

MasterCut

Tool Corp.

World Class Manufacturer of
Rotary Cutting Tools





About Mastercut

Our History

- 1985 – Incorporated in Safety Harbor, FL
- 1986 – Form grinding and brazing operations are added
- 1989 – Company builds its first machine for manufacturing burs
- 1989 – First CNC machine is purchased to help with quality and growth
- 1991 – Production of endmills commences
- 1994 – 5 and 6 axis CNC machines purchased for volume production of burs, endmills and drills
- 1995 – Laser marking introduced; laser inspection systems implemented
- 1999 – Cell concept introduced in a new facility for greater production and quality control
- 2002 - Production of spiral router bits, drills, and reamers commences
- 2003 – ISO 9001:2000 certification achieved; first coating machines purchased
- 2004 – MAP, Mastercut's Automated Production System developed
- 2005 – CNC1st team (customers' needs come 1st) implemented; second coating machine added
- 2006 – Production begins on high-performance endmills, drills and miniature tooling
- 2009 – ISO 9001:2008 certification achieved
- 2011 – New surface treatments introduced
- 2013 – Nano coatings and ultra-performance tools introduced

Today

Mastercut Tool Corp. celebrates many years as a world class carbide and HSS cutting tool manufacturer. From inception to the present, our goal is providing the highest quality products and services to our customers. All products are still manufactured in Florida, using state of the art equipment, skilled craftsmen and our exclusive MAP technology.

Our Thanks to Our Loyal Customers and Associates

Our history would not be possible without the support of all those associated with us. We thank all of our customers and associates, as well as our community, for your dedication and loyalty. We pledge to continuously improve for you!

Please check out the following catalogs and services:

- Metric carbide and HSS tooling
- Solid carbide fractional and metric routers
- Capabilities to produce your special tools for all applications
- Authorized reconditioning factory for complete regrind and reconditioning services

Look for the *Mastercut Sprite* to link you to the Content Tables.

Table of Contents

Technical Information

- Quality Processes9
- Premier Coatings10
- Trouble Shooting Guides12
- Material Groupings.....18
- Feed per Tooth19
- Speeds and Feeds for Materials Application.....20
- Other Technical Information25

Standard Endmills

-  Square Endmills30
-  Ball Endmills33
-  Corner Radius Endmills36
-  6 Flute Square Endmills44
-  Square End - Double End Endmills45
-  Ball End - Double End, Endmills47
-  Ball End - Double End Endmills w/ Flat49
-  Square End - Double End, Endmills w/Flat49
-  90° Drill Mills50
-  Square End, Straight Flute Endmills51
-  Ball End, Straight Flute Endmills51
-  Square Mini Mills52
-  Ball Mini Mills53
-  Square Taper Mills54
-  Ball Taper Mills55

	Cermet	Hardened	Cast Iron	Titanium	Non-Ferrous	Stainless	Steel
	H	K	S	N	M	P	
•		•	•	•	•	•	
•			•	•	•	•	
•			•	•	•	•	
			•	•	•	•	
•			•	•	•	•	
•			•	•	•	•	
•			•	•	•	•	
•			•	•	•	•	
•			•	•	•	•	
•			•	•	•	•	
•			•	•	•	•	
•			•	•	•	•	
•			•	•	•	•	
•			•	•	•	•	
•			•	•	•	•	
•			•	•	•	•	
•			•	•	•	•	
•			•	•	•	•	
•			•	•	•	•	
•			•	•	•	•	
•			•	•	•	•	
•			•	•	•	•	
•			•	•	•	•	
•			•	•	•	•	

Table of Contents

High Performance Endmills


-  V4 Square Endmills 60
-  V4 Ball Endmills62
-  V4 Corner Radius Endmills 64
-  V5 Square Endmills71
-  V5 Ball Endmills.....73
-  V5 Corner Radius Endmills.....74
-  HY5 Square Endmills.....79
-  HY5 Corner Radius Endmills81
-  F45 6FL Square Endmills87
-  F45 6FL Corner Radius Endmills..... 88
-  Mold Mills..... 89
-  3FL 60° Helix Twister Mills.....93
-  Fine Pitch Roughers 94
-  Medium Pitch Roughers 94
-  Coarse Pitch Roughers95
-  Square End AxMills..... 96
-  Ball End AxMills101
-  Corner Radius AxMills.....104
-  Square End Chipbreaker AxMills114
-  Ball End Chipbreaker AxMills.....116
-  Corner Radius Chipbreaker AxMills.....118
-  Square End Necked AxMills.....128
-  Ball End Necked AxMills129
-  Corner Radius Necked AxMills.....130

	Cermet	Hardened	Cast Iron	Titanium	Non-Ferrous	Stainless	Steel
	H	K	S	N	M	P	
•		•	•	•	•	•	
•			•	•	•	•	
•			•	•	•	•	
•			•	•	•	•	
•			•	•	•	•	
•			•	•	•	•	
•			•	•	•	•	
•			•	•	•	•	
•			•	•	•	•	
•			•	•	•	•	
•			•	•	•	•	
•			•	•	•	•	
•			•	•	•	•	
•			•	•	•	•	
•			•	•	•	•	
•			•	•	•	•	
•			•	•	•	•	
•			•	•	•	•	
•			•	•	•	•	
•			•	•	•	•	
•			•	•	•	•	
•			•	•	•	•	
•			•	•	•	•	
•			•	•	•	•	
•			•	•	•	•	
•			•	•	•	•	
•			•	•	•	•	
•			•	•	•	•	
•			•	•	•	•	
•			•	•	•	•	
•			•	•	•	•	
•			•	•	•	•	
•			•	•	•	•	
•			•	•	•	•	
•			•	•	•	•	
•			•	•	•	•	
•			•	•	•	•	
•			•	•	•	•	





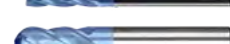





- Standard Endmills
- High Performance Endmills
- Ultra Performance Endmills
- High Performance Routers
- Carbide Drills
- High Performance Hurricane Drills
- Reamers
- Threadmills
- Burs
- Engraving Blanks and Carbide Rod
- High Speed Steel Drills

Table of Contents






High Performance Endmills (cont.)

	45° HyperMills.	131
	55° AlumaZips.	131

Ultra Performance Endmills

	V4 Ultra Square Endmills.	134
	V4 Ultra Ball Endmills	135
	V4 Ultra Corner Radius Endmills	136
	V5 Ultra Square Endmills.	137
	V5 Ultra Ball Endmills	138
	V5 Ultra Corner Radius Endmills	139
	F45 Ultra Square Endmills	140
	F45 Ultra Corner Radius Endmills.	141
	HY5 Ultra Square Endmills.	142
	HY5 Ultra Corner Radius Endmills	143

High Performance Routers

	Compression Routers	146
	4 Flute Fiberglass Mill End Routers.	151
	Diamond Bur Fiberglass Finishers	152
	OFX - O-Flute Extreme Routers	153
	CVD Nano Crystalline Routers	154











	Cermet	Hardened	Cast Iron	Titanium	Non-Ferrous	Stainless	Steel
	H	K	S	N	M	P	
45° HyperMills				•			
55° AlumaZips				•			

V4 Ultra Square Endmills	•	•	•	•	•	•	•
V4 Ultra Ball Endmills	•	•	•	•	•	•	•
V4 Ultra Corner Radius Endmills	•	•	•	•	•	•	•
V5 Ultra Square Endmills	•	•	•	•	•	•	•
V5 Ultra Ball Endmills	•	•	•	•	•	•	•
V5 Ultra Corner Radius Endmills	•	•	•	•	•	•	•
F45 Ultra Square Endmills	•	•	•	•	•	•	•
F45 Ultra Corner Radius Endmills	•	•	•	•	•	•	•
HY5 Ultra Square Endmills	•	•	•	•	•	•	•
HY5 Ultra Corner Radius Endmills	•	•	•	•	•	•	•




	Fiberglass	Graphite	Composite	Metal Matrix	Carbon Fiber	Plastics	Carbon & Honeycomb
Compression Routers	•	•	•	•	•	•	•
4 Flute Fiberglass Mill End Routers	•						
Diamond Bur Fiberglass Finishers	•	•	•				
OFX - O-Flute Extreme Routers						•	
CVD Nano Crystalline Routers	•	•	•	•	•	•	•

Table of Contents



Carbide Drills

	Jobber Drills	158
	Stub Drills	163
	Straight Flute Drills	167
	Spade Drills	168
	NC Spotting Drills	169
	Drill and Countersink / Center Drills	169
	Countersinks, Single Flute	170
	Countersinks, Three Flute	170
	Countersinks, Six Flute	171
	Chamfer Tools.	171

High Performance Hurricane Drills

	Hurricane 3XD Solid & Coolant Through . .	174
	Hurricane 5XD Solid & Coolant Through . .	179
	Hurricane 8XD Coolant Through	184

Reamers

	Straight Flute Reamers - 4 Flute	190
	Straight Flute Reamers - 6 Flute	191

ThreadMills

	Helical Internal UN	194
	Helical BSPP	195
	Helical BSPT	195

	Cermet	Hardened	Cast Iron	Titanium	Non-Ferrous	Stainless	Steel
	H	K	S	N	M	P	
Jobber Drills	•	•	•	•	•	•	•
Stub Drills	•	•	•	•	•	•	•
Straight Flute Drills	•	•	•	•	•	•	•
Spade Drills	•	•	•	•	•	•	•
NC Spotting Drills	•	•	•	•	•	•	•
Drill and Countersink / Center Drills	•	•	•	•	•	•	•
Countersinks, Single Flute		•	•	•	•	•	•
Countersinks, Three Flute		•	•	•	•	•	•
Countersinks, Six Flute		•	•	•	•	•	•
Chamfer Tools		•	•	•	•	•	•

Hurricane 3XD Solid & Coolant Through		•	•	•	•	•	•
Hurricane 5XD Solid & Coolant Through		•	•	•	•	•	•
Hurricane 8XD Coolant Through		•	•	•	•	•	•

Straight Flute Reamers - 4 Flute		•	•	•	•	•	•
Straight Flute Reamers - 6 Flute		•	•	•	•	•	•

Helical Internal UN		•	•	•	•	•	•
Helical BSPP		•	•	•	•	•	•
Helical BSPT		•	•	•	•	•	•

Standard Endmills
High Performance Endmills
Ultra Performance Endmills
High Performance Routers
Carbide Drills
High Performance Hurricane Drills
Reamers
Threadmills
Burs
Engraving Blanks and Carbide Rod
High Speed Steel Drills
















Table of Contents

ThreadMills (cont.)

 Helical NPT196
 Helical Metric197
 Multi-Helix Internal UN198
 Multi-Helix BSPP199
 Multi-Helix BSPT199

	Cermet	Hardened	Cast Iron	Titanium	Non-Ferrous	Stainless	Steel
	H	K	S	N	M	P	
Helical NPT	●	●	●	●	●	●	●
Helical Metric	●	●	●	●	●	●	●
Multi-Helix Internal UN	●	●	●	●	●	●	●
Multi-Helix BSPP	●	●	●	●	●	●	●
Multi-Helix BSPT	●	●	●	●	●	●	●

Burs

 SA Burs - Cylindrical Shape, No Endcut.202
 SB Burs - Cylindrical Shape with End Cut203
 SC Burs - Radius Cylindrical Shape204
 SD Burs - Ball Shape205
 SE Burs - Oval Shape206
 SF Burs - Radius Tree Shape207
 SG Burs - Pointed Tree Shape208
 SH Burs - Flame Shape209
 SJ Burs - 60° Included Cone Shape210
 SK Burs - 90° Included Cone Shape211
 SL Burs - Radius Cone Shape212
 SM Burs - Pointed Cone Shape213
 SN Burs - Inverted Cone Shape214
 Die Mills215
 Piloted Die Mills215

	Cermet	Hardened	Cast Iron	Titanium	Non-Ferrous	Stainless	Steel
	H	K	S	N	M	P	
SA Burs	●	●	●	●	●	●	●
SB Burs	●	●	●	●	●	●	●
SC Burs	●	●	●	●	●	●	●
SD Burs	●	●	●	●	●	●	●
SE Burs	●	●	●	●	●	●	●
SF Burs	●	●	●	●	●	●	●
SG Burs	●	●	●	●	●	●	●
SH Burs	●	●	●	●	●	●	●
SJ Burs	●	●	●	●	●	●	●
SK Burs	●	●	●	●	●	●	●
SL Burs	●	●	●	●	●	●	●
SM Burs	●	●	●	●	●	●	●
SN Burs	●	●	●	●	●	●	●
Die Mills	●	●	●	●	●	●	●
Piloted Die Mills	●	●	●	●	●	●	●

Bur Routers

 Fiberglass Routers216
--	-------------

	Fiberglass	Graphite	Composite	Metal Matrix	Carbon Fiber	Plastics	Carbon & Honeycomb
Fiberglass Routers	●	●	●	●	●	●	●





Table of Contents

Special Application Burs

 Tire Burs217
---	-------------

	Cermet	Hardened	Cast Iron	Titanium	Non-Ferrous	Stainless	Steel
	H	K	S	N	M	P	
Tire Burs	N/A						

Bur Sets & Displays

 8-12 Piece Plastic Box Bur Sets218
 3-5 Piece Power Pouch Bur Sets218
 24 Piece Countertop Displays219
 8-12 Piece Wood Box Bur Sets219









	Cermet	Hardened	Cast Iron	Titanium	Non-Ferrous	Stainless	Steel
	H	K	S	N	M	P	
8-12 Piece Plastic Box Bur Sets	●	●	●	●	●	●	●
3-5 Piece Power Pouch Bur Sets	●	●	●	●	●	●	●
24 Piece Countertop Displays	●	●	●	●	●	●	●
8-12 Piece Wood Box Bur Sets	●	●	●	●	●	●	●

Engraving Blanks and Rod

 Engraving Blanks222
 Carbide Rod223

	Cermet	Hardened	Cast Iron	Titanium	Non-Ferrous	Stainless	Steel
	H	K	S	N	M	P	
Engraving Blanks	●	●	●	●	●	●	●
Carbide Rod	N/A						

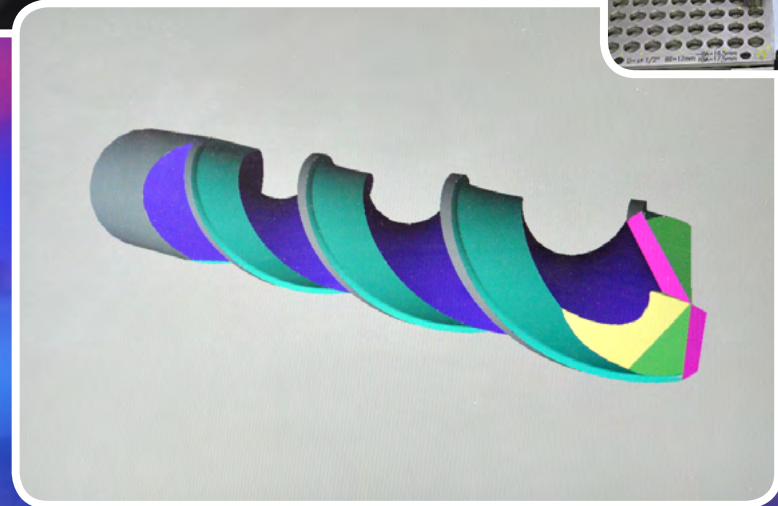
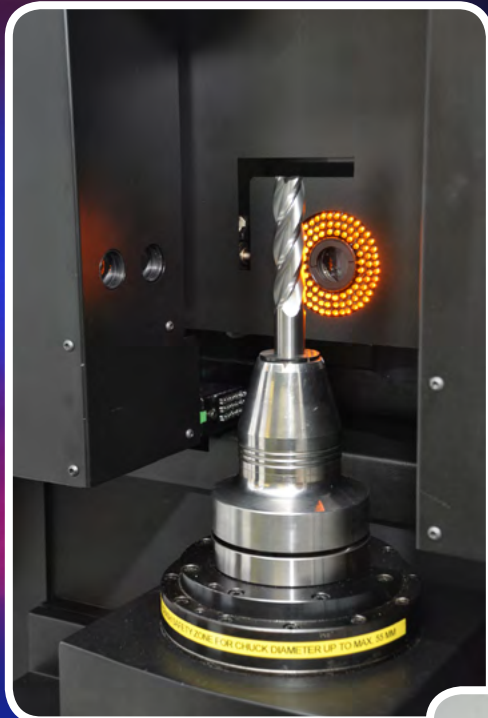
High Speed Steel Drills

 Jobber226
 Screw Machine230
 Reduced Shank Jobber234
 Hand Taps235
 Spiral Point Plug Taps236
 Spiral Flute Taps237
 Pipe Taps237
 Combination Drills and Taps238

	Cermet	Hardened	Cast Iron	Titanium	Non-Ferrous	Stainless	Steel
	H	K	S	N	M	P	
Jobber	●	●	●	●	●	●	●
Screw Machine	●	●	●	●	●	●	●
Reduced Shank Jobber	●	●	●	●	●	●	●
Hand Taps	●	●	●	●	●	●	●
Spiral Point Plug Taps	●	●	●	●	●	●	●
Spiral Flute Taps	●	●	●	●	●	●	●
Pipe Taps	●	●	●	●	●	●	●
Combination Drills and Taps	●	●	●	●	●	●	●

Please contact us for our full line of metric products.

- MAP
- CNC 1st
- ISO
- Coatings
- Trouble Shooting
- Guides
- Speeds and Feeds



Quality Processes

YOUR PREMIER SOURCE FOR THE HIGHEST QUALITY CUTTING TOOLS FOR MORE THAN A QUARTER CENTURY!

From 1985 to the present, the values and ideals of Mastercut Tool Corp. remain steady. We will work relentlessly to continuously improve and provide you with excellence. We are known worldwide for many unique high performance tools engineered in our Florida facilities. Our AxMill, V4, V5, and F45 are just a few products that make Mastercut Tool Corp. your choice for increasing production and reducing costs.



The "MAP" to Your Success!

Our continuous improvement has led us to a process that gives you unmatched, consistent quality. That process is our unique MAP Technology! Mastercut Automated Production is our exclusive method of standardization and quality repeatability. The MAP combines technology, skill, and rigid processes to provide you with the most precise products that money can buy, batch to batch and year to year.

Our MAP...your map to success!

CNC 1st Team

Customers' Needs Come First! This is what truly matters to us. To ensure you the fastest possible service, we have assembled simulation, engineering, production scheduling, and inventory managers into one unit, wherein they can collaborate on any and all special requests from you, the moment your request is received. They are dedicated and qualified to assist you with solutions, fast!



Mastercut's Superior Carbide Blend – A-Gr-SiV (Active Grain Sized Volume)

Our superior tungsten carbide gives you the ability to be aggressive when you need to be. Growth inhibitors in our submicron carbide blanks maintain the most consistent grain size available, giving you superior hardness AND toughness.



ISO 9001:2008

In 2003, Mastercut Tool Corp. successfully achieved registration under ISO 9001:2000 and has maintained our quality system to our current ISO 9001:2008 certification. We maintain these strict standards to further guarantee that every tool you buy from Mastercut Tool Corp. is of the highest quality.

SUCCESS

At Mastercut Tool, we take great pride in our high quality control standards and in the accomplishments of your customers using our superior quality tools. Therefore, our bottom line is:

Your customers' success with our products is the measure of our success!

Mastercut Tool Coating Options

Mastercut Premier Coatings

- Speed and Feed increases from 30 to 200 percent
- Tool life is increased up to 10 times
- Reduces friction, spindle torque and vibration, providing a better finish
- Isolates the tool from the part, avoids edge buildup and tool cratering
- Reduces or eliminates coolant
- Repeatable, stable performance between batches

Preferred Coating Use

Materials	PowerT	PowerC	PowerA	PowerZ	PowerNR	PowerN	PowerDLC	PowerRD
Aluminum, Low Silicon < 10%				✓			✓	✓
Aluminum, High Silicon > 10%		✓		✓			✓	✓
Copper, Copper Alloys	✓		✓	✓			✓	
Ductile, Malleable Cast Iron	✓	✓	✓		✓	✓		
Carbon Steel, 1000 Series	✓	✓	✓		✓	✓		
Alloy Steel, 4 to 9000 Series	✓	✓	✓		✓	✓		
Tool Steel	✓	✓	✓		✓	✓		
SS Steel, 300 Series	✓	✓	✓	✓	✓	✓		
SS Steel, 400 Series	✓	✓	✓	✓	✓	✓		
SS PH Series	✓	✓	✓	✓	✓	✓		
Titanium, Titanium Alloys	✓	✓	✓	✓	✓	✓		
Nickel, Nickel Alloys, Cobalt	✓		✓		✓	✓		
Wood, Paper			✓	✓			✓	
Composites, Plastics	✓		✓	✓		✓	✓	✓
Graphite							✓	✓
Fiberglass		✓	✓	✓			✓	✓

Mastercut Tool Coating Options

Our Available Coatings



PowerT (Titanium Nitride, TiN) (append -2)*

Color: Gold
Vickers Hardness: approximately 2,300 Vickers
General purpose, entry level over uncoated carbide



PowerC (Titanium Carbon Nitride, TiCN) (append -3)*

Color: ranges from slight violet to brown-gray
Vickers Hardness: approximately 3,000 Vickers
Used on ferrous, non-ferrous and non-magnetic stainless steel
Good abrasion resistance, low heat resistance, for applications requiring low RPMs and high thrust



PowerA (Aluminum Titanium Nitride, AlTiN) (append -1)*

Color: Dark Gray
Vickers Hardness: approximately 3,600 Vickers
Nickel Alloys, Stainless Steel, Hardened Steels, Tool Steels, Cast Iron
An excellent broad spectrum grade. May be run in dry or minimum quantity lubrication applications, where heat can be a problem. Also handles light chip loads very well



PowerZ (Zirconium Nitride, ZrN) (append -4)*

Color: dull Gold
Vickers Hardness: approximately 2,800 Vickers
Outstanding on aluminum, including high silica aluminum. Can also be used on cast iron, stainless steels, titanium



PowerN (nACo) nano-composite (nc-AlTiN)/(a-Si³N⁴) (append -5)*

Color: varying shades of blue-gray; blue-based color dissipates immediately upon use.
Vickers Hardness: approximately 4,500 Vickers
Outstanding performance in superalloys, hard material machining, high heat applications and best when used with very rigid setup.



PowerNR (nACrO) nano-composite (nc-AlCrN/a-Si³N⁴)(append -8)*

Color: gray
Vickers Hardness: 4,000 Vickers
Outstanding in high heat applications, better resistance to shock and chipping than nACo, for tough, aggressive cutting applications.



PowerDLC (Diamond Like Carbon)(append -6)*

Color: variable gray to black
Vickers Hardness: approximately 4,000 Vickers
Non-ferrous metals, high silicone aluminum, copper, plastic, graphite, fiberglass or reinforced plastics
Can be applied to any carbide substrate



PowerRD (Real Diamond)(append -7)*

Color: variable gray to black
Vickers Hardness: approximately 8,000 Vickers
Non-ferrous, metals, aluminum, graphite, green ceramics
Requires 6% cobalt carbide for application

*append -# indicates that this coating is applied to uncoated tool part number

Mastercut Troubleshooting Guides

Solid Carbide Endmills		
Challenge	Cause	Corrective Action
Chattering	Incorrect Feed Rate	Reduce feed rate 10%
	Incorrect Speed	Check recommendations, adjust accordingly
	Low Tool Holder Rigidity	Replace tool holder with more rigid tool holder
	Low Machine Tool Spindle Rigidity	Utilize machine with larger spindle
	Relief Angle Too Steep	Switch to tool with less relief or regrind tool to reduce angle
	Low Work Piece Rigidity	Tighten or improve work piece holding method
	Depth of Cut	Reduce depth of cut
	Incorrect Tool Cut Length	Use shorter flute length and/or place tool shank deeper in tool holder
	Bad Collet	Replace collet
Breakage	Tool Too Sharp	Reduce feed rate 10% for initial cut to break in tool
	Incorrect Feed Rate	Reduce feed rate
	Incorrect Depth of Cut	Reduce depth of cut
	Incorrect Tool Cut Length	Use shorter flute length - Place tool shank deeper in tool holder
	Incorrect Tool Overall Length	Use shorter tool or place tool shank deeper in tool holder
	Tool Wear	Replace tool or sharpen tool at earlier stage
Chipping	Chip Impaction	Increase coolant flow
	Incorrect Feed Rate	Reduce feed rate
	Improper Tool Break In	Reduce feed rate 10% for initial cut to break in tool
	Incorrect Feed Direction	Change cut path to climb milling
	Chatter	See recommendations for correcting chatter
	Low Tool Holder Rigidity	Replace tool holder with higher rigidity tool holder
	Low Machine Tool Spindle Rigidity	Utilize machine with larger spindle
	Low Work Piece Rigidity	Tighten or improve work piece holding method
	Tool Too Sharp	Reduce feed rate 10% for initial cut to break in tool
	Loose Tool Holder	Clean and tighten tool holder
Loose End Mill	Tighten tool holder	
Incorrect Speed	Check recommendations and adjust accordingly	

Mastercut Troubleshooting Guides

Solid Carbide Endmills		
Challenge	Cause	Corrective Action
Wear	Incorrect Speed	Check recommendations and adjust accordingly
	Incorrect Feed Rate	Reduce or increase feed rate
	Incorrect Feed Direction	Change cut path to climb milling
	Hard Material	Use tool designed for hard material - Use coated tools
	Chip Impaction	Increase coolant volume - Increase coolant pressure
	Poor Coolant Condition	Replace coolant or correct mix ratio
	Short Tool Life	Use tool designed for work piece material - Use coated tools
	Incorrect Tool Geometry	Utilize tool recommended for work piece material
Chip Impaction	Incorrect Feed Rate	Reduce feed rate
	Incorrect Speed	Check recommendations and adjust accordingly
	Incorrect Tool Geometry	Utilize tool recommended for work piece material
	Insufficient Coolant	Increase coolant volume - Increase coolant pressure
Poor Surface Finish	Incorrect Feed Rate	Reduce feed rate
	Incorrect Speed	Check recommendations and adjust accordingly
	Tool Wear	Replace tool or sharpen tool at earlier stage
	Incorrect Depth of Cut	Reduce depth of cut
	Chip Impaction	Increase coolant volume - Increase coolant pressure
	End Cut Smearing	Grind tool with wiper flat
Burring	Incorrect Tool Geometry	Utilize tool recommended for work piece material
	Tool Wear	Replace tool or sharpen tool at earlier stage
	Incorrect Feed Direction	Change cut path to climb milling
	Incorrect Speed	Check recommendations and adjust accordingly
	Incorrect Feed Rate	Reduce feed rate
	Incorrect Depth of Cut	Reduce depth of cut
Dimensional Inaccuracy	Incorrect Tool Geometry	Utilize tool recommended for work piece material
	Tool Deflection	Reduce tool length of cut - Place tool deeper in tool holder
	Low Tool Holder Rigidity	Replace tool holder with more rigid tool holder
	Low Machine Tool Spindle Rigidity	Utilize machine with larger spindle - Tighten tool holder
	Low Work Piece Rigidity	Tighten or improve work piece holding method
	Bad Collet	Replace collet
	Machine Tool/Work Piece Set Up	Check for proper angular set up

Mastercut Troubleshooting Guides

Solid Carbide Drills

Challenge	Cause	Corrective Action
Drill Point Chipping	Incorrect Feed Rate	Lower feed rate
	Incorrect Speed Rate	Check speed recommendations, adjust accordingly
	Incorrect Tool Cut Length	Use shorter tool - place tool shank deeper in tool holder
	Low Work Piece Rigidity	Tighten or improve work piece holding method
	Loose Tool	Tighten or replace tool holding method
	Poor Coolant Conditions	Replace coolant or correct mix ratio
Chisel/Point Center Breakage	Incorrect Initial Feed Rate	Lower initial feed rate 30%
	Poor Work Piece Surface Condition	Grind or clean work piece surface
	Drill Point Off Center	Re-point drill, check set up in tool holder
	Insufficient Drill (web) Thinning	Re-point and thin drill point
Breakage/Chipping at Outer Cutting Edge	Incorrect Feed Rate	Lower feed rate
	Incorrect Speed Rate	Check speed recommendations, adjust accordingly
	Low Work Piece Rigidity	Tighten or improve work piece holding method
	Low Tool Holding Strength	Tighten tool holder or use end mill holder
	Poor Tool Set Up - Concentricity	Minimize runout to less than .001"
	Poor Coolant Conditions	Replace coolant or correct mix ratio
	Incorrect Tool Cut Length	Use shorter tool - place tool shank deeper in tool holder
Tool Wear Life	Incorrect Speed Rate	Check speed recommendations, adjust accordingly
	Poor Coolant Conditions	Replace coolant or correct mix ratio
	Improper Drill Point	Re-point drill or use recommended drill point for material
	Abrasive/Tough Work Piece Material	Use coated tool (Check recommendations for coating)
Tool Breakage	Inconsistent Feed Rate	Maintain constant feed rate - Peck drill to change feed rate
	Incorrect Feed Rate	Lower feed rate
	Poor Tool Set Up - Concentricity	Minimize runout to less than .001"
	Low Tool Holding Strength	Tighten tool holder or use end mill holder
	Incorrect Tool	Check recommendations for proper drill and drill point
	Poor Coolant Conditions	Replace coolant or correct mix ratio
Outside Margin Damage / Wear	Low Work Piece Rigidity	Tighten or improve work piece holding method
	Poor Tool Set Up - Concentricity	Minimize runout to less than .001"
	Incorrect Tool Selection	Use recommended drill/drill point for work piece material
	Poor Coolant Conditions	Replace coolant or correct mix ratio
	Insufficient Coolant	Increase coolant volume - Increase coolant pressure
	Chip Packing	Increase coolant volume - Increase coolant pressure

