/4	1-5/8	3-1/8	5-3/8	26A12	26B12
7/8	7/8	2	4	6	26A14	26B14
1	1	2-1/2	5	7-1/4	26A16	26B16
1-1/4	1-1/4	3	5	7-1/4	26A20	26B20



Variable Helix Endmills	HPM+ Endmills	High Performance Endmills	Standard Endmills	Solid Carbide Endmills	Metric Carbide Endmills	Solid Carbide Routers	Solid Carbide Drill Mills	Powder Metal Endmills (PM30)	Powder Metal Endmills (PM4)	Cobalt Endmills (M42)	HSS Endmills (M7)
-------------------------	---------------	---------------------------	-------------------	------------------------	-------------------------	-----------------------	---------------------------	------------------------------	-----------------------------	-----------------------	-------------------

Solid Carbide Endmills

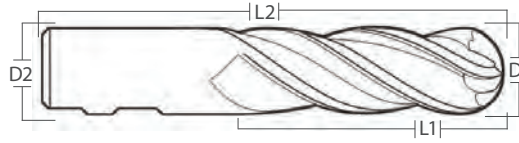
Variable Helix Endmills
HPM+ Endmills
High Performance Endmills
Standard Endmills



4 Flute EndMill Center Cut - General Purpose

- Exxtral Plus (AlTiN) recommended (up to 25% faster)
- General Purpose
- Right Hand Spiral & Cut
- Weldon Flats
- Square & Ballnose End
- Material Code Refer to Page 245 & 246.

P M K S



Cobalt (M42) **4** Flutes **35°**



Exxtral Plus® is ideal for high performance machining of hard materials.

RIGHT HAND

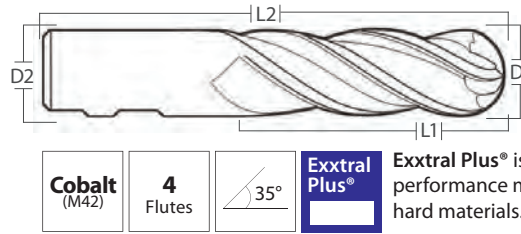
	D1	D2	L1	L2		AlTiN	
	Cutting Dia	Shank Dia	LOC	OAL	Uncoated	Exxtral Plus Coated	Ball End Uncoated
Metric	1/4	3/8	5/8	2-7/16	54004	T4-54004	54104
	1/4	3/8	1-1/4	3-1/16	54204	T4-54204	54304
	1/4	3/8	1-3/4	3-9/16	54404	T4-54404	54504
	1/4	3/8	2	3-3/4	54604	T4-54604	54704
	1/4	3/8	2-1/2	4-1/4	54804	T4-54804	54904
	5/16	3/8	3/4	2-1/2	54005	T4-54005	54105
	5/16	3/8	1-3/8	3-1/8	54205	T4-54205	54305
	5/16	3/8	2	3-3/4	54405	T4-54405	54505
	5/16	3/8	2-1/2	4-1/4	54605	T4-54605	54705
	5/16	3/8	3	4-3/4	54805	T4-54805	54905
Routers	3/8	3/8	3/4	2-1/2	54006	T4-54006	54106
	3/8	3/8	1-1/2	3-1/4	54206	T4-54206	54306
	3/8	3/8	2-1/2	4-1/4	54406	T4-54406	54506
	3/8	3/8	3	4-3/4	54606	T4-54606	54706
	3/8	3/8	4	5-3/4	54806	T4-54806	54906
	Drill Mills	1/2	3/8	1	2-11/16	54008.6	T4-54008.6
1/2		1/2	1	3	54008.8	T4-54008.8	54108.8
1/2		1/2	1-1/4	3-1/4	54008	T4-54008	54108
1/2		1/2	2	4	54208	T4-54208	54308
1/2		1/2	3	5	54408	T4-54408	54508
1/2		1/2	4	6	54608	T4-54608	54708
1/2		1/2	5	7	54608S	T4-54608S	54708S
1/2		1/2	6	8	54808	T4-54808	54908
1/2		1/2	8	10	54808S	T4-54808S	54908S
Powder Metal Endmills		5/8	5/8	1-5/8	3-3/4	54010	T4-54010
	5/8	5/8	2-1/2	4-5/8	54210	T4-54210	54310
	5/8	5/8	3	5-1/8	54410	T4-54410	54510
	5/8	5/8	4	6-1/8	54610	T4-54610	54710
	5/8	5/8	6	8-1/8	54810	T4-54810	54910
	3/4	3/4	1-5/8	3-7/8	54012	T4-54012	54112
	3/4	3/4	2	4-1/4	54212	T4-54212	54312
	3/4	3/4	2-1/4	4-1/2	54212S	T4-54212S	54312S
	3/4	3/4	3	5-1/4	54412	T4-54412	54512
	3/4	3/4	4	6-1/4	54612	T4-54612	54712
3/4	3/4	5	7-1/4	54612S	T4-54612S	54712S	
3/4	3/4	6	8-1/4	54812	T4-54812	54912	
3/4	3/4	8	10-1/4	54812S	T4-54812S	54912S	
Cobalt Endmills (M42)	7/8	7/8	1-7/8	4-1/8	54014	T4-54014	54114
	7/8	3/4	1-7/8	4-1/8	54014.B	T4-54014.B	54114.B
	7/8	7/8	2-1/2	4-3/4	54214	T4-54214	54314
	7/8	7/8	3-1/2	5-3/4	54414	T4-54414	54514
	7/8	7/8	4	6-1/4	54414S	T4-54414S	54514S
	7/8	7/8	5	7-1/4	54614	T4-54614	54714
	7/8	7/8	6	8-1/4	54614S	T4-54614S	54714S
	1	3/4	1-7/8	4-1/8	59G16	T4-59G16	59H16
HSS Endmills (M7)	1	1	1-1/2	4	54016S	T4-54016S	54116S
	1	1	2	4-1/2	54016	T4-54016	54116
	1	1	3	5-1/2	54216	T4-54216	54316
	1	1	4	6-1/2	54416	T4-54416	54516
	1	1	5	7-1/2	54416S	T4-54416S	54516S
	1	1	6	8-1/2	54616	T4-54616	54716

Continue



4 Flute EndMill Center Cut - General Purpose

- Exxtral Plus (AlTiN) recommended (up to 25% faster)
- General Purpose
- Right Hand Spiral & Cut
- Weldon Flats
- Square & Ballnose End
- Material Code Refer to Page 245 & 246.



Cobalt
(M42)

4
Flutes

35°

Exxtral Plus®

Exxtral Plus® is ideal for high performance machining of hard materials.

RIGHT HAND

D1	D2	L1	L2		AlTiN	
Cutting Dia	Shank Dia	LOC	OAL	Uncoated	Exxtral Plus Coated	Ball End Uncoated
1	1	7	9-1/2	54616S	T4-54616S	54716S
1	1	8	10-1/2	54816	T4-54816	54916
1	1	10	12-1/2	54816S	T4-54816S	54916S
1-1/4	1-1/4	2	4-1/2	54020	T4-54020	54120
1-1/4	1-1/4	3	5-1/2	54220	T4-54220	54320
1-1/4	1-1/4	4	6-1/2	54420	T4-54420	54520
1-1/4	1-1/4	5	7-1/2	54420S	T4-54420S	54520S
1-1/4	1-1/4	6	8-1/2	54620	T4-54620	54720
1-1/4	1-1/4	7	9-1/2	54620S	T4-54620S	54720S
1-1/4	1-1/4	8	10-1/2	54820	T4-54820	54920
1-3/8	1	2	4-1/2	54022	T4-54022	54122
1-1/2	1-1/4	2	4-1/2	54024	T4-54024	54124
1-1/2	1-1/4	3	5-1/2	54224	T4-54224	54324
1-1/2	1-1/4	4	6-1/2	54424	T4-54424	54524
1-1/2	1-1/4	6	8-1/2	54624	T4-54624	54724
1-1/2	1-1/4	7	9-1/2	54624S	T4-54624S	54724S
1-1/2	1-1/4	8	10-1/2	54824	T4-54824	54924
2	1-1/4	2	4-1/2	54032	T4-54032	54132
2	1-1/4	3	5-1/2	54232	T4-54232	54332
2	1-1/4	4	6-1/2	54432	T4-54432	54532
2	2	2	5-3/4	48002A	T4-48002A	48102A
2	2	3	6-3/4	48003A	T4-48003A	48103A
2	2	4	7-3/4	48004A	T4-48004A	48104A
2	2	5	8-3/4	48005A	T4-48005A	48105A
2	2	6	9-3/4	48006A	T4-48006A	48106A
2	2	8	11-3/4	48008A	T4-48008A	48108A
2	2	10	13-3/4	48010A	T4-48010A	48110A
2	2	12	15-3/4	48012A	T4-48012A	48112A

*Available 2-1/2" & 3" Sizes Upon Request

Variable Helix Endmills

HPM+ Endmills

High Performance Endmills

Standard Endmills

Solid Carbide Endmills

Carbide Endmills

Solid Carbide Routers

Solid Carbide Drill Mills

Powder Metal (PM30) Endmills

Powder Metal (PM4) Endmills

Cobalt (M42) Endmills

High Speed Steel (M7) Endmills

Metric

Routers

Drill Mills

Powder Metal Endmills

Cobalt Endmills

HSS Endmills

Solid Carbide Endmills

Variable Helix Endmills
HPM+ Endmills
High Performance Endmills
Standard Endmills

Metric

Carbide Endmills

Routers

Solid Carbide Routers

Drill Mills

Solid Carbide Drill Mills

Powder Metal Endmills

Powder Metal Endmills (PM30)

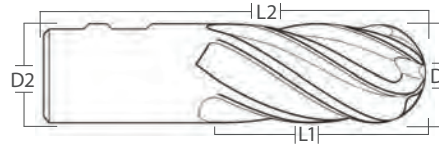
Powder Metal Endmills (PM4)

Cobalt Endmills

Cobalt Endmills (M42)

HSS Endmills

High Speed Steel Endmills (M7)



6 Flute EndMill Center Cut - General Purpose

- Exxtral Plus (AlTiN) recommended (up to 25% faster)
- General Purpose
- Right Hand Spiral & Cut
- Weldon Flats
- Square & Ballnose End
- Material Code Refer to Page 245 & 246.

P M K S

Cobalt (M42)
6 Flutes
35°

Exxtral Plus®

Exxtral Plus® is ideal for high performance machining of hard materials.

RIGHT HAND

D1 Cutting Dia	D2 Shank Dia	L1 LOC	L2 OAL	Uncoated	AITIN Exxtral Plus Coated	Ball End Uncoated
1/2	1/2	1-1/4	3-1/4	54008X	T4-54008X	54108X
1/2	1/2	2	4	54208X	T4-54208X	54308X
1/2	1/2	3	5	54408X	T4-54408X	54508X
1/2	1/2	4	6	54608X	T4-54608X	54708X
1/2	1/2	5	7	54608SX	T4-54608SX	54708SX
1/2	1/2	6	8	54808X	T4-54808X	54908X
1/2	1/2	8	10	54808SX	T4-54808SX	54908SX
5/8	5/8	1-5/8	3-3/4	54010X	T4-54010X	54110X
5/8	5/8	2-1/2	4-5/8	54210X	T4-54210X	54310X
5/8	5/8	3	5-1/8	54410X	T4-54410X	54510X
5/8	5/8	4	6-1/8	54610X	T4-54610X	54710X
5/8	5/8	6	8-1/8	54810X	T4-54810X	54910X
3/4	3/4	1-5/8	3-7/8	54012X	T4-54012X	54112X
3/4	3/4	2	4-1/4	54212X	T4-54212X	54312X
3/4	3/4	3	5-1/4	54412X	T4-54412X	54512X
3/4	3/4	4	6-1/4	54612X	T4-54612X	54712X
3/4	3/4	5	7-1/4	54612SX	T4-54612SX	54712SX
3/4	3/4	6	8-1/4	54812X	T4-54812X	54912X
3/4	3/4	8	10-1/4	54812SX	T4-54812SX	54912SX
7/8	7/8	1-7/8	4-1/8	54014X	T4-54014X	54114X
7/8	7/8	3-1/2	5-3/4	54414X	T4-54414X	54514X
7/8	7/8	6	8-1/4	54614SX	T4-54614SX	54714SX
1	3/4	1-7/8	4-1/8	59G16X	T4-59G16X	59H16X
1	1	2	4-1/2	54016X	T4-54016X	54116X
1	1	3	5-1/2	54216X	T4-54216X	54316X
1	1	4	6-1/2	54416X	T4-54416X	54516X
1	1	5	7-1/2	54416SX	T4-54416SX	54516SX
1	1	6	8-1/2	54616X	T4-54616X	54716X
1	1	7	9-1/2	54616SX	T4-54616SX	54716SX
1	1	8	10-1/2	54816X	T4-54816X	54916X
1	1	10	12-1/2	54816SX	T4-54816SX	54916SX
1-1/8	3/4	1-1/2	3-7/8	59G18X	T4-59G18X	59H18X
1-1/8	1	2	4-1/2	54018X	T4-54018X	54118X
1-1/8	1	3	5-1/2	54218X	T4-54218X	54318X
1-1/8	1	4	6-1/2	54418X	T4-54418X	54518X
1-1/4	3/4	1-1/2	3-7/8	59G20X	T4-59G20X	59H20X
1-1/4	1-1/4	2	4-1/2	54020X	T4-54020X	54120X
1-1/4	1-1/4	3	5-1/2	54220X	T4-54220X	54320X
1-1/4	1-1/4	4	6-1/2	54420X	T4-54420X	54520X
1-1/4	1-1/4	5	7-1/2	54420SX	T4-54420SX	54520SX
1-1/4	1-1/4	6	8-1/2	54620X	T4-54620X	54720X
1-1/4	1-1/4	7	9-1/2	54620SX	T4-54620SX	54720SX
1-1/4	1-1/4	8	10-1/2	54820X	T4-54820X	54920X
1-1/4	1-1/4	10	12-1/2	54820SX	T4-54820SX	54920SX
1-1/2	3/4	1-1/2	3-7/8	59G24X	T4-59G24X	59H24X
1-1/2	1-1/4	2	4-1/2	54024X	T4-54024X	54124X
1-1/2	1-1/4	3	5-1/2	54224X	T4-54224X	54324X
1-1/2	1-1/4	4	6-1/2	54424X	T4-54424X	54524X
1-1/2	1-1/4	5	7-1/2	54424SX	T4-54424SX	54524SX
1-1/2	1-1/4	6	8-1/2	54624X	T4-54624X	54724X
1-1/2	1-1/4	7	9-1/2	54624SX	T4-54624SX	54724SX

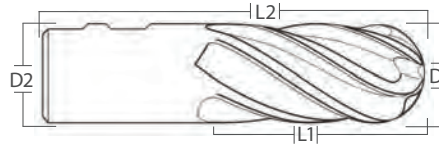
Continue ➡



6 Flute EndMill Center Cut - General Purpose

- Exxtral Plus (AlTiN) recommended (up to 25% faster)
- General Purpose
- Right Hand Spiral & Cut
- Weldon Flats
- Square & Ballnose End
- Material Code Refer to Page 245 & 246.

P M K S



Cobalt (M42) **6** Flutes **35°** **Exxtral Plus®**

Exxtral Plus® is ideal for high performance machining of hard materials.

RIGHT HAND

D1 Cutting Dia	D2 Shank Dia	L1 LOC	L2 OAL	Uncoated	AlTiN Exxtral Plus Coated	Ball End Uncoated
1-1/2	1-1/4	8	10-1/2	54824X	T4-54824X	54924X
1-1/2	1-1/4	10	12-1/2	54824SX	T4-54824SX	54924SX
1-3/4	3/4	1-1/2	3-7/8	59G28X	T4-59G28X	59H28X
2	1-1/4	2	4-1/2	54032X	T4-54032X	54132X
2	1-1/4	3	5-1/2	54232X	T4-54232X	54332X
2	1-1/4	4	6-1/2	54432X	T4-54432X	54532X
2	1-1/4	6	8-1/2	54632X	T4-54632X	54732X
2	1-1/4	8	10-1/2	54832X	T4-54832X	54932X
2	2	2	5-3/4	68002A	T4-68002A	68102A
2	2	3	6-3/4	68003A	T4-68003A	68103A
2	2	4	7-3/4	68004A	T4-68004A	68104A
2	2	5	8-3/4	68005A	T4-68005A	68105A
2	2	6	9-3/4	68006A	T4-68006A	68106A
2	2	8	11-3/4	68008A	T4-68008A	68108A
2	2	10	13-3/4	68010A	T4-68010A	68110A
2	2	12	15-3/4	68012A	T4-68012A	68112A
2	2	14	17-3/4	68014A	T4-68014A	68124A

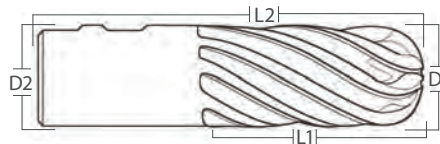
*Available 2-1/2" & 3" Sizes Upon Request



8 Flute EndMill Center Cut - General Purpose

- Exxtral Plus (AlTiN) recommended (up to 25% faster)
- General Purpose
- Right Hand Spiral & Cut
- Weldon Flats
- Square & Ballnose End
- Material Code Refer to Page 245 & 246.

P M K S



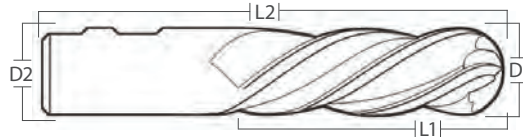
Cobalt (M42) **8** Flutes **35°** **AlTiN**

RIGHT HAND

D1 Cutting Dia	D2 Shank Dia	L1 LOC	L2 OAL	Part # Square	AlTiN Exxtral Coated	Part # Ball
2	3/4	2	4-1/2	59G32Z	T4-59G32Z	59H32Z
2	2	2	5-3/4	88002A	T4-88002A	88102A
2	2	3	6-3/4	88003A	T4-88003A	88103A
2	2	4	7-3/4	88004A	T4-88004A	88104A
2	2	5	8-3/4	88005A	T4-88005A	88105A
2	2	6	9-3/4	88006A	T4-88006A	88106A
2	2	8	11-3/4	88008A	T4-88008A	88108A
2	2	10	13-3/4	88010A	T4-88010A	88110A
2	2	12	15-3/4	88012A	T4-88012A	88112A
2	2	14	17-3/4	88014A	T4-88014A	88114A

*Available 2-1/2" & 3" Sizes Upon Request

Variable Helix Endmills
HPM+ Endmills
High Performance Endmills
Standard Endmills
Solid Carbide Endmills
Metric Carbide Endmills
Routers Solid Carbide Routers
Drill Mills Solid Carbide Drill Mills
Powder Metal Endmills (PM30) Endmills
Powder Metal Endmills (PM4) Endmills
Cobalt Endmills (M42) Endmills
HSS Endmills High Speed Steel (M7) Endmills



Cobalt
(M42)

4
Flutes

35°



4 Flute EndMill Center Cut - General Purpose

- General Purpose
- Left Hand Spiral & Cut
- Weldon Flats
- Square & Ballnose End
- Material Code Refer to Page 245 & 246.