Mastercut Troubleshooting Guides

Solid Carbide Drills

Challenge	Cause	Corrective Action
Outside Margin Damage / Wear (cont.)	Low Work Piece Rigidity	Tighten or improve work piece holding method
	Loose Tool	Tighten or replace tool holding method
	Incorrect Feed Rate	Lower feed rate
	Incorrect Speed Rate	Check speed recommendations adjust accordingly
Chip Impaction	Incorrect Speed Rate	Typically increase speed, check speed recommendations
	Incorrect Feed Rate	Typically increase feed recommendations
	Poor Coolant Conditions	Replace coolant or correct mix ratio
	Insufficient Coolant	Increase coolant volume - Increase coolant pressure
Long/Stringy Chips	Incorrect Tool	Check recommendations for proper drill and drill point
	Incorrect Feed Rate	Typically increase feed, check feed recommendations
	Incorrect Point Angle	Regrind Point to recommended angle, Replace drill
Poor Surface Finish	Edge Sharpness	Hone cutting edge, use pre-honed drill
	Inconsistent Feed Rate	Maintain constant feed rate - Peck Drill to change feed rate
	Incorrect Speed Rate	Typically increase speed, check speed recommendations
Hole Accuracy	Incorrect Feed Rate	Lower feed rate
	Poor Coolant Conditions	Replace coolant or correct mix ratio
	Tool Wear	Regrind or Replace drill
Tool Deflection	Edge Sharpness	Hone cutting edge, use pre-honed drill
	Incorrect Tool	Check recommendations for proper drill and drill point
	Edge Sharpness	Hone cutting edge, use pre-honed drill
	Incorrect Tool Cut Length	Use shorter tool - place tool shank deeper in tool holder
Vibration/Noise	Tool Size Accuracy	Replace tool
	Poor Work Piece Surface Condition	Grind or clean work piece surface
	Incorrect Tool Cut Length	Use shorter tool - place tool shank deeper in tool holder
	Uneven Drill Point	Regrind drill point
	Incorrect Point Angle	Regrind Point to recommended angle, Replace drill
	Uneven Work Surface	Use self centering drill point or spot drill
	Edge Sharpness	Hone cutting edge, use pre-honed drill
	Incorrect Tool Cut Length	Use shorter tool - place tool shank deeper in tool holder
	Incorrect Point Angle	Regrind Point to recommended angle, Replace drill
	Inconsistent Feed Rate	Maintain constant feed rate - Peck Drill to change feed rate
	Incorrect Speed Rate	Check speed recommendations adjust accordingly
	Low Tool Holding Strength	Tighten tool holder or use end mill holder

Mastercut Troubleshooting Guides

Solid Carbide Reamers

Challenge	Cause	Corrective Action
Hole Accuracy	Misaligned Starter Hole	Inspect fixturing/work piece set up - Use floating tool holder or bushing
	Incorrect Speed Rate	Typically increase speed, check speed recommendations
	Incorrect Feed Rate	Typically decrease feed, check feed recommendations
	Incorrect Tool Diameter	Inspect tool diameter. Replace or reduce diameter
Poor Finish	Tool Wear	Sharpen or replace tool - Use coated tool
	Unequal Cutting Edges	Regrind tool with equal chamfer height or radius size
	Incorrect Feed Rate	Check feed recommendations, adjust accordingly
	Incorrect Speed Rate	Check speed recommendations, adjust accordingly
	Chatter	Increase speed rate or decrease feed rate
	Insufficient Material Removal	Reduce initial drill size - Leave 2-3% of finished size for reaming
	Spindle/Tool Holder Runout	Use bushing. Replace tool holder (Bushing to be .0003" larger than reamer)
	Damaged Tool	Regrind or replace tool
	Insufficient Cutting Clearance	Reduce clearance behind chamfer or radius
	Inconsistent Feed Rate	Maintain constant feed. Use power feed on manual machines
Angled Holes	Drill Deflection/Walk	Correct drilling operation (Check drill trouble shooting for corrective actions)
	Insufficient Material Removal	Reduce initial drill size. Leave 2-3% of finished size for reaming
	Misaligned Set Up	Inspect fixturing/work piece set up - Use floating tool holder or bushing
	Insufficient Chamfer Angle	Regrind reamer with higher included angle (100° - 180°)
Premature Tool Wear	Incorrect Material Removal	Drill initial hole size to leave 2-3% of finished size for reaming
	Incorrect Feed Rate	Typically decrease feed, check feed recommendations
	Misaligned Starter Hole	Inspect fixturing/work piece set up. Use floating tool holder or bushing
	Hard or Abrasive Material	Use coated tool
	Poor Coolant Condition	Replace coolant or correct mix ratio
Chatter	Chip evacuation	Increase coolant flow
	Incorrect Speed Rate	Typically increase speed, check speed recommendations
	Incorrect Feed Rate	Typically decrease feed, check feed recommendations
	Loose Tool	Tighten or replace tool holding method
	Low Work Piece Rigidity	Tighten or improve work piece holding method
	Low Tool Holding Strength	Tighten tool holder. Minimize float
	Poor Tool Set Up - Concentricity	Minimize runout to less than .0002"
Tool Breakage	Low Tool Rigidity	Use shorter reamer - Place tool shank deeper in tool holder
	Misaligned Set Up	Inspect fixturing/work piece set up. Use floating tool holder or bushing
	Drill Deflection/Walk	Correct drilling operation (Check drill trouble shooting for corrective actions)
	Tool Wear	Sharpen or replace tool - Use coated tool
	Damaged Tool	Regrind or replace tool
	Incorrect Material Removal	Check initial drill size - Leave 2-3% of finished size for reaming
	Incorrect Speed Rate	Typically decrease speed, check speed recommendations
Tool Bottoming in Hole	Incorrect Feed Rate	Typically increase feed, check feed recommendations
	Tool Bottoming in Hole	Reduce depth of cut - adjust stop depth

Mastercut Troubleshooting Guides

Carbide Burs - Possible Causes and Solutions

Challenge	Excessive Force	Heat From Rubbing Shank	Dull Flutes	Seized In/Against Workpiece	Tool Dropped	Poor Location in Collet	Worn Handpiece Bearings	Bent Shank	Poor Working Stability	Use Coarser Geometry	Use Finer Geometry	Use Double Cut or Chip Breaker Geometry	Soft Material - Lighten Feed	Increase RPMs	Decrease RPMs	Avoid Diamond Cut	Use Anti-stick compound	Faster Feed Rate	Slower Feed	Abrasive Material	Poor Set-Up	Failure To Support / Engage Prior to RPM	
Braze Failure	X	X	X	X	X																		
Poor Hand Control						X	X	X	X	X	X										X		
Chipping				X	X				X				X										
Carbide Fracture				X	X				X														
Plugging									X				X				X						
Handpiece Vibration														X	X			X	X			X	
Poor Workpiece Finish						X	X	X	X	X				X	X			X				X	
Poor Tool Life		X	X			X	X	X	X					X	X	X		X	X	X	X		
Lack of Available Handpiece RPMs												X	X										
Work Hardening of Workpiece	X		X						X	X				X					X				
Severely Bent Shanks of Long Series Burs																					X	X	

Technical Information Materials Groupings









Material Group	Material Type	Hardness	USA Standards, SAE/AISI/UNS
Steel			
1.1	Magnetic soft steel	< 120 B	12L14, 12L15
1.2	Structural, case carburising	< 200 B	1005-1025, 1214, 1215, A36
1.3	Plain carbon steel	< 250 B	1030-1060, 1144-1146
1.4	Alloy Steel	< 250 B	4140, 4340, 52100,8620, H11-H41, A2, D2, O1, P20, 420
1.5	Alloy steel, hardened/tempered steel	350	4140, 4340, 52100,8620, H11-H41, A2, D2, O1, P20, 420
1.6	Alloy steel, hardened/tempered steel	> 350 B	4140, 4340, 52100,8620, H11-H41, A2, D2, O1, P20, 420
1.7	Alloy steel, hardened	49-55 C	A2, H10-H41, L1-L6, M1-M42, T1
1.8	Alloy steel, hardened	55-60 C	A2, H10-H41, L1-L6, M1-M42, T1
1.9	Alloy steel, hardened	>60C	A2, H10-H41, L1-L6, M1-M42, T1
Stainless Steel			
2.1	Free Machining Stainless	< 250 B	200, 303, 416, 420F, 430F,440
2.2	Austenetic	< 250 B	301,302,304,316,321,330,AM-350, Custom 455
2.3	Ferritic + Austenetic, Martensitic	< 300 B	318-329, 400-446, 15-4PH,17-4PH,Duplex
2.4	Precipitation Hardened	< 300 B	15-5PH, 17-4PH, Custom 450
Cast Iron			
3.1	Lamellar graphite	< 150	Grey, G10, Gg40, J431C, A48 Class 20
3.2	Lamellar graphite	>150<300	Grey, GG25-Gg40, J158, A48 Class 40-60
3.3	Nodular graphite, malleable cast iron	< 200	A220, A436, A439, A602, Black, GGG40-GGG70
3.4	Nodular graphite, malleable cast iron	>200<300	Black Gts/Gtw, J434C
Titanium			
4.1	Unalloyed	< 200	Commercially Pure
4.2	Alloyed	< 270	6A14V,6A14V-2Sn, Monel, Monel K
4.3	Alloyed	>270<350	6A14V-4Mo,7A14-V-4Mo, 4911-4967
Nickel			
5.1	Unalloyed	< 150	Commercially Pure
5.2	Alloyed	< 270	Monel 400, Hastelloy C, Inconel 625, Waspaloy
5.3	Alloyed	>270<350	Inconel 718, Nimonic 75-95, Rene 41,Inconel 825, A286
Copper			
6.1	Copper	< 100	Commercially Pure
6.2	β Brass, Bronze	< 200	314-340, 350-370
6.3	¥-Brass	< 200	Alloyed Cu + Al + Fe, Long Chipping
6.4	High Strength Bronze	< 470	Ampco 18-25
Aluminum, Magnesium			
7.1	Al,Mg, unalloyed	< 100	Commercially Pure
7.2	Al alloyed, Si<0.5%	< 150	6061 T6, 7075, 314-340
7.3	Al alloyed, Si>0.5%<10%	< 120	6061 T6, 380-390
7.4	Al alloyed, Si>10%	< 120	Magnesium Whisker Reinforced
Synthetic Materials			
8.1	Thermoplastics	n/a	Ultramid, Polystrol
8.2	Thermosetting plastics	n/a	Bakelite, Pertinax
8.3	Reinforced plastic materials	n/a	CFK, GFKAFK
Hard Materials			
9.1	Cermets (Metal-ceramics)	< 550	

Technical Information

Suggested Endmill Starting Feed Per Tooth												
Cutting Diameter	1/32"	1/16"	1/8"	5/32"	3/16"	1/4"	5/16"	3/8"	1/2"	5/8"	3/4"	1"
Material Group												
1.1	0.0002	0.0004	0.0006	0.0008	0.001	0.0015	0.002	0.0025	0.003	0.0035	0.004	0.0045
1.2	0.0002	0.0004	0.0006	0.0008	0.001	0.0015	0.002	0.0025	0.003	0.0035	0.004	0.0045
1.3	0.0002	0.0004	0.0006	0.0008	0.001	0.0015	0.002	0.0025	0.003	0.0035	0.004	0.0045
1.4	0.0002	0.0004	0.0006	0.0008	0.001	0.0015	0.002	0.0025	0.003	0.0035	0.004	0.0045
1.5	0.0001	0.0002	0.0005	0.0006	0.0007	0.001	0.0015	0.002	0.0025	0.003	0.0035	0.004
1.6	0.0001	0.0002	0.0005	0.0006	0.0007	0.001	0.0015	0.002	0.0025	0.003	0.0035	0.004
1.7	0.0001	0.0002	0.0005	0.0006	0.0007	0.001	0.0015	0.002	0.0025	0.003	0.0035	0.004
1.8	0.0001	0.0002	0.0005	0.0006	0.0007	0.001	0.0015	0.002	0.0025	0.003	0.0035	0.004
1.9	0.0001	0.0002	0.0005	0.0006	0.0007	0.001	0.0015	0.002	0.0025	0.003	0.0035	0.004
2.1	0.0002	0.0005	0.0007	0.0008	0.001	0.0015	0.002	0.0025	0.003	0.0035	0.004	0.0045
2.2	0.0001	0.0002	0.0004	0.0005	0.0006	0.001	0.0015	0.002	0.0025	0.003	0.0035	0.004
2.3	0.0001	0.0002	0.0004	0.0005	0.0006	0.001	0.0015	0.002	0.0025	0.003	0.0035	0.004
2.4	0.0001	0.0001	0.0003	0.0004	0.0005	0.001	0.0015	0.002	0.0025	0.003	0.0035	0.004
3.1	0.0005	0.0007	0.001	0.0012	0.0015	0.002	0.0025	0.003	0.0035	0.004	0.007	0.01
3.2	0.0005	0.0007	0.001	0.0012	0.0015	0.002	0.0025	0.003	0.0035	0.004	0.007	0.01
3.3	0.0005	0.0007	0.001	0.0012	0.0015	0.002	0.0025	0.003	0.0035	0.004	0.007	0.01
3.4	0.0005	0.0007	0.001	0.0012	0.0015	0.002	0.0025	0.003	0.0035	0.004	0.007	0.01
4.1	0.0002	0.0003	0.0005	0.0006	0.00075	0.001	0.0012	0.0015	0.002	0.0025	0.003	0.0035
4.2	0.0002	0.0001	0.0002	0.0003	0.0005	0.001	0.0012	0.0015	0.002	0.0025	0.003	0.0035
4.3	0.0002	0.0003	0.0004	0.0005	0.0006	0.001	0.0012	0.0015	0.002	0.0025	0.003	0.0035
5.1	0.0002	0.0003	0.0004	0.0005	0.0006	0.001	0.0012	0.0015	0.002	0.0025	0.003	0.0035
5.2	0.0002	0.0003	0.0004	0.0005	0.0006	0.001	0.0012	0.0015	0.002	0.0025	0.003	0.0035
5.3	0.0002	0.0003	0.0004	0.0005	0.0006	0.001	0.0012	0.0015	0.002	0.0025	0.003	0.0035
6.1	0.0002	0.0004	0.0006	0.0008	0.001	0.0015	0.002	0.0025	0.003	0.0035	0.004	0.0045
6.2	0.0002	0.0004	0.0006	0.0008	0.001	0.0015	0.002	0.0025	0.003	0.0035	0.004	0.0045
6.3	0.0002	0.0004	0.0006	0.0008	0.001	0.0015	0.002	0.0025	0.003	0.0035	0.004	0.0045
6.4	0.0002	0.0003	0.0005	0.0006	0.00075	0.001	0.0012	0.0015	0.002	0.0025	0.003	0.0035
7.1	0.0005	0.0007	0.001	0.0012	0.0015	0.002	0.0025	0.003	0.0035	0.004	0.007	0.01
7.2	0.0005	0.0007	0.001	0.0012	0.0015	0.002	0.0025	0.003	0.0035	0.004	0.007	0.01
7.3	0.0005	0.0007	0.001	0.0012	0.0015	0.002	0.0025	0.003	0.0035	0.004	0.007	0.01
7.4	0.0005	0.0007	0.001	0.0012	0.0015	0.002	0.0025	0.003	0.0035	0.004	0.007	0.01
8.1	0.0005	0.0007	0.001	0.0012	0.0015	0.002	0.0025	0.003	0.0035	0.004	0.007	0.01
8.02	0.0005	0.0007	0.001	0.0012	0.0015	0.002	0.0025	0.003	0.0035	0.004	0.007	0.01
8.3	0.0005	0.0007	0.001	0.0012	0.0015	0.002	0.0025	0.003	0.0035	0.004	0.007	0.01
9.1	0.0002	0.0004	0.0006	0.0008	0.001	0.0015	0.002	0.0025	0.003	0.0035	0.004	0.0045

Recommendations based on axial loads of ≤ 1Xs the cutter diameter for profiling and .5 Xs the diameter for slotting. Starting recommendations only.

Technical Information for Ultra Endmills

Endmills	V4 Ultra	V4 Ultra	V5 Ultra	V5 Ultra	Hy5 Ultra	Hy5 Ultra	F45 Ultra	F45 Ultra
								
Series	PowerN 450, 452	PowerNR 451	PowerN 453, 455	PowerNR 454	PowerN 456, 458	PowerNR 457	PowerN 459, 461	PowerNR 460
Material Group	Surface Feet Per Minute							
1.1								
1.2								
1.3	540-700	330-425	540-700	330-425	540-700	330-425	540-700	330-425
1.4	540-700	330-425	540-700	330-425	540-700	330-425	540-700	330-425
1.5	340-550	200-330	340-550	200-330	340-550	200-330	340-550	200-330
1.6	175-350	85-150	175-350	85-150	175-350	85-150	175-350	85-150
1.7	175-350	85-150	175-350	85-150	175-350	85-150	175-350	85-150
1.8	175-350	85-150	175-350	85-150	175-350	85-150	175-350	85-150
1.9	125-250	70-125	125-250	70-125	125-250	70-125	125-250	70-125
2.1	340-1,100	200-660	340-1,100	200-660	340-1,100	200-660	340-1,100	200-660
2.2	270-800	160-480	270-800	160-480	270-800	160-480	270-800	160-480
2.3	225-400	135-240	225-400	135-240	225-400	135-240	225-400	135-240
2.4	200-270	120-160	200-270	120-160	200-270	120-160	200-270	120-160
3.1	445-700	170-570	445-700	170-570	445-700	170-570	445-700	170-570
3.2	350-600	145-450	350-600	145-450	350-600	145-450	350-600	145-450
3.3	310-445	120-360	310-445	120-360	310-445	120-360	310-445	120-360
3.4	210-350	90-270	210-350	90-270	210-350	90-270	210-350	90-270
4.1	550-875	160-330	550-875	160-330	550-875	160-330	550-875	160-330
4.2	350-540	80-270	350-540	80-270	350-540	80-270	350-540	80-270
4.3	175-270	105-165	175-270	105-165	175-270	105-165	175-270	105-165
5.1	540-900	325-540	540-900	325-540	540-900	325-540	540-900	325-540
5.2	270-550	160-330	270-550	160-330	270-550	160-330	270-550	160-330
5.3	175-450	105-370	175-450	105-370	175-450	105-370	175-450	105-370
6.1								
6.2								
6.3								
6.4								
7.1								
7.2								
7.3								
7.4								
8.1								
8.2								
8.3								
9.1								

Technical Information for AxMills

Suggested Axial/Radial Loads

Work Material	Type of Cut	Axial DOC	Radial DOC	Number of Flutes
Aluminum Alloys 2024, 6061, 7075	Slotting	1xD	1xD	2
	Roughing	1xD	.75xD	3
	Finishing	1.5xD	.01xD	3
High Silicon Aluminum A380, A390	Slotting	.5xD	1xD	3
	Roughing	1xD	.5xD	3
	Finishing	1.5xD	.01xD	3
Magnesium Alloys	Slotting	1xD	1xD	2
	Roughing	1xD	.75xD	3
	Finishing	1.5xD	.01xD	3
Copper Alloys, Brass, Bronze	Slotting	.75xD	1xD	2
	Roughing	1xD	.75xD	3
	Finishing	1.5xD	.01xD	3
Composites, Plastics, Fiberglass	Slotting	1xD	1xD	3
	Roughing	1xD	.75xD	3
	Finishing	1.5xD	.01xD	3

Technical Information for HP Routers

	FGR	Nicked Trimmer CVD Diamond Coated	Herringbone Compression Finisher CVD Diamond Coated	Semi-Finisher CVD Diamond Coated	Multi-Flute Finisher CVD Diamond Coated
Material Group	Surface Feed per Minute				
CFRP, AFRP (Carbon Fiber, Aramid Fiber, Honeycomb Structures)		425-850	425-850	425-850	425-850
GFRP (Fiberglass)	650-1,000	425-850	425-850	425-850	
Carbon, Graphite	650-1,000	425-850	425-850	425-850	425-850
Metal Matrix		425-850		425-850	425-850
Plastics	800-1,650	425-850		425-850	425-850
Plastics	650-1,000	425-850	425-850	425-850	425-850
Carbon & Honeycomb		425-850	425-850		425-850

Technical Information for Reamers

Carbide Reamer Feeds and Speeds									
Material	Brinell	SFM	1/16"	1/8"	3/16"	1/4"	5/16"	3/8"	1/2"
Carbon Steels 1018, 1020, 1040, 1080 1140, 1212, 12L15 1525, 1536	≤ 200	150	0.002	0.004	0.005	0.007	0.009	0.011	0.014
	>200	75	0.002	0.003	0.005	0.006	0.008	0.009	0.012
	≤ 300								
	>300	55	0.001	0.002	0.003	0.004	0.005	0.006	0.007
Alloy Steels 4140, 4150, 4320, 4340 5120, 5150, 8630, 86L20 50100, 52100	≤ 270	115	0.002	0.003	0.005	0.006	0.008	0.009	0.012
	>270	70	0.002	0.003	0.005	0.006	0.008	0.009	0.012
	≤ 370								
	>370	45	0.001	0.002	0.003	0.004	0.005	0.006	0.007
Tool Steels A2, D2, H13, L2, M2 P20, S7, T15, W2	≤ 250	40	0.001	0.002	0.003	0.004	0.005	0.006	0.008
	>250	25	0.001	0.001	0.002	0.003	0.003	0.004	0.005
	≤ 330								
	>330	20	0.000	0.001	0.001	0.002	0.002	0.002	0.003
Free Machining Stainless 303, 400 Series	≤ 250	75	0.001	0.002	0.003	0.004	0.005	0.006	0.008
	>250	55	0.001	0.002	0.002	0.003	0.004	0.005	0.006
	≤ 330								
Difficult Stainless 304, 316, 321, 15-5 PH, 17-4 PH Nitronic® 32	≤ 270	35	0.001	0.002	0.003	0.004	0.005	0.006	0.008
	>270	25	0.001	0.001	0.002	0.003	0.003	0.004	0.005
	≤ 370								
Cast Iron Gray, Malleable, Ductile	≤ 200	125	0.002	0.004	0.006	0.008	0.010	0.012	0.016
	>200	95	0.002	0.004	0.006	0.008	0.010	0.012	0.016
	≤ 330								
Titanium Ti-6Al4V, Ti-7Al4Mo Ti-5Al1.5VMo-3Cr Ti-8Al1Mo1V	≤ 280	45	0.002	0.003	0.005	0.006	0.008	0.009	0.012
	>280	35	0.001	0.002	0.003	0.004	0.005	0.006	0.008
	≤ 350								
	>350	25	0.001	0.001	0.002	0.003	0.003	0.004	0.005
High Temp (Nickel) Alloys A-286, Hastelloy®, Incoloy®, Inconel®, Rene®, Waspaloy®	≤ 220	20	0.001	0.002	0.002	0.003	0.004	0.005	0.006
	>220	15	0.001	0.001	0.002	0.003	0.003	0.004	0.005
	≤ 330								
	>330	10	0.000	0.001	0.001	0.002	0.002	0.002	0.003
Copper Alloys Aluminum Bronze, C110 Aluminum 6061, 7075, 2017, 2024, 356	≤ 140	115	0.001	0.003	0.004	0.005	0.006	0.008	0.010
	≥ 140	95	0.001	0.003	0.004	0.005	0.006	0.008	0.010
	≤ 80	270	0.003	0.005	0.008	0.010	0.013	0.015	0.020
	≥ 80	230	0.003	0.005	0.008	0.010	0.013	0.015	0.020

Technical Information for HP Drills

Hurricane Drills

Diameter	Feed Rate Code (Thousands per Revolution)								
	1	2	3	4	5	6	7	8	9
1/8"	0.001	0.015	0.002	0.003	0.003	0.004	0.005	0.006	0.006
5/32"	0.002	0.002	0.003	0.003	0.004	0.005	0.006	0.008	0.008
3/16"	0.002	0.002	0.003	0.003	0.004	0.005	0.006	0.008	0.010
1/4"	0.002	0.003	0.003	0.004	0.005	0.006	0.008	0.010	0.125
5/16"	0.003	0.003	0.004	0.004	0.006	0.008	0.010	0.125	0.125
3/8"	0.003	0.004	0.004	0.006	0.008	0.010	0.125	0.016	0.016
1/2"	0.004	0.004	0.005	0.007	0.008	0.010	0.125	0.016	0.020
5/8"	0.004	0.005	0.007	0.008	0.010	0.125	0.016	0.020	0.025
3/4"	0.005	0.006	0.008	0.010	0.125	0.016	0.020	0.025	0.025










- Square End
- Ball End
- Corner Radius
- Double End
- Drill Mills
- Mini Mills
- TaperMills



Table of Section Contents

	Square Endmills	30
	Ball Endmills	33
	Corner Radius Endmills	36
	6 Flute Square Endmills	44
	Square End - Double End Endmills	45
	Ball End - Double End, Endmills	47
	Ball End - Double End Endmills w/ Flat	49
	Square End - Double End, Endmills w/Flat	49
	90° Drill Mills	50
	Square End, Straight Flute Endmills	51
	Ball End, Straight Flute Endmills	51
	Square Mini Mills	52
	Ball Mini Mills	53
	Square TaperMills	54
	Ball TaperMills	55

Features Legend

	2 Flutes		Plain Shank
	3 Flutes		Flat Shank
	4 Flutes		Double End Square
	6 Flutes		Double End Ball
	Corner Radius		

Coatings Legend

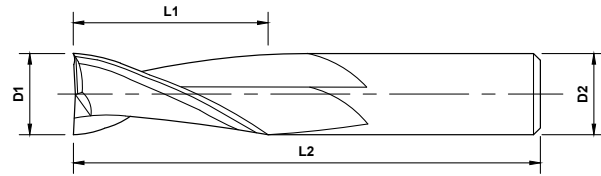
	PowerA Coating
---	----------------

Please contact us for our full line of metric products.

Mastercut's Superior Carbide Blend – A-Gr-SiV (Active Grain Sized Volume)
 Our superior tungsten carbide gives you the ability to be *aggressive* when you need to be.
 Growth inhibitors in our submicron carbide blanks maintain the most consistent grain size available, giving you superior hardness AND toughness.

Square Endmills

Standard, Stub and Long • 2, 3, & 4 Flutes
Coated and Uncoated



- Genuine **A-Gr-SiV** submicron grain carbide
- Proven versatile performance
- MAP certified quality

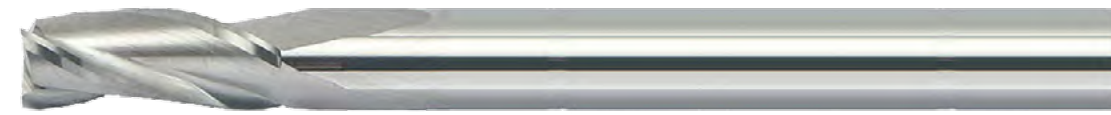
Cermet	Cast Iron	Titanium	Non-Ferrous	Stainless	Steel
K	S	N	M	P	



Stub
Uncoated



Standard
Uncoated



Long
Uncoated

OD D1	LOC L1	SHK D2	OAL L2	Uncoated			PowerA		
				2 Flute	3 Flute	4 Flute	2 Flute	3 Flute	4 Flute
1/32	1/16	1/8	1-1/2	213-102	-	213-702	213-102-1	-	213-702-1
1/32	3/32	1/8	1-1/2	209-202	210-202	211-202	209-202-1	210-202-1	211-202-1
3/64	3/32	1/8	1-1/2	213-104	-	213-704	213-104-1	-	213-704-1
3/64	1/8	1/8	1-1/2	209-204	210-204	211-204	209-204-1	210-204-1	211-204-1
1/16	1/8	1/8	1-1/2	213-106	-	213-706	213-106-1	-	213-706-1
1/16	1/4	1/8	1-1/2	209-206	210-206	211-206	209-206-1	210-206-1	211-206-1
5/64	1/4	1/8	1-1/2	209-208	210-208	211-208	209-208-1	210-208-1	211-208-1
3/32	3/16	1/8	1-1/2	213-108	-	213-708	213-108-1	-	213-708-1
3/32	3/8	1/8	1-1/2	209-210	210-210	211-210	209-210-1	210-210-1	211-210-1
7/64	3/8	1/8	1-1/2	209-212	210-212	211-212	209-212-1	210-212-1	211-212-1
1/8	1/4	1/8	1-1/2	213-112	-	213-712	213-112-1	-	213-712-1
1/8	1/2	1/8	1-1/2	209-214	210-214	211-214	209-214-1	210-214-1	211-214-1
1/8	5/8	1/8	2	204-202	-	206-202	204-202-1	-	206-202-1
1/8	3/4	1/8	2	204-204	-	206-204	204-204-1	-	206-204-1
1/8	1	1/8	3	204-206	-	206-206	204-206-1	-	206-206-1
9/64	9/16	3/16	2	209-216	210-216	211-216	209-216-1	210-216-1	211-216-1
5/32	5/16	3/16	2	213-110	-	213-710	213-110-1	-	213-710-1
5/32	9/16	3/16	2	209-218	210-218	211-218	209-218-1	210-218-1	211-218-1

Square Endmills

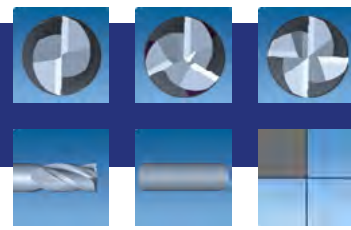
Standard, Stub and Long • 2, 3, & 4 Flutes
Coated and Uncoated

Cermet	Cast Iron	Titanium	Non-Ferrous	Stainless	Steel
K	S	N	M	P	

OD D1	LOC L1	SHK D2	OAL L2	Uncoated			PowerA		
				2 Flute	3 Flute	4 Flute	2 Flute	3 Flute	4 Flute
11/64	9/16	3/16	2	209-220	210-220	211-220	209-220-1	210-220-1	211-220-1
3/16	3/8	3/16	2	213-114	-	213-714	213-114-1	-	213-714-1
3/16	5/8	3/16	2	209-222	210-222	211-222	209-222-1	210-222-1	211-222-1
3/16	3/4	3/16	2-1/2	204-208	-	206-208	204-208-1	-	206-208-1
3/16	1-1/8	3/16	3	204-210	-	206-210	204-210-1	-	206-210-1
3/16	1	3/16	4	204-212	-	206-212	204-212-1	-	206-212-1
13/64	5/8	1/4	2-1/2	209-224	210-224	211-224	209-224-1	210-224-1	211-224-1
7/32	7/16	1/4	2	213-116	-	213-716	213-116-1	-	213-716-1
7/32	5/8	1/4	2-1/2	209-226	210-226	211-226	209-226-1	210-226-1	211-226-1
15/64	3/4	1/4	2-1/2	209-228	210-228	211-228	209-228-1	210-228-1	211-228-1
1/4	1/2	1/4	2	213-118	-	213-718	213-118-1	-	213-718-1
1/4	3/4	1/4	2-1/2	209-230	210-230	211-230	209-230-1	210-230-1	211-230-1
1/4	1-1/8	1/4	3	204-214	-	206-214	204-214-1	-	206-214-1
1/4	1	1/4	4	204-216	-	206-216	204-216-1	-	206-216-1
1/4	1-1/2	1/4	4	204-218	-	206-218	204-218-1	-	206-218-1
1/4	1-1/2	1/4	6	204-220	-	206-220	204-220-1	-	206-220-1
17/64	7/8	5/16	2-1/2	209-232	210-232	211-232	209-232-1	210-232-1	211-232-1
9/32	7/8	5/16	2-1/2	209-234	210-234	211-234	209-234-1	210-234-1	211-234-1
19/64	7/8	5/16	2-1/2	209-236	210-236	211-236	209-236-1	210-236-1	211-236-1
5/16	1/2	5/16	2	213-120	-	213-720	213-120-1	-	213-720-1
5/16	7/8	5/16	2-1/2	209-238	210-238	211-238	209-238-1	210-238-1	211-238-1
5/16	1-1/8	5/16	3	204-222	-	206-222	204-222-1	-	206-222-1
5/16	1	5/16	4	204-224	-	206-224	204-224-1	-	206-224-1
5/16	1-5/8	5/16	4	204-226	-	206-226	204-226-1	-	206-226-1
5/16	1-1/2	5/16	6	204-228	-	206-228	204-228-1	-	206-228-1
21/64	7/8	3/8	2-1/2	209-240	210-240	211-240	209-240-1	210-240-1	211-240-1
11/32	7/8	3/8	2-1/2	209-242	210-242	211-242	209-242-1	210-242-1	211-242-1
23/64	7/8	3/8	2-1/2	209-244	210-244	211-244	209-244-1	210-244-1	211-244-1
3/8	5/8	3/8	2	213-122	-	213-722	213-122-1	-	213-722-1
3/8	7/8	3/8	2-1/2	209-246	210-246	211-246	209-246-1	210-246-1	211-246-1
3/8	1-1/8	3/8	3	204-230	-	206-230	204-230-1	-	206-230-1
3/8	1-3/4	3/8	4	204-232	-	206-232	204-232-1	-	206-232-1
3/8	2	3/8	4	204-234	-	206-234	204-234-1	-	206-234-1
3/8	1-1/2	3/8	6	204-236	-	206-236	204-236-1	-	206-236-1

Square Endmills

Standard, Stub and Long • 2, 3, & 4 Flutes
Coated and Uncoated

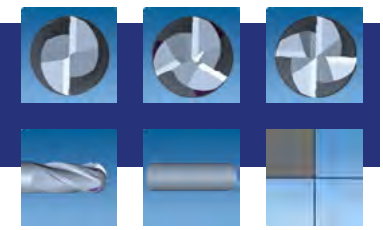


Cermet	Cast Iron	Titanium	Non-Ferrous	Stainless	Steel
K	S	N	M	P	

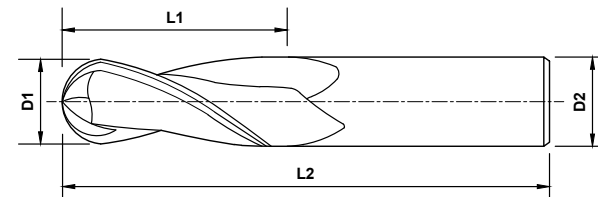
OD D1	LOC L1	SHK D2	OAL L2	Uncoated			PowerA		
				2 Flute	3 Flute	4 Flute	2 Flute	3 Flute	4 Flute
3/8	3	3/8	6	204-238	-	206-238	204-238-1	-	206-238-1
25/64	7/8	7/16	2-1/2	209-248	210-248	211-248	209-248-1	210-248-1	211-248-1
13/32	7/8	7/16	2-1/2	209-250	210-250	211-250	209-250-1	210-250-1	211-250-1
27/64	7/8	7/16	2-1/2	209-252	210-252	211-252	209-252-1	210-252-1	211-252-1
7/16	5/8	7/16	2-1/2	213-124	-	213-724	213-124-1	-	213-724-1
7/16	1	7/16	2-1/2	209-254	210-254	211-254	209-254-1	210-254-1	211-254-1
7/16	1	7/16	4	204-240	-	206-240	204-240-1	-	206-240-1
7/16	2	7/16	4	204-242	-	206-242	204-242-1	-	206-242-1
7/16	1-1/2	7/16	6	204-244	-	206-244	204-244-1	-	206-244-1
7/16	3	7/16	6	204-246	-	206-246	204-246-1	-	206-246-1
29/64	1	1/2	3	209-256	210-256	211-256	209-256-1	210-256-1	211-256-1
15/32	1	1/2	3	209-258	210-258	211-258	209-258-1	210-258-1	211-258-1
31/64	1	1/2	3	209-260	210-260	211-260	209-260-1	210-260-1	211-260-1
1/2	5/8	1/2	2-1/2	213-126	-	213-726	213-126-1	-	213-726-1
1/2	1	1/2	3	209-262	210-262	211-262	209-262-1	210-262-1	211-262-1
1/2	1	1/2	4	204-248	-	206-248	204-248-1	-	206-248-1
1/2	1-1/2	1/2	6	204-250	-	206-250	204-250-1	-	206-250-1
1/2	2	1/2	4	204-252	-	206-252	204-252-1	-	206-252-1
1/2	3	1/2	6	204-254	-	206-254	204-254-1	-	206-254-1
9/16	1-1/4	9/16	3-1/2	209-264	210-264	211-264	209-264-1	210-264-1	211-264-1
5/8	3/4	5/8	3	213-128	-	213-728	213-128-1	-	213-728-1
5/8	1-1/4	5/8	3-1/2	209-266	210-266	211-266	209-266-1	210-266-1	211-266-1
5/8	2-1/4	5/8	5	204-256	-	206-256	204-256-1	-	206-256-1
5/8	3	5/8	6	204-258	-	206-258	204-258-1	-	206-258-1
11/16	1-1/2	3/4	4	209-268	210-268	211-268	209-268-1	210-268-1	211-268-1
3/4	1	3/4	3	213-130	-	213-730	213-130-1	-	213-730-1
3/4	1-1/2	3/4	4	209-270	210-270	211-270	209-270-1	210-270-1	211-270-1
3/4	2-1/4	3/4	5	204-260	-	206-260	204-260-1	-	206-260-1
3/4	3	3/4	6	204-262	-	206-262	204-262-1	-	206-262-1
7/8	1-1/2	7/8	4	209-272	210-272	211-272	209-272-1	210-272-1	211-272-1
1	1	1	3	213-132	-	213-732	213-132-1	-	213-732-1
1	1-1/2	1	4	209-274	210-274	211-274	209-274-1	210-274-1	211-274-1
1	2	1	6	204-264	-	206-264	204-264-1	-	206-264-1
1	3	1	6	204-266	-	206-266	204-266-1	-	206-266-1
1	4	1	6	204-268	-	206-268	204-268-1	-	206-268-1
1-1/4	2	1-1/4	4-1/2	209-276	210-276	211-276	209-276-1	210-276-1	211-276-1

Ball Endmills

Standard, Stub and Long • 2, 3, & 4 Flutes
Coated and Uncoated



Cermet	Cast Iron	Titanium	Non-Ferrous	Stainless	Steel
K	S	N	M	P	



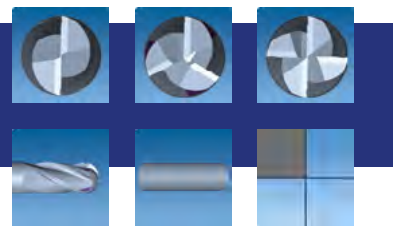
- Genuine **A-Gr-SiV** submicron grain carbide
- Proven versatile performance
- MAP certified quality



OD D1	LOC L1	SHK D2	OAL L2	Uncoated			PowerA		
				2 Flute	3 Flute	4 Flute	2 Flute	3 Flute	4 Flute
1/32	1/16	1/8	1-1/2	213-002	-	213-602	213-002-1	-	213-602-1
1/32	3/32	1/8	1-1/2	209-002	210-002	211-002	209-002-1	210-002-1	211-002-1
3/64	3/32	1/8	1-1/2	213-004	-	213-604	213-004-1	-	213-604-1
3/64	1/8	1/8	1-1/2	209-004	210-004	211-004	209-004-1	210-004-1	211-004-1
1/16	1/8	1/8	1-1/2	213-006	-	213-606	213-006-1	-	213-606-1
1/16	1/4	1/8	1-1/2	209-006	210-006	211-006	209-006-1	210-006-1	211-006-1
5/64	1/4	1/8	1-1/2	209-008	210-008	211-008	209-008-1	210-008-1	211-008-1
3/32	3/16	1/8	1-1/2	213-008	-	213-608	213-008-1	-	213-608-1
3/32	3/8	1/8	1-1/2	209-010	210-010	211-010	209-010-1	210-010-1	211-010-1
7/64	3/8	1/8	1-1/2	209-012	210-012	211-012	209-012-1	210-012-1	211-012-1
1/8	1/4	1/8	1-1/2	213-012	-	213-612	213-012-1	-	213-612-1
1/8	1/2	1/8	1-1/2	209-014	210-014	211-014	209-014-1	210-014-1	211-014-1
1/8	5/8	1/8	2	204-002	-	206-002	204-002-1	-	206-002-1
1/8	3/4	1/8	2	204-004	-	206-004	204-004-1	-	206-004-1
1/8	1	1/8	3	204-006	-	206-006	204-006-1	-	206-006-1
9/64	9/16	3/16	2	209-016	210-016	211-016	209-016-1	210-016-1	211-016-1

Ball Endmills

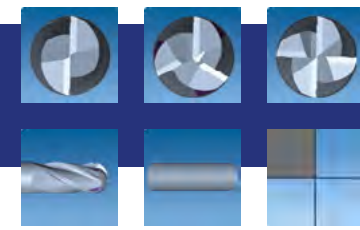
Standard, Stub and Long • 2, 3, & 4 Flutes
Coated and Uncoated



OD D1	LOC L1	SHK D2	OAL L2	Uncoated			PowerA		
				2 Flute	3 Flute	4 Flute	2 Flute	3 Flute	4 Flute
5/32	5/16	3/16	2	213-010	-	213-610	213-010-1	-	213-610-1
5/32	9/16	3/16	2	209-018	210-018	211-018	209-018-1	210-018-1	211-018-1
11/64	9/16	3/16	2	209-020	210-020	211-020	209-020-1	210-020-1	211-020-1
3/16	3/8	3/16	2	213-014	-	213-614	213-014-1	-	213-614-1
3/16	5/8	3/16	2	209-022	210-022	211-022	209-022-1	210-022-1	211-022-1
3/16	3/4	3/16	2-1/2	204-008	-	206-008	204-008-1	-	206-008-1
3/16	1-1/8	3/16	3	204-010	-	206-010	204-010-1	-	206-010-1
3/16	1	3/16	4	204-012	-	206-012	204-012-1	-	206-012-1
13/64	5/8	1/4	2-1/2	209-024	210-024	211-024	209-024-1	210-024-1	211-024-1
7/32	7/16	1/4	2	213-016	-	213-616	213-016-1	-	213-616-1
7/32	5/8	1/4	2-1/2	209-026	210-026	211-026	209-026-1	210-026-1	211-026-1
15/64	3/4	1/4	2-1/2	209-028	210-028	211-028	209-028-1	210-028-1	211-028-1
1/4	1/2	1/4	2	213-018	-	213-618	213-018-1	-	213-618-1
1/4	3/4	1/4	2-1/2	209-030	210-030	211-030	209-030-1	210-030-1	211-030-1
1/4	1-1/8	1/4	3	204-014	-	206-014	204-014-1	-	206-014-1
1/4	1	1/4	4	204-016	-	206-016	204-016-1	-	206-016-1
1/4	1-1/2	1/4	4	204-018	-	206-018	204-018-1	-	206-018-1
1/4	1-1/2	1/4	6	204-020	-	206-020	204-020-1	-	206-020-1
17/64	7/8	5/16	2-1/2	209-032	210-032	211-032	209-032-1	210-032-1	211-032-1
9/32	7/8	5/16	2-1/2	209-034	210-034	211-034	209-034-1	210-034-1	211-034-1
19/64	7/8	5/16	2-1/2	209-036	210-036	211-036	209-036-1	210-036-1	211-036-1
5/16	1/2	5/16	2	213-020	-	213-620	213-020-1	-	213-620-1
5/16	7/8	5/16	2-1/2	209-038	210-038	211-038	209-038-1	210-038-1	211-038-1
5/16	1-1/8	5/16	3	204-022	-	206-022	204-022-1	-	206-022-1
5/16	1	5/16	4	204-024	-	206-024	204-024-1	-	206-024-1
5/16	1-5/8	5/16	4	204-026	-	206-026	204-026-1	-	206-026-1
5/16	1-1/2	5/16	6	204-028	-	206-028	204-028-1	-	206-028-1
21/64	7/8	3/8	2-1/2	209-040	210-040	211-040	209-040-1	210-040-1	211-040-1
11/32	7/8	3/8	2-1/2	209-042	210-042	211-042	209-042-1	210-042-1	211-042-1
23/64	7/8	3/8	2-1/2	209-044	210-044	211-044	209-044-1	210-044-1	211-044-1
3/8	5/8	3/8	2	213-022	-	213-622	213-022-1	-	213-622-1
3/8	7/8	3/8	2-1/2	209-046	210-046	211-046	209-046-1	210-046-1	211-046-1
3/8	1-1/8	3/8	3	204-030	-	206-030	204-030-1	-	206-030-1
3/8	1-3/4	3/8	4	204-032	-	206-032	204-032-1	-	206-032-1
3/8	2	3/8	4	204-034	-	206-034	204-034-1	-	206-034-1
3/8	1-1/2	3/8	6	204-036	-	206-036	204-036-1	-	206-036-1

Ball Endmills

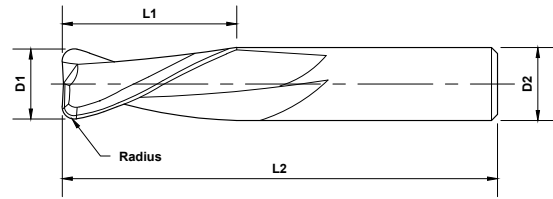
Standard, Stub and Long • 2, 3, & 4 Flutes
Coated and Uncoated



OD D1	LOC L1	SHK D2	OAL L2	Uncoated			PowerA		
				2 Flute	3 Flute	4 Flute	2 Flute	3 Flute	4 Flute
3/8	3	3/8	6	204-038	-	206-038	204-038-1	-	206-038-1
25/64	7/8	7/16	2-1/2	209-048	210-048	211-048	209-048-1	210-048-1	211-048-1
13/32	7/8	7/16	2-1/2	209-050	210-050	211-050	209-050-1	210-050-1	211-050-1
27/64	7/8	7/16	2-1/2	209-052	210-052	211-052	209-052-1	210-052-1	211-052-1
7/16	5/8	7/16	2-1/2	213-024	-	213-624	213-024-1	-	213-624-1
7/16	1	7/16	2-1/2	209-054	210-054	211-054	209-054-1	210-054-1	211-054-1
7/16	1	7/16	4	204-040	-	206-040	204-040-1	-	206-040-1
7/16	2	7/16	4	204-042	-	206-042	204-042-1	-	206-042-1
7/16	1-1/2	7/16	6	204-044	-	206-044	204-044-1	-	206-044-1
7/16	3	7/16	6	204-046	-	206-046	204-046-1	-	206-046-1
29/64	1	1/2	3	209-056	210-056	211-056	209-056-1	210-056-1	211-056-1
15/32	1	1/2	3	209-058	210-058	211-058	209-058-1	210-058-1	211-058-1
31/64	1	1/2	3	209-060	210-060	211-060	209-060-1	210-060-1	211-060-1
1/2	5/8	1/2	2-1/2	213-026	-	213-626	213-026-1	-	213-626-1
1/2	1	1/2	3	209-062	210-062	211-062	209-062-1	210-062-1	211-062-1
1/2	1	1/2	4	204-048	-	206-048	204-048-1	-	206-048-1
1/2	1-1/2	1/2	6	204-050	-	206-050	204-050-1	-	206-050-1
1/2	2	1/2	4	204-052	-	206-052	204-052-1	-	206-052-1
1/2	3	1/2	6	204-054	-	206-054	204-054-1	-	206-054-1
9/16	1-1/4	9/16	3-1/2	209-064	210-064	211-064	209-064-1	210-064-1	211-064-1
5/8	3/4	5/8	3	213-028	-	213-628	213-028-1	-	213-628-1
5/8	1-1/4	5/8	3-1/2	209-066	210-066	211-066	209-066-1	210-066-1	211-066-1
5/8	2-1/4	5/8	5	204-056	-	206-056	204-056-1	-	206-056-1
5/8	3	5/8	6	204-058	-	206-058	204-058-1	-	206-058-1
11/16	1-1/2	3/4	4	209-068	210-068	211-068	209-068-1	210-068-1	211-068-1
3/4	1	3/4	3	213-030	-	213-630	213-030-1	-	213-630-1
3/4	1-1/2	3/4	4	209-070	210-070	211-070	209-070-1	210-070-1	211-070-1
3/4	2-1/4	3/4	5	204-060	-	206-060	204-060-1	-	206-060-1
3/4	3	3/4	6	204-062	-	206-062	204-062-1	-	206-062-1
7/8	1-1/2	7/8	4	209-072	210-072	211-072	209-072-1	210-072-1	211-072-1
1	1	1	3	213-032	-	213-632	213-032-1	-	213-632-1
1	1-1/2	1	4	209-074	210-074	211-074	209-074-1	210-074-1	211-074-1
1	2	1	6	204-064	-	206-064	204-064-1	-	206-064-1
1	3	1	6	204-066	-	206-066	204-066-1	-	206-066-1
1	4	1	6	204-068	-	206-068	204-068-1	-	206-068-1
1-1/4	2	1-1/4	4-1/2	209-076	210-076	211-076	209-076-1	210-076-1	211-076-1

Corner Radius Endmills

2 and 4 Flutes • Coated and Uncoated



- Genuine **A-Gr-SiV** submicron grain carbide
- Corner radius for extra strength and precision
- MAP certified quality

Cermet	Cast Iron	Titanium	Non-Ferrous	Stainless	Steel
K	S	N	M	P	



Stub Uncoated



Standard Uncoated



Long Uncoated

OD D1	LOC L1	SHK D2	OAL L2	Radius R	Uncoated		PowerA	
					2 Flute	4 Flute	2 Flute	4 Flute
1/8	1/2	1/8	1-1/2	.015	209-401	211-401	209-401-1	211-401-1
1/8	1/2	1/8	1-1/2	.020	209-402	211-402	209-402-1	211-402-1
1/8	1/2	1/8	1-1/2	.030	209-403	211-403	209-403-1	211-403-1
1/8	1/2	1/8	1-1/2	.045	209-404	211-404	209-404-1	211-404-1
1/8	1/2	1/8	1-1/2	.060	209-405	211-405	209-405-1	211-405-1
1/8	1	1/8	3	.010	204-400	206-400	204-400-1	206-400-1
1/8	1	1/8	3	.015	204-401	206-401	204-401-1	206-401-1
1/8	1	1/8	3	.020	204-402	206-402	204-402-1	206-402-1
1/8	1	1/8	3	.030	204-403	206-403	204-403-1	206-403-1
1/8	1	1/8	3	.045	204-404	206-404	204-404-1	206-404-1
3/16	5/8	3/16	2	.015	209-411	211-411	209-411-1	211-411-1
3/16	5/8	3/16	2	.020	209-412	211-412	209-412-1	211-412-1
3/16	5/8	3/16	2	.030	209-413	211-413	209-413-1	211-413-1
3/16	5/8	3/16	2	.045	209-414	211-414	209-414-1	211-414-1
3/16	5/8	3/16	2	.060	209-415	211-415	209-415-1	211-415-1
3/16	1-1/8	3/16	3	.010	204-410	206-410	204-410-1	206-410-1
3/16	1-1/8	3/16	3	.015	204-411	206-411	204-411-1	206-411-1
3/16	1-1/8	3/16	3	.020	204-412	206-412	204-412-1	206-412-1

Corner Radius Endmills

2 and 4 Flutes • Coated and Uncoated

Cermet	Cast Iron	Titanium	Non-Ferrous	Stainless	Steel
K	S	N	M	P	

OD D1	LOC L1	SHK D2	OAL L2	Radius R	Uncoated		PowerA	
					2 Flute	4 Flute	2 Flute	4 Flute
3/16	1-1/8	3/16	3	.030	204-413	206-413	204-413-1	206-413-1
3/16	1-1/8	3/16	3	.045	204-414	206-414	204-414-1	206-414-1
3/16	1-1/8	3/16	3	.060	204-415	206-415	204-415-1	206-415-1
3/16	1	3/16	4	.010	204-420	206-420	204-420-1	206-420-1
3/16	1	3/16	4	.015	204-421	206-421	204-421-1	206-421-1
3/16	1	3/16	4	.020	204-422	206-422	204-422-1	206-422-1
3/16	1	3/16	4	.030	204-423	206-423	204-423-1	206-423-1
3/16	1	3/16	4	.045	204-424	206-424	204-424-1	206-424-1
3/16	1	3/16	4	.060	204-425	206-425	204-425-1	206-425-1
1/4	3/4	1/4	2-1/2	.015	209-421	211-421	209-421-1	211-421-1
1/4	3/4	1/4	2-1/2	.020	209-422	211-422	209-422-1	211-422-1
1/4	3/4	1/4	2-1/2	.030	209-423	211-423	209-423-1	211-423-1
1/4	3/4	1/4	2-1/2	.045	209-424	211-424	209-424-1	211-424-1
1/4	3/4	1/4	2-1/2	.060	209-425	211-425	209-425-1	211-425-1
1/4	1-1/8	1/4	3	.010	204-430	206-430	204-430-1	206-430-1
1/4	1-1/8	1/4	3	.015	204-431	206-431	204-431-1	206-431-1
1/4	1-1/8	1/4	3	.020	204-432	206-432	204-432-1	206-432-1
1/4	1-1/8	1/4	3	.030	204-433	206-433	204-433-1	206-433-1
1/4	1-1/8	1/4	3	.045	204-434	206-434	204-434-1	206-434-1
1/4	1-1/8	1/4	3	.060	204-435	206-435	204-435-1	206-435-1
1/4	1	1/4	4	.010	204-440	206-440	204-440-1	206-440-1
1/4	1	1/4	4	.015	204-441	206-441	204-441-1	206-441-1
1/4	1	1/4	4	.020	204-442	206-442	204-442-1	206-442-1
1/4	1	1/4	4	.030	204-443	206-443	204-443-1	206-443-1
1/4	1	1/4	4	.045	204-444	206-444	204-444-1	206-444-1
1/4	1	1/4	4	.060	204-445	206-445	204-445-1	206-445-1
1/4	1-1/2	1/4	4	.010	204-450	206-450	204-450-1	206-450-1
1/4	1-1/2	1/4	4	.015	204-451	206-451	204-451-1	206-451-1
1/4	1-1/2	1/4	4	.020	204-452	206-452	204-452-1	206-452-1
1/4	1-1/2	1/4	4	.030	204-453	206-453	204-453-1	206-453-1
1/4	1-1/2	1/4	4	.045	204-454	206-454	204-454-1	206-454-1
1/4	1-1/2	1/4	4	.060	204-455	206-455	204-455-1	206-455-1
1/4	1-1/2	1/4	6	.010	204-460	206-460	204-460-1	206-460-1
1/4	1-1/2	1/4	6	.015	204-461	206-461	204-461-1	206-461-1