P M K S

LEFT HAND

D1	D2	L1	L2	Part #	Part #
Cutting Dia	Shank Dia	LOC	OAL	Square	Ball
1/4	3/8	5/8	2-7/16	56004	56104
1/4	3/8	1-1/4	3-1/16	56204	56304
1/4	3/8	1-3/4	3-9/16	56404	56504
1/4	3/8	2	3-3/4	56604	56704
1/4	3/8	2-1/2	4-1/4	56804	56904
5/16	3/8	3/4	2-1/2	56005	56105
5/16	3/8	1-3/8	3-1/8	56205	56305
5/16	3/8	2	3-3/4	56405	56505
5/16	3/8	2-1/2	4-1/4	56605	56705
5/16	3/8	3	4-3/4	56805	56905
3/8	3/8	3/4	2-1/2	56006	56106
3/8	3/8	1-1/2	3-1/4	56206	56306
3/8	3/8	2-1/2	4-1/4	56406	56506
3/8	3/8	2-3/4	4-1/2	56606	56706
3/8	3/8	4	5-3/4	56806	56906
7/16	3/8	1	2-11/16	56007	56107
7/16	1/2	1-3/4	3-3/4	56207	56307
7/16	1/2	3	5	56407	56507
1/2	1/2	1-1/4	3-1/4	56008	56108
1/2	1/2	2	4	56208	56308
1/2	1/2	3	5	56408	56508
1/2	1/2	4	6	56608	56708
1/2	1/2	5	7	56608S	56708S
1/2	1/2	6	8	56808	56908
1/2	1/2	8	10	56808S	56908S
5/8	5/8	1-5/8	3-3/4	56010	56110
5/8	5/8	2-1/2	4-5/8	56210	56310
5/8	5/8	3	5-1/8	56410	56510
5/8	5/8	4	6-1/8	56610	56710
5/8	5/8	6	8-1/8	56810	56910
3/4	3/4	1-5/8	3-7/8	56012	56112
3/4	3/4	2	4-1/4	56212	56312
3/4	3/4	2-1/4	4-1/2	56212S	56312S
3/4	3/4	3	5-1/4	56412	56512
3/4	3/4	4	6-1/4	56612	56712
3/4	3/4	5	7-1/4	56612S	56712S
3/4	3/4	6	8-1/4	56812	56912
3/4	3/4	8	10-1/4	56812S	56912S
7/8	7/8	1-7/8	4-1/8	56014	56114
7/8	7/8	2-1/2	4-3/4	56214	56314

D1	D2	L1	L2	Part #	Part #
Cutting Dia	Shank Dia	LOC	OAL	Square	Ball
7/8	7/8	3-1/2	5-3/4	56414	56514
7/8	7/8	4	6-1/4	56414S	56514S
7/8	7/8	5	7-1/4	56614	56714
7/8	7/8	6	8-1/4	56614S	56714S
1	1	1	3-1/2	56016.F	56116.F
1	1	2	4-1/2	56016	56116
1	1	3	5-1/2	56216	56316
1	1	4	6-1/2	56416	56516
1	1	5	7-1/2	56416S	56516S
1	1	6	8-1/2	56616	56716
1	1	7	9-1/2	56616S	56716S
1	1	8	10-1/2	56816	56916
1-1/4	1-1/4	2	4-1/2	56020	56120
1-1/4	1-1/4	3	5-1/2	56220	56320
1-1/4	1-1/4	4	6-1/2	56420	56520
1-1/4	1-1/4	5	7-1/2	56420S	56520S
1-1/4	1-1/4	6	8-1/2	56620	56720
1-1/4	1-1/4	7	9-1/2	56620S	56720S
1-1/4	1-1/4	8	10-1/2	56820	56920
1-3/8	1	2	4-1/2	56022	56122
1-1/2	1-1/4	2	4-1/2	56024	56124
1-1/2	1-1/4	3	5-1/2	56224	56324
1-1/2	1-1/4	4	6-1/2	56424	56524
1-1/2	1-1/4	6	8-1/2	56624	56724
1-1/2	1-1/4	8	10-1/2	56824	56924
1-3/4	1-1/4	2	4-1/2	56028	56128
2	1-1/4	2	4-1/2	56032	56132
2	1-1/4	3	5-1/2	56232	56332
2	1-1/4	4	6-1/2	56432	56532
2	1-1/4	6	8-1/2	56632	56732
2	1-1/4	8	10-1/2	56832	56932
2	2	2	5-3/4	48F02A	48G02A
2	2	3	6-3/4	48F03A	48G03A
2	2	4	7-3/4	48F04A	48G04A
2	2	5	8-3/4	48F05A	48G05A
2	2	6	9-3/4	48F06A	48G06A
2	2	8	11-3/4	48F08A	48G08A
2	2	10	13-3/4	48F10A	48G10A
2	2	12	15-3/4	48F12A	48G12A
2	2	14	17-3/4	48F14A	48G14A

Available 2-1/2" & 3" Sizes Upon Request

* Available Until Stock Lasts.

Solid Carbide Endmills

Metric

Routers

Drill Mills

Powder Metal Endmills

Cobalt Endmills

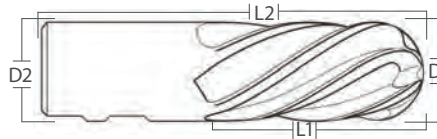
HSS Endmills



6 Flute EndMill Center Cut - General Purpose

- General Purpose
- Left Hand Spiral & Cut
- Weldon Flats
- Square & Ballnose End
- Material Code Refer to Page 245 & 246.

P M K S



Cobalt (M42) 6 Flutes 35°

LEFT HAND COBALT ENDMILLS

LEFT HAND

D1 Cutting Dia	D2 Shank Dia	L1 LOC	L2 OAL	Part # Square	Part # Ball
1/2	1/2	1-1/4	3-1/4	56008X	56108X
1/2	1/2	2	4	56208X	56308X
1/2	1/2	3	5	56408X	56508X
1/2	1/2	4	6	56608X	56708X
1/2	1/2	6	8	56808X	56908X
1/2	1/2	8	10	56808SX	56908SX
5/8	5/8	1-5/8	3-3/4	56010X	56110X
5/8	5/8	2-1/2	4-5/8	56210X	56310X
5/8	5/8	3	5-1/8	56410X	56510X
5/8	5/8	4	6-1/8	56610X	56710X
5/8	5/8	6	8-1/8	56810X	56910X
3/4	3/4	1-5/8	3-7/8	56012X	56112X
3/4	3/4	2	4-1/4	56212X	56312X
3/4	3/4	3	5-1/4	56412X	56512X
3/4	3/4	4	6-1/4	56612X	56712X
3/4	3/4	5	7-1/4	56612SX	56712SX
3/4	3/4	6	8-1/4	56812X	56912X
3/4	3/4	8	10-1/4	56812SX	56912SX
7/8	7/8	3-1/2	5-3/4	56414X	56514X
7/8	7/8	4	6-1/4	56414SX	56514SX
7/8	7/8	6	8-1/4	56614SX	56714SX
1	1	2	4-1/2	56016X	56116X
1	1	3	5-1/2	56216X	56316X
1	1	4	6-1/2	56416X	56516X
1	1	5	7-1/2	56416SX	56516SX
1	1	6	8-1/2	56616X	56716X
1	1	7	9-1/2	56616SX	56716SX
1	1	8	10-1/2	56816X	56916X
1	1	10	12-1/2	56816SX	56916SX
1-1/4	1-1/4	2	4-1/2	56020X	56120X

D1 Cutting Dia	D2 Shank Dia	L1 LOC	L2 OAL	Part # Square	Part # Ball
1-1/4	1-1/4	3	5-1/2	56220X	56320X
1-1/4	1-1/4	4	6-1/2	56420X	56520X
1-1/4	1-1/4	5	7-1/2	56420SX	56520SX
1-1/4	1-1/4	6	8-1/2	56620X	56720X
1-1/4	1-1/4	7	9-1/2	56620SX	56720SX
1-1/4	1-1/4	8	10-1/2	56820X	56920X
1-1/4	1-1/4	10	12-1/2	56820SX	56920SX
1-3/8	1	2	4-1/2	56022X	56122X
1-1/2	1-1/4	2	4-1/2	56024X	56124X
1-1/2	1-1/4	3	5-1/2	56224X	56324X
1-1/2	1-1/4	4	6-1/2	56424X	56524X
1-1/2	1-1/4	5	7-1/2	56424SX	56524SX
1-1/2	1-1/4	6	8-1/2	56624X	56724X
1-1/2	1-1/4	7	9-1/2	56624SX	56724SX
1-1/2	1-1/4	8	10-1/2	56824X	56924X
1-1/2	1-1/4	10	12-1/2	56824SX	56924SX
2	1-1/4	2	4-1/2	56032X	56132X
2	1-1/4	3	5-1/2	56232X	56332X
2	1-1/4	4	6-1/2	56432X	56532X
2	1-1/4	6	8-1/2	56632X	56732X
2	1-1/4	8	10-1/2	56832X	56932X
2	2	2	5-3/4	68F02A	68G02A
2	2	3	6-3/4	68F03A	68G03A
2	2	4	7-3/4	68F04A	68G04A
2	2	5	8-3/4	68F05A	68G05A
2	2	6	9-3/4	68F06A	68G06A
2	2	8	11-3/4	68F08A	68G08A
2	2	10	13-3/4	68F10A	68G10A
2	2	12	15-3/4	68F12A	68G12A
2	2	14	17-3/4	68F14A	68G14A

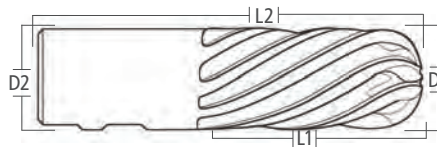
*Available 2-1/2" & 3" Sizes Upon Request



8 Flute EndMill Center Cut - General Purpose

- General Purpose
- Left Hand Spiral & Cut
- Weldon Flats
- Square & Ballnose End
- Material Code Refer to Page 245 & 246.

P M K S



Cobalt (M42) 8 Flutes 35°

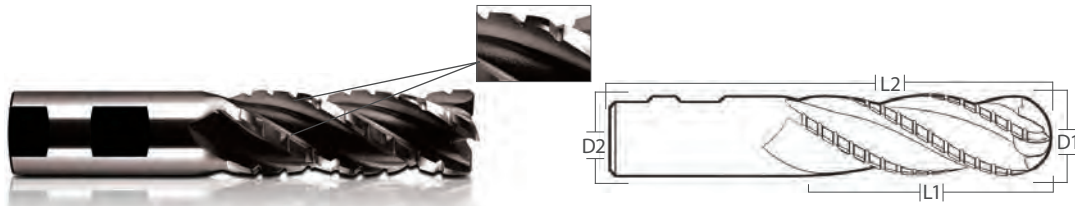
LEFT HAND COBALT ENDMILLS

LEFT HAND

D1 Cutting Dia	D2 Shank Dia	L1 LOC	L2 OAL	Part # Square	Part # Ball
2	2	2	5-3/4	88F02A	88G02A
2	2	3	6-3/4	88F03A	88G03A
2	2	4	7-3/4	88F04A	88G04A
2	2	5	8-3/4	88F05A	88G05A
2	2	6	9-3/4	88F06A	88G06A

D1 Cutting Dia	D2 Shank Dia	L1 LOC	L2 OAL	Part # Square	Part # Ball
2	2	8	11-3/4	88F08A	88G08A
2	2	10	13-3/4	88F10A	88G10A
2	2	12	15-3/4	88F12A	88G12A
2	2	14	17-3/4	88F14A	88G14A

Variable Helix Endmills
HPM+ Endmills
High Performance Endmills
Standard Endmills
Carbide Endmills
Solid Carbide Routers
Solid Carbide Drill Mills
Powder Metal Endmills (PM30)
Powder Metal Endmills (PM4)
Cobalt Endmills (M42)
HSS Endmills (M7)



4 Flute Roughing / Finishing

- Ideal for Titanium & Stainless Steel Alloys
- Right Hand Spiral & Cut
- Weldon Flats
- Square & Ballnose End
- Material Code Refer to Page 245 & 246.

P M K S

Cobalt
(M42)

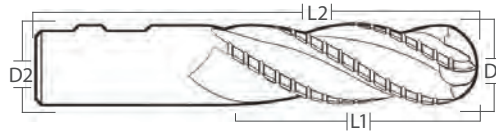
4
Flutes

35°

Roughing
Finishing

RIGHT HAND

D1	D2	L1	L2	Part #	Part #	D1	D2	L1	L2	Part #	Part #
Cutting Dia	Shank Dia	LOC	OAL	Square	Ball	Cutting Dia	Shank Dia	LOC	OAL	Square	Ball
1/2	1/2	1-1/4	3-1/4	RF54008	RF54108	1	1	5	7-1/2	RF54416S	RF54516S
1/2	1/2	2	4	RF54208	RF54308	1	1	6	8-1/2	RF54616	RF54716
1/2	1/2	3	5	RF54408	RF54508	1	1	7	9-1/2	RF54616S	RF54716S
1/2	1/2	4	6	RF54608	RF54708	1	1	8	10-1/2	RF54816	RF54916
1/2	1/2	5	7	RF54608S	RF54708S	1	1	10	12-1/2	RF54816S	RF54916S
1/2	1/2	6	8	RF54808	RF54908	1-1/4	1-1/4	2	4-1/2	RF54020	RF54120
1/2	1/2	8	10	RF54808S	RF54908S	1-1/4	1-1/4	3	5-1/2	RF54220	RF54320
5/8	5/8	1-5/8	3-3/4	RF54010	RF54110	1-1/4	1-1/4	4	6-1/2	RF54420	RF54520
5/8	5/8	2-1/2	4-5/8	RF54210	RF54310	1-1/4	1-1/4	5	7-1/2	RF54420S	RF54520S
5/8	5/8	3	5-1/8	RF54410	RF54510	1-1/4	1-1/4	6	8-1/2	RF54620	RF54720
5/8	5/8	4	6-1/8	RF54610	RF54710	1-1/4	1-1/4	7	9-1/2	RF54620S	RF54720S
5/8	5/8	6	8-1/8	RF54810	RF54910	1-1/4	1-1/4	8	10-1/2	RF54820	RF54920
3/4	3/4	1-5/8	3-7/8	RF54012	RF54112	1-3/8	1	2	4-1/2	RF54022	RF54122
3/4	3/4	2	4-1/4	RF54212	RF54312	1-1/2	1-1/4	2	4-1/2	RF54024	RF54124
3/4	3/4	2-1/4	4-1/2	RF54212S	RF54312S	1-1/2	1-1/4	3	5-1/2	RF54224	RF54324
3/4	3/4	3	5-1/4	RF54412	RF54512	1-1/2	1-1/4	4	6-1/2	RF54424	RF54524
3/4	3/4	4	6-1/4	RF54612	RF54712	1-1/2	1-1/4	6	8-1/2	RF54624	RF54724
3/4	3/4	5	7-1/4	RF54612S	RF54712S	1-1/2	1-1/4	7	9-1/2	RF54624S	RF54724S
3/4	3/4	6	8-1/4	RF54812	RF54912	1-1/2	1-1/4	8	10-1/2	RF54824	RF54924
3/4	3/4	8	10-1/4	RF54812S	RF54912S	2	1-1/4	2	4-1/2	RF54032	RF54132
7/8	7/8	1-7/8	4-1/8	RF54014	RF54114	2	1-1/4	3	5-1/2	RF54232	RF54332
7/8	3/4	1-7/8	4-1/8	RF54014.B	RF54114.B	2	1-1/4	4	6-1/2	RF54432	RF54532
7/8	7/8	2-1/2	4-3/4	RF54214	RF54314	2	2	2	5-3/4	RF48002A	RF48102A
7/8	7/8	3-1/2	5-3/4	RF54414	RF54514	2	2	3	6-3/4	RF48003A	RF48103A
7/8	7/8	4	6-1/4	RF54414S	RF54514S	2	2	4	7-3/4	RF48004A	RF48104A
7/8	7/8	5	7-1/4	RF54614	RF54714	2	2	5	8-3/4	RF48005A	RF48105A
7/8	7/8	6	8-1/4	RF54614S	RF54714S	2	2	6	9-3/4	RF48006A	RF48106A
1	1	1-1/2	4	RF54016S	RF54116S	2	2	8	11-3/4	RF48008A	RF48108A
1	1	2	4-1/2	RF54016	RF54116	2	2	10	13-3/4	RF48010A	RF48110A
1	1	3	5-1/2	RF54216	RF54316	2	2	12	15-3/4	RF48012A	RF48112A
1	1	4	6-1/2	RF54416	RF54516						



6 Flute Roughing / Finishing

- Ideal for Titanium & Stainless Steel Alloys
- Right Hand Spiral & Cut
- Weldon Flats
- Square & Ballnose End
- Material Code Refer to Page 245 & 246.