Corner Radius Endmills

2 and 4 Flutes • Coated and Uncoated



Cermet	Cast Iron	Titanium	Non-Ferrous	Stainless	Steel
K	S	N	M	P	

OD D1	LOC L1	SHK D2	OAL L2	Radius R	Uncoated		PowerA	
					2 Flute	4 Flute	2 Flute	4 Flute
1/4	1-1/2	1/4	6	.020	204-462	206-462	204-462-1	206-462-1
1/4	1-1/2	1/4	6	.030	204-463	206-463	204-463-1	206-463-1
1/4	1-1/2	1/4	6	.045	204-464	206-464	204-464-1	206-464-1
1/4	1-1/2	1/4	6	.060	204-465	206-465	204-465-1	206-465-1
5/16	13/16	5/16	2-1/2	.015	209-431	211-431	209-431-1	211-431-1
5/16	13/16	5/16	2-1/2	.020	209-432	211-432	209-432-1	211-432-1
5/16	13/16	5/16	2-1/2	.030	209-433	211-433	209-433-1	211-433-1
5/16	13/16	5/16	2-1/2	.045	209-434	211-434	209-434-1	211-434-1
5/16	13/16	5/16	2-1/2	.060	209-435	211-435	209-435-1	211-435-1
5/16	1-1/8	5/16	3	.010	204-470	206-470	204-470-1	206-470-1
5/16	1-1/8	5/16	3	.015	204-471	206-471	204-471-1	206-471-1
5/16	1-1/8	5/16	3	.020	204-472	206-472	204-472-1	206-472-1
5/16	1-1/8	5/16	3	.030	204-473	206-473	204-473-1	206-473-1
5/16	1-1/8	5/16	3	.045	204-474	206-474	204-474-1	206-474-1
5/16	1-1/8	5/16	3	.060	204-475	206-475	204-475-1	206-475-1
5/16	1-1/8	5/16	3	.090	204-476	206-476	204-476-1	206-476-1
5/16	1-1/8	5/16	3	.125	204-477	206-477	204-477-1	206-477-1
5/16	1-5/8	5/16	4	.010	204-480	206-480	204-480-1	206-480-1
5/16	1-5/8	5/16	4	.015	204-481	206-481	204-481-1	206-481-1
5/16	1-5/8	5/16	4	.020	204-482	206-482	204-482-1	206-482-1
5/16	1-5/8	5/16	4	.030	204-483	206-483	204-483-1	206-483-1
5/16	1-5/8	5/16	4	.045	204-484	206-484	204-484-1	206-484-1
5/16	1-5/8	5/16	4	.060	204-485	206-485	204-485-1	206-485-1
5/16	1-5/8	5/16	4	.090	204-486	206-486	204-486-1	206-486-1
5/16	1-5/8	5/16	4	.125	204-487	206-487	204-487-1	206-487-1
3/8	1	3/8	2-1/2	.015	209-441	211-441	209-441-1	211-441-1
3/8	1	3/8	2-1/2	.020	209-442	211-442	209-442-1	211-442-1
3/8	1	3/8	2-1/2	.030	209-443	211-443	209-443-1	211-443-1
3/8	1	3/8	2-1/2	.045	209-444	211-444	209-444-1	211-444-1
3/8	1	3/8	2-1/2	.060	209-445	211-445	209-445-1	211-445-1
3/8	1-1/8	3/8	3	.010	204-490	206-490	204-490-1	206-490-1
3/8	1-1/8	3/8	3	.015	204-491	206-491	204-491-1	206-491-1
3/8	1-1/8	3/8	3	.020	204-492	206-492	204-492-1	206-492-1
3/8	1-1/8	3/8	3	.030	204-493	206-493	204-493-1	206-493-1

Corner Radius Endmills

2 and 4 Flutes • Coated and Uncoated



Cermet	Cast Iron	Titanium	Non-Ferrous	Stainless	Steel
K	S	N	M	P	

OD D1	LOC L1	SHK D2	OAL L2	Radius R	Uncoated		PowerA	
					2 Flute	4 Flute	2 Flute	4 Flute
3/8	1-1/8	3/8	3	.045	204-494	206-494	204-494-1	206-494-1
3/8	1-1/8	3/8	3	.060	204-495	206-495	204-495-1	206-495-1
3/8	1-1/8	3/8	3	.090	204-496	206-496	204-496-1	206-496-1
3/8	1-1/8	3/8	3	.125	204-497	206-497	204-497-1	206-497-1
3/8	1-3/4	3/8	4	.010	204-500	206-500	204-500-1	206-500-1
3/8	1-3/4	3/8	4	.015	204-501	206-501	204-501-1	206-501-1
3/8	1-3/4	3/8	4	.020	204-502	206-502	204-502-1	206-502-1
3/8	1-3/4	3/8	4	.030	204-503	206-503	204-503-1	206-503-1
3/8	1-3/4	3/8	4	.045	204-504	206-504	204-504-1	206-504-1
3/8	1-3/4	3/8	4	.060	204-505	206-505	204-505-1	206-505-1
3/8	1-3/4	3/8	4	.090	204-506	206-506	204-506-1	206-506-1
3/8	1-3/4	3/8	4	.125	204-507	206-507	204-507-1	206-507-1
3/8	2	3/8	4	.010	204-510	206-510	204-510-1	206-510-1
3/8	2	3/8	4	.015	204-511	206-511	204-511-1	206-511-1
3/8	2	3/8	4	.020	204-512	206-512	204-512-1	206-512-1
3/8	2	3/8	4	.030	204-513	206-513	204-513-1	206-513-1
3/8	2	3/8	4	.045	204-514	206-514	204-514-1	206-514-1
3/8	2	3/8	4	.060	204-515	206-515	204-515-1	206-515-1
3/8	2	3/8	4	.090	204-516	206-516	204-516-1	206-516-1
3/8	2	3/8	4	.125	204-517	206-517	204-517-1	206-517-1
3/8	1-1/2	3/8	6	.010	204-520	206-520	204-520-1	206-520-1
3/8	1-1/2	3/8	6	.015	204-521	206-521	204-521-1	206-521-1
3/8	1-1/2	3/8	6	.020	204-522	206-522	204-522-1	206-522-1
3/8	1-1/2	3/8	6	.030	204-523	206-523	204-523-1	206-523-1
3/8	1-1/2	3/8	6	.045	204-524	206-524	204-524-1	206-524-1
3/8	1-1/2	3/8	6	.060	204-525	206-525	204-525-1	206-525-1
3/8	1-1/2	3/8	6	.090	204-526	206-526	204-526-1	206-526-1
3/8	1-1/2	3/8	6	.125	204-527	206-527	204-527-1	206-527-1
3/8	3	3/8	6	.010	204-530	206-530	204-530-1	206-530-1
3/8	3	3/8	6	.015	204-531	206-531	204-531-1	206-531-1
3/8	3	3/8	6	.020	204-532	206-532	204-532-1	206-532-1
3/8	3	3/8	6	.030	204-533	206-533	204-533-1	206-533-1
3/8	3	3/8	6	.045	204-534	206-534	204-534-1	206-534-1
3/8	3	3/8	6	.060	204-535	206-535	204-535-1	206-535-1

Corner Radius Endmills

2 and 4 Flutes • Coated and Uncoated



Cermet	Cast Iron	Titanium	Non-Ferrous	Stainless	Steel
K	S	N	M	P	

OD D1	LOC L1	SHK D2	OAL L2	Radius R	Uncoated		PowerA	
					2 Flute	4 Flute	2 Flute	4 Flute
3/8	3	3/8	6	.090	204-536	206-536	204-536-1	206-536-1
3/8	3	3/8	6	.125	204-537	206-537	204-537-1	206-537-1
5/16	1-1/2	5/16	6	.010	204-540	206-540	204-540-1	206-540-1
5/16	1-1/2	5/16	6	.015	204-541	206-541	204-541-1	206-541-1
5/16	1-1/2	5/16	6	.020	204-542	206-542	204-542-1	206-542-1
5/16	1-1/2	5/16	6	.030	204-543	206-543	204-543-1	206-543-1
5/16	1-1/2	5/16	6	.045	204-544	206-544	204-544-1	206-544-1
5/16	1-1/2	5/16	6	.060	204-545	206-545	204-545-1	206-545-1
5/16	1-1/2	5/16	6	.090	204-546	206-546	204-546-1	206-546-1
5/16	1-1/2	5/16	6	.125	204-547	206-547	204-547-1	206-547-1
7/16	2	7/16	4	.010	204-550	206-550	204-550-1	206-550-1
7/16	2	7/16	4	.015	204-551	206-551	204-551-1	206-551-1
7/16	2	7/16	4	.020	204-552	206-552	204-552-1	206-552-1
7/16	2	7/16	4	.030	204-553	206-553	204-553-1	206-553-1
7/16	2	7/16	4	.045	204-554	206-554	204-554-1	206-554-1
7/16	2	7/16	4	.060	204-555	206-555	204-555-1	206-555-1
7/16	2	7/16	4	.090	204-556	206-556	204-556-1	206-556-1
7/16	2	7/16	4	.125	204-557	206-557	204-557-1	206-557-1
7/16	3	7/16	6	.010	204-560	206-560	204-560-1	206-560-1
7/16	3	7/16	6	.015	204-561	206-561	204-561-1	206-561-1
7/16	3	7/16	6	.020	204-562	206-562	204-562-1	206-562-1
7/16	3	7/16	6	.030	204-563	206-563	204-563-1	206-563-1
7/16	3	7/16	6	.045	204-564	206-564	204-564-1	206-564-1
7/16	3	7/16	6	.060	204-565	206-565	204-565-1	206-565-1
7/16	3	7/16	6	.090	204-566	206-566	204-566-1	206-566-1
7/16	3	7/16	6	.125	204-567	206-567	204-567-1	206-567-1
1/2	1	1/2	3	.010	209-450	211-450	209-450-1	211-450-1
1/2	1	1/2	3	.015	209-451	211-451	209-451-1	211-451-1
1/2	1	1/2	3	.020	209-452	211-452	209-452-1	211-452-1
1/2	1	1/2	3	.030	209-453	211-453	209-453-1	211-453-1
1/2	1	1/2	3	.045	209-454	211-454	209-454-1	211-454-1
1/2	1	1/2	3	.060	209-455	211-455	209-455-1	211-455-1
1/2	1	1/2	3	.090	209-456	211-456	209-456-1	211-456-1
1/2	1	1/2	4	.010	204-570	206-570	204-570-1	206-570-1

Corner Radius Endmills

2 and 4 Flutes • Coated and Uncoated



Cermet	Cast Iron	Titanium	Non-Ferrous	Stainless	Steel
K	S	N	M	P	

OD D1	LOC L1	SHK D2	OAL L2	Radius R	Uncoated		PowerA	
					2 Flute	4 Flute	2 Flute	4 Flute
1/2	1	1/2	4	.015	204-571	206-571	204-571-1	206-571-1
1/2	1	1/2	4	.020	204-572	206-572	204-572-1	206-572-1
1/2	1	1/2	4	.030	204-573	206-573	204-573-1	206-573-1
1/2	1	1/2	4	.045	204-574	206-574	204-574-1	206-574-1
1/2	1	1/2	4	.060	204-575	206-575	204-575-1	206-575-1
1/2	1	1/2	4	.090	204-576	206-576	204-576-1	206-576-1
1/2	1	1/2	4	.125	204-577	206-577	204-577-1	206-577-1
1/2	1-1/2	1/2	6	.010	204-580	206-580	204-580-1	206-580-1
1/2	1-1/2	1/2	6	.015	204-581	206-581	204-581-1	206-581-1
1/2	1-1/2	1/2	6	.020	204-582	206-582	204-582-1	206-582-1
1/2	1-1/2	1/2	6	.030	204-583	206-583	204-583-1	206-583-1
1/2	1-1/2	1/2	6	.045	204-584	206-584	204-584-1	206-584-1
1/2	1-1/2	1/2	6	.060	204-585	206-585	204-585-1	206-585-1
1/2	1-1/2	1/2	6	.090	204-586	206-586	204-586-1	206-586-1
1/2	1-1/2	1/2	6	.125	204-587	206-587	204-587-1	206-587-1
1/2	2	1/2	4	.010	204-590	206-590	204-590-1	206-590-1
1/2	2	1/2	4	.015	204-591	206-591	204-591-1	206-591-1
1/2	2	1/2	4	.020	204-592	206-592	204-592-1	206-592-1
1/2	2	1/2	4	.030	204-593	206-593	204-593-1	206-593-1
1/2	2	1/2	4	.045	204-594	206-594	204-594-1	206-594-1
1/2	2	1/2	4	.060	204-595	206-595	204-595-1	206-595-1
1/2	2	1/2	4	.090	204-596	206-596	204-596-1	206-596-1
1/2	2	1/2	4	.125	204-597	206-597	204-597-1	206-597-1
1/2	3	1/2	6	.010	204-600	206-600	204-600-1	206-600-1
1/2	3	1/2	6	.015	204-601	206-601	204-601-1	206-601-1
1/2	3	1/2	6	.020	204-602	206-602	204-602-1	206-602-1
1/2	3	1/2	6	.030	204-603	206-603	204-603-1	206-603-1
1/2	3	1/2	6	.045	204-604	206-604	204-604-1	206-604-1
1/2	3	1/2	6	.060	204-605	206-605	204-605-1	206-605-1
1/2	3	1/2	6	.090	204-606	206-606	204-606-1	206-606-1
1/2	3	1/2	6	.125	204-607	206-607	204-607-1	206-607-1
5/8	1-1/4	5/8	3-1/2	.015	209-461	211-461	209-461-1	211-461-1
5/8	1-1/4	5/8	3-1/2	.020	209-462	211-462	209-462-1	211-462-1
5/8	1-1/4	5/8	3-1/2	.030	209-463	211-463	209-463-1	211-463-1

Corner Radius Endmills

2 and 4 Flutes • Coated and Uncoated



Cermet	Cast Iron	Titanium	Non-Ferrous	Stainless	Steel
K	S	N	M	P	

OD	LOC	SHK	OAL	Radius	Uncoated		PowerA	
					2 Flute	4 Flute	2 Flute	4 Flute
D1	L1	D2	L2	R				
5/8	1-1/4	5/8	3-1/2	.045	209-464	211-464	209-464-1	211-464-1
5/8	1-1/4	5/8	3-1/2	.060	209-465	211-465	209-465-1	211-465-1
5/8	1-1/4	5/8	3-1/2	.090	209-466	211-466	209-466-1	211-466-1
5/8	2-1/4	5/8	5	.010	204-610	206-610	204-610-1	206-610-1
5/8	2-1/4	5/8	5	.015	204-611	206-611	204-611-1	206-611-1
5/8	2-1/4	5/8	5	.020	204-612	206-612	204-612-1	206-612-1
5/8	2-1/4	5/8	5	.030	204-613	206-613	204-613-1	206-613-1
5/8	2-1/4	5/8	5	.045	204-614	206-614	204-614-1	206-614-1
5/8	2-1/4	5/8	5	.060	204-615	206-615	204-615-1	206-615-1
5/8	2-1/4	5/8	5	.090	204-616	206-616	204-616-1	206-616-1
5/8	2-1/4	5/8	5	.125	204-617	206-617	204-617-1	206-617-1
5/8	3	5/8	6	.010	204-620	206-620	204-620-1	206-620-1
5/8	3	5/8	6	.015	204-621	206-621	204-621-1	206-621-1
5/8	3	5/8	6	.020	204-622	206-622	204-622-1	206-622-1
5/8	3	5/8	6	.030	204-623	206-623	204-623-1	206-623-1
5/8	3	5/8	6	.045	204-624	206-624	204-624-1	206-624-1
5/8	3	5/8	6	.060	204-625	206-625	204-625-1	206-625-1
5/8	3	5/8	6	.090	204-626	206-626	204-626-1	206-626-1
5/8	3	5/8	6	.125	204-627	206-627	204-627-1	206-627-1
3/4	1-1/2	3/4	4	.015	209-471	211-471	209-471-1	211-471-1
3/4	1-1/2	3/4	4	.020	209-472	211-472	209-472-1	211-472-1
3/4	1-1/2	3/4	4	.030	209-473	211-473	209-473-1	211-473-1
3/4	1-1/2	3/4	4	.045	209-474	211-474	209-474-1	211-474-1
3/4	1-1/2	3/4	4	.060	209-475	211-475	209-475-1	211-475-1
3/4	1-1/2	3/4	4	.090	209-476	211-476	209-476-1	211-476-1
3/4	2-1/4	3/4	5	.015	204-631	206-631	204-631-1	206-631-1
3/4	2-1/4	3/4	5	.020	204-632	206-632	204-632-1	206-632-1
3/4	2-1/4	3/4	5	.030	204-633	206-633	204-633-1	206-633-1
3/4	2-1/4	3/4	5	.045	204-634	206-634	204-634-1	206-634-1
3/4	2-1/4	3/4	5	.060	204-635	206-635	204-635-1	206-635-1
3/4	2-1/4	3/4	5	.090	204-636	206-636	204-636-1	206-636-1
3/4	2-1/4	3/4	5	.125	204-637	206-637	204-637-1	206-637-1
3/4	3	3/4	6	.015	204-641	206-641	204-641-1	206-641-1
3/4	3	3/4	6	.020	204-642	206-642	204-642-1	206-642-1

Corner Radius Endmills

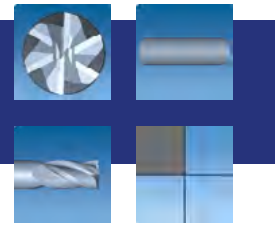
2 and 4 Flutes • Coated and Uncoated



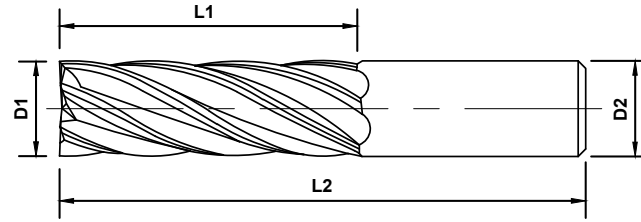
Cermet	Cast Iron	Titanium	Non-Ferrous	Stainless	Steel
K	S	N	M	P	

OD	LOC	SHK	OAL	Radius	Uncoated		PowerA	
					2 Flute	4 Flute	2 Flute	4 Flute
D1	L1	D2	L2	R				
3/4	3	3/4	6	.030	204-643	206-643	204-643-1	206-643-1
3/4	3	3/4	6	.045	204-644	206-644	204-644-1	206-644-1
3/4	3	3/4	6	.060	204-645	206-645	204-645-1	206-645-1
3/4	3	3/4	6	.090	204-646	206-646	204-646-1	206-646-1
3/4	3	3/4	6	.125	204-647	206-647	204-647-1	206-647-1
1	1-1/2	1	4	.015	209-481	211-481	209-481-1	211-481-1
1	1-1/2	1	4	.020	209-482	211-482	209-482-1	211-482-1
1	1-1/2	1	4	.030	209-483	211-483	209-483-1	211-483-1
1	1-1/2	1	4	.045	209-484	211-484	209-484-1	211-484-1
1	1-1/2	1	4	.060	209-485	211-485	209-485-1	211-485-1
1	1-1/2	1	4	.090	209-486	211-486	209-486-1	211-486-1
1	3	1	6	.015	204-651	206-651	204-651-1	206-651-1
1	3	1	6	.020	204-652	206-652	204-652-1	206-652-1
1	3	1	6	.030	204-653	206-653	204-653-1	206-653-1
1	3	1	6	.045	204-654	206-654	204-654-1	206-654-1
1	3	1	6	.060	204-655	206-655	204-655-1	206-655-1
1	3	1	6	.090	204-656	206-656	204-656-1	206-656-1
1	3	1	6	.125	204-657	206-657	204-657-1	206-657-1

6 Flute Square End



Standard Length • Coated and Uncoated



- Genuine **A-Gr-SiV** submicron grain carbide
- 6 flutes for superior finish
- MAP certified quality

Cast Iron	Titanium	Stainless	Steel
K	S	M	P



Uncoated



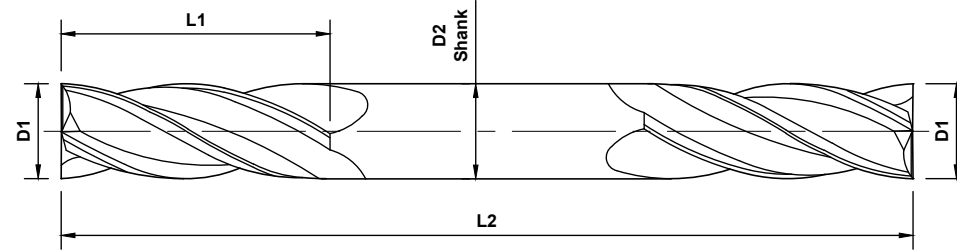
PowerA

OD	LOC	SHK	OAL	Uncoated	PowerA
D1	L1	D2	L2	6 Flute	6 Flute
3/16	5/8	3/16	2	212-222	212-222-1
1/4	3/4	1/4	2-1/2	212-230	212-230-1
5/16	7/8	5/16	2-1/2	212-238	212-238-1
3/8	1	3/8	2-1/2	212-246	212-246-1
7/16	1	7/16	2-1/2	212-254	212-254-1
1/2	1	1/2	3	212-262	212-262-1
5/8	1-1/4	5/8	3-1/2	212-266	212-266-1
3/4	1-1/2	3/4	4	212-270	212-270-1
7/8	1-1/2	7/8	4	212-272	212-272-1

Square End - Double End



Standard, Stub and Long, 2 and 4 Flutes
Coated and Uncoated



Cermet	Cast Iron	Titanium	Non-Ferrous	Stainless	Steel
K	S	N	M	P	



Uncoated



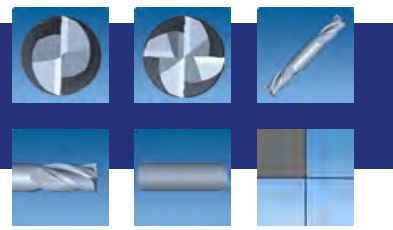
PowerA

- Genuine **A-Gr-SiV** submicron grain carbide
- Proven versatile performance
- MAP certified quality

OD	LOC	SHK	OAL	Uncoated		PowerA	
D1	L1	D2	L2	2 Flute	4 Flute	2 Flute	4 Flute
1/32	1/16	1/8	1-1/2	202-102	202-302	202-102-1	202-302-1
1/32	3/32	1/8	2	201-102	201-302	201-102-1	201-302-1
3/64	3/32	1/8	1-1/2	202-104	202-304	202-104-1	202-304-1
3/64	1/8	1/8	2	201-104	201-304	201-104-1	201-304-1
1/16	1/8	1/8	1-1/2	202-106	202-306	202-106-1	202-306-1
1/16	3/16	1/8	2	201-106	201-306	201-106-1	201-306-1
5/64	3/16	1/8	1-1/2	202-108	202-308	202-108-1	202-308-1
3/32	3/16	1/8	1-1/2	202-110	202-310	202-110-1	202-310-1
3/32	1/4	1/8	2	201-108	201-308	201-108-1	201-308-1
7/64	1/4	1/8	1-1/2	202-112	202-312	202-112-1	202-312-1
1/8	1/4	1/8	1-1/2	202-114	202-314	202-114-1	202-314-1
1/8	3/8	1/8	2	201-110	201-310	201-110-1	201-310-1
5/32	5/16	3/16	2	202-116	202-316	202-116-1	202-316-1
5/32	7/16	3/16	2-1/2	201-112	201-312	201-112-1	201-312-1
3/16	3/8	3/16	2	202-118	202-318	202-118-1	202-318-1
3/16	1/2	3/16	2-1/2	201-114	201-314	201-114-1	201-314-1
7/32	1/2	1/4	2-1/2	202-120	202-320	202-120-1	202-320-1
7/32	9/16	1/4	2-1/2	201-116	201-316	201-116-1	201-316-1

Square End - Double End

Standard, Stub and Long, 2 and 4 Flutes
Coated and Uncoated

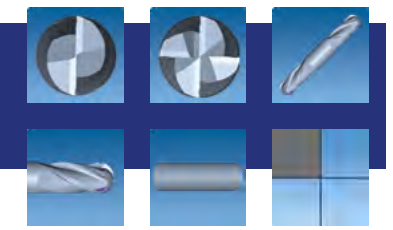


Cermet	Cast Iron	Titanium	Non-Ferrous	Stainless	Steel
	K	S	N	M	P

OD D1	LOC L1	SHK D2	OAL L2	Uncoated		PowerA	
				2 Flute	4 Flute	2 Flute	4 Flute
1/4	1/2	1/4	2-1/2	202-122	202-322	202-122-1	202-322-1
1/4	5/8	1/4	2-1/2	201-118	201-318	201-118-1	201-318-1
5/16	1/2	5/16	2-1/2	202-124	202-324	202-124-1	202-324-1
5/16	3/4	5/16	3-1/2	201-120	201-320	201-120-1	201-320-1
3/8	1/2	3/8	2-1/2	202-126	202-326	202-126-1	202-326-1
3/8	3/4	3/8	3-1/2	201-122	201-322	201-122-1	201-322-1
7/16	1/2	7/16	2-1/2	202-128	202-328	202-128-1	202-328-1
7/16	7/8	7/16	4	201-124	201-324	201-124-1	201-324-1
1/2	5/8	1/2	3	202-130	202-330	202-130-1	202-330-1
1/2	1	1/2	4	201-126	201-326	201-126-1	201-326-1
9/16	1-1/4	9/16	6	201-128	201-328	201-128-1	201-328-1
5/8	3/4	5/8	4	202-132	202-332	202-132-1	202-332-1
5/8	1-1/4	5/8	6	201-130	201-330	201-130-1	201-330-1
3/4	1	3/4	4	202-134	202-334	202-134-1	202-334-1
3/4	1-1/2	3/4	6	201-132	201-332	201-132-1	201-332-1
7/8	1-1/2	7/8	6	201-134	201-334	201-134-1	201-334-1
1	1-1/2	1	6	201-136	201-336	201-136-1	201-336-1

Ball End - Double End

Standard, Stub and Long • 2 and 4 Flutes
Coated and Uncoated



Cermet	Cast Iron	Titanium	Non-Ferrous	Stainless	Steel
	K	S	N	M	P

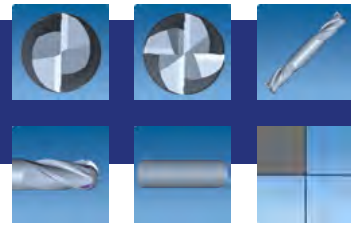
- Genuine **A-Gr-SiV** submicron grain carbide
- Proven versatile performance
- MAP certified quality



OD D1	LOC L1	SHK D2	OAL L2	Uncoated		PowerA	
				2 Flute	4 Flute	2 Flute	4 Flute
1/32	1/16	1/8	1-1/2	202-002	202-202	202-002-1	202-202-1
1/32	3/32	1/8	2	201-002	201-202	201-002-1	201-202-1
3/64	3/32	1/8	1-1/2	202-004	202-204	202-004-1	202-204-1
3/64	1/8	1/8	2	201-004	201-204	201-004-1	201-204-1
1/16	1/8	1/8	1-1/2	202-006	202-206	202-006-1	202-206-1
1/16	3/16	1/8	2	201-006	201-206	201-006-1	201-206-1
5/64	3/16	1/8	1-1/2	202-008	202-208	202-008-1	202-208-1
3/32	3/16	1/8	1-1/2	202-010	202-210	202-010-1	202-210-1
3/32	1/4	1/8	2	201-008	201-208	201-008-1	201-208-1
7/64	1/4	1/8	1-1/2	202-012	202-212	202-012-1	202-212-1
1/8	1/4	1/8	1-1/2	202-014	202-214	202-014-1	202-214-1
1/8	3/8	1/8	2	201-010	201-210	201-010-1	201-210-1
5/32	5/16	3/16	2	202-016	202-216	202-016-1	202-216-1
5/32	7/16	3/16	2-1/2	201-012	201-212	201-012-1	201-212-1
3/16	3/8	3/16	2	202-018	202-218	202-018-1	202-218-1
3/16	1/2	3/16	2-1/2	201-014	201-214	201-014-1	201-214-1
7/32	1/2	1/4	2-1/2	202-020	202-220	202-020-1	202-220-1

Ball End - Double End

Standard, Stub and Long • 2 and 4 Flutes
Coated and Uncoated



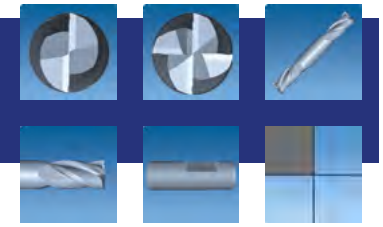
Cermet	Cast Iron	Titanium	Non-Ferrous	Stainless	Steel
K	S	N	M	P	

OD D1	LOC L1	SHK D2	OAL L2	Uncoated		PowerA	
				2 Flute	4 Flute	2 Flute	4 Flute
7/32	9/16	1/4	2-1/2	201-016	201-216	201-016-1	201-216-1
1/4	1/2	1/4	2-1/2	202-022	202-222	202-022-1	202-222-1
1/4	5/8	1/4	2-1/2	201-018	201-218	201-018-1	201-218-1
5/16	1/2	5/16	2-1/2	202-024	202-224	202-024-1	202-224-1
5/16	3/4	5/16	3-1/2	201-020	201-220	201-020-1	201-220-1
3/8	1/2	3/8	2-1/2	202-026	202-226	202-026-1	202-226-1
3/8	3/4	3/8	3-1/2	201-022	201-222	201-022-1	201-222-1
7/16	1/2	7/16	2-1/2	202-028	202-228	202-028-1	202-228-1
7/16	7/8	7/16	4	201-024	201-224	201-024-1	201-224-1
1/2	5/8	1/2	3	202-030	202-230	202-030-1	202-230-1
1/2	1	1/2	4	201-026	201-226	201-026-1	201-226-1
9/16	1-1/4	9/16	6	201-028	201-228	201-028-1	201-228-1
5/8	3/4	5/8	4	202-032	202-232	202-032-1	202-232-1
5/8	1-1/4	5/8	6	201-030	201-230	201-030-1	201-230-1
3/4	1	3/4	4	202-034	202-234	202-034-1	202-234-1
3/4	1-1/2	3/4	6	201-032	201-232	201-032-1	201-232-1
7/8	1-1/2	7/8	6	201-034	201-234	201-034-1	201-234-1
1	1-1/2	1	6	201-036	201-236	201-036-1	201-236-1