P M K S

Cobalt
(M42)

6
Flutes

35°

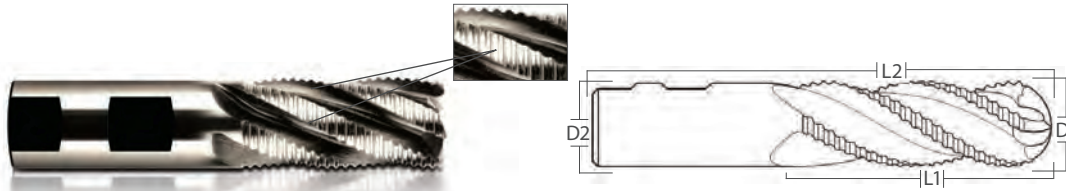
Roughing
Finishing

RIGHT HAND

D1 Cutting Dia	D2 Shank Dia	L1 LOC	L2 OAL	Part # Square	Part # Ball
3/4	3/4	1-5/8	3-7/8	RF54012X	RF54112X
3/4	3/4	2	4-1/4	RF54212X	RF54312X
3/4	3/4	3	5-1/4	RF54412X	RF54512X
3/4	3/4	4	6-1/4	RF54612X	RF54712X
3/4	3/4	5	7-1/4	RF54612SX	RF54712SX
3/4	3/4	6	8-1/4	RF54812X	RF54912X
3/4	3/4	8	10-1/4	RF54812SX	RF54912SX
7/8	7/8	1-7/8	4-1/8	RF54014X	RF54114X
7/8	7/8	3-1/2	5-3/4	RF54414X	RF54514X
7/8	7/8	6	8-1/4	RF54614SX	RF54714SX
1	1	2	4-1/2	RF54016X	RF54116X
1	1	3	5-1/2	RF54216X	RF54316X
1	1	4	6-1/2	RF54416X	RF54516X
1	1	5	7-1/2	RF54416SX	RF54516SX
1	1	6	8-1/2	RF54616X	RF54716X
1	1	7	9-1/2	RF54616SX	RF54716SX
1	1	8	10-1/2	RF54816X	RF54916X
1	1	10	12-1/2	RF54816SX	RF54916SX
1-1/8	1	2	4-1/2	RF54018X	RF54118X
1-1/8	1	3	5-1/2	RF54218X	RF54318X
1-1/8	1	4	6-1/2	RF54418X	RF54518X
1-1/4	1-1/4	2	4-1/2	RF54020X	RF54120X
1-1/4	1-1/4	3	5-1/2	RF54220X	RF54320X
1-1/4	1-1/4	4	6-1/2	RF54420X	RF54520X
1-1/4	1-1/4	5	7-1/2	RF54420SX	RF54520SX

D1 Cutting Dia	D2 Shank Dia	L1 LOC	L2 OAL	Part # Square	Part # Ball
1-1/4	1-1/4	6	8-1/2	RF54620X	RF54720X
1-1/4	1-1/4	7	9-1/2	RF54620SX	RF54720SX
1-1/4	1-1/4	8	10-1/2	RF54820X	RF54920X
1-1/4	1-1/4	10	12-1/2	RF54820SX	RF54920SX
1-1/2	1-1/4	2	4-1/2	RF54024X	RF54124X
1-1/2	1-1/4	3	5-1/2	RF54224X	RF54324X
1-1/2	1-1/4	4	6-1/2	RF54424X	RF54524X
1-1/2	1-1/4	5	7-1/2	RF54424SX	RF54524SX
1-1/2	1-1/4	6	8-1/2	RF54624X	RF54724X
1-1/2	1-1/4	7	9-1/2	RF54624SX	RF54724SX
1-1/2	1-1/4	8	10-1/2	RF54824X	RF54924X
1-1/2	1-1/4	10	12-1/2	RF54824SX	RF54924SX
2	1-1/4	2	4-1/2	RF54032X	RF54132X
2	1-1/4	3	5-1/2	RF54232X	RF54332X
2	1-1/4	4	6-1/2	RF54432X	RF54532X
2	1-1/4	6	8-1/2	RF54632X	RF54732X
2	1-1/4	8	10-1/2	RF54832X	RF54932X
2	2	2	5-3/4	RF68002A	RF68102A
2	2	3	6-3/4	RF68003A	RF68103A
2	2	4	7-3/4	RF68004A	RF68104A
2	2	5	8-3/4	RF68005A	RF68105A
2	2	6	9-3/4	RF68006A	RF68106A
2	2	8	11-3/4	RF68008A	RF68108A
2	2	10	13-3/4	RF68010A	RF68110A
2	2	12	15-3/4	RF68012A	RF68112A

Variable Helix Endmills	HPM+ Endmills	High Performance Endmills	Standard Endmills	Carbide Endmills	Solid Carbide Routers	Solid Carbide Drill Mills	Powder Metal (PM30) Endmills	Powder Metal (PM4) Endmills	Cobalt (M42) Endmills	High Speed Steel (M7) Endmills		
Solid Carbide Endmills				Metric		Routers		Drill Mills		Powder Metal Endmills	Cobalt Endmills	HSS Endmills



Multi Flute Coarse Rougher - General Purpose

- General Purpose
- Right Hand Spiral & Cut
- Weldon Flats
- Square & Ballnose End
- Material Code Refer to Page 245 & 246.

P M K S

Cobalt
(M42)

4,5,6,8
Flutes

30°

Rougher

RIGHT HAND - 4 Flutes

D1 Cutting Dia	D2 Shank Dia	L1 LOC	L2 OAL	Uncoated	AITiN Exxtral Plus Coated	Ball End Uncoated
1/2	1/2	1/2	2-1/2	RS54008	T4-RS54008	RS54108
1/2	1/2	1-1/4	3-1/4	R54008	T4-R54008	R54108
1/2	1/2	2	4	R54208	T4-R54208	R54308
1/2	1/2	3	5	R54408	T4-R54408	R54508
1/2	1/2	4	6	R54608	T4-R54608	R54708
1/2	1/2	5	7	R54608S	T4-R54608S	R54708S
1/2	1/2	6	8	R54808	T4-R54808	R54908
1/2	1/2	8	10	R54808S	T4-R54808S	R54908S
* 9/16	1/2	1-3/8	3-3/8	R54009	T4-R54009	R54109
5/8	5/8	1-5/8	3-3/4	R54010	T4-R54010	R54110
5/8	5/8	2-1/2	4-5/8	R54210	T4-R54210	R54310
5/8	5/8	3	5-1/8	R54410	T4-R54410	R54510
5/8	5/8	4	6-1/8	R54610	T4-R54610	R54710
5/8	5/8	6	8-1/8	R54810	T4-R54810	R54910
3/4	3/4	3/4	2-7/8	RS54012	T4-RS54012	RS54112
3/4	3/4	1-5/8	3-7/8	R54012	T4-R54012	R54112
3/4	5/8	1-5/8	3-3/4	R54012.1	T4-R54012.1	R54112.1
3/4	3/4	2-1/4	4-1/2	R54212S	T4-R54212S	R54312S
3/4	3/4	3	5-1/4	R54412	T4-R54412	R54512
3/4	5/8	3	5-1/8	R54412.1	T4-R54412.1	R54512.1
3/4	3/4	4	6-1/4	R54612	T4-R54612	R54712
3/4	3/4	5	7-1/4	R54612S	T4-R54612S	R54712S
3/4	3/4	6	8-1/4	R54812	T4-R54812	R54912
3/4	3/4	8	10-1/4	R54812S	T4-R54812S	R54912S

RIGHT HAND - 5 Flutes

D1 Cutting Dia	D2 Shank Dia	L1 LOC	L2 OAL	Uncoated	AITiN Exxtral Plus Coated	Ball End Uncoated
7/8	7/8	7/8	3-1/8	RS54014Y	T4-RS54014Y	RS54114Y
7/8	3/4	1-7/8	4-1/8	R54014.BY	T4-R54014.BY	R54114.BY
7/8	7/8	1-7/8	4-1/8	R54014Y	T4-R54014Y	R54114Y
7/8	7/8	2-1/2	4-3/4	R54214Y	T4-R54214Y	R54314Y
7/8	7/8	3-1/2	5-3/4	R54414Y	T4-R54414Y	R54514Y
7/8	7/8	6	8-1/4	R54614SY	T4-R54614SY	R54714SY
1	1	1	3-1/2	RS54016Y	T4-RS54016Y	RS54116Y
1	3/4	2	4-1/4	R54016.BY	T4-R54016.BY	R54116.BY
1	1	2	4-1/2	R54016Y	T4-R54016Y	R54116Y
1	1	3	5-1/2	R54216Y	T4-R54216Y	R54316Y
1	1	4	6-1/2	R54416Y	T4-R54416Y	R54516Y
1	1	5	7-1/2	R54416SY	T4-R54416SY	R54516SY
1	1	6	8-1/2	R54616Y	T4-R54616Y	R54716Y
1	1	7	9-1/2	R54616SY	T4-R54616SY	R54716SY
1	1	8	10-1/2	R54816Y	T4-R54816Y	R54916Y
1	1	10	12-1/2	R54816SY	T4-R54816SY	R54916SY

* Available Until Stock Lasts.

RIGHT HAND - 6 Flutes

D1 Cutting Dia	D2 Shank Dia	L1 LOC	L2 OAL	Uncoated	AITIN Exxtral Plus Coated	Ball End Uncoated
1-1/8	3/4	2	4-1/4	R54018.BX	T4-R54018.BX	R54118.BX
1-1/8	1	2	4-1/2	R54018X	T4-R54018X	R54118X
1-1/4	3/4	2	4-1/4	R54020.BX	T4-R54020.BX	R54120.BX
1-1/4	1-1/4	2	4-1/2	R54020X	T4-R54020X	R54120X
1-1/4	1-1/4	3	5-1/2	R54220X	T4-R54220X	R54320X
1-1/4	1-1/4	4	6-1/2	R54420X	T4-R54420X	R54520X
1-1/4	1-1/4	5	7-1/2	R54420SX	T4-R54420SX	R54520SX
1-1/4	1-1/4	6	8-1/2	R54620X	T4-R54620X	R54720X
1-1/4	1-1/4	7	9-1/2	R54620SX	T4-R54620SX	R54720SX
1-1/4	1-1/4	8	10-1/2	R54820X	T4-R54820X	R54920X
1-1/4	1-1/4	10	12-1/2	R54820SX	T4-R54820SX	R54920SX
1-3/8	3/4	2	4-1/4	R54022.BX	T4-R54022.BX	R54122.BX
1-1/2	3/4	2	4-1/4	R54024.BX	T4-R54024.BX	R54124.BX
1-1/2	1-1/4	2	4-1/2	R54024X	T4-R54024X	R54124X
1-1/2	1-1/4	3	5-1/2	R54224X	T4-R54224X	R54324X
1-1/2	1-1/4	4	6-1/2	R54424X	T4-R54424X	R54524X
1-1/2	1-1/4	5	7-1/2	R54424SX	T4-R54424SX	R54524SX
1-1/2	1-1/4	6	8-1/2	R54624X	T4-R54624X	R54724X
1-1/2	1-1/4	7	9-1/2	R54624SX	T4-R54624SX	R54724SX
1-1/2	1-1/4	8	10-1/2	R54824X	T4-R54824X	R54924X
1-1/2	1-1/4	10	12-1/2	R54824SX	T4-R54824SX	R54924SX
1-3/4	3/4	2	4-1/4	R54028.BX	T4-R54028.BX	R54128.BX
1-3/4	1-1/4	2	4-1/2	R54028X	T4-R54028X	R54128X
1-3/4	1-1/4	3	5-1/2	R54228X	T4-R54228X	R54328X
1-3/4	1-1/4	4-1/2	7	R54428X	T4-R54428X	R54528X
1-3/4	1-1/4	6	8-1/2	R54628X	T4-R54628X	R54728X
2	1-1/4	2	4-1/2	R54032X	T4-R54032X	R54132X
2	1-1/4	3	5-1/2	R54232X	T4-R54232X	R54332X
2	1-1/4	4	6-1/2	R54432X	T4-R54432X	R54532X
2	1-1/4	6	8-1/2	R54632X	T4-R54632X	R54732X
2	1-1/4	8	10-1/2	R54832X	T4-R54832X	R54932X
2	2	2	5-3/4	R68002A	T4-R68002A	R68102A
2	2	3	6-3/4	R68003A	T4-R68003A	R68103A
2	2	4	7-3/4	R68004A	T4-R68004A	R68104A
2	2	5	8-3/4	R68005A	T4-R68005A	R68105A
2	2	6	9-3/4	R68006A	T4-R68006A	R68106A
2	2	8	11-3/4	R68008A	T4-R68008A	R68108A
2	2	10	13-3/4	R68010A	T4-R68010A	R68110A
2	2	12	15-3/4	R68012A	T4-R68012A	R68112A

RIGHT HAND - 8 Flutes

D1 Cutting Dia	D2 Shank Dia	L1 LOC	L2 OAL	Uncoated	AITIN Exxtral Plus Coated	Ball End Uncoated
2	1-1/4	2	4-1/2	R54032Z	T4-R54032Z	R54132Z
2	1-1/4	3	5-1/2	R54232Z	T4-R54232Z	R54332Z
2	1-1/4	4	6-1/2	R54432Z	T4-R54432Z	R54532Z
2	1-1/4	6	8-1/2	R54632Z	T4-R54632Z	R54732Z
2	1-1/4	8	10-1/2	R54832Z	T4-R54832Z	R54932Z
2	2	2	5-3/4	R88002A	T4-R88002A	R88102A
2	2	3	6-3/4	R88003A	T4-R88003A	R88103A
2	2	4	7-3/4	R88004A	T4-R88004A	R88104A
2	2	5	8-3/4	R88005A	T4-R88005A	R88105A
2	2	6	9-3/4	R88006A	T4-R88006A	R88106A
2	2	8	11-3/4	R88008A	T4-R88008A	R88108A
2	2	10	13-3/4	R88010A	T4-R88010A	R88110A
2	2	12	15-3/4	R88012A	T4-R88012A	R88112A

Variable Helix
EndmillsHPM+
EndmillsHigh Performance
EndmillsStandard
EndmillsCarbide
EndmillsSolid Carbide
RoutersSolid Carbide
RoutersSolid Carbide
Drill MillsPowder Metal
(PM30) EndmillsPowder Metal
(PM4) EndmillsCobalt
(M42) EndmillsHigh Speed Steel
(M7) Endmills

Solid Carbide Endmills

Metric

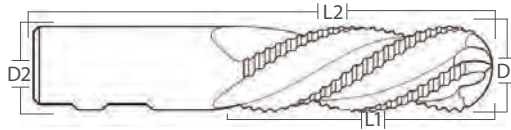
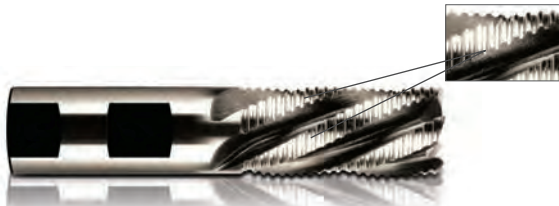
Routers

Drill Mills

Powder Metal Endmills

Cobalt Endmills

HSS Endmills



Multi Flute Coarse Pitch Center Cut - General Purpose

- General Purpose
- Left Hand Spiral & Cut
- Weldon Flats
- Square & Ballnose End
- Material Code Refer to Page 245 & 246.

P M K S

Cobalt (M42)	4,5,6,8 Flutes	30°	Rougher
------------------------	--------------------------	------------	----------------

LEFT HAND
COBALT ENDMILLS

LEFT HAND - 4 Flutes

D1	D2	L1	L2	Part #	Part #
Cutting Dia	Shank Dia	LOC	OAL	Square	Ball
*	1/4	3/8	5/8	2-7/16	R56004 R56104
*	5/16	3/8	3/4	2-1/2	R56005 R56105
*	3/8	3/8	3/4	2-1/2	R56006 R56106
*	7/16	1/2	1-1/4	3-1/4	R56007 R56107
	1/2	1/2	1-1/4	3-1/4	R56008 R56108
	1/2	1/2	2	4	R56208 R56308
	1/2	1/2	3	5	R56408 R56508
	1/2	1/2	4	6	R56608 R56708
	1/2	1/2	5	7	R56608S R56708S
	1/2	1/2	6	8	R56808 R56908
	1/2	1/2	8	10	R56808S R56908S
	5/8	5/8	1-5/8	3-3/4	R56010 R56110
	5/8	5/8	2-1/2	4-5/8	R56210 R56310
	5/8	5/8	3	5-1/8	R56410 R56510
	5/8	5/8	4	6-1/8	R56610 R56710
	5/8	5/8	6	8-1/8	R56810 R56910
	3/4	3/4	1-5/8	3-7/8	R56012 R56112
	3/4	3/4	2-1/4	4-1/2	R56212S R56312S
	3/4	3/4	3	5-1/4	R56412 R56512
	3/4	3/4	4	6-1/4	R56612 R56712
	3/4	3/4	5	7-1/4	R56612S R56712S
	3/4	3/4	6	8-1/4	R56812 R56912
	3/4	3/4	8	10-1/4	R56812S R56912S

LEFT HAND - 5 Flutes

D1	D2	L1	L2	Part #	Part #
Cutting Dia	Shank Dia	LOC	OAL	Square	Ball
	7/8	7/8	1-7/8	4-1/8	R56014Y R56114Y
	7/8	7/8	2-1/2	4-3/4	R56214Y R56314Y
	7/8	7/8	5	7-1/4	R56614Y R56714Y
	7/8	7/8	6	8-1/4	R56614SY R56714SY
	1	1	2	4-1/2	R56016Y R56116Y
	1	1	3	5-1/2	R56216Y R56316Y
	1	1	4	6-1/2	R56416Y R56516Y
	1	1	5	7-1/2	R56416SY R56516SY
	1	1	6	8-1/2	R56616Y R56716Y
	1	1	7	9-1/2	R56616SY R56716SY
	1	1	8	10-1/2	R56816Y R56916Y
	1	1	10	12-1/2	R56816SY R56916SY

* Available Until Stock Lasts.

Continue ➡

Solid Carbide Endmills

Metric

Routers

Drill Mills

Powder Metal Endmills

Cobalt Endmills

HSS Endmills

LEFT HAND - 6 Flutes

D1 Cutting Dia	D2 Shank Dia	L1 LOC	L2 OAL	Part # Square	Part # Ball
1-1/4	1-1/4	2	4-1/2	R56020X	R56120X
1-1/4	1-1/4	3	5-1/2	R56220X	R56320X
1-1/4	1-1/4	4	6-1/2	R56420X	R56520X
1-1/4	1-1/4	5	7-1/2	R56420SX	R56520SX
1-1/4	1-1/4	6	8-1/2	R56620X	R56720X
1-1/4	1-1/4	7	9-1/2	R56620SX	R56720SX
1-1/4	1-1/4	8	10-1/2	R56820X	R56920X
1-1/4	1-1/4	10	12-1/2	R56820SX	R56920SX
1-1/2	1-1/4	2	4-1/2	R56024X	R56124X
1-1/2	1-1/4	3	5-1/2	R56224X	R56324X
1-1/2	1-1/4	4	6-1/2	R56424X	R56524X
1-1/2	1-1/4	5	7-1/2	R56424SX	R56524SX
1-1/2	1-1/4	6	8-1/2	R56624X	R56724X
1-1/2	1-1/4	7	9-1/2	R56624SX	R56724SX
1-1/2	1-1/4	8	10-1/2	R56824X	R56924X
1-1/2	1-1/4	10	12-1/2	R56824SX	R56924SX
2	1-1/4	2	4-1/2	R56032X	R56132X
2	1-1/4	3	5-1/2	R56232X	R56332X
2	1-1/4	4	6-1/2	R56432X	R56532X
2	1-1/4	6	8-1/2	R56632X	R56732X
2	1-1/4	8	10-1/2	R56832X	R56932X
2	2	2	5-3/4	R68F02A	R68G02A
2	2	3	6-3/4	R68F03A	R68G03A
2	2	4	7-3/4	R68F04A	R68G04A
2	2	5	8-3/4	R68F05A	R68G05A
2	2	6	9-3/4	R68F06A	R68G06A
2	2	8	11-3/4	R68F08A	R68G08A

**LEFT HAND
COBALT ENDMILLS**

LEFT HAND - 8 Flutes

D1 Cutting Dia	D2 Shank Dia	L1 LOC	L2 OAL	Part # Square	Part # Ball
2	1-1/4	2	4-1/2	R56032Z	R56132Z
2	1-1/4	3	5-1/2	R56232Z	R56332Z
2	1-1/4	4	6-1/2	R56432Z	R56532Z
2	1-1/4	6	8-1/2	R56632Z	R56732Z
2	1-1/4	8	10-1/2	R56832Z	R56932Z
2	2	2	5-3/4	R88F02A	R88G02A
2	2	3	6-3/4	R88F03A	R88G03A
2	2	4	7-3/4	R88F04A	R88G04A
2	2	5	8-3/4	R88F05A	R88G05A
2	2	6	9-3/4	R88F06A	R88G06A
2	2	8	11-3/4	R88F08A	R88G08A
2	2	10	13-3/4	R88F10A	R88G10A
2	2	12	15-3/4	R88F12A	R88G12A

Variable Helix
EndmillsHPM+
EndmillsHigh Performance
EndmillsStandard
EndmillsCarbide
EndmillsSolid Carbide
RoutersSolid Carbide
Drill MillsPowder Metal
(PM30) EndmillsPowder Metal
(PM4) EndmillsCobalt
(M42) EndmillsHigh Speed Steel
(M7) Endmills

Solid Carbide Endmills

Metric

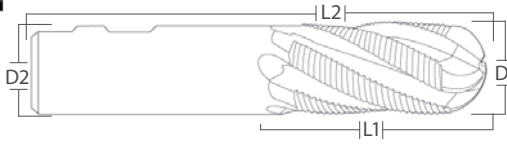
Routers

Drill Mills

Powder Metal Endmills

Cobalt Endmills

HSS Endmills



Multi Flute Fine Pitch Rougher - General Purpose

- General Purpose
- Right Hand Spiral & Cut
- Weldon Flats
- Square & Ballnose End
- Material Code Refer to Page 245 & 246.