Square End • Double End

Common Shank with Flat • 2 and 4 Flutes
Coated and Uncoated

- Genuine **A-Gr-SiV** submicron grain carbide
- Proven versatile performance



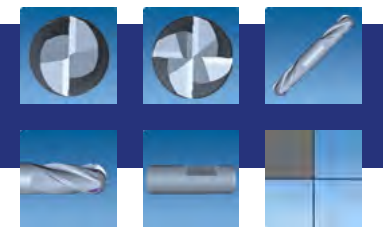
Cermet	Cast Iron	Titanium	Non-Ferrous	Stainless	Steel
K	S	N	M	P	



OD D1	LOC L1	SHK D2	OAL L2	Uncoated		PowerA	
				2 Flute	4 Flute	2 Flute	4 Flute
1/8	3/8	3/8	3	200-102W	200-302W	200-102W-1	200-302W-1
5/32	7/16	3/8	3-1/2	200-114W	200-314W	200-114W-1	200-314W-1
3/16	1/2	3/8	3	200-104W	200-304W	200-104W-1	200-304W-1
7/32	9/16	3/8	3	200-106W	200-306W	200-106W-1	200-306W-1
1/4	5/8	3/8	3	200-108W	200-308W	200-108W-1	200-308W-1
5/16	3/4	3/8	3-1/2	200-110W	200-310W	200-110W-1	200-310W-1
3/8	3/4	3/8	3-1/2	200-112W	200-312W	200-112W-1	200-312W-1

Ball End • Double End

Common Shank with Flat • 2 and 4 Flutes
Coated and Uncoated



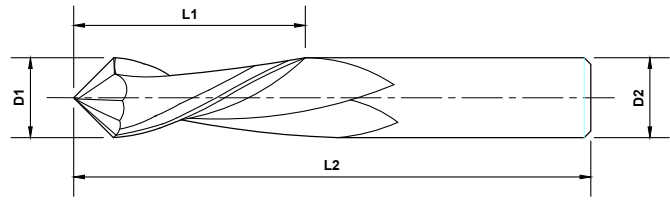
Cermet	Cast Iron	Titanium	Non-Ferrous	Stainless	Steel
K	S	N	M	P	



OD D1	LOC L1	SHK D2	OAL L2	Uncoated		PowerA	
				2 Flute	4 Flute	2 Flute	4 Flute
1/8	3/8	3/8	3	200-002W	200-202W	200-002W-1	200-202W-1
5/32	7/16	3/8	3-1/2	200-014W	200-214W	200-014W-1	200-214W-1
3/16	1/2	3/8	3	200-004W	200-204W	200-004W-1	200-204W-1
7/32	9/16	3/8	3	200-006W	200-206W	200-006W-1	200-206W-1
1/4	5/8	3/8	3	200-008W	200-208W	200-008W-1	200-208W-1
5/16	3/4	3/8	3-1/2	200-010W	200-210W	200-010W-1	200-210W-1
3/8	3/4	3/8	3-1/2	200-012W	200-212W	200-012W-1	200-212W-1

90° Drill Mills

2 and 4 Flutes • Coated and Uncoated



- Genuine **A-Gr-SiV** submicron grain carbide
- Chamfering, countersinking, spotting, and profile milling
- MAP certified quality

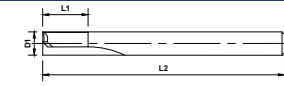
Cermet	Cast Iron	Titanium	Non-Ferrous	Stainless	Steel
K	S	N	M	P	



OD	LOC	SHK	OAL	Uncoated		PowerA	
D1	L1	D2	L2	2 Flute	4 Flute	2 Flute	4 Flute
1/8	1/2	1/8	1-1/2	214-002	214-302	214-002-1	214-302-1
3/16	5/8	3/16	2	214-004	214-304	214-004-1	214-304-1
1/4	3/4	1/4	2-1/2	214-006	214-306	214-006-1	214-306-1
5/16	7/8	5/16	2-1/2	214-008	214-308	214-008-1	214-308-1
3/8	7/8	3/8	2-1/2	214-010	214-310	214-010-1	214-310-1
7/16	1	7/16	2-1/2	214-012	214-312	214-012-1	214-312-1
1/2	1	1/2	3	214-014	214-314	214-014-1	214-314-1
5/8	1-1/4	5/8	3-1/2	214-016	214-316	214-016-1	214-316-1
3/4	1-1/2	3/4	4	214-018	214-318	214-018-1	214-318-1

Square End Straight Flute

2 and 4 Flutes • Coated and Uncoated



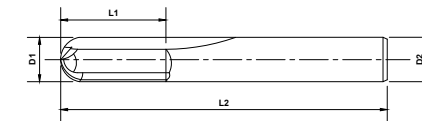
- Genuine **A-Gr-SiV** submicron grain carbide
- Superb performance in hardened materials

Hardened	Cast Iron	Steel
H	K	P

OD	LOC	SHK	OAL	Uncoated		PowerA	
D1	L1	D2	L2	2 Flute	4 Flute	2 Flute	4 Flute
1/8	1/2	1/8	1-1/2	203-102	203-302	203-102-1	203-302-1
3/16	5/8	3/16	2	203-104	203-304	203-104-1	203-304-1
7/32	5/8	1/4	2-1/2	203-106	203-306	203-106-1	203-306-1
1/4	3/4	1/4	2-1/2	203-108	203-308	203-108-1	203-308-1
5/16	13/16	5/16	2-1/2	203-110	203-310	203-110-1	203-310-1
3/8	1	3/8	2-1/2	203-112	203-312	203-112-1	203-312-1
1/2	1	1/2	3	203-114	203-314	203-114-1	203-314-1
5/8	1-1/4	5/8	3-1/2	203-116	203-316	203-116-1	203-316-1

Ball End Straight Flute

2 and 4 Flutes • Coated and Uncoated



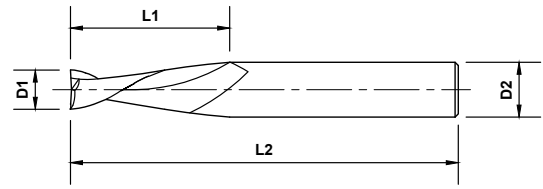
- Genuine **A-Gr-SiV** submicron grain carbide
- Superb performance in hardened materials
- MAP certified quality

Hardened	Cast Iron	Steel
H	K	P

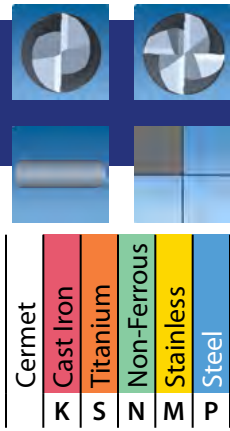
OD	LOC	SHK	OAL	Uncoated		PowerA	
D1	L2	D2	L2	2 Flute	4 Flute	2 Flute	4 Flute
1/8	1/2	1/8	1-1/2	203-002	203-202	203-002-1	203-202-1
3/16	5/8	3/16	2	203-004	203-204	203-004-1	203-204-1
7/32	5/8	1/4	2-1/2	203-006	203-206	203-006-1	203-206-1
1/4	3/4	1/4	2-1/2	203-008	203-208	203-008-1	203-208-1
5/16	13/16	5/16	2-1/2	203-010	203-210	203-010-1	203-210-1
3/8	1	3/8	2-1/2	203-012	203-212	203-012-1	203-212-1
1/2	1	1/2	3	203-014	203-214	203-014-1	203-214-1
5/8	1-1/4	5/8	3-1/2	203-016	203-216	203-016-1	203-216-1

Square Mini Mills

2 and 4 Flutes • Coated and Uncoated



- Genuine **A-Gr-SiV** submicron grain carbide
- Rigid, accurate design for micro applications
- MAP certified quality



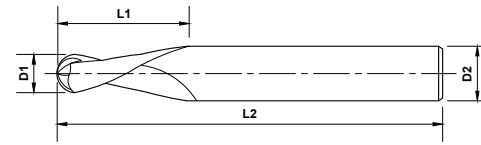
Uncoated

OD D1	LOC L1	SHK D2	OAL L2	Uncoated		PowerA	
				2 Flute	4 Flute	2 Flute	4 Flute
.005	.015	1/8	1-1/2	207-102	-	207-102-1	-
.010	.03	1/8	1-1/2	207-104	207-504	207-104-1	207-504-1
.015	.045	1/8	1-1/2	207-106	207-506	207-106-1	207-506-1
.020	.06	1/8	1-1/2	207-108	207-508	207-108-1	207-508-1
.025	.075	1/8	1-1/2	207-110	207-510	207-110-1	207-510-1
.030	.09	1/8	1-1/2	207-112	207-512	207-112-1	207-512-1
.035	.105	1/8	1-1/2	207-114	207-514	207-114-1	207-514-1
.040	.12	1/8	1-1/2	207-116	207-516	207-116-1	207-516-1
.045	.81	1/8	1-1/2	207-118	207-518	207-118-1	207-518-1
.050	.174	1/8	1-1/2	207-120	207-520	207-120-1	207-520-1
.055	.267	1/8	1-1/2	207-122	207-522	207-122-1	207-522-1
.060	.360	1/8	1-1/2	207-124	207-524	207-124-1	207-524-1
.065	.453	1/8	1-1/2	207-126	207-526	207-126-1	207-526-1
.070	.546	1/8	1-1/2	207-128	207-528	207-128-1	207-528-1
.075	.639	1/8	1-1/2	207-130	207-530	207-130-1	207-530-1
.080	.732	1/8	1-1/2	207-132	207-532	207-132-1	207-532-1
.085	.825	1/8	1-1/2	207-134	207-534	207-134-1	207-534-1
.090	.918	1/8	1-1/2	207-136	207-536	207-136-1	207-536-1
.095	.1011	1/8	1-1/2	207-138	207-538	207-138-1	207-538-1
.100	.1104	1/8	1-1/2	207-140	207-540	207-140-1	207-540-1
.105	.1197	1/8	1-1/2	207-142	207-542	207-142-1	207-542-1
.110	.1290	1/8	1-1/2	207-144	207-544	207-144-1	207-544-1
.115	.1383	1/8	1-1/2	207-146	207-546	207-146-1	207-546-1
.120	.1476	1/8	1-1/2	207-148	207-548	207-148-1	207-548-1

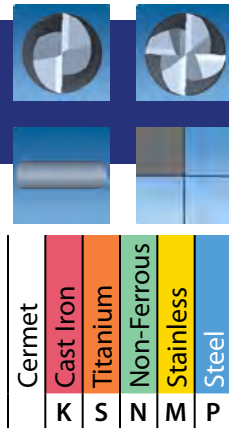
Call us regarding 3 flute MiniMills and other flute configurations.

Ball Mini Mills

2 and 4 Flutes • Coated and Uncoated



- Genuine **A-Gr-SiV** submicron grain carbide
- Rigid, accurate design for micro applications
- MAP certified quality



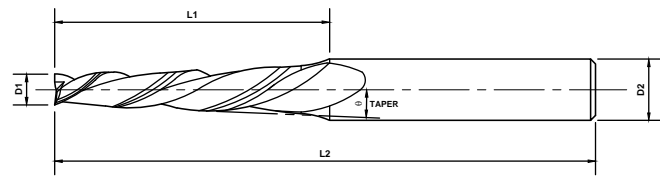
Uncoated

OD D1	LOC L1	SHK D2	OAL L2	Uncoated		PowerA	
				2 Flute	4 Flute	2 Flute	4 Flute
.005	.015	1/8	1-1/2	207-002	-	207-002-1	-
.010	.03	1/8	1-1/2	207-004	207-404	207-004-1	207-404-1
.015	.045	1/8	1-1/2	207-006	207-406	207-006-1	207-406-1
.020	.06	1/8	1-1/2	207-008	207-408	207-008-1	207-408-1
.025	.075	1/8	1-1/2	207-010	207-410	207-010-1	207-410-1
.030	.09	1/8	1-1/2	207-012	207-412	207-012-1	207-412-1
.035	.105	1/8	1-1/2	207-014	207-414	207-014-1	207-414-1
.040	.12	1/8	1-1/2	207-016	207-416	207-016-1	207-416-1
.045	.81	1/8	1-1/2	207-018	207-418	207-018-1	207-418-1
.050	.174	1/8	1-1/2	207-020	207-420	207-020-1	207-420-1
.055	.267	1/8	1-1/2	207-022	207-422	207-022-1	207-422-1
.060	.360	1/8	1-1/2	207-024	207-424	207-024-1	207-424-1
.065	.453	1/8	1-1/2	207-026	207-426	207-026-1	207-426-1
.070	.546	1/8	1-1/2	207-028	207-428	207-028-1	207-428-1
.075	.639	1/8	1-1/2	207-030	207-430	207-030-1	207-430-1
.080	.732	1/8	1-1/2	207-032	207-432	207-032-1	207-432-1
.085	.825	1/8	1-1/2	207-034	207-434	207-034-1	207-434-1
.090	.918	1/8	1-1/2	207-036	207-436	207-036-1	207-436-1
.095	.1011	1/8	1-1/2	207-038	207-438	207-038-1	207-438-1
.100	.1104	1/8	1-1/2	207-040	207-440	207-040-1	207-440-1
.105	.1197	1/8	1-1/2	207-042	207-442	207-042-1	207-442-1
.110	.1290	1/8	1-1/2	207-044	207-444	207-044-1	207-444-1
.115	.1383	1/8	1-1/2	207-046	207-446	207-046-1	207-446-1
.120	.1476	1/8	1-1/2	207-048	207-448	207-048-1	207-448-1

Call us regarding 3 flute MiniMills and other flute configurations.

Square Taper Mills

3 Flutes • Coated and Uncoated



- Genuine **A-Gr-SiV** submicron grain carbide
- Precise design, great versatility
- MAP certified quality

Cermet	Cast Iron	Titanium	Non-Ferrous	Stainless	Steel
K	S	N	M	P	



Uncoated

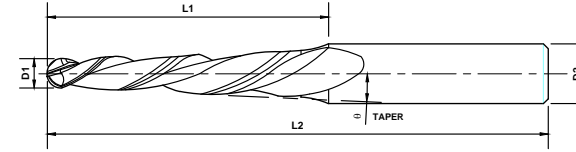


PowerA

SHK	Degree	Small OD	LOC	OAL	Uncoated	PowerA
D2	θ	D1	L1	L2	3 Flute	3 Flute
1/4	5	1/8	3/4	3	208-102	208-102-1
1/4	7	1/8	1/2	3	208-104	208-104-1
1/4	10	3/32	1/2	3	208-106	208-106-1
3/8	5	1/8	1-1/2	3-1/2	208-108	208-108-1
3/8	7	1/8	3/4	3-1/2	208-110	208-110-1
3/8	10	1/8	3/4	3-1/2	208-112	208-112-1
1/2	5	1/4	1-1/4	4	208-114	208-114-1
1/2	7	3/16	1-1/4	4	208-116	208-116-1
1/2	10	1/8	1	4	208-118	208-118-1

Ball Taper Mills

3 Flutes • Coated and Uncoated



- Genuine **A-Gr-SiV** submicron grain carbide
- Precise design, great versatility
- MAP certified quality

Cermet	Cast Iron	Titanium	Non-Ferrous	Stainless	Steel
K	S	N	M	P	



Uncoated



PowerA

SHK	Degree	Small OD	LOC	OAL	Uncoated	PowerA
D2	θ	D1	L1	L2	3 Flute	3 Flute
1/4	5	1/8	3/4	3	208-002	208-002-1
1/4	7	1/8	1/2	3	208-004	208-004-1
1/4	10	3/32	1/2	3	208-006	208-006-1
3/8	5	1/8	1-1/2	3-1/2	208-008	208-008-1
3/8	7	1/8	3/4	3-1/2	208-010	208-010-1
3/8	10	1/8	3/4	3-1/2	208-012	208-012-1
1/2	5	1/4	1-1/4	4	208-014	208-014-1
1/2	7	3/16	1-1/4	4	208-016	208-016-1
1/2	10	1/8	1	4	208-018	208-018-1

High Performance EndMills

- **V4 & V5**
- **HY5**
- **F45**
- **Mold Mills**
- **TwisterMills**
- **Roughers**
- **AxMills**
- **45° HyperMills**
- **55° AlumaZips**



Table of Section Contents

	V4 Square Endmills	60
	V4 Ball Endmills	62
	V4 Corner Radius Endmills	64
	V5 Square Endmills	71
	V5 Ball Endmills	73
	V5 Corner Radius Endmills	74
	HY5 Square Endmills	79
	HY5 Corner Radius Endmills	81
	F45 6FL Square Endmills.	87
	F45 6FL Corner Radius Endmills	88
	Mold Mills.	89
	3FL 60° Helix TwisterMills	93
	Fine Pitch Roughers	94
	Medium Pitch Roughers.	94
	Coarse Pitch Roughers.	95
	Square End AxMills	96
	Ball End AxMills	101
	Corner Radius AxMills	104
	Square End Chipbreaker AxMills	114
	Ball End Chipbreaker AxMills	116
	Corner Radius Chipbreaker AxMills.	118
	Square End Necked AxMills	128
	Ball End Necked AxMills.	129
	Corner Radius Necked AxMills.	130
	45° HyperMills	131
	55° AlumaZips	131




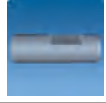






Please contact us for our full line of metric products.

Email: sales@mastercuttool.com
www.mastercuttool.com








Features and Coating Legends

Features Legend

	2 Flutes		Plain shank
	3 Flutes		Flat Shank
	4 Flutes		Double End Square
	5 Flutes		Double End Ball
	6 Flutes		Corner Radius

Coatings Legend

	PowerA Coating		PowerN Coating
	PowerT Coating		PowerNR Coating
	PowerZ Coating		

Mastercut's Superior Carbide Blend – A-Gr-SiV (Active Grain Sized Volume)

Our superior tungsten carbide gives you the ability to be *aggressive* when you need to be. Growth inhibitors in our submicron carbide blanks maintain the most consistent grain size available, giving you superior hardness AND toughness.

High Performance Tool Features



V4

- The variable 4 flute design interrupts harmonic vibrations to provide improved feeds and speeds, superior finishes and longer tool life.
- Ideal for roughing to finishing operations, in both peripheral and slotting functions
- Available in our proprietary and proven PowerA (AlTiN) and the optional nanocomposite PowerNR (nACRo) for difficult-to-machine alloys
- Also see our Ultra Performance V4 line



V5

- An impressive combination of variable flutes, a thicker core and eccentric-ground relief, adding to performance and value.
- A strong, stable performer sure to provide chatter-free finishes AND aggressive material removal rates.
- Available in PowerA (AlTiN) and nanocomposite PowerNR (nACRo) where tool-life demands the very finest coating available
- 5 Flute design

High Performance Tool Features



HYS

- High performing, broad spectrum semi-finisher/finisher
- Outstanding in stainless steels, high temp alloys, mold steels to 45 Rc
- 5 flute, 45° helix, eccentric grind provides a smooth cutting action with superb chip evacuation.
- 20% + increase in productivity versus 4 fluted endmills
- Minimal tool deflection equals better part tolerance
- Stub, standard and long lengths, in square end and corner radius options
- Coated with PowerA (AlTiN)



F45

- 6 flute, high performance finisher providing superb finishes in stainless steels, nickel alloys, Inconels, titanium and more
- 45° degree helix provides superb chip evacuation and excellent shearing action.
- Reduced load pressures and super-stiff design promotes less chatter and the best performance in light finishing applications.
- Coated with PowerA (AlTiN)



Ax Mill

- High performance design for aggressive aluminum milling
- Incorporating a high shear, high rake geometry
- 2 and 3 flute, square end, corner radius and ballend styles
- Available in uncoated and optional PowerZ (Zirconium Nitride) coating
- Chipbreaker option where chip control or spindle horsepower is a concern



HyperMill

- Aggressive metal removal rates in aluminum and non-ferrous materials
- 45° helix increases stiffness and improves surface finish.
- 2 Flute design

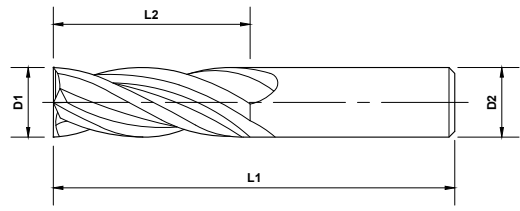


AlumaZip

- High performance 2 Flute design for high metal removal rates in aluminum and non-ferrous materials
- 55° helix combines a super-stiff profile with a rapid evacuation of chips.
- High helix fluting increases contact area, thereby imparting better surface finishes.

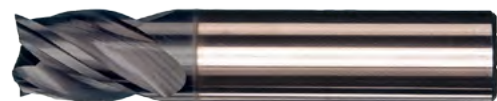
V4 Square Endmills

4 Flutes • Coated with and without Flat



- High Performance **A-Gr-SiV** submicron grain carbide
- Unique variable design for faster speeds and feeds
- Quiet operation and better finish
- MAP certified quality

Cermet	Hardened	Cast Iron	Titanium	Stainless	Steel
H	K	S	M	P	



PowerA

OD D1	LOC L1	SHK D2	OAL L2	PowerA	
				No Flat	With Flat
1/8	1/4	1/8	1-1/2	402-004-1	402-004W-1
1/8	3/8	1/8	1-1/2	400-002-1	400-002W-1
5/32	5/16	3/16	2	402-002-1	402-002W-1
5/32	7/16	3/16	2	400-004-1	400-004W-1
3/16	3/8	3/16	2	402-006-1	402-006W-1
3/16	7/16	3/16	2	400-006-1	400-006W-1
7/32	7/16	1/4	2	402-008-1	402-008W-1
7/32	7/16	1/4	2-1/2	400-008-1	400-008W-1

V4 Square Endmills

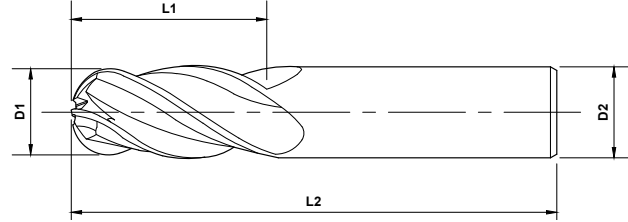
Cermet	Hardened	Cast Iron	Titanium	Stainless	Steel
H	K	S	M	P	

OD D1	LOC L1	SHK D2	OAL L2	PowerA	
				No Flat	With Flat
1/4	1/2	1/4	2	402-010-1	402-010W-1
1/4	5/8	1/4	2-1/2	400-010-1	400-010W-1
1/4	1-1/8	1/4	3	401-002-1	401-002W-1
5/16	1/2	5/16	2	402-012-1	402-012W-1
5/16	13/16	5/16	2-1/2	400-012-1	400-012W-1
5/16	1-1/8	5/16	3	401-004-1	401-004W-1
11/32	13/16	3/8	2-1/2	400-014-1	400-014W-1
3/8	5/8	3/8	2	402-014-1	402-014W-1
3/8	7/8	3/8	2-1/2	400-016-1	400-016W-1
3/8	1-1/8	3/8	3	401-006-1	401-006W-1
15/32	1	1/2	3	400-018-1	400-018W-1
7/16	5/8	7/16	2-1/2	402-016-1	402-016W-1
7/16	1	7/16	2-3/4	400-020-1	400-020W-1
1/2	5/8	1/2	2-1/2	402-018-1	402-018W-1
1/2	1	1/2	3	400-022-1	400-022W-1
1/2	1-1/4	1/2	3	400-024-1	400-024W-1
1/2	2	1/2	4	401-008-1	401-008W-1
9/16	1-1/8	9/16	3-1/2	400-026-1	400-026W-1
5/8	3/4	5/8	3	402-020-1	402-020W-1
5/8	1-1/4	5/8	3-1/2	400-028-1	400-028W-1
5/8	2-1/4	5/8	5	401-010-1	401-010W-1
3/4	1	3/4	3	402-024-1	402-024W-1
3/4	7/8	3/4	3-1/2	402-022-1	402-022W-1
3/4	1-1/2	3/4	4	400-030-1	400-030W-1
3/4	1-5/8	3/4	4	400-032-1	400-032W-1
3/4	2-1/4	3/4	5	401-012-1	401-012W-1
3/4	3	3/4	6	401-014-1	401-014W-1
3/4	4	3/4	6	401-016-1	401-016W-1
1	1-1/2	1	4	400-034-1	400-034W-1
1	2-1/4	1	5	401-018-1	401-018W-1
1	3	1	6	401-020-1	401-020W-1
1	4	1	7	401-022-1	401-022W-1



V4 Ball Endmills

4 Flutes • Coated with and without Flat



- High Performance **A-Gr-SiV** submicron grain carbide
- Unique variable design for faster speeds and feeds
- Quiet operation and better finish
- MAP certified quality

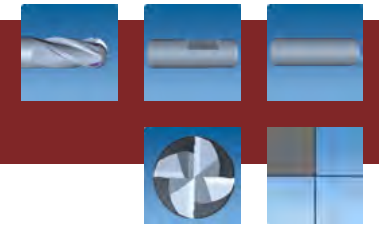
Cermet	Hardened	Cast Iron	Titanium	Stainless	Steel
H	K	S	M	P	



PowerA

OD D1	LOC L2	SHK D2	OAL L2	PowerA	
				No Flat	With Flat
1/8	1/4	1/8	1-1/2	402-204-1	402-204W-1
1/8	3/8	1/8	1-1/2	400-202-1	400-202W-1
5/32	5/16	3/16	2	402-202-1	402-202W-1
5/32	7/16	3/16	2	400-204-1	400-204W-1
3/16	3/8	3/16	2	402-206-1	402-206W-1
3/16	7/16	3/16	2	400-206-1	400-206W-1
7/32	7/16	1/4	2	402-208-1	402-208W-1
7/32	7/16	1/4	2-1/2	400-208-1	400-208W-1
1/4	1/2	1/4	2	402-210-1	402-210W-1
1/4	5/8	1/4	2-1/2	400-210-1	400-210W-1
1/4	1-1/8	1/4	3	401-202-1	401-202W-1
5/16	1/2	5/16	2	402-212-1	402-212W-1
5/16	13/16	5/16	2-1/2	400-212-1	400-212W-1
5/16	1-1/8	5/16	3	401-204-1	401-204W-1
11/32	13/16	3/8	2-1/2	400-214-1	400-214W-1
3/8	5/8	3/8	2	402-214-1	402-214W-1
3/8	7/8	3/8	2-1/2	400-216-1	400-216W-1
3/8	1-1/8	3/8	3	401-206-1	401-206W-1

V4 Ball Endmills



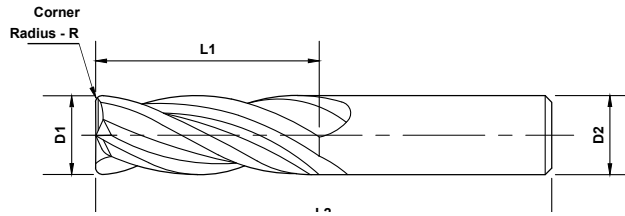
Cermet	Hardened	Cast Iron	Titanium	Stainless	Steel
H	K	S	M	P	

OD D1	LOC L2	SHK D2	OAL L2	PowerA	
				No Flat	With Flat
15/32	1	1/2	3	400-218-1	400-218W-1
7/16	5/8	7/16	2-1/2	402-216-1	402-216W-1
7/16	1	7/16	2-3/4	400-220-1	400-220W-1
1/2	5/8	1/2	2-1/2	402-218-1	402-218W-1
1/2	1	1/2	3	400-222-1	400-222W-1
1/2	1-1/4	1/2	3	400-224-1	400-224W-1
1/2	2	1/2	4	401-208-1	401-208W-1
9/16	1-1/8	9/16	3-1/2	400-226-1	400-226W-1
5/8	3/4	5/8	3	402-220-1	402-220W-1
5/8	1-1/4	5/8	3-1/2	400-228-1	400-228W-1
5/8	2-1/4	5/8	5	401-210-1	401-210W-1
3/4	1	3/4	3	402-224-1	402-224W-1
3/4	7/8	3/4	3-1/2	402-222-1	402-222W-1
3/4	1-1/2	3/4	4	400-230-1	400-230W-1
3/4	1-5/8	3/4	4	400-232-1	400-232W-1
3/4	2-1/4	3/4	5	401-212-1	401-212W-1
3/4	3	3/4	6	401-214-1	401-214W-1
3/4	4	3/4	6	401-216-1	401-216W-1
1	1-1/2	1	4	400-234-1	400-234W-1
1	2-1/4	1	5	401-218-1	401-218W-1
1	3	1	6	401-220-1	401-220W-1
1	4	1	7	401-222-1	401-222W-1



V4 Corner Radius Endmills

4 Flutes • Coated with and without Flat



- High Performance **A-Gr-SiV** submicron grain carbide
- Unique variable design for faster speeds and feeds
- Quiet operation and better finish
- MAP certified quality

Cermet	Hardened	Cast Iron	Titanium	Stainless	Steel
H	K	S	M	P	



PowerA

OD D1	LOC L1	SHK D2	OAL L2	Radius R	PowerA	
					No Flat	With Flat
1/8	1/4	1/8	1-1/2	.015	402-401-1	402-401W-1
1/8	1/4	1/8	1-1/2	.020	402-402-1	402-402W-1
1/8	1/4	1/8	1-1/2	.030	402-403-1	402-403W-1
1/8	1/4	1/8	1-1/2	.045	402-404-1	402-404W-1
1/8	3/8	1/8	1-1/2	.015	400-401-1	400-401W-1
1/8	3/8	1/8	1-1/2	.020	400-402-1	400-402W-1
1/8	3/8	1/8	1-1/2	.030	400-403-1	400-403W-1
1/8	3/8	1/8	1-1/2	.045	400-404-1	400-404W-1
5/32	5/16	3/16	2	.015	402-411-1	402-411W-1
5/32	5/16	3/16	2	.020	402-412-1	402-412W-1
5/32	5/16	3/16	2	.030	402-413-1	402-413W-1
5/32	5/16	3/16	2	.045	402-414-1	402-414W-1
3/16	3/8	3/16	2	.015	402-421-1	402-421W-1
3/16	3/8	3/16	2	.020	402-422-1	402-422W-1
3/16	3/8	3/16	2	.030	402-423-1	402-423W-1
3/16	3/8	3/16	2	.045	402-424-1	402-424W-1
3/16	7/16	3/16	2	.015	400-411-1	400-411W-1
3/16	7/16	3/16	2	.020	400-412-1	400-412W-1

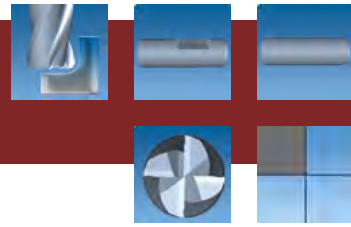
V4 Corner Radius Endmills

Cermet	Hardened	Cast Iron	Titanium	Stainless	Steel
H	K	S	M	P	

OD D1	LOC L1	SHK D2	OAL L2	Radius R	PowerA	
					No Flat	With Flat
3/16	7/16	3/16	2	.030	400-413-1	400-413W-1
3/16	7/16	3/16	2	.045	400-414-1	400-414W-1
7/32	7/16	1/4	2	.015	402-431-1	402-431W-1
7/32	7/16	1/4	2	.020	402-432-1	402-432W-1
7/32	7/16	1/4	2	.030	402-433-1	402-433W-1
7/32	7/16	1/4	2	.045	402-434-1	402-434W-1
7/32	7/16	1/4	2	.060	402-435-1	402-435W-1
1/4	1/2	1/4	2	.010	402-440-1	402-440W-1
1/4	1/2	1/4	2	.015	402-441-1	402-441W-1
1/4	1/2	1/4	2	.020	402-442-1	402-442W-1
1/4	1/2	1/4	2	.030	402-443-1	402-443W-1
1/4	1/2	1/4	2	.045	402-444-1	402-444W-1
1/4	1/2	1/4	2	.060	402-445-1	402-445W-1
1/4	5/8	1/4	2-1/2	.015	400-421-1	400-421W-1
1/4	5/8	1/4	2-1/2	.020	400-422-1	400-422W-1
1/4	5/8	1/4	2-1/2	.030	400-423-1	400-423W-1
1/4	5/8	1/4	2-1/2	.045	400-424-1	400-424W-1
1/4	5/8	1/4	2-1/2	.060	400-425-1	400-425W-1
1/4	1-1/8	1/4	3	.015	401-401-1	401-401W-1
1/4	1-1/8	1/4	3	.020	401-402-1	401-402W-1
1/4	1-1/8	1/4	3	.030	401-403-1	401-403W-1
1/4	1-1/8	1/4	3	.045	401-404-1	401-404W-1
1/4	1-1/8	1/4	3	.060	401-405-1	401-405W-1
5/16	1/2	5/16	2	.015	402-451-1	402-451W-1
5/16	1/2	5/16	2	.020	402-452-1	402-452W-1
5/16	1/2	5/16	2	.030	402-453-1	402-453W-1
5/16	1/2	5/16	2	.045	402-454-1	402-454W-1
5/16	1/2	5/16	2	.060	402-455-1	402-455W-1
5/16	13/16	5/16	2-1/2	.015	400-431-1	400-431W-1
5/16	13/16	5/16	2-1/2	.020	400-432-1	400-432W-1
5/16	13/16	5/16	2-1/2	.030	400-433-1	400-433W-1
5/16	13/16	5/16	2-1/2	.045	400-434-1	400-434W-1
5/16	13/16	5/16	2-1/2	.060	400-435-1	400-435W-1
5/16	1-1/8	5/16	3	.020	401-412-1	401-412W-1



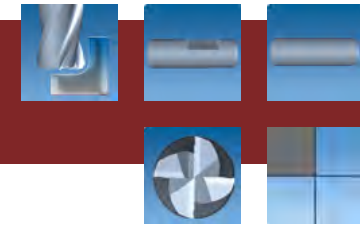
V4 Corner Radius Endmills



Cermet	Hardened	Cast Iron	Titanium	Stainless	Steel
	H	K	S	M	P

OD D1	LOC L1	SHK D2	OAL L2	Radius R	PowerA	
					No Flat	With Flat
3/8	5/8	3/8	2	.015	402-461-1	402-461W-1
3/8	5/8	3/8	2	.020	402-462-1	402-462W-1
3/8	5/8	3/8	2	.030	402-463-1	402-463W-1
3/8	5/8	3/8	2	.045	402-464-1	402-464W-1
3/8	5/8	3/8	2	.060	402-465-1	402-465W-1
3/8	7/8	3/8	2-1/2	.015	400-441-1	400-441W-1
3/8	7/8	3/8	2-1/2	.020	400-442-1	400-442W-1
3/8	7/8	3/8	2-1/2	.030	400-443-1	400-443W-1
3/8	7/8	3/8	2-1/2	.045	400-444-1	400-444W-1
3/8	7/8	3/8	2-1/2	.060	400-445-1	400-445W-1
3/8	1-1/8	3/8	3	.015	401-421-1	401-421W-1
3/8	1-1/8	3/8	3	.020	401-422-1	401-422W-1
3/8	1-1/8	3/8	3	.030	401-423-1	401-423W-1
3/8	1-1/8	3/8	3	.045	401-424-1	401-424W-1
3/8	1-1/8	3/8	3	.060	401-425-1	401-425W-1
7/16	5/8	7/16	2-1/2	.015	402-471-1	402-471W-1
7/16	5/8	7/16	2-1/2	.020	402-472-1	402-472W-1
7/16	5/8	7/16	2-1/2	.030	402-473-1	402-473W-1
7/16	5/8	7/16	2-1/2	.045	402-474-1	402-474W-1
7/16	5/8	7/16	2-1/2	.060	402-475-1	402-475W-1
7/16	5/8	7/16	2-1/2	.090	402-476-1	402-476W-1
7/16	1	7/16	2-3/4	.015	400-451-1	400-451W-1
7/16	1	7/16	2-3/4	.020	400-452-1	400-452W-1
7/16	1	7/16	2-3/4	.030	400-453-1	400-453W-1
7/16	1	7/16	2-3/4	.045	400-454-1	400-454W-1
7/16	1	7/16	2-3/4	.060	400-456-1	400-456W-1
1/2	5/8	1/2	2-1/2	.015	402-481-1	402-481W-1
1/2	5/8	1/2	2-1/2	.020	402-482-1	402-482W-1
1/2	5/8	1/2	2-1/2	.030	402-483-1	402-483W-1
1/2	5/8	1/2	2-1/2	.045	402-484-1	402-484W-1
1/2	5/8	1/2	2-1/2	.060	402-485-1	402-485W-1
1/2	5/8	1/2	2-1/2	.090	402-486-1	402-486W-1
1/2	1	1/2	3	.015	400-461-1	400-461W-1
1/2	1	1/2	3	.020	400-462-1	400-462W-1

V4 Corner Radius Endmills



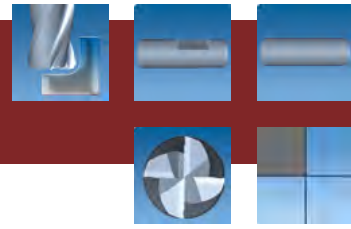
Cermet	Hardened	Cast Iron	Titanium	Stainless	Steel
	H	K	S	M	P

OD D1	LOC L1	SHK D2	OAL L2	Radius R	PowerA	
					No Flat	With Flat
1/2	1	1/2	3	.030	400-463-1	400-463W-1
1/2	1	1/2	3	.045	400-464-1	400-464W-1
1/2	1	1/2	3	.060	400-465-1	400-465W-1
1/2	1	1/2	3	.090	400-466-1	400-466W-1
1/2	1	1/2	3	.125	400-467-1	400-467W-1
1/2	1-1/4	1/2	3	.015	400-471-1	400-471W-1
1/2	1-1/4	1/2	3	.020	400-472-1	400-472W-1
1/2	1-1/4	1/2	3	.030	400-473-1	400-473W-1
1/2	1-1/4	1/2	3	.045	400-474-1	400-474W-1
1/2	1-1/4	1/2	3	.060	400-475-1	400-475W-1
1/2	1-1/4	1/2	3	.090	400-476-1	400-476W-1
1/2	1-1/4	1/2	3	.125	400-477-1	400-477W-1
1/2	2	1/2	4	.015	401-431-1	401-431W-1
1/2	2	1/2	4	.020	401-432-1	401-432W-1
1/2	2	1/2	4	.030	401-433-1	401-433W-1
1/2	2	1/2	4	.045	401-434-1	401-434W-1
1/2	2	1/2	4	.060	401-435-1	401-435W-1
1/2	2	1/2	4	.090	401-436-1	401-436W-1
1/2	2	1/2	4	.125	401-437-1	401-437W-1
9/16	1-1/8	9/16	3-1/2	.015	400-481-1	400-481W-1
9/16	1-1/8	9/16	3-1/2	.020	400-482-1	400-482W-1
9/16	1-1/8	9/16	3-1/2	.030	400-483-1	400-483W-1
9/16	1-1/8	9/16	3-1/2	.045	400-484-1	400-484W-1
9/16	1-1/8	9/16	3-1/2	.060	400-485-1	400-485W-1
5/8	3/4	5/8	3	.015	402-491-1	402-491W-1
5/8	3/4	5/8	3	.020	402-492-1	402-492W-1
5/8	3/4	5/8	3	.030	402-493-1	402-493W-1
5/8	3/4	5/8	3	.045	402-494-1	402-494W-1
5/8	3/4	5/8	3	.060	402-495-1	402-495W-1
5/8	3/4	5/8	3	.090	402-496-1	402-496W-1
5/8	1-1/4	5/8	3-1/2	.015	400-491-1	400-491W-1
5/8	1-1/4	5/8	3-1/2	.020	400-492-1	400-492W-1
5/8	1-1/4	5/8	3-1/2	.030	400-493-1	400-493W-1
5/8	1-1/4	5/8	3-1/2	.045	400-494-1	400-494W-1

HP
Endmills



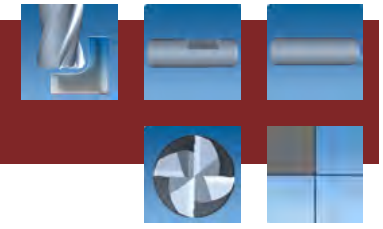
V4 Corner Radius Endmills



Cermet	Hardened	Cast Iron	Titanium	Stainless	Steel
H	K	S	M	P	

OD D1	LOC L1	SHK D2	OAL L2	Radius R	PowerA	
					No Flat	With Flat
5/8	1-1/4	5/8	3-1/2	.060	400-495-1	400-495W-1
5/8	2-1/4	5/8	5	.015	401-441-1	401-441W-1
5/8	2-1/4	5/8	5	.020	401-442-1	401-442W-1
5/8	2-1/4	5/8	5	.030	401-443-1	401-443W-1
5/8	2-1/4	5/8	5	.045	401-444-1	401-444W-1
5/8	2-1/4	5/8	5	.060	401-445-1	401-445W-1
5/8	2-1/4	5/8	5	.090	401-446-1	401-446W-1
3/4	1	3/4	3	.015	402-501-1	402-501W-1
3/4	1	3/4	3	.020	402-502-1	402-502W-1
3/4	1	3/4	3	.030	402-503-1	402-503W-1
3/4	1	3/4	3	.045	402-504-1	402-504W-1
3/4	1	3/4	3	.060	402-505-1	402-505W-1
3/4	1	3/4	3	.090	402-506-1	402-506W-1
3/4	7/8	3/4	3-1/2	.015	402-511-1	402-511W-1
3/4	7/8	3/4	3-1/2	.020	402-512-1	402-512W-1
3/4	7/8	3/4	3-1/2	.030	402-513-1	402-513W-1
3/4	7/8	3/4	3-1/2	.045	402-514-1	402-514W-1
3/4	7/8	3/4	3-1/2	.060	402-515-1	402-515W-1
3/4	7/8	3/4	3-1/2	.090	402-516-1	402-516W-1
3/4	1-1/2	3/4	4	.015	400-501-1	400-501W-1
3/4	1-1/2	3/4	4	.020	400-502-1	400-502W-1
3/4	1-1/2	3/4	4	.030	400-503-1	400-503W-1
3/4	1-1/2	3/4	4	.045	400-504-1	400-504W-1
3/4	1-1/2	3/4	4	.060	400-505-1	400-505W-1
3/4	1-1/2	3/4	4	.090	400-506-1	400-506W-1
3/4	1-1/2	3/4	4	.125	400-507-1	400-507W-1
3/4	1-5/8	3/4	4	.015	400-511-1	400-511W-1
3/4	1-5/8	3/4	4	.020	400-512-1	400-512W-1
3/4	1-5/8	3/4	4	.030	400-513-1	400-513W-1
3/4	1-5/8	3/4	4	.045	400-514-1	400-514W-1
3/4	1-5/8	3/4	4	.060	400-515-1	400-515W-1
3/4	1-5/8	3/4	4	.090	400-516-1	400-516W-1
3/4	2-1/4	3/4	5	.015	401-451-1	401-451W-1
3/4	2-1/4	3/4	5	.020	401-452-1	401-452W-1

V4 Corner Radius Endmills



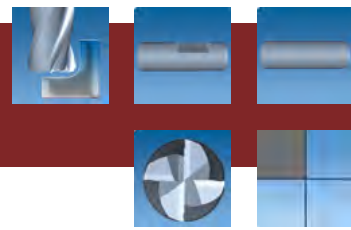
Cermet	Hardened	Cast Iron	Titanium	Stainless	Steel
H	K	S	M	P	

OD D1	LOC L1	SHK D2	OAL L2	Radius R	PowerA	
					No Flat	With Flat
3/4	2-1/4	3/4	5	.030	401-453-1	401-453W-1
3/4	2-1/4	3/4	5	.060	401-455-1	401-455W-1
3/4	2-1/4	3/4	5	.090	401-456-1	401-456W-1
3/4	2-1/4	3/4	5	.125	401-457-1	401-457W-1
3/4	3	3/4	6	.015	401-461-1	401-461W-1
3/4	3	3/4	6	.020	401-462-1	401-462W-1
3/4	3	3/4	6	.030	401-463-1	401-463W-1
3/4	3	3/4	6	.045	401-464-1	401-464W-1
3/4	3	3/4	6	.060	401-465-1	401-465W-1
3/4	3	3/4	6	.090	401-466-1	401-466W-1
3/4	4	3/4	6	.015	401-471-1	401-471W-1
3/4	4	3/4	6	.020	401-472-1	401-472W-1
3/4	4	3/4	6	.030	401-473-1	401-473W-1
3/4	4	3/4	6	.045	401-474-1	401-474W-1
3/4	4	3/4	6	.060	401-475-1	401-475W-1
3/4	4	3/4	6	.090	401-476-1	401-476W-1
1	1-1/2	1	4	.020	400-522-1	400-522W-1
1	1-1/2	1	4	.030	400-523-1	400-523W-1
1	1-1/2	1	4	.045	400-524-1	400-524W-1
1	1-1/2	1	4	.060	400-525-1	400-525W-1
1	1-1/2	1	4	.090	400-526-1	400-526W-1
1	2-1/4	1	5	.015	401-481-1	401-481W-1
1	2-1/4	1	5	.020	401-482-1	401-482W-1
1	2-1/4	1	5	.030	401-483-1	401-483W-1
1	2-1/4	1	5	.045	401-484-1	401-484W-1
1	2-1/4	1	5	.060	401-485-1	401-485W-1
1	2-1/4	1	5	.090	401-486-1	401-486W-1
1	3	1	6	.015	401-491-1	401-491W-1
1	3	1	6	.020	401-492-1	401-492W-1
1	3	1	6	.030	401-493-1	401-493W-1
1	3	1	6	.045	401-494-1	401-494W-1
1	3	1	6	.060	401-495-1	401-495W-1
1	3	1	6	.090	401-496-1	401-496W-1
1	4	1	7	.015	401-501-1	401-501W-1

HP
Endmills



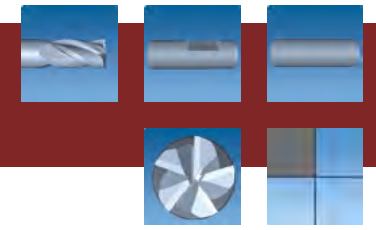
V4 Corner Radius Endmills



Cermet	Hardened	Cast Iron	Titanium	Stainless	Steel
H	K	S	M	P	

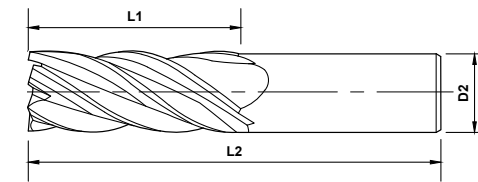
OD	LOC	SHK	OAL	Radius	PowerA	
					No Flat	With Flat
D1	L1	D2	L2	R		
1	4	1	7	.020	401-502-1	401-502W-1
1	4	1	7	.030	401-503-1	401-503W-1
1	4	1	7	.045	401-504-1	401-504W-1
1	4	1	7	.060	401-505-1	401-505W-1
1	4	1	7	.090	401-506-1	401-506W-1

V5 Square Endmills



Cermet	Hardened	Cast Iron	Titanium	Stainless	Steel
H	K	S	M	P	

5 Flutes • Coated with and without Flat



- High Performance **A-Gr-SiV** submicron grain carbide
- Unique variable design for faster speeds and feeds
- Quiet operation and better finish
- MAP certified quality



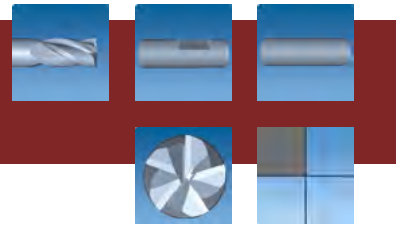
PowerA

OD	LOC	SHK	OAL	PowerA	
				No Flat	With Flat
D1	L1	D2	L2		
5/16	1/2	5/16	2	410-012-1	410-012W-1
5/16	13/16	5/16	2-1/2	408-008-1	408-008W-1
3/8	5/8	3/8	2	410-014-1	410-014W-1
3/8	7/8	3/8	2-1/2	408-010-1	408-010W-1
3/8	1-1/8	3/8	3	409-004-1	409-004W-1
7/16	5/8	7/16	2-1/2	410-016-1	410-016W-1
7/16	1	7/16	2-3/4	408-012-1	408-012W-1
1/2	5/8	1/2	2-1/2	410-018-1	410-018W-1
1/2	1	1/2	3	408-014-1	408-014W-1
1/2	1-1/4	1/2	3	408-016-1	408-016W-1
1/2	2	1/2	4	409-006-1	409-006W-1
9/16	1-1/8	9/16	3-1/2	408-018-1	408-018W-1
5/8	3/4	5/8	3	410-020-1	410-020W-1
5/8	1-1/4	5/8	3-1/2	408-020-1	408-020W-1
5/8	2-1/4	5/8	5	409-008-1	409-008W-1
3/4	7/8	3/4	3-1/2	410-024-1	410-024W-1
3/4	1	3/4	3	410-022-1	410-022W-1
3/4	1-5/8	3/4	4	408-022-1	408-022W-1

HP Endmills



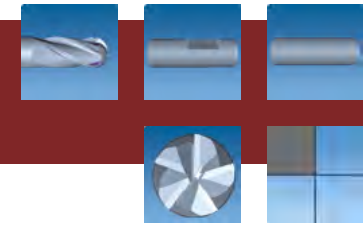
V5 Square Endmills



Cermet	Hardened	Cast Iron	Titanium	Stainless	Steel
H	K	S	M	P	

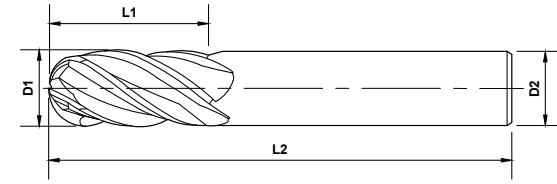
OD D1	LOC L1	SHK D2	OAL L2	PowerA	
				No Flat	With Flat
3/4	1-1/2	3/4	4	408-024-1	408-024W-1
3/4	2-1/4	3/4	5	409-010-1	409-010W-1
3/4	3	3/4	6	409-012-1	409-012W-1
1	1-1/2	1	4	408-026-1	408-026W-1
1	2-1/4	1	5	409-014-1	409-014W-1
1	3	1	6	409-016-1	409-016W-1
1	4	1	7	409-018-1	409-018W-1

V5 Ball Endmills



Cermet	Hardened	Cast Iron	Titanium	Stainless	Steel
H	K	S	M	P	

5 Flutes • Coated with and without Flat



- High Performance **A-Gr-SiV** submicron grain carbide
- Unique variable design for faster speeds and feeds
- Quiet operation and better finish
- MAP certified quality



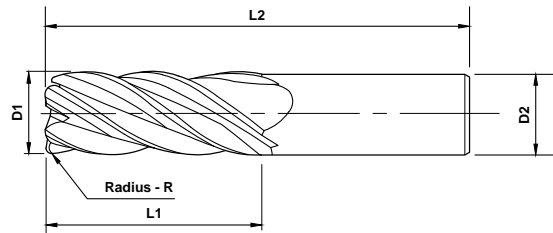
OD D1	LOC L1	SHK D2	OAL L2	PowerA	
				No Flat	With Flat
5/16	1/2	5/16	2	410-212-1	410-212W-1
5/16	13/16	5/16	2-1/2	408-208-1	408-208W-1
3/8	5/8	3/8	2	410-214-1	410-214W-1
3/8	7/8	3/8	2-1/2	408-210-1	408-210W-1
3/8	1-1/8	3/8	3	409-204-1	409-204W-1
7/16	5/8	7/16	2-1/2	410-216-1	410-216W-1
7/16	1	7/16	2-3/4	408-212-1	408-212W-1
1/2	5/8	1/2	2-1/2	410-218-1	410-218W-1
1/2	1	1/2	3	408-214-1	408-214W-1
1/2	1-1/4	1/2	3	408-216-1	408-216W-1
1/2	2	1/2	4	409-206-1	409-206W-1
9/16	1-1/8	9/16	3-1/2	408-218-1	408-218W-1
5/8	3/4	5/8	3	410-220-1	410-220W-1
5/8	1-1/4	5/8	3-1/2	408-220-1	408-220W-1
5/8	2-1/4	5/8	5	409-208-1	409-208W-1
3/4	1	3/4	3	410-222-1	410-222W-1
3/4	7/8	3/4	3-1/2	410-224-1	410-224W-1
3/4	1-1/2	3/4	4	408-222-1	408-222W-1
3/4	1-5/8	3/4	4	408-224-1	408-224W-1
3/4	2-1/4	3/4	5	409-210-1	409-210W-1
3/4	3	3/4	6	409-212-1	409-212W-1
1	1-1/2	1	4	408-226-1	408-226W-1
1	2-1/4	1	5	409-214-1	409-214W-1
1	3	1	6	409-216-1	409-216W-1
1	4	1	7	409-218-1	409-218W-1

HP Endmills



V5 Corner Radius Endmills

5 Flutes • Coated with and without Flat



- High Performance **A-Gr-SiV** submicron grain carbide
- Unique variable design for faster speeds and feeds
- Quiet operation and better finish
- MAP certified quality

Cermet	Hardened	Cast Iron	Titanium	Stainless	Steel
H	K	S	M	P	



PowerA

OD D1	LOC L1	SHK D2	OAL L2	Radius R	PowerA	
					No Flat	With Flat
5/16	1/2	5/16	2	.015	410-451-1	410-451W-1
5/16	1/2	5/16	2	.020	410-452-1	410-452W-1
5/16	1/2	5/16	2	.030	410-453-1	410-453W-1
5/16	1/2	5/16	2	.045	410-454-1	410-454W-1
5/16	1/2	5/16	2	.060	410-455-1	410-455W-1
5/16	13/16	5/16	2-1/2	.015	408-431-1	408-431W-1
5/16	13/16	5/16	2-1/2	.020	408-432-1	408-432W-1
5/16	13/16	5/16	2-1/2	.030	408-433-1	408-433W-1
5/16	13/16	5/16	2-1/2	.045	408-434-1	408-434W-1
5/16	13/16	5/16	2-1/2	.060	408-435-1	408-435W-1
3/8	5/8	3/8	2	.015	410-461-1	410-461W-1
3/8	5/8	3/8	2	.020	410-462-1	410-462W-1
3/8	5/8	3/8	2	.030	410-463-1	410-463W-1
3/8	5/8	3/8	2	.045	410-464-1	410-464W-1
3/8	5/8	3/8	2	.060	410-465-1	410-465W-1
3/8	7/8	3/8	2-1/2	.015	408-441-1	408-441W-1
3/8	7/8	3/8	2-1/2	.020	408-442-1	408-442W-1
3/8	7/8	3/8	2-1/2	.030	408-443-1	408-443W-1

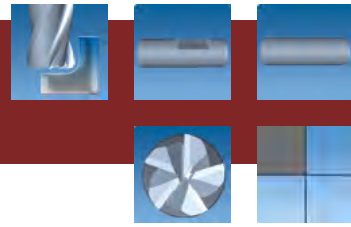
V5 Corner Radius Endmills

Cermet	Hardened	Cast Iron	Titanium	Stainless	Steel
H	K	S	M	P	

OD D1	LOC L1	SHK D2	OAL L2	Radius R	PowerA	
					No Flat	With Flat
3/8	7/8	3/8	2-1/2	.045	408-444-1	408-444W-1
3/8	7/8	3/8	2-1/2	.060	408-445-1	408-445W-1
3/8	1-1/8	3/8	3	.015	409-411-1	409-411W-1
3/8	1-1/8	3/8	3	.020	409-412-1	409-412W-1
3/8	1-1/8	3/8	3	.030	409-413-1	409-413W-1
3/8	1-1/8	3/8	3	.045	409-414-1	409-414W-1
3/8	1-1/8	3/8	3	.060	409-415-1	409-415W-1
7/16	5/8	7/16	2-1/2	.015	410-471-1	410-471W-1
7/16	5/8	7/16	2-1/2	.020	410-472-1	410-472W-1
7/16	5/8	7/16	2-1/2	.030	410-473-1	410-473W-1
7/16	5/8	7/16	2-1/2	.045	410-474-1	410-474W-1
7/16	5/8	7/16	2-1/2	.060	410-475-1	410-475W-1
7/16	5/8	7/16	2-1/2	.090	410-476-1	410-476W-1
7/16	1	7/16	2-3/4	.015	408-451-1	408-451W-1
7/16	1	7/16	2-3/4	.020	408-452-1	408-452W-1
7/16	1	7/16	2-3/4	.030	408-453-1	408-453W-1
7/16	1	7/16	2-3/4	.045	408-454-1	408-454W-1
7/16	1	7/16	2-3/4	.060	408-455-1	408-455W-1
7/16	1	7/16	2-3/4	.090	408-456-1	408-456W-1
1/2	5/8	1/2	2-1/2	.015	410-481-1	410-481W-1
1/2	5/8	1/2	2-1/2	.020	410-482-1	410-482W-1
1/2	5/8	1/2	2-1/2	.030	410-483-1	410-483W-1
1/2	5/8	1/2	2-1/2	.045	410-484-1	410-484W-1
1/2	5/8	1/2	2-1/2	.060	410-485-1	410-485W-1
1/2	5/8	1/2	2-1/2	.090	410-486-1	410-486W-1
1/2	1	1/2	3	.015	408-461-1	408-461W-1
1/2	1	1/2	3	.020	408-462-1	408-462W-1
1/2	1	1/2	3	.030	408-463-1	408-463W-1
1/2	1	1/2	3	.045	408-464-1	408-464W-1
1/2	1	1/2	3	.060	408-465-1	408-465W-1
1/2	1	1/2	3	.090	408-466-1	408-466W-1
1/2	1-1/4	1/2	3	.015	408-471-1	408-471W-1
1/2	1-1/4	1/2	3	.020	408-472-1	408-472W-1
1/2	1-1/4	1/2	3	.030	408-473-1	408-473W-1