Cobalt (M42) **4,5,6,8** Flutes **30°** **Rougher**

RIGHT HAND - 4 Flutes

	D1	D2	L1	L2		AITiN	
	Cutting Dia	Shank Dia	LOC	OAL	Uncoated	Exxtral Plus Coated	Ball End Uncoated
*	1/4	3/8	5/8	2-7/16	F54004	T4-F54004	F54104
*	1/4	3/8	1-1/4	3-1/16	F54204	T4-F54204	F54304
*	1/4	3/8	1-3/4	3-9/16	F54404	T4-F54404	F54504
*	1/4	3/8	2	3-3/4	F54604	T4-F54604	F54704
*	1/4	3/8	2-1/2	4-1/4	F54804	T4-F54804	F54904
*	5/16	3/8	3/4	2-1/2	F54005	T4-F54005	F54105
*	5/16	3/8	1-3/8	3-1/8	F54205	T4-F54205	F54305
*	5/16	3/8	2	3-3/4	F54405	T4-F54405	F54505
*	5/16	3/8	2-1/2	4-1/4	F54605	T4-F54605	F54705
*	5/16	3/8	3	4-3/4	F54805	T4-F54805	F54905
*	3/8	3/8	3/8	2-5/32	F554006	T4-F554006	F554106
*	3/8	3/8	3/4	2-1/2	F54006	T4-F54006	F54106
*	3/8	3/8	1-1/2	3-1/4	F54206	T4-F54206	F54306
*	3/8	3/8	2-1/2	4-1/4	F54406	T4-F54406	F54506
*	3/8	3/8	3	4-3/4	F54606	T4-F54606	F54706
*	3/8	3/8	4	5-3/4	F54806	T4-F54806	F54906
*	7/16	1/2	1-1/4	3-1/4	F54007	T4-F54007	F54107
*	7/16	1/2	1-3/4	3-3/4	F54207	T4-F54207	F54307
*	1/2	1/2	1/2	2-1/2	F554008	T4-F554008	F554108
*	1/2	1/2	1-1/4	3-1/4	F54008	T4-F54008	F54108
*	1/2	1/2	2	4	F54208	T4-F54208	F54308
*	1/2	1/2	3	5	F54408	T4-F54408	F54508
*	1/2	1/2	4	6	F54608	T4-F54608	F54708
*	1/2	1/2	5	7	F54608S	T4-F54608S	F54708S
*	1/2	1/2	6	8	F54808	T4-F54808	F54908
*	1/2	1/2	8	10	F54808S	T4-F54808S	F54908S
*	9/16	1/2	1-3/8	3-3/8	F54009	T4-F54009	F54109
*	5/8	5/8	1-5/8	3-3/4	F54010	T4-F54010	F54110
*	5/8	5/8	2-1/2	4-5/8	F54210	T4-F54210	F54310
*	5/8	5/8	3	5-1/8	F54410	T4-F54410	F54510
*	5/8	5/8	4	6-1/8	F54610	T4-F54610	F54710
*	5/8	5/8	6	8-1/8	F54810	T4-F54810	F54910
*	3/4	3/4	3/4	2-7/8	F554012	T4-F554012	F554112
*	3/4	3/4	1-5/8	3-7/8	F54012	T4-F54012	F54112
*	3/4	5/8	1-5/8	3-3/4	F54012.1	T4-F54012.1	F54112.1
*	3/4	3/4	2	4-1/4	F54212	T4-F54212	F54312
*	3/4	3/4	2-1/4	4-1/2	F54212S	T4-F54212S	F54312S
*	3/4	3/4	3	5-1/4	F54412	T4-F54412	F54512
*	3/4	3/4	4	6-1/4	F54612	T4-F54612	F54712
*	3/4	3/4	5	7-1/4	F54612S	T4-F54612S	F54712S
*	3/4	3/4	6	8-1/4	F54812	T4-F54812	F54912
*	3/4	3/4	8	10-1/4	F54812S	T4-F54812S	F54912S

RIGHT HAND - 5 Flutes

	D1	D2	L1	L2		AITiN	
	Cutting Dia	Shank Dia	LOC	OAL	Uncoated	Exxtral Plus Coated	Ball End Uncoated
	7/8	3/4	1-7/8	4-1/8	F54014.BY	T4-F54014.BY	F54114.BY
	7/8	7/8	7/8	3-7/8	F554014Y	T4-F554014Y	F554114Y
	7/8	7/8	1-7/8	4-1/8	F54014Y	T4-F54014Y	F54114Y
	7/8	7/8	2-1/2	4-3/4	F54214Y	T4-F54214Y	F54314Y
	7/8	7/8	3-1/2	5-3/4	F54414Y	T4-F54414Y	F54514Y
	7/8	7/8	5	7-1/4	F54614Y	T4-F54614Y	F54714Y
	7/8	7/8	6	8-1/4	F54614SY	T4-F54614SY	F54714SY

* Available Until Stock Lasts.

Continue

D1	D2	L1	L2	AlTiN		
Cutting Dia	Shank Dia	LOC	OAL	Uncoated	Exxtral Plus Coated	Ball End Uncoated
1	3/4	2	4-1/4	F54016.BY	T4-F54016.BY	F54116.BY
1	1	1	3-1/2	F554016Y	T4-F554016Y	F554116Y
1	1	2	4-1/2	F54016Y	T4-F54016Y	F54116Y
1	1	3	5-1/2	F54216Y	T4-F54216Y	F54316Y
1	1	4	6-1/2	F54416Y	T4-F54416Y	F54516Y
1	1	5	7-1/2	F54416SY	T4-F54416SY	F54516SY
1	1	6	8-1/2	F54616Y	T4-F54616Y	F54716Y
1	1	7	9-1/2	F54616SY	T4-F54616SY	F54716SY
1	1	8	10-1/2	F54816Y	T4-F54816Y	F54916Y
1	1	10	12-1/2	F54816SY	T4-F54816SY	F54916SY

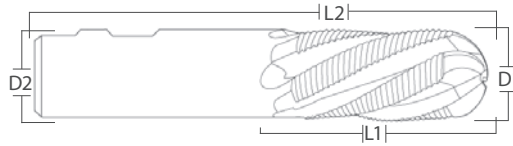
RIGHT HAND - 6 Flutes

D1	D2	L1	L2	AlTiN		
Cutting Dia	Shank Dia	LOC	OAL	Uncoated	Exxtral Plus Coated	Ball End Uncoated
1-1/8	3/4	2	4-1/4	F54018.BX	T4-F54018.BX	F54118.BX
1-1/8	1	2	4-1/2	F54018X	T4-F54018X	F54118X
1-1/4	3/4	2	4-1/4	F54020.BX	T4-F54020.BX	F54120.BX
1-1/4	1-1/4	2	4-1/2	F54020X	T4-F54020X	F54120X
1-1/4	1-1/4	3	5-1/2	F54220X	T4-F54220X	F54320X
1-1/4	1-1/4	4	6-1/2	F54420X	T4-F54420X	F54520X
1-1/4	1-1/4	5	7-1/2	F54420SX	T4-F54420SX	F54520SX
1-1/4	1-1/4	6	8-1/2	F54620X	T4-F54620X	F54720X
1-1/4	1-1/4	7	9-1/2	F54620SX	T4-F54620SX	F54720SX
1-1/4	1-1/4	8	10-1/2	F54820X	T4-F54820X	F54920X
1-1/4	1-1/4	10	12-1/2	F54820SX	T4-F54820SX	F54920SX
1-3/8	3/4	2	4-1/4	F54022.BX	T4-F54022.BX	F54122.BX
1-1/2	3/4	2	4-1/4	F54024.BX	T4-F54024.BX	F54124.BX
1-1/2	1-1/4	2	4-1/2	F54024X	T4-F54024X	F54124X
1-1/2	1-1/4	3	5-1/2	F54224X	T4-F54224X	F54324X
1-1/2	1-1/4	4	6-1/2	F54424X	T4-F54424X	F54524X
1-1/2	1-1/4	5	7-1/2	F54424SX	T4-F54424SX	F54524SX
1-1/2	1-1/4	6	8-1/2	F54624X	T4-F54624X	F54724X
1-1/2	1-1/4	7	9-1/2	F54624SX	T4-F54624SX	F54724SX
1-1/2	1-1/4	8	10-1/2	F54824X	T4-F54824X	F54924X
1-1/2	1-1/4	10	12-1/2	F54824SX	T4-F54824SX	F54924SX
1-3/4	3/4	2	4-1/4	F54028.BX	T4-F54028.BX	F54128.BX
1-3/4	1-1/4	2	4-1/2	F54028X	T4-F54028X	F54128X
1-3/4	1-1/4	4-1/2	7	F54428X	T4-F54428X	F54528X
2	1-1/4	2	4-1/2	F54032X	T4-F54032X	F54132X
2	1-1/4	3	5-1/2	F54232X	T4-F54232X	F54332X
2	1-1/4	4	6-1/2	F54432X	T4-F54432X	F54532X
2	1-1/4	6	8-1/2	F54632X	T4-F54632X	F54732X
2	1-1/4	8	10-1/2	F54832X	T4-F54832X	F54932X
2	2	2	5-3/4	F68002A	T4-F68002A	F68102A
2	2	3	6-3/4	F68003A	T4-F68003A	F68103A
2	2	4	7-3/4	F68004A	T4-F68004A	F68104A
2	2	5	8-3/4	F68005A	T4-F68005A	F68105A
2	2	6	9-3/4	F68006A	T4-F68006A	F68106A
2	2	8	11-3/4	F68008A	T4-F68008A	F68108A
2	2	10	13-3/4	F68010A	T4-F68010A	F68110A
2	2	12	15-3/4	F68012A	T4-F68012A	F68112A

RIGHT HAND - 8 Flutes

D1	D2	L1	L2	AlTiN		
Cutting Dia	Shank Dia	LOC	OAL	Uncoated	Exxtral Plus Coated	Ball End Uncoated
2	1-1/4	2	4-1/2	F54032Z	T4-F54032Z	F54132Z
2	1-1/4	3	5-1/2	F54232Z	T4-F54232Z	F54332Z
2	1-1/4	4	6-1/2	F54432Z	T4-F54432Z	F54532Z
2	1-1/4	6	8-1/2	F54632Z	T4-F54632Z	F54732Z
2	1-1/4	8	10-1/2	F54832Z	T4-F54832Z	F54932Z
2	2	2	5-3/4	F88002A	T4-F88002A	F88102A
2	2	3	6-3/4	F88003A	T4-F88003A	F88103A
2	2	4	7-3/4	F88004A	T4-F88004A	F88104A
2	2	5	8-3/4	F88005A	T4-F88005A	F88105A
2	2	6	9-3/4	F88006A	T4-F88006A	F88106A
2	2	8	11-3/4	F88008A	T4-F88008A	F88108A
2	2	10	13-3/4	F88010A	T4-F88010A	F88110A
2	2	12	15-3/4	F88012A	T4-F88012A	F88112A

Variable Helix Endmills
 HPM+ Endmills
 High Performance Endmills
 Standard Endmills
 Carbide Endmills
 Solid Carbide Routers
 Solid Carbide Drill Mills
 Powder Metal Endmills (PM30)
 Powder Metal Endmills (PM4)
 Cobalt Endmills (M42)
 High Speed Steel Endmills (M7)



Multi Flute Fine Pitch Rougher - General Purpose

- General Purpose
- Left Hand Spiral & Cut
- Weldon Flats
- Square & Ballnose End
- Material Code Refer to Page 245 & 246.

P M K S

Cobalt (M42) **4,5,6,8** Flutes **30°** **Rougher**

LEFT HAND COBALT ENDMILLS

LEFT HAND - 4 Flutes

D1 Cutting Dia	D2 Shank Dia	L1 LOC	L2 OAL	Part # Square	Part # Ball
1/2	1/2	1-1/4	3-1/4	F56008	F56108
1/2	1/2	2	4	F56208	F56308
1/2	1/2	3	5	F56408	F56508
1/2	1/2	4	6	F56608	F56708
1/2	1/2	5	7	F56608S	F56708S
1/2	1/2	6	8	F56808	F56908
1/2	1/2	8	10	F56808S	F56908S
5/8	5/8	1-5/8	3-3/4	F56010	F56110
5/8	5/8	2-1/2	4-5/8	F56210	F56310
5/8	5/8	3	5-1/8	F56410	F56510
5/8	5/8	4	6-1/8	F56610	F56710
5/8	5/8	6	8-1/8	F56810	F56910
3/4	3/4	1-5/8	3-7/8	F56012	F56112
3/4	3/4	2-1/4	4-1/2	F56212S	F56312S
3/4	3/4	3	5-1/4	F56412	F56512
3/4	3/4	4	6-1/4	F56612	F56712
3/4	3/4	5	7-1/4	F56612S	F56712S
3/4	3/4	6	8-1/4	F56812	F56912
3/4	3/4	8	10-1/4	F56812S	F56912S

D1 Cutting Dia	D2 Shank Dia	L1 LOC	L2 OAL	Part # Square	Part # Ball
1-1/2	1-1/4	6	8-1/2	F56624X	F56724X
1-1/2	1-1/4	7	9-1/2	F56624SX	F56724SX
1-1/2	1-1/4	8	10-1/2	F56824X	F56924X
1-1/2	1-1/4	10	12-1/2	F56824SX	F56924SX
2	1-1/4	2	4-1/2	F56032X	F56132X
2	1-1/4	3	5-1/2	F56232X	F56332X
2	1-1/4	4	6-1/2	F56432X	F56532X
2	1-1/4	6	8-1/2	F56632X	F56732X
2	1-1/4	8	10-1/2	F56832X	F56932X
2	2	2	5-3/4	F68F02A	F68G02A
2	2	4	7-3/4	F68F04A	F68G04A
2	2	6	9-3/4	F68F06A	F68G06A

LEFT HAND - 5 Flutes

D1 Cutting Dia	D2 Shank Dia	L1 LOC	L2 OAL	Part # Square	Part # Ball
1	1	2	4-1/2	F56016Y	F56116Y
1	1	3	5-1/2	F56216Y	F56316Y
1	1	4	6-1/2	F56416Y	F56516Y
1	1	6	8-1/2	F56616Y	F56716Y
1	1	8	10-1/2	F56816Y	F56916Y
1	1	10	12-1/2	F56816SY	F56916SY

LEFT HAND - 8 Flutes

D1 Cutting Dia	D2 Shank Dia	L1 LOC	L2 OAL	Part # Square	Part # Ball
2	1-1/4	2	4-1/2	F56032Z	F56132Z
2	1-1/4	3	5-1/2	F56232Z	F56332Z
2	1-1/4	4	6-1/2	F56432Z	F56532Z
2	1-1/4	6	8-1/2	F56632Z	F56732Z
2	1-1/4	8	10-1/2	F56832Z	F56932Z
2	2	2	5-3/4	F88F02A	F88G02A
2	2	4	7-3/4	F88F04A	F88G04A
2	2	6	9-3/4	F88F06A	F88G06A

LEFT HAND - 6 Flutes

D1 Cutting Dia	D2 Shank Dia	L1 LOC	L2 OAL	Part # Square	Part # Ball
1-1/4	1-1/4	2	4-1/2	F56020X	F56120X
1-1/4	1-1/4	3	5-1/2	F56220X	F56320X
1-1/4	1-1/4	4	6-1/2	F56420X	F56520X
1-1/4	1-1/4	5	7-1/2	F56420SX	F56520SX
1-1/4	1-1/4	6	8-1/2	F56620X	F56720X
1-1/4	1-1/4	7	9-1/2	F56620SX	F56720SX
1-1/4	1-1/4	8	10-1/2	F56820X	F56920X
1-1/4	1-1/4	10	12-1/2	F56820SX	F56920SX
1-1/2	1-1/4	2	4-1/2	F56024X	F56124X
1-1/2	1-1/4	3	5-1/2	F56224X	F56324X
1-1/2	1-1/4	4	6-1/2	F56424X	F56524X
1-1/2	1-1/4	5	7-1/2	F56424SX	F56524SX

Continue ➡



PRECISION CUTTING TOOLS, INC.

CONNECT WITH US



PCT runs full-on campaigns on Facebook, YouTube and Twitter. These campaigns will include FREE giveaways, exclusive promotional codes (free-shipping, dollar/percentage off online order), contests, sweepstakes and product updates. There is no cost to join our social media pages.

facebook.com/PCTcutters



youtube.com/PCTcutters



twitter.com/pctcutters





Multi Flute CurveCut Ground - High Temp. Alloys

- Available in Exxtral Plus Coating - T4
- Ideal for Titanium & Stainless Steel Alloys
- Right Hand Spiral & Cut
- Weldon Flats
- Square & Ballnose End
- Material Code Refer to Page 245 & 246.

P M K S

M42	4,6,8 Flutes		Exxtral Plus®
------------	------------------------	--	----------------------

Exxtral Plus® is ideal for high performance machining of hard materials.

Speeds and Feeds Refer to Page 230.

RIGHT HAND

	D1 Cutting Dia	D2 Shank Dia	L1 LOC	L2 OAL	FLUTES	Uncoated	AITiN Exxtral Plus Coated
	3/4	3/4	1-5/8	3-7/8	4	CC54012	T4-CC54012
	3/4	3/4	2-1/4	4-1/2	4	CC54212S	T4-CC54212S
	3/4	3/4	3	5-1/4	4	CC54412	T4-CC54412
	3/4	3/4	4	6-1/4	4	CC54612	T4-CC54612
	1	1	2	4-1/2	4	CC54016	T4-CC54016
	1	1	2	4-1/2	6	CC54016X	T4-CC54016X
	1	1	3	5-1/2	4	CC54216	T4-CC54216
	1	1	3	5-1/2	6	CC54216X	T4-CC54216X
	1	1	4	6-1/2	4	CC54416	T4-CC54416
	1	1	4	6-1/2	6	CC54416X	T4-CC54416X
	1	1	6	8-1/2	4	CC54616	T4-CC54616
	1-1/4	1-1/4	2	4-1/2	4	CC54020	T4-CC54020
	1-1/4	1-1/4	2	4-1/2	6	CC54020X	T4-CC54020X
	1-1/4	1-1/4	3	5-1/2	4	CC54220	T4-CC54220
	1-1/4	1-1/4	3	5-1/2	6	CC54220X	T4-CC54220X
	1-1/4	1-1/4	4	6-1/2	4	CC54420	T4-CC54420
	1-1/4	1-1/4	4	6-1/2	6	CC54420X	T4-CC54420X
	1-1/4	1-1/4	6	8-1/2	6	CC54620X	T4-CC54620X
	1-1/2	1-1/4	2	4-1/2	4	CC54024	T4-CC54024
	1-1/2	1-1/4	2	4-1/2	6	CC54024X	T4-CC54024X
	1-1/2	1-1/4	3	5-1/2	4	CC54224	T4-CC54224
	1-1/2	1-1/4	3	5-1/2	6	CC54224X	T4-CC54224X
	1-1/2	1-1/4	4	6-1/2	4	CC54424	T4-CC54424
	1-1/2	1-1/4	4	6-1/2	6	CC54424X	T4-CC54424X
	1-1/2	1-1/4	6	8-1/2	6	CC54624X	T4-CC54624X
	2	2	2	5-3/4	6	CC68002A	T4-CC68002A
	2	2	3	6-3/4	6	CC68003A	T4-CC68003A
	2	2	3	6-3/4	8	CC88003A	T4-CC88003A
	2	2	4	7-3/4	6	CC68004A	T4-CC68004A
	2	2	4	7-3/4	8	CC88004A	T4-CC88004A
	2	2	6	9-3/4	6	CC68006A	T4-CC68006A
	2	2	6	9-3/4	8	CC88006A	T4-CC88006A
	2	2	8	11-3/4	6	CC68008A	T4-CC68008A

Left Hand Available Upon Request

Starting Recommended Speeds & Feeds

Material		Titanium Alloy <38HRC	Titanium Alloy >38HRC	Stainless Steel >28HRC	Stainless Steel 36-48HRC
Cutting Speed	CC- Ground	70 SFM	50 SFM	110 SFM	100 SFM
Feed Rate (CLPT)	3/4"	CC- Ground 0.0045	0.0035	0.0048	0.0042
	1"	CC- Ground 0.0050	0.0038	0.0053	0.0046
	1-1/4"	CC- Ground 0.0053	0.0039	0.0058	0.0050
	1-1/2"	CC- Ground 0.0055	0.0042	0.0064	0.0056
	2"	CC- Ground 0.0060	0.0050	0.0070	0.0061
Maximum Depths of cut					
Profiling	Radial	0.4xD		0.25xD	
	Axial	1.5xD		1xD	
Slotting	Axial	1xD		1xD	

The values are for cobalt tools. For Powder Metal you can increase Feed Rates by 30%



Multi Flute CurveCut Milled - High Temp. Alloys

- Available in Exxtral Plus Coating - T4
- Ideal for Titanium & Stainless Steel Alloys
- Right Hand Spiral & Cut
- Weldon Flats
- Square & Ballnose End
- Material Code Refer to Page 245 & 246.

P M K S

M42	4,6,8 Flutes		Exxtral Plus®
------------	------------------------	--	----------------------

Exxtral Plus® is ideal for high performance machining of hard materials.

Speeds and Feeds Refer to Page 231.

RIGHT HAND

D1 Cutting Dia	D2 Shank Dia	L1 LOC	L2 OAL	FLUTES	Uncoated	AlTiN Exxtral Plus Coated
3/4	3/4	1-5/8	3-7/8	4	CCM-54012	T4-CCM-54012
3/4	3/4	2-1/4	4-1/2	4	CCM-54212S	T4-CCM-54212S
3/4	3/4	3	5-1/4	4	CCM-54412	T4-CCM-54412
3/4	3/4	4	6-1/4	4	CCM-54612	T4-CCM-54612
1	1	2	4-1/2	4	CCM-54016	T4-CCM-54016
1	1	2	4-1/2	6	CCM-54016X	T4-CCM-54016X
1	1	3	5-1/2	4	CCM-54216	T4-CCM-54216
1	1	3	5-1/2	6	CCM-54216X	T4-CCM-54216X
1	1	4	6-1/2	4	CCM-54416	T4-CCM-54416
1	1	4	6-1/2	6	CCM-54416X	T4-CCM-54416X
1	1	6	8-1/2	4	CCM-54616	T4-CCM-54616
1-1/4	1-1/4	2	4-1/2	4	CCM-54020	T4-CCM-54020
1-1/4	1-1/4	2	4-1/2	6	CCM-54020X	T4-CCM-54020X
1-1/4	1-1/4	3	5-1/2	4	CCM-54220	T4-CCM-54220
1-1/4	1-1/4	3	5-1/2	6	CCM-54220X	T4-CCM-54220X
1-1/4	1-1/4	4	6-1/2	4	CCM-54420	T4-CCM-54420
1-1/4	1-1/4	4	6-1/2	6	CCM-54420X	T4-CCM-54420X
1-1/4	1-1/4	6	8-1/2	6	CCM-54620X	T4-CCM-54620X
1-1/2	1-1/4	2	4-1/2	4	CCM-54024	T4-CCM-54024
1-1/2	1-1/4	2	4-1/2	6	CCM-54024X	T4-CCM-54024X
1-1/2	1-1/4	3	5-1/2	4	CCM-54224	T4-CCM-54224
1-1/2	1-1/4	3	5-1/2	6	CCM-54224X	T4-CCM-54224X
1-1/2	1-1/4	4	6-1/2	4	CCM-54424	T4-CCM-54424
1-1/2	1-1/4	4	6-1/2	6	CCM-54424X	T4-CCM-54424X
1-1/2	1-1/4	6	8-1/2	6	CCM-54624X	T4-CCM-54624X
2	2	2	5-3/4	6	CCM-68002A	T4-CCM-68002A
2	2	3	6-3/4	6	CCM-68003A	T4-CCM-68003A
2	2	3	6-3/4	8	CCM-88003A	T4-CCM-88003A
2	2	4	7-3/4	6	CCM-68004A	T4-CCM-68004A
2	2	4	7-3/4	8	CCM-88004A	T4-CCM-88004A
2	2	6	9-3/4	6	CCM-68006A	T4-CCM-68006A
2	2	6	9-3/4	8	CCM-88006A	T4-CCM-88006A
2	2	8	11-3/4	6	CCM-68008A	T4-CCM-68008A

Left Hand Available Upon Request

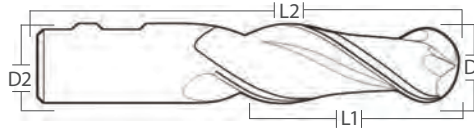
Starting Recommended Speeds & Feeds

Material		Titanium Alloy <38HRC	Titanium Alloys >38HRC	Stainless Steel >28HRC	Stainless Steel 36-48HRC
Cutting Speed	CC- Milled	50 SFM	40 SFM	90 SFM	80 SFM
Feed Rate (CLPT)	3/4"	0.0035	0.0028	0.0038	0.0034
	1"	0.0040	0.0030	0.0042	0.0037
	1-1/4"	0.0042	0.0035	0.0047	0.0041
	1-1/2"	0.0045	0.0038	0.0052	0.0045
	2"	0.0050	0.0039	0.0056	0.0049
Maximum Depths of cut					
Profiling	Radial	0.4xD		0.25xD	
	Axial	1.5xD		1xD	
Slotting	Axial	1xD		1xD	

The values are for cobalt tools. For Powder Metal you can increase Feed Rates by 30%

Variable Helix Endmills
HPM+ Endmills
High Performance Endmills
Standard Endmills
Solid Carbide Endmills
Metric Carbide Endmills
Solid Carbide Routers
Solid Carbide Drill Mills
Powder Metal Endmills (PM30)
Powder Metal Endmills (PM4)
Cobalt Endmills (M42)
High Speed Steel Endmills (M7)

Solid Carbide Endmills



2 Flute EndMill Center Cut - General Purpose

- General Purpose
- Right Hand Spiral & Cut
- Weldon Flats
- Square & Ballnose End
- Material Code Refer to Page 245 & 246.



HSS (M7) **2 Flutes** **30°**

RIGHT HAND

D1	D2	L1	L2	Part #		D1	D2	L1	L2	Part #	
				Cutting Dia	Shank Dia					LOC	OAL
1/4	3/8	1/2	2-5/16	21004	21104	7/8	7/8	3	5-1/4	21614	21714
1/4	3/8	1	2-13/16	21204	21304	* 15/16	5/8	1-1/2	3-5/8	21015.1	21115.1
1/4	3/8	1-1/2	3-5/16	21404	21504	1	1	1-5/8	4-1/8	21016	21116
1/4	3/8	2	3-3/4	21604	21704	1	5/8	1-1/2	3-5/8	21016.1	21116.1
5/16	3/8	9/16	2-5/16	21005	21105	1	1	2-1/4	4-3/4	21216	21316
5/16	3/8	1	2-3/4	21205	21305	1	1	3	5-1/2	21416	21516
5/16	3/8	1-1/2	3-1/4	21405	21505	1	1	4	6-1/2	21616	21716
5/16	3/8	2	3-3/4	21605	21705	1-1/8	1	1-5/8	4-1/8	21018	21118
3/8	3/8	9/16	2-5/16	21006	21106	1-1/8	1	2-1/4	4-3/4	21218	21318
3/8	3/8	1	2-3/4	21206	21306	1-1/8	1	3	5-1/2	21418	21518
3/8	3/8	1-1/2	3-1/4	21406	21506	1-1/4	1-1/4	1-5/8	4-1/8	21020	21120
3/8	3/8	2-1/2	4-1/4	21606	21706	1-1/4	1-1/4	2-1/4	4-3/4	21220	21320
* 7/16	3/8	13/16	2-1/2	21007	21107	1-1/4	1-1/4	3	5-1/2	21420	21520
1/2	1/2	1	3	21008	21108	1-1/4	1-1/4	4	6-1/2	21620	21720
1/2	3/8	13/16	2-1/2	21008.6	21108.6	1-1/4	1-1/4	6	8-1/2	21620S	21720S
1/2	1/2	1-1/2	3-1/2	21208	21308	1-1/4	1-1/4	8	10-1/2	21820	21920
1/2	1/2	2	4	21408	21508	1-3/8	1-1/4	1-5/8	4-1/8	21022	21122
1/2	1/2	3	5	21608	21708	1-3/8	1-1/4	2-1/4	4-3/4	21222	21322
1/2	1/2	4	6	21608S	21708S	1-3/8	1-1/4	3	5-1/2	21422	21522
* 9/16	1/2	1-1/8	3-1/8	21009	21109	1-1/2	1-1/4	1-5/8	4-1/8	21024	21124
5/8	5/8	1-5/16	3-7/16	21010	21110	1-1/2	1-1/4	2-1/4	4-3/4	21224	21324
5/8	1/2	1-1/8	3-1/8	21010.8	21110.8	1-1/2	1-1/4	3	5-1/2	21424	21524
5/8	5/8	1-5/8	3-3/4	21210	21310	1-1/2	1-1/4	4	6-1/2	21624	21724
5/8	5/8	2	4-1/8	21410	21510	1-1/2	1-1/4	6	8-1/2	21624S	21724S
5/8	5/8	3	5-1/8	21610	21710	1-1/2	1-1/4	8	10-1/2	21824	21924
* 11/16	5/8	1-5/16	3-7/16	21011	21111	1-5/8	1-1/4	1-5/8	4-1/8	21026	21126
* 11/16	1/2	1-5/16	3-5/16	21011.8	21111.8	1-5/8	1-1/4	2-1/4	4-3/4	21226	21326
3/4	3/4	1-5/16	3-9/16	21012	21112	1-5/8	1-1/4	3	5-1/2	21426	21526
3/4	5/8	1-5/16	3-7/16	21012.1	21112.1	1-3/4	1-1/4	1-5/8	4-1/8	21028	21128
3/4	1/2	1-5/16	3-5/16	21012.8	21112.8	1-3/4	1-1/4	2-1/4	4-3/4	21228	21328
3/4	3/4	1-3/4	4	21212	21312	1-3/4	1-1/4	3	5-1/2	21428	21528
3/4	3/4	2-1/4	4-1/2	21412	21512	1-7/8	1-1/4	1-5/8	4-1/8	21030	21130
3/4	3/4	3	5-1/4	21612	21712	1-7/8	1-1/4	3	5-1/2	21430	21530
* 13/16	5/8	1-1/2	3-5/8	21013.1	21113.1	2	1-1/4	1-5/8	4-1/8	21032	21132
7/8	7/8	1-1/2	3-3/4	21014	21114	2	1-1/4	2-1/4	4-3/4	21232	21332
7/8	5/8	1-1/2	3-5/8	21014.1	21114.1	2	1-1/4	3	5-1/2	21432	21532
7/8	7/8	2	4-1/4	21214	21314	2	1-1/4	4	6-1/2	21632	21732
7/8	7/8	2-1/2	4-3/4	21414	21514						

Available 2-1/2" & 3" Sizes Upon Request

* Available Until Stock Lasts.

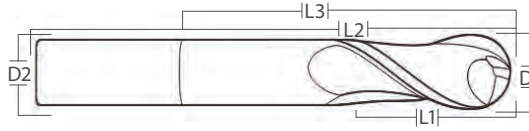
HSS Endmills



2 Flute EndMill Center Cut - General Purpose

- General Purpose
- Right Hand Spiral & Cut
- Weldon Flats
- Square & Ballnose End
- Material Code Refer to Page 245 & 246.

P M K S



HSS (M7) **2 Flutes** **30°**

RIGHT HAND HSS ENDMILLS

RIGHT HAND - Extended Neck

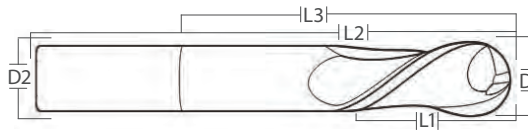
D1 Cutting Dia	D2 Shank Dia	L1 LOC	L3 REACH	L2 OAL	Part # Square	Part # Ball
1/4	3/8	5/8	1-1/2	3-1/16	29A04	29B04
5/16	3/8	3/4	1-3/4	3-5/16	29A05	29B05
3/8	3/8	3/4	1-3/4	3-5/16	29A06	29B06
1/2	1/2	1	2-3/4	4	29A08	29B08
5/8	5/8	1-3/8	2-3/4	4-5/8	29A10	29B10
3/4	3/4	1-5/8	3-1/8	5-3/8	29A12	29B12
7/8	7/8	2	4	6	29A14	29B14
1	1	2-1/2	5	7-1/4	29A16	29B16
1-1/4	1-1/4	3	5	7-1/4	29A20	29B20



2 Flute EndMill Center Cut - General Purpose

- General Purpose
- Left Hand Spiral & Cut
- Weldon Flats
- Square & Ballnose End
- Material Code Refer to Page 245 & 246.

P M K S

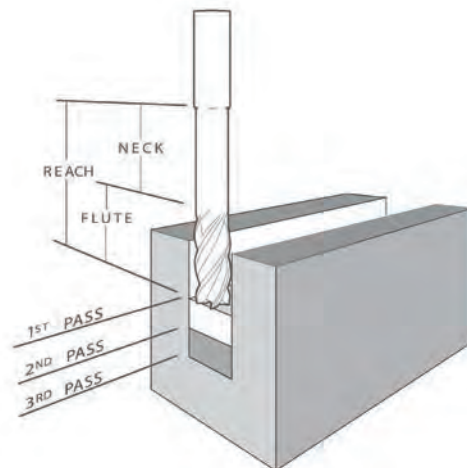


HSS (M7) **2 Flutes** **30°**

LEFT HAND HSS ENDMILLS

LEFT HAND - Extended Neck

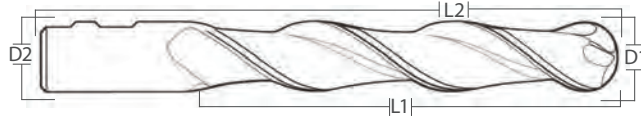
D1 Cutting Dia	D2 Shank Dia	L1 LOC	L3 REACH	L2 OAL	Part # Square	Part # Ball
1/4	3/8	5/8	1-1/2	3-1/16	28A04	28B04
5/16	3/8	3/4	1-3/4	3-5/16	28A05	28B05
3/8	3/8	3/4	1-3/4	3-5/16	28A06	28B06
1/2	1/2	1	2-3/4	4	28A08	28B08
5/8	5/8	1-3/8	2-3/4	4-5/8	28A10	28B10
3/4	3/4	1-5/8	3-1/8	5-3/8	28A12	28B12
7/8	7/8	2	4	6	28A14	28B14
1	1	2-1/2	5	7-1/4	28A16	28B16
1-1/4	1-1/4	3	5	7-1/4	28A20	28B20



Variable Helix Endmills	HPM+ Endmills	High Performance Endmills	Standard Endmills	Solid Carbide Endmills	Metric Carbide Endmills	Solid Carbide Routers	Solid Carbide Drill Mills	Powder Metal (PM30) Endmills	Powder Metal (PM4) Endmills	Cobalt (M42) Endmills	High Speed Steel (M7) Endmills
-------------------------	---------------	---------------------------	-------------------	------------------------	-------------------------	-----------------------	---------------------------	------------------------------	-----------------------------	-----------------------	--------------------------------

Solid Carbide Endmills

Variable Helix Endmills
 HPM+ Endmills
 High Performance Endmills
 Standard Endmills



2 Flute EndMill Center Cut - Aluminum Alloys

- Ideal for Aluminum Alloys
- Right Hand Spiral & Cut
- Weldon Flats
- Square & Ballnose End
- Material Code Refer to Page 245 & 246.