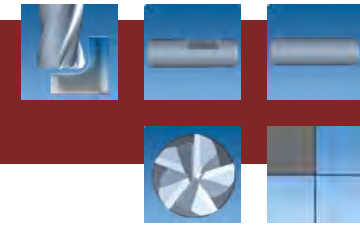
V5 Corner Radius Endmills



Cermet	Hardened	Cast Iron	Titanium	Stainless	Steel
H	K	S	M	P	

OD D1	LOC L1	SHK D2	OAL L2	Radius R	PowerA	
					No Flat	With Flat
1/2	1-1/4	1/2	3	.045	408-474-1	408-474W-1
1/2	1-1/4	1/2	3	.060	408-475-1	408-475W-1
1/2	1-1/4	1/2	3	.090	408-476-1	408-476W-1
1/2	2	1/2	4	.015	409-421-1	409-421W-1
1/2	2	1/2	4	.020	409-422-1	409-422W-1
1/2	2	1/2	4	.030	409-423-1	409-423W-1
1/2	2	1/2	4	.045	409-424-1	409-424W-1
1/2	2	1/2	4	.060	409-425-1	409-425W-1
1/2	2	1/2	4	.090	409-426-1	409-426W-1
9/16	1-1/8	9/16	3-1/2	.015	408-481-1	408-481W-1
9/16	1-1/8	9/16	3-1/2	.020	408-482-1	408-482W-1
9/16	1-1/8	9/16	3-1/2	.030	408-483-1	408-483W-1
9/16	1-1/8	9/16	3-1/2	.045	408-484-1	408-484W-1
9/16	1-1/8	9/16	3-1/2	.060	408-485-1	408-485W-1
9/16	1-1/8	9/16	3-1/2	.090	408-486-1	408-486W-1
5/8	3/4	5/8	3	.015	410-491-1	410-491W-1
5/8	3/4	5/8	3	.020	410-492-1	410-492W-1
5/8	3/4	5/8	3	.030	410-493-1	410-493W-1
5/8	3/4	5/8	3	.045	410-494-1	410-494W-1
5/8	3/4	5/8	3	.060	410-495-1	410-495W-1
5/8	3/4	5/8	3	.090	410-496-1	410-496W-1
5/8	1-1/4	5/8	3-1/2	.015	408-491-1	408-491W-1
5/8	1-1/4	5/8	3-1/2	.020	408-492-1	408-492W-1
5/8	1-1/4	5/8	3-1/2	.030	408-493-1	408-493W-1
5/8	1-1/4	5/8	3-1/2	.045	408-494-1	408-494W-1
5/8	1-1/4	5/8	3-1/2	.060	408-495-1	408-495W-1
5/8	1-1/4	5/8	3-1/2	.090	408-496-1	408-496W-1
5/8	2-1/4	5/8	5	.030	409-431-1	409-431W-1
5/8	2-1/4	5/8	5	.030	409-432-1	409-432W-1
5/8	2-1/4	5/8	5	.030	409-433-1	409-433W-1
5/8	2-1/4	5/8	5	.045	409-434-1	409-434W-1
5/8	2-1/4	5/8	5	.060	409-435-1	409-435W-1
5/8	2-1/4	5/8	5	.090	409-436-1	409-436W-1
3/4	1	3/4	3	.015	410-501-1	410-501W-1

V5 Corner Radius Endmills



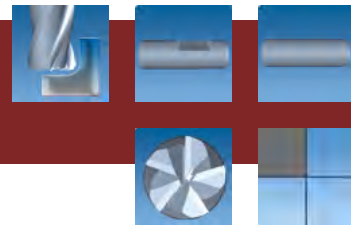
Cermet	Hardened	Cast Iron	Titanium	Stainless	Steel
H	K	S	M	P	

OD D1	LOC L1	SHK D2	OAL L2	Radius R	PowerA	
					No Flat	With Flat
3/4	1	3/4	3	.020	410-502-1	410-502W-1
3/4	1	3/4	3	.030	410-503-1	410-503W-1
3/4	1	3/4	3	.045	410-504-1	410-504W-1
3/4	1	3/4	3	.060	410-505-1	410-505W-1
3/4	1	3/4	3	.090	410-506-1	410-506W-1
3/4	7/8	3/4	3-1/2	.015	410-511-1	410-511W-1
3/4	7/8	3/4	3-1/2	.020	410-512-1	410-512W-1
3/4	7/8	3/4	3-1/2	.030	410-513-1	410-513W-1
3/4	7/8	3/4	3-1/2	.045	410-514-1	410-514W-1
3/4	7/8	3/4	3-1/2	.060	410-515-1	410-515W-1
3/4	7/8	3/4	3-1/2	.090	410-516-1	410-516W-1
3/4	1-1/2	3/4	4	.015	408-501-1	408-501W-1
3/4	1-1/2	3/4	4	.020	408-502-1	408-502W-1
3/4	1-1/2	3/4	4	.030	408-503-1	408-503W-1
3/4	1-1/2	3/4	4	.045	408-504-1	408-504W-1
3/4	1-1/2	3/4	4	.060	408-505-1	408-505W-1
3/4	1-1/2	3/4	4	.090	408-506-1	408-506W-1
3/4	1-5/8	3/4	4	.015	408-511-1	408-511W-1
3/4	1-5/8	3/4	4	.020	408-512-1	408-512W-1
3/4	1-5/8	3/4	4	.030	408-513-1	408-513W-1
3/4	1-5/8	3/4	4	.045	408-514-1	408-514W-1
3/4	1-5/8	3/4	4	.060	408-515-1	408-515W-1
3/4	1-5/8	3/4	4	.090	408-516-1	408-516W-1
3/4	2-1/4	3/4	5	.015	409-441-1	409-441W-1
3/4	2-1/4	3/4	5	.020	409-442-1	409-442W-1
3/4	2-1/4	3/4	5	.030	409-443-1	409-443W-1
3/4	2-1/4	3/4	5	.045	409-444-1	409-444W-1
3/4	2-1/4	3/4	5	.060	409-445-1	409-445W-1
3/4	2-1/4	3/4	5	.090	409-446-1	409-446W-1
3/4	3	3/4	6	.015	409-451-1	409-451W-1
3/4	3	3/4	6	.020	409-452-1	409-452W-1
3/4	3	3/4	6	.030	409-453-1	409-453W-1
3/4	3	3/4	6	.045	409-454-1	409-454W-1
3/4	3	3/4	6	.060	409-455-1	409-455W-1

HP Endmills



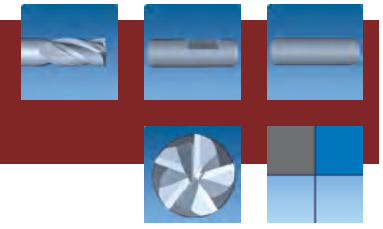
V5 Corner Radius Endmills



Cermet	Hardened	Cast Iron	Titanium	Stainless	Steel
H	K	S	M	P	

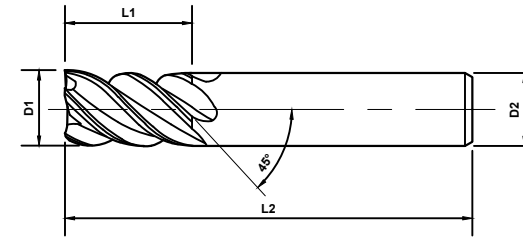
OD D1	LOC L1	SHK D2	OAL L2	Radius R	PowerA	
					No Flat	With Flat
3/4	3	3/4	6	.090	409-456-1	409-456W-1
1	1-1/2	1	4	.015	408-521-1	408-521W-1
1	1-1/2	1	4	.020	408-522-1	408-522W-1
1	1-1/2	1	4	.030	408-523-1	408-523W-1
1	1-1/2	1	4	.045	408-524-1	408-524W-1
1	1-1/2	1	4	.060	408-525-1	408-525W-1
1	1-1/2	1	4	.090	408-526-1	408-526W-1
1	2-1/4	1	5	.015	409-461-1	409-461W-1
1	2-1/4	1	5	.020	409-462-1	409-462W-1
1	2-1/4	1	5	.030	409-463-1	409-463W-1
1	2-1/4	1	5	.045	409-464-1	409-464W-1
1	2-1/4	1	5	.060	409-465-1	409-465W-1
1	2-1/4	1	5	.090	409-466-1	409-466W-1
1	3	1	6	.015	409-471-1	409-471W-1
1	3	1	6	.020	409-472-1	409-472W-1
1	3	1	6	.030	409-473-1	409-473W-1
1	3	1	6	.045	409-474-1	409-474W-1
1	3	1	6	.060	409-475-1	409-475W-1
1	3	1	6	.090	409-476-1	409-476W-1
1	4	1	7	.015	409-481-1	409-481W-1
1	4	1	7	.020	409-482-1	409-482W-1
1	4	1	7	.030	409-483-1	409-483W-1
1	4	1	7	.045	409-484-1	409-484W-1
1	4	1	7	.060	409-485-1	409-485W-1
1	4	1	7	.090	409-486-1	409-486W-1

HY5 Square Endmills



Cermet	Hardened	Cast Iron	Titanium	Stainless	Steel
H	K	S	M	P	

5 Flutes • Coated with and without Flat



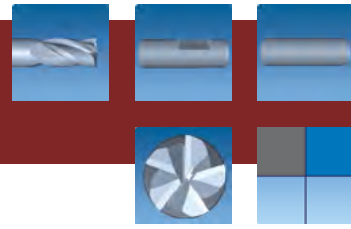
- High Performance **A-Gr-SiV** submicron grain carbide
- Unique 5 flute design for faster speeds and feeds
- MAP certified quality



OD D1	LOC L1	SHK D2	OAL L2	PowerA	
				No Flat	With Flat
1/8	1/4	1/8	1-1/2	447-004-1	447-004W-1
1/8	1/2	1/8	1-1/2	445-002-1	445-002W-1
5/32	5/16	3/16	2	447-002-1	447-002W-1
5/32	7/16	3/16	2	445-004-1	445-004W-1
3/16	3/8	3/16	2	447-006-1	447-006W-1
3/16	7/16	3/16	2	445-006-1	445-006W-1
7/32	7/16	1/4	2	447-008-1	447-008W-1
7/32	7/16	1/4	2-1/2	445-008-1	445-008W-1
1/4	1/2	1/4	2	447-010-1	447-010W-1
1/4	3/4	1/4	2-1/2	445-010-1	445-010W-1
1/4	1-1/8	1/4	3	446-002-1	446-002W-1
5/16	1/2	5/16	2	447-012-1	447-012W-1
5/16	13/16	5/16	2-1/2	445-012-1	445-012W-1
5/16	1-1/8	5/16	3	446-004-1	446-004W-1
11/32	13/16	3/8	2-1/2	445-014-1	445-014W-1
3/8	5/8	3/8	2	447-014-1	447-014W-1
3/8	7/8	3/8	2-1/2	445-016-1	445-016W-1
3/8	1-1/8	3/8	3	446-006-1	446-006W-1



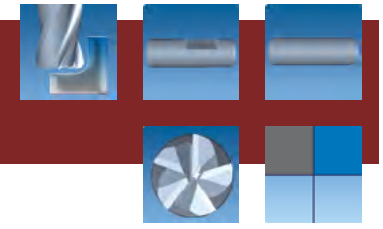
HY5 Square Endmills



Cermet	Hardened	Cast Iron	Titanium	Stainless	Steel
H	K	S	M	P	

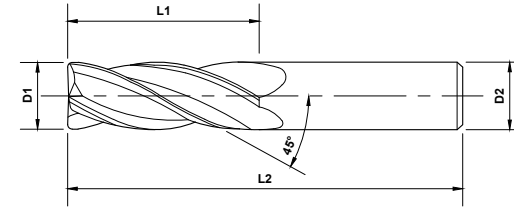
OD D1	LOC L1	SHK D2	OAL L2	PowerA	
				No Flat	With Flat
15/32	1	1/2	3	445-018-1	445-018W-1
7/16	5/8	7/16	2-1/2	447-016-1	447-016W-1
7/16	1	7/16	2-3/4	445-020-1	445-020W-1
1/2	5/8	1/2	2-1/2	447-018-1	447-018W-1
1/2	1	1/2	3	445-022-1	445-022W-1
1/2	1-1/4	1/2	3	445-024-1	445-024W-1
1/2	2	1/2	4	446-008-1	446-008W-1
9/16	1-1/8	9/16	3-1/2	445-026-1	445-026W-1
5/8	3/4	5/8	3	447-020-1	447-020W-1
5/8	1-1/4	5/8	3-1/2	445-028-1	445-028W-1
5/8	2-1/4	5/8	5	446-010-1	446-010W-1
3/4	1	3/4	3	447-024-1	447-024W-1
3/4	7/8	3/4	3-1/2	447-022-1	447-022W-1
3/4	1-1/2	3/4	4	445-030-1	445-030W-1
3/4	1-5/8	3/4	4	445-032-1	445-032W-1
3/4	2-1/4	3/4	5	446-012-1	446-012W-1
3/4	3	3/4	6	446-014-1	446-014W-1
3/4	4	3/4	6	446-016-1	446-016W-1
1	1-1/2	1	4	445-034-1	445-034W-1
1	2-1/4	1	5	446-018-1	446-018W-1
1	3	1	6	446-020-1	446-020W-1
1	4	1	7	446-022-1	446-022W-1

HY5 Corner Radius Endmills



Cermet	Hardened	Cast Iron	Titanium	Stainless	Steel
H	K	S	M	P	

5 Flutes • Coated with and without Flat

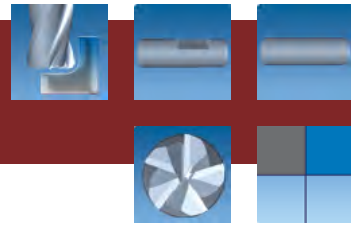


- High Performance **A-Gr-SiV** submicron grain carbide
- Unique 5 flute design for faster speeds and feeds
- MAP certified quality



OD D1	LOC L1	SHK D2	OAL L2	Radius R	PowerA	
					No Flat	With Flat
1/8	1/4	1/8	1-1/2	.015	447-401-1	447-401W-1
1/8	1/4	1/8	1-1/2	.020	447-402-1	447-402W-1
1/8	1/4	1/8	1-1/2	.030	447-403-1	447-403W-1
1/8	1/4	1/8	1-1/2	.045	447-404-1	447-404W-1
1/8	1/2	1/8	1-1/2	.015	445-401-1	445-401W-1
1/8	1/2	1/8	1-1/2	.020	445-402-1	445-402W-1
1/8	1/2	1/8	1-1/2	.030	445-403-1	445-403W-1
1/8	1/2	1/8	1-1/2	.045	445-404-1	445-404W-1
5/32	5/16	3/16	2	.015	447-411-1	447-411W-1
5/32	5/16	3/16	2	.020	447-412-1	447-412W-1
5/32	5/16	3/16	2	.030	447-413-1	447-413W-1
5/32	5/16	3/16	2	.045	447-414-1	447-414W-1
3/16	3/8	3/16	2	.015	447-421-1	447-421W-1
3/16	3/8	3/16	2	.020	447-422-1	447-422W-1
3/16	3/8	3/16	2	.030	447-423-1	447-423W-1
3/16	3/8	3/16	2	.045	447-424-1	447-424W-1
3/16	7/16	3/16	2	.015	445-411-1	445-411W-1
3/16	7/16	3/16	2	.020	445-412-1	445-412W-1

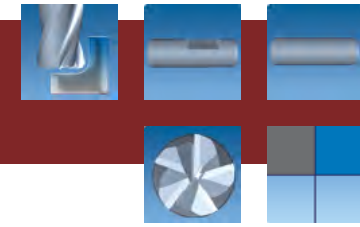
HY5 Corner Radius Endmills



Cermet	Hardened	Cast Iron	Titanium	Stainless	Steel
H	K	S	M	P	

OD D1	LOC L1	SHK D2	OAL L2	Radius R	PowerA	
					No Flat	With Flat
3/16	7/16	3/16	2	.030	445-413-1	445-413W-1
3/16	7/16	3/16	2	.045	445-414-1	445-414W-1
7/32	7/16	1/4	2	.015	447-431-1	447-431W-1
7/32	7/16	1/4	2	.020	447-432-1	447-432W-1
7/32	7/16	1/4	2	.030	447-433-1	447-433W-1
7/32	7/16	1/4	2	.045	447-434-1	447-434W-1
7/32	7/16	1/4	2	.060	447-435-1	447-435W-1
1/4	1/2	1/4	2	.010	447-440-1	447-440W-1
1/4	1/2	1/4	2	.015	447-441-1	447-441W-1
1/4	1/2	1/4	2	.020	447-442-1	447-442W-1
1/4	1/2	1/4	2	.030	447-443-1	447-443W-1
1/4	1/2	1/4	2	.045	447-444-1	447-444W-1
1/4	1/2	1/4	2	.060	447-445-1	447-445W-1
1/4	3/4	1/4	2-1/2	.015	445-421-1	445-421W-1
1/4	3/4	1/4	2-1/2	.020	445-422-1	445-422W-1
1/4	3/4	1/4	2-1/2	.030	445-423-1	445-423W-1
1/4	3/4	1/4	2-1/2	.045	445-424-1	445-424W-1
1/4	3/4	1/4	2-1/2	.060	445-425-1	445-425W-1
1/4	1-1/8	1/4	3	.015	446-401-1	446-401W-1
1/4	1-1/8	1/4	3	.020	446-402-1	446-402W-1
1/4	1-1/8	1/4	3	.030	446-403-1	446-403W-1
1/4	1-1/8	1/4	3	.045	446-404-1	446-404W-1
1/4	1-1/8	1/4	3	.060	446-405-1	446-405W-1
5/16	1/2	5/16	2	.015	447-451-1	447-451W-1
5/16	1/2	5/16	2	.020	447-452-1	447-452W-1
5/16	1/2	5/16	2	.030	447-453-1	447-453W-1
5/16	1/2	5/16	2	.045	447-454-1	447-454W-1
5/16	1/2	5/16	2	.060	447-455-1	447-455W-1
5/16	13/16	5/16	2-1/2	.015	445-431-1	445-431W-1
5/16	13/16	5/16	2-1/2	.020	445-432-1	445-432W-1
5/16	13/16	5/16	2-1/2	.030	445-433-1	445-433W-1
5/16	13/16	5/16	2-1/2	.045	445-434-1	445-434W-1
5/16	13/16	5/16	2-1/2	.060	445-435-1	445-435W-1
5/16	1-1/8	5/16	3	.020	446-412-1	446-412W-1

HY5 Corner Radius Endmills



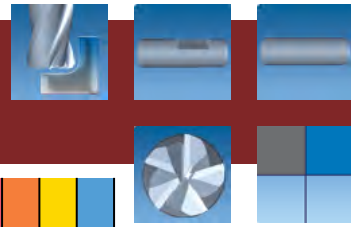
Cermet	Hardened	Cast Iron	Titanium	Stainless	Steel
H	K	S	M	P	

OD D1	LOC L1	SHK D2	OAL L2	Radius R	PowerA	
					No Flat	With Flat
3/8	5/8	3/8	2	.015	447-461-1	447-461W-1
3/8	5/8	3/8	2	.020	447-462-1	447-462W-1
3/8	5/8	3/8	2	.030	447-463-1	447-463W-1
3/8	5/8	3/8	2	.045	447-464-1	447-464W-1
3/8	5/8	3/8	2	.060	447-465-1	447-465W-1
3/8	7/8	3/8	2-1/2	.015	445-441-1	445-441W-1
3/8	7/8	3/8	2-1/2	.020	445-442-1	445-442W-1
3/8	7/8	3/8	2-1/2	.030	445-443-1	445-443W-1
3/8	7/8	3/8	2-1/2	.045	445-444-1	445-444W-1
3/8	7/8	3/8	2-1/2	.060	445-445-1	445-445W-1
3/8	1-1/8	3/8	3	.015	446-421-1	446-421W-1
3/8	1-1/8	3/8	3	.020	446-422-1	446-422W-1
3/8	1-1/8	3/8	3	.030	446-423-1	446-423W-1
3/8	1-1/8	3/8	3	.045	446-424-1	446-424W-1
3/8	1-1/8	3/8	3	.060	446-425-1	446-425W-1
7/16	5/8	7/16	2-1/2	.015	447-471-1	447-471W-1
7/16	5/8	7/16	2-1/2	.020	447-472-1	447-472W-1
7/16	5/8	7/16	2-1/2	.030	447-473-1	447-473W-1
7/16	5/8	7/16	2-1/2	.045	447-474-1	447-474W-1
7/16	5/8	7/16	2-1/2	.060	447-475-1	447-475W-1
7/16	5/8	7/16	2-1/2	.090	447-476-1	447-476W-1
7/16	1	7/16	2-3/4	.015	445-451-1	445-451W-1
7/16	1	7/16	2-3/4	.020	445-452-1	445-452W-1
7/16	1	7/16	2-3/4	.030	445-453-1	445-453W-1
7/16	1	7/16	2-3/4	.045	445-454-1	445-454W-1
7/16	1	7/16	2-3/4	.060	445-456-1	445-456W-1
1/2	5/8	1/2	2-1/2	.015	447-481-1	447-481W-1
1/2	5/8	1/2	2-1/2	.020	447-482-1	447-482W-1
1/2	5/8	1/2	2-1/2	.030	447-483-1	447-483W-1
1/2	5/8	1/2	2-1/2	.045	447-484-1	447-484W-1
1/2	5/8	1/2	2-1/2	.060	447-485-1	447-485W-1
1/2	5/8	1/2	2-1/2	.090	447-486-1	447-486W-1
1/2	1	1/2	3	.015	445-461-1	445-461W-1
1/2	1	1/2	3	.020	445-462-1	445-462W-1

HP Endmills



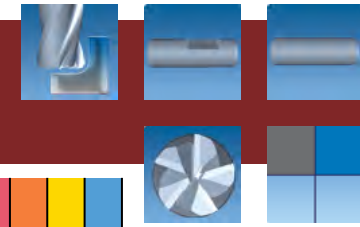
HY5 Corner Radius Endmills



Cermet	Hardened	Cast Iron	Titanium	Stainless	Steel
H	K	S	M	P	

OD D1	LOC L1	SHK D2	OAL L2	Radius R	PowerA	
					No Flat	With Flat
1/2	1	1/2	3	.030	445-463-1	445-463W-1
1/2	1	1/2	3	.045	445-464-1	445-464W-1
1/2	1	1/2	3	.060	445-465-1	445-465W-1
1/2	1	1/2	3	.090	445-466-1	445-466W-1
1/2	1	1/2	3	.125	445-467-1	445-467W-1
1/2	1-1/4	1/2	3	.015	445-471-1	445-471W-1
1/2	1-1/4	1/2	3	.020	445-472-1	445-472W-1
1/2	1-1/4	1/2	3	.030	445-473-1	445-473W-1
1/2	1-1/4	1/2	3	.045	445-474-1	445-474W-1
1/2	1-1/4	1/2	3	.060	445-475-1	445-475W-1
1/2	1-1/4	1/2	3	.090	445-476-1	445-476W-1
1/2	1-1/4	1/2	3	.125	445-477-1	445-477W-1
1/2	2	1/2	4	.015	446-431-1	446-431W-1
1/2	2	1/2	4	.020	446-432-1	446-432W-1
1/2	2	1/2	4	.030	446-433-1	446-433W-1
1/2	2	1/2	4	.045	446-434-1	446-434W-1
1/2	2	1/2	4	.060	446-435-1	446-435W-1
1/2	2	1/2	4	.090	446-436-1	446-436W-1
1/2	2	1/2	4	.125	446-437-1	446-437W-1
9/16	1-1/8	9/16	3-1/2	.015	445-481-1	445-481W-1
9/16	1-1/8	9/16	3-1/2	.020	445-482-1	445-482W-1
9/16	1-1/8	9/16	3-1/2	.030	445-483-1	445-483W-1
9/16	1-1/8	9/16	3-1/2	.045	445-484-1	445-484W-1
9/16	1-1/8	9/16	3-1/2	.060	445-485-1	445-485W-1
5/8	3/4	5/8	3	.015	447-491-1	447-491W-1
5/8	3/4	5/8	3	.020	447-492-1	447-492W-1
5/8	3/4	5/8	3	.030	447-493-1	447-493W-1
5/8	3/4	5/8	3	.045	447-494-1	447-494W-1
5/8	3/4	5/8	3	.060	447-495-1	447-495W-1
5/8	3/4	5/8	3	.090	447-496-1	447-496W-1
5/8	1-1/4	5/8	3-1/2	.015	445-491-1	445-491W-1
5/8	1-1/4	5/8	3-1/2	.020	445-492-1	445-492W-1
5/8	1-1/4	5/8	3-1/2	.030	445-493-1	445-493W-1
5/8	1-1/4	5/8	3-1/2	.045	445-494-1	445-494W-1
5/8	1-1/4	5/8	3-1/2	.060	445-495-1	445-495W-1

HY5 Corner Radius Endmills



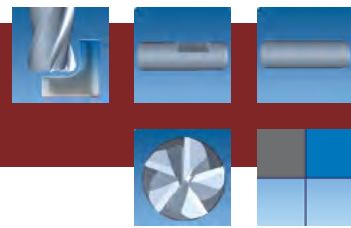
Cermet	Hardened	Cast Iron	Titanium	Stainless	Steel
H	K	S	M	P	

OD D1	LOC L1	SHK D2	OAL L2	Radius R	PowerA	
					No Flat	With Flat
5/8	2-1/4	5/8	5	.015	446-441-1	446-441W-1
5/8	2-1/4	5/8	5	.020	446-442-1	446-442W-1
5/8	2-1/4	5/8	5	.030	446-443-1	446-443W-1
5/8	2-1/4	5/8	5	.045	446-444-1	446-444W-1
5/8	2-1/4	5/8	5	.060	446-445-1	446-445W-1
5/8	2-1/4	5/8	5	.090	446-446-1	446-446W-1
3/4	1	3/4	3	.015	447-501-1	447-501W-1
3/4	1	3/4	3	.020	447-502-1	447-502W-1
3/4	1	3/4	3	.030	447-503-1	447-503W-1
3/4	1	3/4	3	.045	447-504-1	447-504W-1
3/4	1	3/4	3	.060	447-505-1	447-505W-1
3/4	1	3/4	3	.090	447-506-1	447-506W-1
3/4	7/8	3/4	3-1/2	.015	447-511-1	447-511W-1
3/4	7/8	3/4	3-1/2	.020	447-512-1	447-512W-1
3/4	7/8	3/4	3-1/2	.030	447-513-1	447-513W-1
3/4	7/8	3/4	3-1/2	.045	447-514-1	447-514W-1
3/4	7/8	3/4	3-1/2	.060	447-515-1	447-515W-1
3/4	7/8	3/4	3-1/2	.090	447-516-1	447-516W-1
3/4	1-1/2	3/4	4	.015	445-501-1	445-501W-1
3/4	1-1/2	3/4	4	.020	445-502-1	445-502W-1
3/4	1-1/2	3/4	4	.030	445-503-1	445-503W-1
3/4	1-1/2	3/4	4	.045	445-504-1	445-504W-1
3/4	1-1/2	3/4	4	.060	445-505-1	445-505W-1
3/4	1-1/2	3/4	4	.090	445-506-1	445-506W-1
3/4	1-1/2	3/4	4	.125	445-507-1	445-507W-1
3/4	1-5/8	3/4	4	.015	445-511-1	445-511W-1
3/4	1-5/8	3/4	4	.020	445-512-1	445-512W-1
3/4	1-5/8	3/4	4	.030	445-513-1	445-513W-1
3/4	1-5/8	3/4	4	.045	445-514-1	445-514W-1
3/4	1-5/8	3/4	4	.060	445-515-1	445-515W-1
3/4	1-5/8	3/4	4	.090	445-516-1	445-516W-1
3/4	2-1/4	3/4	5	.015	446-451-1	446-451W-1
3/4	2-1/4	3/4	5	.020	446-452-1	446-452W-1
3/4	2-1/4	3/4	5	.030	446-453-1	446-453W-1
3/4	2-1/4	3/4	5	.060	446-455-1	446-455W-1