N

HSS (M7) **2 Flutes** **37°**



RIGHT HAND

D1	D2	L1	L2	Part #	Part #
Cutting Dia	Shank Dia	LOC	OAL	Square	Ball
* 1/8	3/8	3/8	2-5/16	23002	23102
* 3/16	3/8	1/2	2-3/8	23003	23103
1/4	3/8	5/8	2-7/16	23004	23104
1/4	3/8	1-1/4	3-1/16	23204	23304
1/4	3/8	1-3/4	3-9/16	23404	23504
5/16	3/8	3/4	2-1/2	23005	23105
5/16	3/8	1-3/8	3-1/8	23205	23305
5/16	3/8	2	3-3/4	23405	23505
3/8	3/8	3/4	2-1/2	23006	23106
3/8	3/8	1-1/2	3-1/4	23206	23306
3/8	3/8	2-1/2	4-1/4	23406	23506
7/16	3/8	1	2-11/16	23007	23107
7/16	1/2	1-3/4	3-3/4	23207	23307
7/16	1/2	2-3/4	4-3/4	23407	23507
1/2	1/2	1-1/4	3-1/4	23008	23108
1/2	1/2	2	4	23208	23308
1/2	1/2	3	5	23408	23508
1/2	1/2	4	6	23608	23708
1/2	1/2	6	8	23608S	23708S
1/2	1/2	8	10	23808	23908
5/8	5/8	1-5/8	3-3/4	23010	23110
5/8	5/8	2-1/2	4-5/8	23210	23310
5/8	5/8	3	5-1/8	23410	23510
5/8	5/8	4	6-1/8	23610	23710
5/8	5/8	6	8-1/8	23610S	23710S
5/8	5/8	8	10-1/8	23810	23910
3/4	3/4	1-5/8	3-7/8	23012	23112
3/4	3/4	2	4-1/4	23212	23312
3/4	3/4	2-1/4	4-1/2	23212S	23312S
3/4	3/4	3	5-1/4	23412	23512
3/4	3/4	4	6-1/4	23612	23712
3/4	3/4	6	8-1/4	23612S	23712S
3/4	3/4	8	10-1/4	23812	23912
7/8	7/8	1-7/8	4-1/8	23014	23114
7/8	7/8	2-1/2	4-3/4	23214	23314
7/8	7/8	3-1/2	5-3/4	23414	23514
7/8	7/8	5	7-1/4	23614	23714
7/8	7/8	7	9-1/4	23614S	23714S
1	1	2	4-1/2	23016	23116
1	1	3	5-1/2	23216	23316

D1	D2	L1	L2	Part #	Part #
Cutting Dia	Shank Dia	LOC	OAL	Square	Ball
1	1	4	6-1/2	23416	23516
1	1	5	7-1/2	23416S	23516S
1	1	6	8-1/2	23616	23716
1	1	7	9-1/2	23616S	23716S
1	1	8	10-1/2	23816	23916
1	1	10	12-1/2	23816S	23916S
1-1/4	1-1/4	2	4-1/2	23020	23120
1-1/4	1-1/4	3	5-1/2	23220	23320
1-1/4	1-1/4	4	6-1/2	23420	23520
1-1/4	1-1/4	5	7-1/2	23420S	23520S
1-1/4	1-1/4	6	8-1/2	23620	23720
1-1/4	1-1/4	7	9-1/2	23620S	23720S
1-1/4	1-1/4	8	10-1/2	23820	23920
1-1/4	1-1/4	10	12-1/2	23820S	23920S
1-1/2	1-1/4	2	4-1/2	23024	23124
1-1/2	1-1/4	3	5-1/2	23224	23324
1-1/2	1-1/4	4	6-1/2	23424	23524
1-1/2	1-1/4	5	7-1/2	23424S	23524S
1-1/2	1-1/4	6	8-1/2	23624	23724
1-1/2	1-1/4	7	9-1/2	23624S	23724S
1-1/2	1-1/4	8	10-1/2	23824	23924
1-3/4	1-1/4	2	4-1/2	23028	23128
1-3/4	1-1/4	3	5-1/2	23228	23328
1-3/4	1-1/4	4	6-1/2	23428	23528
2	1-1/4	2	4-1/2	23032	23132
2	1-1/4	3	5-1/2	23232	23332
2	1-1/4	4	6-1/2	23432	23532
2	1-1/4	5	7-1/2	23432S	23532S
2	1-1/4	6	8-1/2	23632	23732
2	1-1/4	7	9-1/2	23632S	23732S
2	1-1/4	8	10-1/2	23832	23932
2	2	2	5-3/4	27002A	27102A
2	2	3	6-3/4	27003A	27103A
2	2	4	7-3/4	27004A	27104A
2	2	5	8-3/4	27005A	27105A
2	2	6	9-3/4	27006A	27106A
2	2	8	11-3/4	27008A	27108A
2	2	10	13-3/4	27010A	27110A
2	2	12	15-3/4	27012A	27112A

Available 2-1/2" & 3" Sizes Upon Request

* Available Until Stock Lasts.

HSS Endmills

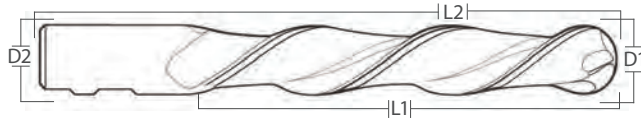
High Speed Steel (M7) Endmills



2 Flute EndMill Center Cut - Aluminum Alloys

- Ideal for Aluminum Alloys
- Left Hand Spiral & Cut
- Weldon Flats
- Square & Ballnose End
- Material Code Refer to Page 245 & 246.

N



HSS (M7) **2 Flutes** **37°**

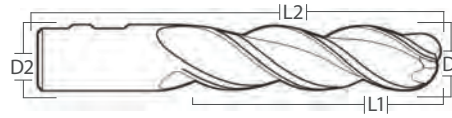
LEFT HAND HSS ENDMILLS

LEFT HAND

D1	D2	L1	L2	Part #	Part #	D1	D2	L1	L2	Part #	Part #
Cutting Dia	Shank Dia	LOC	OAL	Square	Ball	Cutting Dia	Shank Dia	LOC	OAL	Square	Ball
1/4	3/8	5/8	2-7/16	25004	25104	1	1	5	7-1/2	25416S	25516S
1/4	3/8	1-1/4	3-1/16	25204	25304	1	1	6	8-1/2	25616	25716
1/4	3/8	1-3/4	3-9/16	25404	25504	1	1	7	9-1/2	25616S	25716S
5/16	3/8	3/4	2-1/2	25005	25105	1	1	8	10-1/2	25816	25916
5/16	3/8	1-3/8	3-1/8	25205	25305	1	1	10	12-1/2	25816S	25916S
5/16	3/8	2	3-3/4	25405	25505	1-1/4	1-1/4	2	4-1/2	25020	25120
3/8	3/8	3/4	2-1/2	25006	25106	1-1/4	1-1/4	3	5-1/2	25220	25320
3/8	3/8	1-1/2	3-1/4	25206	25306	1-1/4	1-1/4	4	6-1/2	25420	25520
3/8	3/8	2-1/2	4-1/4	25406	25506	1-1/4	1-1/4	5	7-1/2	25420S	25520S
7/16	3/8	1	2-11/16	25007	25107	1-1/4	1-1/4	6	8-1/2	25620	25720
7/16	1/2	1-3/4	3-3/4	25207	25307	1-1/4	1-1/4	7	9-1/2	25620S	25720S
7/16	1/2	2-3/4	4-3/4	25407	25507	1-1/4	1-1/4	8	10-1/2	25820	25920
1/2	1/2	1-1/4	3-1/4	25008	25108	1-1/4	1-1/4	10	12-1/2	25820S	25920S
1/2	1/2	2	4	25208	25308	1-1/2	1-1/4	2	4-1/2	25024	25124
1/2	1/2	3	5	25408	25508	1-1/2	1-1/4	3	5-1/2	25224	25324
1/2	1/2	4	6	25608	25708	1-1/2	1-1/4	4	6-1/2	25424	25524
1/2	1/2	6	8	25608S	25708S	1-1/2	1-1/4	5	7-1/2	25424S	25524S
1/2	1/2	8	10	25808	25908	1-1/2	1-1/4	6	8-1/2	25624	25724
5/8	5/8	1-5/8	3-3/4	25010	25110	1-1/2	1-1/4	7	9-1/2	25624S	25724S
5/8	5/8	2-1/2	4-5/8	25210	25310	1-1/2	1-1/4	8	10-1/2	25824	25924
5/8	5/8	3	5-1/8	25410	25510	1-3/4	1-1/4	2	4-1/2	25028	25128
5/8	5/8	4	6-1/8	25610	25710	1-3/4	1-1/4	3	5-1/2	25228	25328
5/8	5/8	6	8-1/8	25610S	25710S	1-3/4	1-1/4	4	6-1/2	25428	25528
5/8	5/8	8	10-1/8	25810	25910	2	1-1/4	2	4-1/2	25032	25132
3/4	3/4	1-5/8	3-7/8	25012	25112	2	1-1/4	3	5-1/2	25232	25332
3/4	3/4	2	4-1/4	25212	25312	2	1-1/4	4	6-1/2	25432	25532
3/4	3/4	2-1/4	4-1/2	25212S	25312S	2	1-1/4	5	7-1/2	25432S	25532S
3/4	3/4	3	5-1/4	25412	25512	2	1-1/4	6	8-1/2	25632	25732
3/4	3/4	4	6-1/4	25612	25712	2	1-1/4	7	9-1/2	25632S	25732S
3/4	3/4	6	8-1/4	25612S	25712S	2	1-1/4	8	10-1/2	25832	25932
3/4	3/4	8	10-1/4	25812	25912	2	2	2	5-3/4	27F02A	27G02A
7/8	7/8	1-7/8	4-1/8	25014	25114	2	2	3	6-3/4	27F03A	27G03A
7/8	7/8	2-1/2	4-3/4	25214	25314	2	2	4	7-3/4	27F04A	27G04A
7/8	7/8	3-1/2	5-3/4	25414	25514	2	2	5	8-3/4	27F05A	27G05A
7/8	7/8	5	7-1/4	25614	25714	2	2	6	9-3/4	27F06A	27G06A
7/8	7/8	7	9-1/4	25614S	25714S	2	2	8	11-3/4	27F08A	27G08A
1	1	2	4-1/2	25016	25116	2	2	10	13-3/4	27F10A	27G10A
1	1	3	5-1/2	25216	25316	2	2	12	15-3/4	27F12A	27G12A
1	1	4	6-1/2	25416	25516						

Available 2-1/2" & 3" Sizes Upon Request

Variable Helix Endmills
 HPM+ Endmills
 High Performance Endmills
 Standard Endmills
 Carbide Endmills
 Solid Carbide Routers
 Solid Carbide Drill Mills
 Powder Metal Endmills (PM30)
 Powder Metal Endmills (PM4)
 Cobalt Endmills (M42)
 HSS Endmills (M7)



3 Flute EndMill Center Cut - Aluminum Alloys

- Z-Power (ZrN) recommended (up to 25% faster)
- Ideal for Aluminum Alloys
- Right Hand Spiral & Cut
- Weldon Flats
- Square & Ballnose End
- Material Code Refer to Page 245 & 246.

HSS
(M7)

3
Flutes

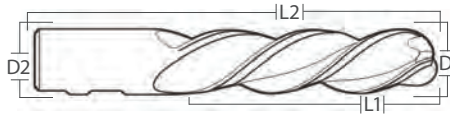
N

RIGHT HAND
HSS ENDMILLS

RIGHT HAND

Metric	Endmills	D1	D2	L1	L2	Part # Square	Part # Ball	D1 Cutting Dia	D2 Shank Dia	L1 LOC	L2 OAL	Part # Square	Part # Ball
		Cutting Dia	Shank Dia	LOC	OAL								
		1/4	3/8	5/8	2-7/16	33004	33104	1	1	4	6-1/2	33416	33516
		1/4	3/8	1-1/4	3-1/16	33204	33304	1	1	5	7-1/2	33416S	33516S
		1/4	3/8	1-3/4	3-9/16	33404	33504	1	1	6	8-1/2	33616	33716
		5/16	3/8	3/4	2-1/2	33005	33105	1	1	7	9-1/2	33616S	33716S
		5/16	3/8	1-3/8	3-1/8	33205	33305	1	1	8	10-1/2	33816	33916
		5/16	3/8	2	3-3/4	33405	33505	1	1	10	12-1/2	33816S	33916S
		3/8	3/8	3/4	2-1/2	33006	33106	1-1/4	1-1/4	2	4-1/2	33020	33120
		3/8	3/8	1-1/2	3-1/4	33206	33306	1-1/4	1-1/4	3	5-1/2	33220	33320
		3/8	3/8	2-1/2	4-1/4	33406	33506	1-1/4	1-1/4	4	6-1/2	33420	33520
		7/16	3/8	1	2-11/16	33007	33107	1-1/4	1-1/4	5	7-1/2	33420S	33520S
		7/16	1/2	1-3/4	3-3/4	33207	33307	1-1/4	1-1/4	6	8-1/2	33620	33720
		7/16	1/2	2-3/4	4-3/4	33407	33507	1-1/4	1-1/4	7	9-1/2	33620S	33720S
		1/2	1/2	1-1/4	3-1/4	33008	33108	1-1/4	1-1/4	8	10-1/2	33820	33920
		1/2	1/2	2	4	33208	33308	1-1/4	1-1/4	10	12-1/2	33820S	33920S
		1/2	1/2	3	5	33408	33508	1-1/2	1-1/4	2	4-1/2	33024	33124
		1/2	1/2	4	6	33608	33708	1-1/2	1-1/4	3	5-1/2	33224	33324
		1/2	1/2	6	8	33608S	33708S	1-1/2	1-1/4	4	6-1/2	33424	33524
		1/2	1/2	8	10	33808	33908	1-1/2	1-1/4	5	7-1/2	33424S	33524S
		5/8	5/8	1-5/8	3-3/4	33010	33110	1-1/2	1-1/4	6	8-1/2	33624	33724
		5/8	5/8	2-1/2	4-5/8	33210	33310	1-1/2	1-1/4	7	9-1/2	33624S	33724S
		5/8	5/8	3	5-1/8	33410	33510	1-1/2	1-1/4	8	10-1/2	33824	33924
		5/8	5/8	4	6-1/8	33610	33710	1-3/4	1-1/4	2	4-1/2	33028	33128
		5/8	5/8	6	8-1/8	33610S	33710S	1-3/4	1-1/4	3	5-1/2	33228	33328
		5/8	5/8	8	10-1/8	33810	33910	1-3/4	1-1/4	4	6-1/2	33428	33528
		3/4	3/4	1-5/8	3-7/8	33012	33112	2	1-1/4	2	4-1/2	33032	33132
		3/4	3/4	2	4-1/4	33212	33312	2	1-1/4	3	5-1/2	33232	33332
		3/4	3/4	2-1/4	4-1/2	33212S	33312S	2	1-1/4	4	6-1/2	33432	33532
		3/4	3/4	3	5-1/4	33412	33512	2	1-1/4	5	7-1/2	33432S	33532S
		3/4	3/4	4	6-1/4	33612	33712	2	1-1/4	6	8-1/2	33632	33732
		3/4	3/4	6	8-1/4	33612S	33712S	2	1-1/4	7	9-1/2	33632S	33732S
		3/4	3/4	8	10-1/4	33812	33912	2	1-1/4	8	10-1/2	33832	33932
		7/8	7/8	1-7/8	4-1/8	33014	33114	2	2	2	5-3/4	37002A	37102A
		7/8	7/8	2-1/2	4-3/4	33214	33314	2	2	3	6-3/4	37003A	37103A
		7/8	7/8	3-1/2	5-3/4	33414	33514	2	2	4	7-3/4	37004A	37104A
		7/8	7/8	4	6-1/4	33414S	33514S	2	2	5	8-3/4	37005A	37105A
		7/8	7/8	5	7-1/4	33614	33714	2	2	6	9-3/4	37006A	37106A
		7/8	7/8	7	9-1/4	33614S	33714S	2	2	8	11-3/4	37008A	37108A
		1	1	2	4-1/2	33016	33116	2	2	10	13-3/4	37010A	37110A
		1	1	3	5-1/2	33216	33316	2	2	12	15-3/4	37012A	37112A

Available 2-1/2" & 3" Sizes Upon Request



HSS (M7) **3 Flutes** **37°**

3 Flute EndMill Center Cut - Aluminum Alloys

- Ideal for Aluminum Alloys
- Left Hand Spiral & Cut
- Weldon Flats
- Square & Ballnose End
- Material Code Refer to Page 245 & 246.



LEFT HAND HSS ENDMILLS

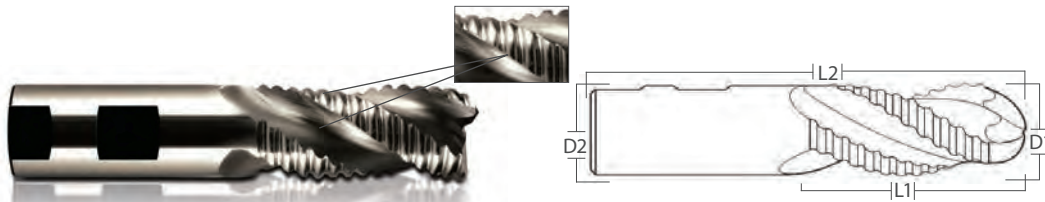
LEFT HAND

D1 Cutting Dia	D2 Shank Dia	L1 LOC	L2 OAL	Part # Square	Part # Ball
1/4	3/8	5/8	2-7/16	35004	35104
1/4	3/8	1-1/4	3-1/16	35204	35304
1/4	3/8	1-3/4	3-9/16	35404	35504
5/16	3/8	3/4	2-1/2	35005	35105
5/16	3/8	1-3/8	3-1/8	35205	35305
5/16	3/8	2	3-3/4	35405	35505
3/8	3/8	3/4	2-1/2	35006	35106
3/8	3/8	1-1/2	3-1/4	35206	35306
3/8	3/8	2-1/2	4-1/4	35406	35506
7/16	3/8	1	2-11/16	35007	35107
7/16	1/2	1-3/4	3-3/4	35207	35307
7/16	1/2	2-3/4	4-3/4	35407	35507
1/2	1/2	1-1/4	3-1/4	35008	35108
1/2	1/2	2	4	35208	35308
1/2	1/2	3	5	35408	35508
1/2	1/2	4	6	35608	35708
1/2	1/2	6	8	35608S	35708S
1/2	1/2	8	10	35808	35908
5/8	5/8	1-5/8	3-3/4	35010	35110
5/8	5/8	2-1/2	4-5/8	35210	35310
5/8	5/8	3	5-1/8	35410	35510
5/8	5/8	4	6-1/8	35610	35710
5/8	5/8	6	8-1/8	35610S	35710S
5/8	5/8	8	10-1/8	35810	35910
3/4	3/4	1-5/8	3-7/8	35012	35112
3/4	3/4	2	4-1/4	35212	35312
3/4	3/4	2-1/4	4-1/2	35212S	35312S
3/4	3/4	3	5-1/4	35412	35512
3/4	3/4	4	6-1/4	35612	35712
3/4	3/4	6	8-1/4	35612S	35712S
3/4	3/4	8	10-1/4	35812	35912
7/8	7/8	1-7/8	4-1/8	35014	35114
7/8	7/8	2-1/2	4-3/4	35214	35314
7/8	7/8	3-1/2	5-3/4	35414	35514
7/8	7/8	5	7-1/4	35614	35714
7/8	7/8	7	9-1/4	35614S	35714S
1	1	2	4-1/2	35016	35116
1	1	3	5-1/2	35216	35316
1	1	4	6-1/2	35416	35516

D1 Cutting Dia	D2 Shank Dia	L1 LOC	L2 OAL	Part # Square	Part # Ball
1	1	5	7-1/2	35416S	35516S
1	1	6	8-1/2	35616	35716
1	1	7	9-1/2	35616S	35716S
1	1	8	10-1/2	35816	35916
1	1	10	12-1/2	35816S	35916S
1-1/4	1-1/4	2	4-1/2	35020	35120
1-1/4	1-1/4	3	5-1/2	35220	35320
1-1/4	1-1/4	4	6-1/2	35420	35520
1-1/4	1-1/4	5	7-1/2	35420S	35520S
1-1/4	1-1/4	6	8-1/2	35620	35720
1-1/4	1-1/4	7	9-1/2	35620S	35720S
1-1/4	1-1/4	8	10-1/2	35820	35920
1-1/4	1-1/4	10	12-1/2	35820S	35920S
1-1/2	1-1/4	2	4-1/2	35024	35124
1-1/2	1-1/4	3	5-1/2	35224	35324
1-1/2	1-1/4	4	6-1/2	35424	35524
1-1/2	1-1/4	5	7-1/2	35424S	35524S
1-1/2	1-1/4	6	8-1/2	35624	35724
1-1/2	1-1/4	7	9-1/2	35624S	35724S
1-1/2	1-1/4	8	10-1/2	35824	35924
1-3/4	1-1/4	2	4-1/2	35028	35128
1-3/4	1-1/4	3	5-1/2	35228	35328
1-3/4	1-1/4	4	6-1/2	35428	35528
2	1-1/4	2	4-1/2	35032	35132
2	1-1/4	3	5-1/2	35232	35332
2	1-1/4	4	6-1/2	35432	35532
2	1-1/4	5	7-1/2	35432S	35532S
2	1-1/4	6	8-1/2	35632	35732
2	1-1/4	7	9-1/2	35632S	35732S
2	1-1/4	8	10-1/2	35832	35932
2	2	2	5-3/4	37F02A	37G02A
2	2	3	6-3/4	37F03A	37G03A
2	2	4	7-3/4	37F04A	37G04A
2	2	5	8-3/4	37F05A	37G05A
2	2	6	9-3/4	37F06A	37G06A
2	2	8	11-3/4	37F08A	37G08A
2	2	10	13-3/4	37F10A	37G10A
2	2	12	15-3/4	37F12A	37G12A

Available 2-1/2" & 3" Sizes Upon Request

Variable Helix Endmills HPM+ Endmills High Performance Endmills Standard Endmills Solid Carbide Endmills Metric Carbide Endmills Solid Carbide Routers Solid Carbide Drill Mills Powder Metal Endmills (PM30) Powder Metal Endmills (PM4) Cobalt Endmills (M42) High Speed Steel (M7) Endmills



3 Flute EndMill - Coarse Pitch - Aluminum Alloys

- Z-Power (ZrN) recommended (up to 25% faster)
- Ideal for Aluminum Alloys
- Right Hand Spiral & Cut
- Weldon Flats
- Square & Ballnose End
- Material Code Refer to Page 245 & 246.

HSS
(M7)

3
Flutes

37°

Rougher

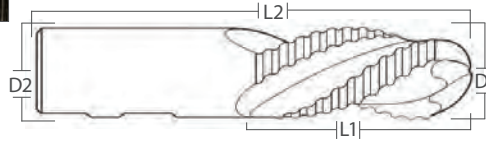


RIGHT HAND

	RIGHT HAND						RIGHT HAND					
	D1 Cutting Dia	D2 Shank Dia	L1 LOC	L2 OAL	Part # Square	Part # Ball	D1 Cutting Dia	D2 Shank Dia	L1 LOC	L2 OAL	Part # Square	Part # Ball
Metric	* 1/4	3/8	5/8	2-7/16	R33004	R33104	7/8	7/8	7	9-1/4	R33614S	R33714S
	* 1/4	3/8	1-1/4	3-1/16	R33204	R33304	1	1	2	4-1/2	R33016	R33116
	* 1/4	3/8	1-3/4	3-9/16	R33404	R33504	1	1	3	5-1/2	R33216	R33316
Routers	* 5/16	3/8	3/4	2-1/2	R33005	R33105	1	1	4	6-1/2	R33416	R33516
	* 5/16	3/8	1-3/8	3-1/8	R33205	R33305	1	1	6	8-1/2	R33616	R33716
	* 5/16	3/8	2	3-3/4	R33405	R33505	1	1	8	10-1/2	R33816	R33916
	* 3/8	3/8	3/4	2-1/2	R33006	R33106	1-1/4	1-1/4	2	4-1/2	R33020	R33120
	* 3/8	3/8	1-1/2	3-1/4	R33206	R33306	1-1/4	1-1/4	3	5-1/2	R33220	R33320
	* 3/8	3/8	2-1/2	4-1/4	R33406	R33506	1-1/4	1-1/4	4	6-1/2	R33420	R33520
	* 7/16	3/8	1	2-11/16	R33007	R33107	1-1/4	1-1/4	5	7-1/2	R33420S	R33520S
	* 7/16	1/2	1-3/4	3-3/4	R33207	R33307	1-1/4	1-1/4	6	8-1/2	R33620	R33720
	* 7/16	1/2	2-3/4	4-3/4	R33407	R33507	1-1/4	1-1/4	8	10-1/2	R33820	R33920
	Drill Mills	1/2	1/2	1-1/4	3-1/4	R33008	R33108	1-1/2	1-1/4	2	4-1/2	R33024
1/2		1/2	2	4	R33208	R33308	1-1/2	1-1/4	3	5-1/2	R33224	R33324
1/2		1/2	3	5	R33408	R33508	1-1/2	1-1/4	4	6-1/2	R33424	R33524
1/2		1/2	4	6	R33608	R33708	1-1/2	1-1/4	6	8-1/2	R33624	R33724
1/2		1/2	6	8	R33608S	R33708S	1-1/2	1-1/4	8	10-1/2	R33824	R33924
5/8		5/8	1-5/8	3-3/4	R33010	R33110	2	1-1/4	2	4-1/2	R33032	R33132
5/8		5/8	2-1/2	4-5/8	R33210	R33310	2	1-1/4	3	5-1/2	R33232	R33332
5/8		5/8	3	5-1/8	R33410	R33510	2	1-1/4	4	6-1/2	R33432	R33532
5/8		5/8	4	6-1/8	R33610	R33710	2	1-1/4	6	8-1/2	R33632	R33732
5/8		5/8	6	8-1/8	R33610S	R33710S	2	1-1/4	8	10-1/2	R33832	R33932
Powder Metal Endmills	3/4	3/4	1-5/8	3-7/8	R33012	R33112	2	2	2	5-3/4	R37002A	R37102A
	3/4	3/4	2	4-1/4	R33212	R33312	2	2	3	6-3/4	R37003A	R37103A
	3/4	3/4	2-1/4	4-1/2	R33212S	R33312S	2	2	4	7-3/4	R37004A	R37104A
	3/4	3/4	3	5-1/4	R33412	R33512	2	2	5	8-3/4	R37005A	R37105A
	3/4	3/4	4	6-1/4	R33612	R33712	2	2	6	9-3/4	R37006A	R37106A
	3/4	3/4	6	8-1/4	R33612S	R33712S	2	2	8	11-3/4	R37008A	R37108A
	7/8	3/4	1-7/8	4-1/8	R33014.B	R33114.B	2	2	10	13-3/4	R37010A	R37110A
	7/8	7/8	3-1/2	5-3/4	R33414	R33514	2	2	12	15-3/4	R37012A	R37112A
	7/8	7/8	5	7-1/4	R33614	R33714						

Available 2-1/2" & 3" Sizes Upon Request

* Available Until Stock Lasts.



3 Flute EndMill - Coarse Pitch - Aluminum Alloys

- Z-Power (ZrN) recommended (up to 25% faster)
- Ideal for Aluminum Alloys
- Left Hand Spiral & Cut
- Weldon Flats
- Square & Ballnose End
- Material Code Refer to Page 245 & 246.

HSS
(M7)

3
Flutes

37°

Rougher

LEFT HAND
HSS ENDMILLS

LEFT HAND

D1 Cutting Dia	D2 Shank Dia	L1 LOC	L2 OAL	Part # Square	Part # Ball
1/4	3/8	5/8	2-7/16	R35004	R35104
1/4	3/8	1-1/4	3-1/16	R35204	R35304
1/4	3/8	1-3/4	3-9/16	R35404	R35504
5/16	3/8	3/4	2-1/2	R35005	R35105
5/16	3/8	1-3/8	3-1/8	R35205	R35305
5/16	3/8	2	3-3/4	R35405	R35505
3/8	3/8	3/4	2-1/2	R35006	R35106
3/8	3/8	1-1/2	3-1/4	R35206	R35306
3/8	3/8	2-1/2	4-1/4	R35406	R35506
7/16	3/8	1	2-11/16	R35007	R35107
7/16	1/2	1-3/4	3-3/4	R35207	R35307
7/16	3/8	2-3/4	4-3/4	R35407	R35507
1/2	1/2	1-1/4	3-1/4	R35008	R35108
1/2	1/2	2	4	R35208	R35308
1/2	1/2	3	5	R35408	R35508
1/2	1/2	4	6	R35608	R35708
1/2	1/2	6	8	R35608S	R35708S
5/8	5/8	1-5/8	3-3/4	R35010	R35110
5/8	5/8	2-1/2	4-5/8	R35210	R35310
5/8	5/8	3	5-1/8	R35410	R35510
5/8	5/8	4	6-1/8	R35610	R35710
5/8	5/8	6	8-1/8	R35610S	R35710S
3/4	3/4	1-5/8	3-7/8	R35012	R35112
3/4	3/4	2	4-1/4	R35212	R35312
3/4	3/4	2-1/4	4-1/2	R35212S	R35312S
3/4	3/4	3	5-1/4	R35412	R35512
3/4	3/4	4	6-1/4	R35612	R35712
3/4	3/4	6	8-1/4	R35612S	R35712S

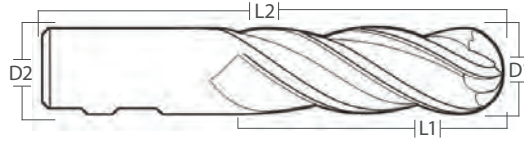
D1 Cutting Dia	D2 Shank Dia	L1 LOC	L2 OAL	Part # Square	Part # Ball
1	1	2	4-1/2	R35016	R35116
1	1	3	5-1/2	R35216	R35316
1	1	4	6-1/2	R35416	R35516
1	1	6	8-1/2	R35616	R35716
1	1	8	10-1/2	R35616S	R35716S
1-1/4	1-1/4	2	4-1/2	R35020	R35120
1-1/4	1-1/4	3	5-1/2	R35220	R35320
1-1/4	1-1/4	4	6-1/2	R35420	R35520
1-1/4	1-1/4	6	8-1/2	R35620	R35720
1-1/4	1-1/4	8	10-1/2	R35820	R35920
1-1/2	1-1/4	2	4-1/2	R35024	R35124
1-1/2	1-1/4	3	5-1/2	R35224	R35324
1-1/2	1-1/4	4	6-1/2	R35424	R35524
1-1/2	1-1/4	6	8-1/2	R35624	R35724
1-1/2	1-1/4	8	10-1/2	R35824	R35924
2	1-1/4	2	4-1/2	R35032	R35132
2	1-1/4	3	5-1/2	R35232	R35332
2	1-1/4	4	6-1/2	R35432	R35532
2	1-1/4	6	8-1/2	R35632	R35732
2	1-1/4	8	10-1/2	R35832	R35932
2	2	2	5-3/4	R37F02A	R37G02A
2	2	3	6-3/4	R37F03A	R37G03A
2	2	4	7-3/4	R37F04A	R37G04A
2	2	5	8-3/4	R37F05A	R37G05A
2	2	6	9-3/4	R37F06A	R37G06A
2	2	8	11-3/4	R37F08A	R37G08A
2	2	10	13-3/4	R37F10A	R37G10A
2	2	12	15-3/4	R37F12A	R37G12A

Available 2-1/2" & 3" Sizes Upon Request

Variable Helix Endmills	Solid Carbide Endmills
HPM+ Endmills	Solid Carbide Endmills
High Performance Endmills	Solid Carbide Endmills
Standard Endmills	Solid Carbide Endmills
Carbide Endmills	Metric
Solid Carbide Routers	Routers
Solid Carbide Drill Mills	Drill Mills
Powder Metal (PM30) Endmills	Powder Metal Endmills
Powder Metal (PM4) Endmills	Powder Metal Endmills
Cobalt (M42) Endmills	Cobalt Endmills
High Speed Steel (M7) Endmills	HSS Endmills

Solid Carbide Endmills

Variable Helix Endmills
HPM+ Endmills
High Performance Endmills
Standard Endmills



4 Flute EndMill Center Cut - General Purpose

- General Purpose
- Right Hand Spiral & Cut
- Weldon Flats
- Square & Ballnose End
- Material Code Refer to Page 245 & 246.

P M K S

HSS (M7) **4** Flutes $\gamma 32-1/2^\circ$

RIGHT HAND
Discontinued
while supplies last

RIGHT HAND

D1 Cutting Dia	D2 Shank Dia	L1 LOC	L2 OAL	Part # Square	Part # Ball
3/16	3/8	1/2	2-3/8	52003	52103
1/4	3/8	5/8	2-7/16	52004	52104
5/16	3/8	3/4	2-1/2	52005	52105
5/16	3/8	1-3/8	3-1/8	52205	52305
3/8	3/8	1-1/2	3-1/4	52206	52306
3/8	3/8	2-1/2	4-1/4	52406	52506
1/2	1/2	2	4	52208	52102
5/8	5/8	1-5/8	3-3/4	52010	52110
5/8	5/8	2-1/2	4-5/8	52210	52310
5/8	5/8	3	5-1/8	52410	52510
3/4	3/4	1-5/8	3-7/8	52012	52112
3/4	3/4	4	6-1/4	52612	52712

D1 Cutting Dia	D2 Shank Dia	L1 LOC	L2 OAL	Part # Square	Part # Ball
1-1/4	1-1/4	2	4-1/2	52020	52120
1-1/4	1-1/4	3	5-1/2	52220	52320
1-1/4	1-1/4	4	6-1/2	52420	52520
1-1/2	1-1/4	3	5-1/2	52224	52324
1-1/2	1-1/4	4	6-1/2	52424	52524
1-3/4	1-1/4	2	4-1/2	52028	52128
2	2	2	5-3/4	47202A	47102A
2	2	3	6-3/4	47203A	47103A
2	2	4	7-3/4	47204A	47104A

Metric

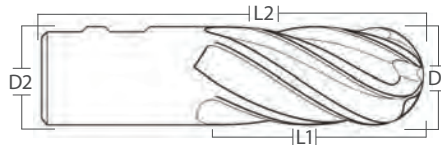
Routers

Drill Mills

Powder Metal Endmills

Cobalt Endmills

HSS Endmills



6 Flute EndMill Center Cut - General Purpose

- General Purpose
- Right Hand Spiral & Cut
- Weldon Flats
- Square & Ballnose End
- Material Code Refer to Page 245 & 246.

P M K S

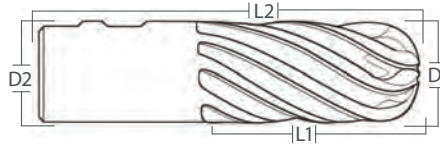
HSS (M7) **6** Flutes $\gamma 32-1/2^\circ$

RIGHT HAND
Discontinued
while supplies last

RIGHT HAND

D1 Cutting Dia	D2 Shank Dia	L1 LOC	L2 OAL	Part # Square	Part # Ball
3/4	3/4	1-5/8	3-7/8	52012X	52112X
3/4	3/4	3	5-1/4	52412X	52512X
3/4	3/4	4	6-1/4	52612X	52712X
1	1	2	4-1/2	52016X	52324
1	1	3	5-1/2	52216X	52316X
1	1	4	6-1/2	52416X	52516X
1-1/4	1-1/4	2	4-1/2	52020X	52120X
1-1/4	1-1/4	3	5-1/2	52220X	52320X
1-1/4	1-1/4	4	6-1/2	52420X	52520X

D1 Cutting Dia	D2 Shank Dia	L1 LOC	L2 OAL	Part # Square	Part # Ball
1-1/4	1-1/4	6	8-1/2	52620X	52720X
1-1/2	1-1/4	2	4-1/2	52024X	52124X
1-1/2	1-1/4	3	5-1/2	52224X	52324X
1-1/2	1-1/4	4	6-1/2	52424X	52524X
2	1-1/4	4	6-1/2	52432X	52532X
2	2	2	5-3/4	67202A	67102A
2	2	3	6-3/4	67203A	67103A
2	2	4	7-3/4	67204A	67104A
2	2	5	8-3/4	67205A	67105A



8 Flute EndMill Center Cut - General Purpose

- General Purpose
- Right Hand Spiral & Cut
- Weldon Flats
- Square & Ballnose End
- Material Code Refer to Page 245 & 246.

P M K S

HSS
(M7)

8
Flutes

$32-1/2^\circ$

RIGHT HAND

D1 Cutting Dia	D2 Shank Dia	L1 LOC	L2 OAL	Part # Square	Part # Ball
2	1-1/4	2	4-1/2	52032Z	52132Z
2	1-1/4	4	6-1/2	52432Z	52532Z
2	2	2	5-3/4	87202A	87102A
2	2	10	13-3/4	87210A	87110A

RIGHT HAND
Discontinued
 while supplies last

Variable Helix Endmills	HPM+ Endmills	High Performance Endmills	Standard Endmills	Carbide Endmills	Solid Carbide Routers	Solid Carbide Drill Mills	Powder Metal (PM30) Endmills	Powder Metal (PM4) Endmills	Cobalt (M42) Endmills	High Speed Steel (M7) Endmills
Solid Carbide Endmills				Metric	Routers	Drill Mills	Powder Metal Endmills	Powder Metal Endmills	Cobalt Endmills	HSS Endmills

All PCT Endmills conform to N.A.S 986 Specifications

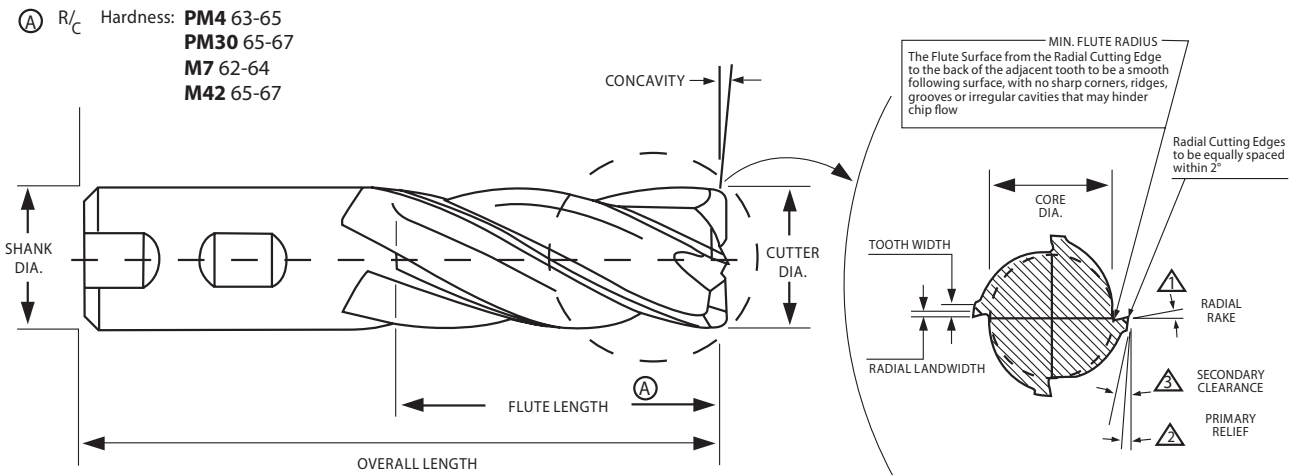
Cutter Diam. Inches	10	15	20	25	30	35	40	45	50	60	70	80	90	100
	REVOLUTIONS PER MINUTE													
1/16	611	917	1222	1528	1834	2140	2445	2751	3057	3668	4280	4891	5502	6114
3/32	407	611	815	1019	1222	1426	1630	1834	2038	2446	2853	3261	3667	4075
1/8	306	458	611	764	917	1070	1222	1375	1528	1834	2139	2445	2750	3056
5/32	244	367	489	611	733	856	978	1100	1222	1466	1711	1955	2200	2444
3/16	204	306	407	509	611	713	815	917	1019	1222	1426	1630	1834	2038
1/4	153	229	306	382	458	535	611	688	764	917	1070	1222	1376	1528
5/16	122	183	244	306	367	428	489	550	611	733	856	978	1100	1222
3/8	102	153	204	255	306	357	408	458	509	611	713	815	916	1018
7/16	87	131	175	218	262	306	349	393	437	524	611	699	786	874
1/2	76	115	153	191	229	268	306	344	382	459	535	611	688	764
9/16	68	103	137	172	204	238	272	306	340	407	475	543	611	679
5/8	61	92	122	153	184	214	245	276	306	367	428	489	552	612
11/16	55	84	112	140	167	194	222	249	278	333	389	444	500	555
3/4	51	76	102	127	153	178	203	229	254	306	357	408	458	508
13/16	47	71	95	118	142	166	190	213	237	284	332	379	427	474
7/8	44	66	87	109	131	153	175	196	219	262	306	349	392	438
1	38	57	76	96	115	134	153	172	191	229	267	306	344	382
1-1/8	34	51	68	85	102	119	136	153	170	204	238	272	306	340
1-1/4	31	46	61	76	92	107	123	137	153	183	214	245	274	306
1-3/8	28	42	56	70	83	89	111	125	139	167	195	222	250	278
1-1/2	25	38	51	64	76	89	102	115	127	153	178	204	230	254
1-3/4	22	33	44	55	66	76	88	98	109	131	153	175	196	218
2	19	29	38	48	57	67	76	86	96	115	134	153	172	191
2-1/4	17	26	34	42	51	59	68	76	86	102	119	136	153	170
2-1/2	15	23	31	38	46	54	61	69	76	92	107	122	138	153

PCT Mill Diameter Tolerances			
Type	Flute	Style	Tolerance
Finishing	2 flute	Single	+0.001
	3 flute		.000
	Multiflute	Double	.000
			-.001
Roughing/ Finishing	3 flute	Single	+0.003
	Multiflute		.000
Rougher Coarse Fine	3 flute	Single	+0.006
	Multiflute		-.006

* All Endmills have Shank – .0002 / – .0005 (except Double end).

All PCT Endmills conform to N.A.S 986 Specifications

Series #	No. of Flute	Helix Angle	Material Cut	Tool Material	Radial Rake $\pm 2^\circ$	Prim. $\pm 2^\circ$	Sec. $+5^\circ -3^\circ$
PM-33, PM-37	3	37°	Aluminum, Magnesium, and Zinc Alloys.	PM4	11°	10°	25°
PM-R33, PM-R37	3	37°		PM4	20°	-	-
23,25,27	2	37°		M2	11°	10°	25°
33, 35, 37	3	37°		M2	11°	10°	25°
RF33, RF35	3	37°		M2	11°	10°	25°
R33, R35, R37	3	37°		M2	20°	-	-
21,28, 29, 52, 47, 67, 87	2 4, 6, 8	30° 32 ¹ / ₂ °	Steel, Brass, Bronze, Iron, Carbon, Manganese, Steel for machining material of medium hardness.	M2	10°	12°	25°
				M2	10°	8°	16°
24, 26 54, 56, 59 48, 68, 88 RF54 PM3-54, PM3-88 PM3-68	2 4, 6, 8 4, 6, 8 4, 6, 8 4, 5, 6, 8 6	35° 35° 35° 35° 35°	To machine most materials up to medium hardness; 4 - 6 flute for Titanium Base & Stainless Steel Alloys; 6 - 8 flute for Nickel Base Alloys.	M42	10°	10°	20°
				M42	10°	10°	20°
				M42	10°	10°	20°
				M42	10°	10°	-
				PM30			
				PM30			
RS54, R54 R68, R88, R56 PM3-RS54	3, 4, 5, 6, 8 3, 4, 5, 6, 8 4, 5	30° 30° 35°	Material of medium hardness up to 32 R/c including Aluminum Alloys, Plastics, Annealed Titanium, & Non Hardenable Stainless, Alloy & Cast Steels, Brasses & Bronzes.	M42	15°	-	-
				M42	15°	-	-
				PM30			
FS54, F54 F68, F88, F56 PM3-F54 PM3-F554 PM3-F88	3, 4, 5, 6, 8 3, 4, 5, 6, 8 4, 5, 6, 8 4, 5 8	30° 30° 35° 35° 35°	Material of medium to high hardness including Stainless & Tool Steels, Super Hi-Temp., Nickel & Titanium Alloys, Nitriding & Heat treated Cast Iron & Steels.	M42	15°	-	-
				M42	15°	-	-
				PM30			
				PM30			
				PM30			



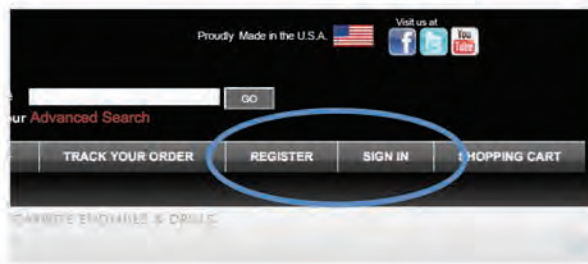
TRY our Online Feature!

"Track Your Order"

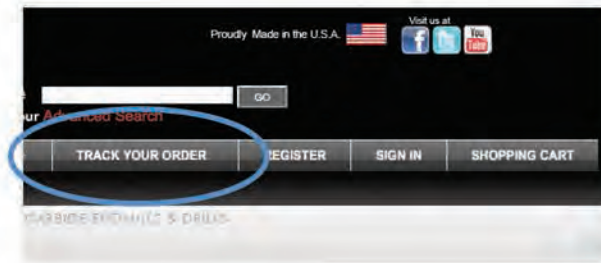
Step 1: Visit our website at www.pctcutters.com



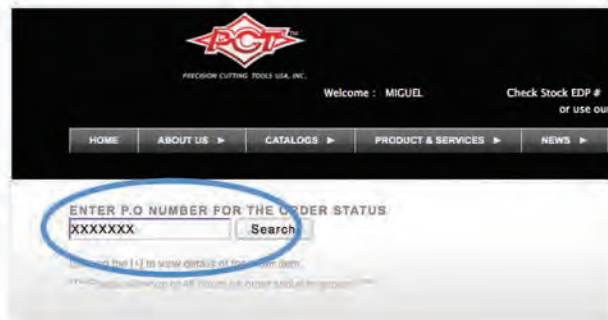
Step 2: Sign in
(If you do not have a sign-in, simply create one by clicking the **Register** tab)



Step 3: Select "TRACK YOUR ORDER"



Step 4: To view P.O. Status type in your Purchase Order# and Press "Search"



P.O. Status

Order Date	Sales Order	View Item(s) by Invoice No.				Print Invoice	Ship Via	Tracking Number																				
5/14/2013	00018386	15573 <table border="1"> <thead> <tr> <th>Item #</th> <th>Description</th> <th>Qty Ordered</th> <th>Qty Shipped</th> <th>Qty Backordered</th> </tr> </thead> <tbody> <tr> <td>0360160403754.1B</td> <td>XXXXXXXXXXXXXXXX-XXXX XXXX</td> <td>12</td> <td>12</td> <td>0</td> </tr> <tr> <td>SXC2010320T9</td> <td>XXXXXXXXXXXXXXXX-XXXX XXXX</td> <td>8</td> <td>8</td> <td>0</td> </tr> <tr> <td>AXC0120000T6</td> <td>XXXXXXXXXXXXXXXX-XXXX XXXX</td> <td>10</td> <td>10</td> <td>0</td> </tr> </tbody> </table>				Item #	Description	Qty Ordered	Qty Shipped	Qty Backordered	0360160403754.1B	XXXXXXXXXXXXXXXX-XXXX XXXX	12	12	0	SXC2010320T9	XXXXXXXXXXXXXXXX-XXXX XXXX	8	8	0	AXC0120000T6	XXXXXXXXXXXXXXXX-XXXX XXXX	10	10	0	PDF	Ground	XXXXXXXXXXXXXXXXXXXX
Item #	Description	Qty Ordered	Qty Shipped	Qty Backordered																								
0360160403754.1B	XXXXXXXXXXXXXXXX-XXXX XXXX	12	12	0																								
SXC2010320T9	XXXXXXXXXXXXXXXX-XXXX XXXX	8	8	0																								
AXC0120000T6	XXXXXXXXXXXXXXXX-XXXX XXXX	10	10	0																								

Order Date

Sales Order

View Item(s) by Invoice No.
Click to view your Item(s)

Print Invoice

Ship Via

Tracking Details

MATERIAL CODE

P	1	Low-Carbon Steels- 1000 Series (>25 HRc)
	2	Low-Carbon Steels- 1000 Series (<25 HRc)
	3	Alloy Tool Steels- 1300,2000, 3000 (≤35HRc)
	4	Alloy Tool Steels- 1300,2000, 3000 (36-48 HRc)
	5	Ferritic, Martensitic & PH Stainless Steels- 400's,pH Types(15-5, 13-8, 17-4) (≤35HRc)
	6	Ferritic, Martensitic & PH Stainless Steels- 400's,pH Types(15-5, 13-8, 17-4)(36-48 HRc)
M	1	Austenitic Stainless Steel-Inox, 200 Series, 300 Series and 304L
	2	Austenitic Stainless Steel & Cast Stainless Steel- 310, 314, 316 (<25HRc)
	3	Duplex Steel (Austenitic & Ferritic)- 323, 329, F55, 2205
K	1	Gray Cast Iron
	2	Ductile Iron- 60-40-18, 65-45-12 (<28HRc)
	3	Ductile Iron- 32510, 35018 (<38HRc)
N	1	Wrought Aluminum Alloys
	2	Low-Silicon Aluminum Alloys SI <12.2% - 6061, 7075
	3	High-Silicon Aluminum Alloys SI <12.2% -6061, 7075
	4	Metal Matrix Composite (Glass Filament Epoxy,Fiber Glass, Graphite)
	5	Copper & Copper Alloys
	6	Carbon & Graphite Composites
S	1	Iron-Based, Heat-Resistant Alloys- Incoloy 800-802, A-286, N-155
	2	Nickel Based, Cobalt Based, Heat-Resistant Alloys- Haynes 188,Haynes 21, Hastelloy, Waspaloy, Inconel 625/718 (≤48 HRc)
	4	Titanium Alloys- Commercially Pure, 6Al-4V, Astm 1/2/3, Ti-6Al-2Sn-4Zr-2Mo (≤48 HRc)
H	1	Hardened Tool Steels- H Series(10,11,13), D Series (2,3), 4340, P20 (≤48 HRc)
	2	Hardened Tool Steels- H Series(10,11,13), D Series (2,3), 4340, P20 (48-55 HRc)
	3	Hardened Tool Steels- H Series(10,11,13), D Series (2,3), 4340, P20 (56-60 HRc)
	4	Hardened Tool Steels- H Series(10,11,13), D Series (2,3), 4340, P20 (60-62 HRc) H Series(10,11,13), D Series (2,3), 4340, P20 (62-64 HRc)

CÓDIGO DE MATERIAL

P	1	Acero Bajo en Carbono - Series 1000 (> 25 HRc)
	2	Acero Bajo en Carbono - Series 1000(<25 HRc)
	3	Aleación de Aceros - 1300,2000, 3000 (≤ 35 HRc)
	4	Aleación de Aceros - 1300,2000, 3000 (36-48 HRc)
	5	Ferríticos, Martensíticos y Aceros Inoxidables PH - 400's, Tipos pH(15-5, 13-8, 17-4) (≤ 35 HRc)
	6	Ferríticos, Martensíticos y Aceros Inoxidables PH - 400's,Tipos pH(15-5, 13-8, 17-4) (36-48 HRc)
M	1	Acero Inoxidable Austenítico -Inox, 200 Series, 300 Series and 304L
	2	Austenítico de Acero Fundido y Acero Inoxidable - 310, 314, 316 (<25HRc)
	3	Acero Duplex (Austenítico y ferrítico) - 323, 329, F55, 2205
K	1	Hierro Fundido Gris
	2	Hierro Dúctil - 60-40-18, 65-45-12 (<28HRc)
	3	Hierro Dúctil -32510, 35018 (<38HRc)
N	1	Aleaciones de Aluminio Forjado
	2	Aleaciones de Alumini Bajo en Silicio SI <12.2% - 6061, 7075
	3	Aleaciones de Aluminio Alto en Silicio SI <12.2% -6061, 7075
	4	Metal Compuesto (Filamento de vidrio epoxi, fibra de vidrio, grafito)
	5	Cobre y Aleaciones de Cobre
	6	Carbono y compuestos de Grafito
S	1	Aleaciones a Base de Hierro, Aleaciones Resistentes al Calor - Incoloy 800-802, A-286, N-155
	2	Aleaciones de níquel, Aleaciones Basados en Cobalto, Aleaciones Resistentes a Altas Temperaturas - Haynes 188, Haynes 21, Hastelloy, Waspaloy, Inconel 625/718 (≤ 48 HRc)
	4	Aleaciones de Titanio -Commercially Pure, 6Al-4V, Astm 1/2/3, Ti-6Al-2Sn-4Zr-2Mo (≤ 48 HRc)
H	1	Acero Endurecido - H Series(10,11,13), D Series (2,3), 4340, P20 (≤ 48 HRc)
	2	Acero Endurecido - H Series(10,11,13), D Series (2,3), 4340, P20 (48-55 HRc)
	3	Acero Endurecido - H Series(10,11,13), D Series (2,3), 4340, P20 (56-60 HRc)
	4	Acero Endurecido - H Series(10,11,13), D Series (2,3), 4340, P20 (60-62 HRc) H Series(10,11,13), D Series (2,3), 4340, P20 (62-64 HRc)

NEW

GET A STRONGER GRIP

WITH THE NEWLY DESIGNED SHANK

FIRM HOLD 

The **New Firm Hold Shank** can be applied to any of our standard end mills or special tools. The shank is diamond blasted, to create an overall stronger grip and maximize tool performance. Don't risk damaging your part or breaking your tool.

Before



After



BENEFITS

- ✓ Minimizes Tool Pull-Out
- ✓ Maintains h6 Tolerance
- ✓ Preserves Shank Concentricity



PRECISION CUTTING TOOLS, INC.

Manufacturer of HSS, Cobalt, Powder Metal, & Carbide Precision Tools. Endmills, Drills, Routers, Drill Mills, and Specials Per Print

Proudly Manufactured in the
United States of America



562. 921.7898 | sales@pctcutters.com | www.pctcutters.com

IN-HOUSE COATING

PCT offers a variety of coatings for all your cutting tools through its in-house coating facility, PCT Coating Solutions. PCT Coating Solutions is ISO 9001:2008 certified and is sure to provide you with the highest-quality PVD coatings. Our experts will help you choose the proper coating for your specific needs and will have your tools coated within a 24-48hr. time frame.



VARIANTA® SUPRAL-T9

Titanium Aluminum
Carbo-Nitride



EXXTRAL PLUS® -T4

Aluminum
Titanium Nitride



EXXTRAL® SILVER-T8

Aluminum Titanium
Chrome Nitride



SISTRAL® -T7

Aluminum Titanium
Nitride (w/addition)



BEST OF BOTH WORLDS



PRECISION CUTTING TOOLS, INC.

AND



PCT COATING SOLUTIONS

TiN - T1

Titanium
Nitride



VARIANTIC®-T5

Titanium Aluminum
Carbo - Nitride



Z-POWER®-T6

Zirconium Nitride



TiCN - T2

Titanium
Carbo - Nitride





50 YEARS IN THE INDUSTRY

**Committed to our
Exclusive Distributors**

Find one near you >>




PRECISION CUTTING TOOLS, INC

13701 Excelsior Dr.
Santa Fe Springs, CA 90670
1-800-334-9373
1-562-921-7898
FAX 1-562-926-0156



ORDER ONLINE

www.pctcutters.com

PCT PROUD MEMBER OF:



UNITED STATES CUTTING TOOL INSTITUTE



In-House Coating



PCT COATING SOLUTIONS

**ISO 9001:2008
CERTIFIED**

Join us for Exclusive Discounts & Product information



Like us on facebook.com/PCTCutters



Follow us @ twitter.com/pctcutters



Watch us on youtube.com/pctcutters



linkedin.com/company/precision-cutting-tools