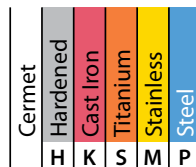
HP
Endmills



HY5 Corner Radius Endmills

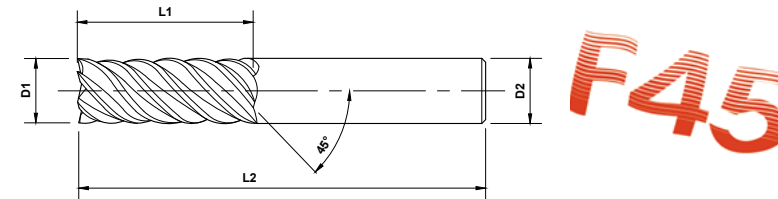


OD	LOC	SHK	OAL	Radius	PowerA	
D1	L1	D2	L2	R	No Flat	With Flat
3/4	2-1/4	3/4	5	.090	446-456-1	446-456W-1
3/4	2-1/4	3/4	5	.125	446-457-1	446-457W-1
3/4	3	3/4	6	.015	446-461-1	446-461W-1
3/4	3	3/4	6	.020	446-462-1	446-462W-1
3/4	3	3/4	6	.030	446-463-1	446-463W-1
3/4	3	3/4	6	.045	446-464-1	446-464W-1
3/4	3	3/4	6	.060	446-465-1	446-465W-1
3/4	3	3/4	6	.090	446-466-1	446-466W-1
3/4	4	3/4	6	.015	446-471-1	446-471W-1
3/4	4	3/4	6	.020	446-472-1	446-472W-1
3/4	4	3/4	6	.030	446-473-1	446-473W-1
3/4	4	3/4	6	.045	446-474-1	446-474W-1
3/4	4	3/4	6	.060	446-475-1	446-475W-1
3/4	4	3/4	6	.090	446-476-1	446-476W-1
1	1-1/2	1	4	.020	445-522-1	445-522W-1
1	1-1/2	1	4	.030	445-523-1	445-523W-1
1	1-1/2	1	4	.045	445-524-1	445-524W-1
1	1-1/2	1	4	.060	445-525-1	445-525W-1
1	1-1/2	1	4	.090	445-526-1	445-526W-1
1	2-1/4	1	5	.015	446-481-1	446-481W-1
1	2-1/4	1	5	.020	446-482-1	446-482W-1
1	2-1/4	1	5	.030	446-483-1	446-483W-1
1	2-1/4	1	5	.045	446-484-1	446-484W-1
1	2-1/4	1	5	.060	446-485-1	446-485W-1
1	2-1/4	1	5	.090	446-486-1	446-486W-1
1	3	1	6	.015	446-491-1	446-491W-1
1	3	1	6	.020	446-492-1	446-492W-1
1	3	1	6	.030	446-493-1	446-493W-1
1	3	1	6	.045	446-494-1	446-494W-1
1	3	1	6	.060	446-495-1	446-495W-1
1	3	1	6	.090	446-496-1	446-496W-1
1	4	1	7	.015	446-501-1	446-501W-1
1	4	1	7	.020	446-502-1	446-502W-1
1	4	1	7	.030	446-503-1	446-503W-1
1	4	1	7	.045	446-504-1	446-504W-1
1	4	1	7	.060	446-505-1	446-505W-1
1	4	1	7	.090	446-506-1	446-506W-1



F45 6 Flute Square Endmills

6 Flutes • Coated and Uncoated



F45

- High Performance **A-Gr-SiV** submicron grain carbide
- 45° 6 flute design for superior finish
- MAP certified quality

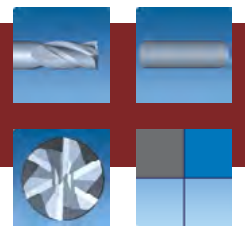


Uncoated



PowerA

OD	LOC	SHK	OAL	Uncoated	PowerA
D1	L1	D2	L2		
3/16	5/8	3/16	2	411-002	411-002-1
1/4	3/4	1/4	2-1/2	411-004	411-004-1
5/16	7/8	5/16	2-1/2	411-006	411-006-1
3/8	1	3/8	2-1/2	411-008	411-008-1
7/16	1	7/16	2-1/2	411-010	411-010-1
1/2	1	1/2	3	411-012	411-012-1
9/16	1	9/16	3	411-014	411-014-1
5/8	1-1/4	5/8	3-1/2	411-016	411-016-1
3/4	1-1/2	3/4	4	411-018	411-018-1
7/8	1-1/2	7/8	4	411-020	411-020-1
1	1-1/2	1	4	411-022	411-022-1
1	2-1/4	1	5	411-024	411-024-1

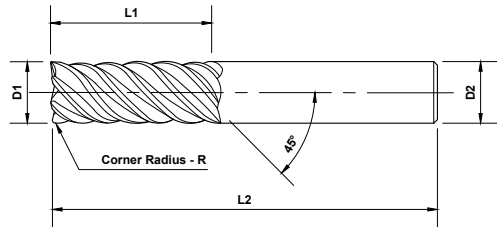


HP Endmills

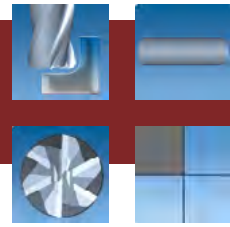


F45 6 FL Corner Radius Endmill

6 Flutes • Coated and Uncoated



- High Performance **A-Gr-SiV** submicron grain carbide
- 45° 6 Flute design for superior finish
- MAP certified quality



Cermet	Hardened	Cast Iron	Titanium	Stainless	Steel
H	K	S	M	P	



Uncoated



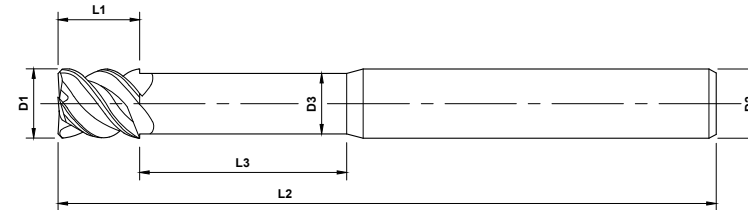
PowerA

OD D1	LOC L1	SHK D2	OAL L2	Radius R	Uncoated 6 Flute	PowerA 6 Flute
1/4	3/4	1/4	2-1/2	.010	411-200	411-200-1
5/16	7/8	5/16	2-1/2	.012	411-210	411-210-1
3/8	1	3/8	2-1/2	.012	411-220	411-220-1
7/16	1	7/16	2-1/2	.015	411-231	411-231-1
1/2	1	1/2	3	.015	411-241	411-241-1
9/16	1	9/16	3	.020	411-252	411-252-1
5/8	1-1/4	5/8	3-1/2	.020	411-262	411-262-1
3/4	1-1/2	3/4	4	.030	411-273	411-273-1
7/8	1-1/2	7/8	4	.030	411-283	411-283-1
1	1-1/2	1	4	.030	411-293	411-293-1

Mold Mills

Corner Radius Necked

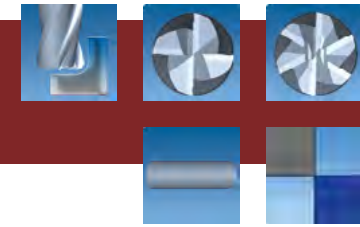
4 and 6 Flutes • Coated and Uncoated



- High Performance **A-Gr-SiV** submicron grain carbide
- Superb quality for mold and die operation
- MAP certified quality



Uncoated



Cermet	Hardened	Cast Iron	Titanium	Stainless	Steel
H	K	S	M	P	

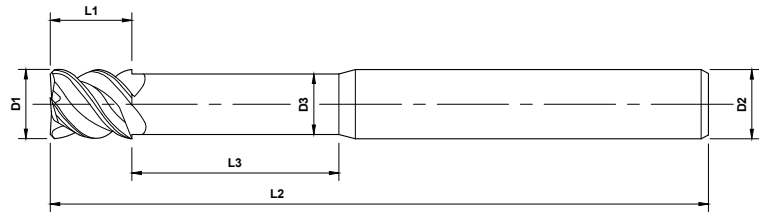
HP Endmills

OD D1	LOC L1	SHK D2	OAL L2	Neck OD D3	Neck Length L3	Radius R	Uncoated		PowerA		PowerN	
							4 Flute	6 Flute	4 Flute	6 Flute	4 Flute	6 Flute
1/8	1/8	1/8	2-1/4	.115	1/2	.010	440-002	-	440-002-1	-	440-002-5	-
1/8	1/8	1/8	2-1/4	.115	1/2	.015	440-004	-	440-004-1	-	440-004-5	-
1/8	1/8	1/8	2-1/4	.115	1/2	.020	440-006	-	440-006-1	-	440-006-5	-
3/16	3/16	3/16	2-1/2	.175	1/2	.010	440-008	-	440-008-1	-	440-008-5	-
3/16	3/16	3/16	2-1/2	.175	1/2	.020	440-010	-	440-010-1	-	440-010-5	-
3/16	3/16	3/16	2-1/2	.175	1/2	.030	440-012	-	440-012-1	-	440-012-5	-
1/4	1/4	1/4	2-1/2	.230	3/4	.010	-	440-014	-	440-014-1	-	440-014-5
1/4	1/4	1/4	2-1/2	.230	3/4	.020	-	440-016	-	440-016-1	-	440-016-5
1/4	1/4	1/4	2-1/2	.230	3/4	.030	-	440-018	-	440-018-1	-	440-018-5
1/4	1/4	1/4	3	.230	3/4	.030	-	440-020	-	440-020-1	-	440-020-5
3/8	3/8	3/8	3	.345	1	.010	-	440-022	-	440-022-1	-	440-022-5
3/8	3/8	3/8	3	.345	1	.020	-	440-024	-	440-024-1	-	440-024-5
3/8	3/8	3/8	3	.345	1	.030	-	440-026	-	440-026-1	-	440-026-5
1/2	1/2	1/2	3-1/2	.460	1	.015	-	440-028	-	440-028-1	-	440-028-5
1/2	1/2	1/2	3-1/2	.460	1	.030	-	440-030	-	440-030-1	-	440-030-5
1/2	1/2	1/2	3-1/2	.460	1	.060	-	440-032	-	440-032-1	-	440-032-5
1/2	1/2	1/2	4	.460	1	.060	-	440-034	-	440-034-1	-	440-034-5

Mold Mills

Corner Radius Necked Long

4 and 6 Flutes • Coated and Uncoated



- High Performance **A-Gr-SiV** submicron grain carbide
- Superb quality for mold and die operation
- MAP certified quality



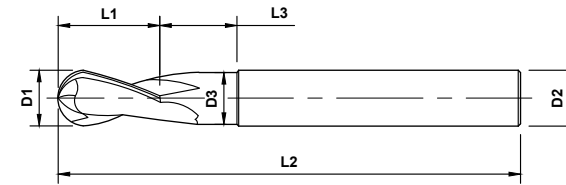
Uncoated

OD	LOC	SHK	OAL	Neck OD	Neck Length	Radius	Uncoated		PowerA		PowerN	
							4 Flute	6 Flute	4 Flute	6 Flute	4 Flute	6 Flute
D1	L1	D2	L2	D3	L3	R						
1/8	1/8	1/8	4	.115	1-1/4	.010	440-202	-	440-202-1	-	440-202-5	-
1/8	1/8	1/8	4	.115	1-1/4	.015	440-204	-	440-204-1	-	440-204-5	-
1/8	1/8	1/8	4	.115	1-1/4	.020	440-206	-	440-206-1	-	440-206-5	-
3/16	3/16	3/16	4	.175	1-1/2	.010	440-208	-	440-208-1	-	440-208-5	-
3/16	3/16	3/16	4	.175	1-1/2	.020	440-210	-	440-210-1	-	440-210-5	-
3/16	3/16	3/16	4	.175	1-1/2	.030	440-212	-	440-212-1	-	440-212-5	-
1/4	1/4	1/4	6	.230	2	.010	-	440-214	-	440-214-1	-	440-214-5
1/4	1/4	1/4	6	.230	2	.020	-	440-216	-	440-216-1	-	440-216-5
1/4	1/4	1/4	6	.230	2	.030	-	440-218	-	440-218-1	-	440-218-5
3/8	3/8	3/8	6	.345	2-1/4	.010	-	440-220	-	440-220-1	-	440-220-5
3/8	3/8	3/8	6	.345	2-1/4	.020	-	440-222	-	440-222-1	-	440-222-5
3/8	3/8	3/8	6	.345	2-1/4	.030	-	440-224	-	440-224-1	-	440-224-5
1/2	1/2	1/2	6	.460	2-1/2	.015	-	440-226	-	440-226-1	-	440-226-5
1/2	1/2	1/2	6	.460	2-1/2	.030	-	440-228	-	440-228-1	-	440-228-5
1/2	1/2	1/2	6	.460	2-1/2	.060	-	440-230	-	440-230-1	-	440-230-5

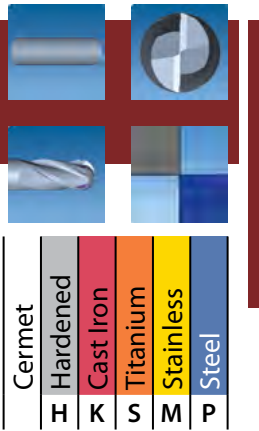
Mold Mills

Ball Necked

2 Flutes • Coated and Uncoated



- High Performance **A-Gr-SiV** submicron grain carbide
- Superb quality for mold and die operation
- MAP certified quality



Uncoated

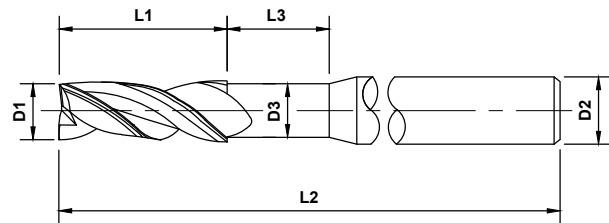
OD	LOC	SHK	OAL	Neck OD	Neck Length	Uncoated	PowerA	PowerN
D1	L1	D2	L2	D3	L3			
1/32	1/32	1/8	2-1/2	.027	3/32	440-402	440-402-1	440-402-5
1/16	1/16	1/8	2-1/2	.053	3/16	440-404	440-404-1	440-404-5
1/16	1/16	1/4	2	.053	3/16	440-406	440-406-1	440-406-5
1/16	1/16	1/4	2-1/2	.053	3/16	440-408	440-408-1	440-408-5
5/64	1/8	1/8	2	.067	3/16	440-410	440-410-1	440-410-5
1/8	1/8	1/8	3	.115	3/8	440-412	440-412-1	440-412-5
1/8	1/8	1/4	2-1/4	.115	3/8	440-414	440-414-1	440-414-5
1/8	1/8	1/4	3	.115	3/8	440-416	440-416-1	440-416-5
3/16	3/16	3/16	3	.175	9/16	440-418	440-418-1	440-418-5
3/16	3/16	3/16	4	.175	9/16	440-420	440-420-1	440-420-5
3/16	3/16	1/4	2-1/4	.175	9/16	440-422	440-422-1	440-422-5
3/16	3/16	1/4	3	.175	9/16	440-424	440-424-1	440-424-5
1/4	1/4	1/4	2-1/4	.230	3/4	440-426	440-426-1	440-426-5
1/4	1/4	1/4	3	.230	1-1/2	440-428	440-428-1	440-428-5
5/16	5/16	5/16	3	.285	1	440-430	440-430-1	440-430-5
3/8	3/8	3/8	2-1/2	.345	5/8	440-432	440-432-1	440-432-5
3/8	3/8	3/8	3-1/2	.345	1-1/8	440-434	440-434-1	440-434-5
1/2	1/2	1/2	3	.460	3/4	440-436	440-436-1	440-436-5
1/2	1/2	1/2	4	.460	1-1/8	440-438	440-438-1	440-438-5
5/8	5/8	5/8	4-1/2	.575	2-1/4	440-440	440-440-1	440-440-5

HP Endmills

Mold Mills

Square Necked

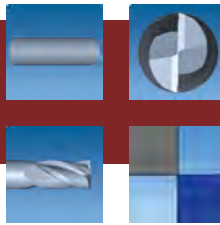
2 Flutes • Coated and Uncoated



PowerA

- High Performance **A-Gr-SiV** submicron grain carbide
- Superb quality for mold and die operation
- MAP certified quality

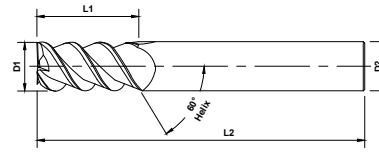
Cermet	Hardened	Cast Iron	Titanium	Stainless	Steel
H	K	S	M	P	



OD	LOC	SHK	OAL	Neck OD	Neck Length	Uncoated	PowerA	PowerN
D1	L1	D2	L2	D3	L3			
1/8	5/32	1/8	1-1/2	.115	3/8	441-202	441-202-1	441-202-5
3/16	1/4	3/16	2	.175	1/2	441-204	441-204-1	441-204-5
1/4	5/16	1/4	2-1/2	.230	1/2	441-206	441-206-1	441-206-5
5/16	3/8	5/16	2-1/2	.288	1/2	441-208	441-208-1	441-208-5
3/8	7/16	3/8	2-1/2	.345	1/2	441-210	441-210-1	441-210-5
7/16	1/2	7/16	3	.403	9/16	441-212	441-212-1	441-212-5
1/2	9/16	1/2	3	.460	5/8	441-214	441-214-1	441-214-5
5/8	3/4	5/8	3-1/2	.575	3/4	441-216	441-216-1	441-216-5
3/4	13/16	3/4	4	.710	7/8	441-218	441-218-1	441-218-5

3FL 60° Helix Twister Mills

3 Flutes • Coated and Uncoated

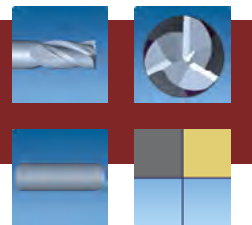


Uncoated

- High Performance **A-Gr-SiV** submicron grain carbide
- 60° Helix for stainless steels and hi-temp alloys
- MAP certified quality

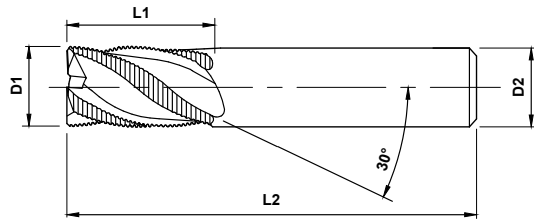
Titanium	Stainless	Steel
S	M	P

OD	LOC	SHK	OAL	Uncoated	PowerA	PowerZ
D1	L1	D2	L2			
1/8	5/8	1/8	1-1/2	432-002	432-002-1	432-002-4
1/4	3/4	1/4	2-1/2	432-004	432-004-1	432-004-4
7/16	1	7/16	3	432-006	432-006-1	432-006-4
5/16	13/16	5/16	2-1/2	432-008	432-008-1	432-008-4
3/8	1	3/8	2-1/2	432-010	432-010-1	432-010-4
1/2	1	1/2	3	432-012	432-012-1	432-012-4
5/8	1-1/4	5/8	3-1/2	432-014	432-014-1	432-014-4
3/4	1-1/2	3/4	4	432-016	432-016-1	432-016-4
1	1-1/2	1	4	432-018	432-018-1	432-018-4



HP Endmills

Roughers - Fine Pitch



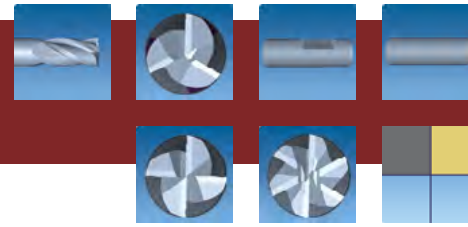
3, 4 and 6 Flutes •
Coated and Uncoated



PowerA
PowerZ

- High Performance **A-Gr-SiV** submicron grain carbide
- Rigid design for fast material removal
- MAP certified quality

Cermet	Hardened	Cast Iron	Titanium	Non-Ferrous	Stainless	Steel
H	K	S	N	M	P	



OD D1	LOC L1	SHK D2	OAL L2	Flutes	Uncoated	PowerA	PowerZ
1/4	3/4	1/4	2-1/2	3	433-102	433-102-1	433-102-4
5/16	3/4	5/16	2-1/2	3	433-104	433-104-1	433-104-4
3/8	7/8	3/8	2-1/2	3	433-106	433-106-1	433-106-4
1/2	1	1/2	3	4	433-108W	433-108W-1	433-108W-4
5/8	1-1/4	5/8	3-1/2	4	433-110W	433-110W-1	433-110W-4
3/4	1-1/2	3/4	4	4	433-112W	433-112W-1	433-112W-4
1	1-1/2	1	4	6	433-114W	433-114W-1	433-114W-4

Roughers - Medium Pitch

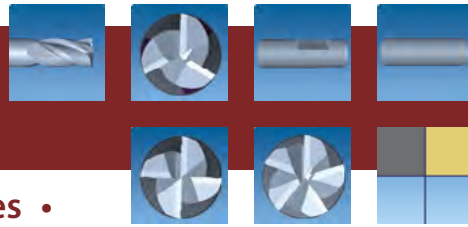


PowerA
PowerZ

3, 4 and 5 Flutes •
Coated and Uncoated

- High Performance **A-Gr-SiV** submicron grain carbide
- Rigid design for fast material removal

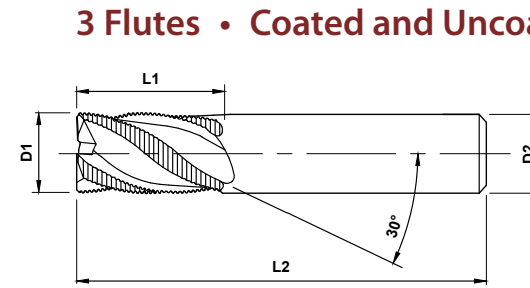
Cermet	Hardened	Cast Iron	Titanium	Non-Ferrous	Stainless	Steel
H	K	S	N	M	P	



OD D1	LOC L1	SHK D2	OAL L2	Flutes	Uncoated	PowerA	PowerZ
1/4	3/4	1/4	2-1/2	3	433-202	433-202-1	433-202-4
5/16	3/4	5/16	2-1/2	3	433-204	433-204-1	433-204-4
3/8	7/8	3/8	2-1/2	3	433-206	433-206-1	433-206-4
1/2	1	1/2	3	4	433-208W	433-208W-1	433-208W-4
5/8	1-1/4	5/8	3-1/2	4	433-210W	433-210W-1	433-210W-4
3/4	1-1/2	3/4	4	4	433-212W	433-212W-1	433-212W-4
1	1-1/2	1	4	5	433-214W	433-214W-1	433-214W-4

'W' appended to part numbers indicate this tool is manufactured with a flat on the shank

Roughers - Coarse Pitch



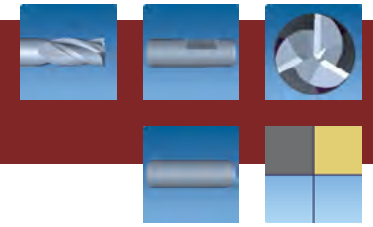
3 Flutes • Coated and Uncoated with and without flat



PowerA
PowerZ

- High Performance **A-Gr-SiV** submicron grain carbide
- Rigid design for fast material removal
- MAP certified quality

Cermet	Hardened	Cast Iron	Titanium	Non-Ferrous	Stainless	Steel
H	K	S	N	M	P	

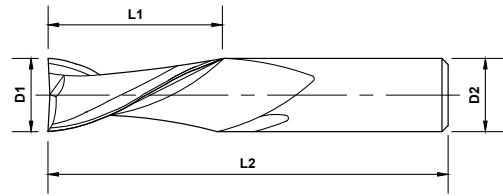


OD D1	LOC L1	SHK D2	OAL L2	Flutes	Uncoated	PowerA	PowerZ
1/4	3/4	1/4	2-1/2	3	433-002	433-002-1	433-002-4
5/16	3/4	5/16	2-1/2	3	433-004	433-004-1	433-004-4
3/8	7/8	3/8	2-1/2	3	433-006	433-006-1	433-006-4
1/2	1	1/2	3	3	433-008W	433-008W-1	433-008W-4
5/8	1-1/4	5/8	3-1/2	3	433-010W	433-010W-1	433-010W-4
3/4	1-1/2	3/4	4	3	433-012W	433-012W-1	433-012W-4
1	1-1/2	1	4	3	433-014W	433-014W-1	433-014W-4

'W' appended to part numbers indicates this tool is manufactured with a flat on the shank.

Square End AxMills

2 and 3 Flutes • Coated and Uncoated



- High Performance **A-Gr-SiV** submicron grain carbide
- Unique flute and relief angles for aluminum
- Faster speeds and feeds
- MAP certified quality

Non-Ferrous
& Aluminum
N



Uncoated



PowerZ

OD D1	LOC L1	SHK D2	OAL L2	Uncoated		PowerZ	
				2 Flute	3 Flute	2 Flute	3 Flute
1/8	1/4	1/8	1-1/2	-	422-002	-	422-002-4
1/8	5/16	1/8	1-1/2	-	422-004	-	422-004-4
1/8	3/8	1/8	1-1/2	-	422-006	-	422-006-4
1/8	1/2	1/8	1-1/2	414-002	420-002	414-002-4	420-002-4
1/8	1/2	1/8	2	-	421-070	-	421-070-4
1/8	5/8	1/8	2	415-002	421-002	415-002-4	421-002-4
1/8	3/4	1/8	2	415-004	421-004	415-004-4	421-004-4
1/8	1	1/8	2-1/2	-	421-072	-	421-072-4
1/8	1/4	1/8	3	-	421-074	-	421-074-4
1/8	1	1/8	3	415-006	421-006	415-006-4	421-006-4
5/32	9/16	5/32	2	414-004	420-004	414-004-4	420-004-4
5/32	5/16	3/16	2	-	422-008	-	422-008-4
5/32	9/16	3/16	2	-	420-038	-	420-038-4
3/16	5/16	3/16	2	-	422-010	-	422-010-4
3/16	3/8	3/16	2	-	422-012	-	422-012-4
3/16	3/4	3/16	2	414-006	420-006	414-006-4	420-006-4
3/16	5/8	3/16	2-1/2	-	421-076	-	421-076-4
3/16	3/4	3/16	2-1/2	415-008	421-008	415-008-4	421-008-4

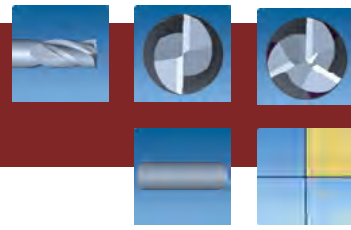
Square End AxMills

Non-Ferrous
& Aluminum
N

HP
Endmills

OD D1	LOC L1	SHK D2	OAL L2	Uncoated		PowerZ	
				2 Flute	3 Flute	2 Flute	3 Flute
3/16	1	3/16	2-1/2	-	421-078	-	421-078-4
3/16	5/16	3/16	3	-	421-080	-	421-080-4
3/16	1-1/8	3/16	3	415-010	421-010	415-010-4	421-010-4
3/16	1	3/16	4	415-012	421-012	415-012-4	421-012-4
7/32	3/8	1/4	2-1/2	-	422-014	-	422-014-4
7/32	3/4	1/4	2-1/2	-	420-040	-	420-040-4
1/4	3/8	1/4	2-1/2	-	422-016	-	422-016-4
1/4	1/2	1/4	2-1/2	-	422-018	-	422-018-4
1/4	5/8	1/4	2-1/2	-	420-042	-	420-042-4
1/4	3/4	1/4	2-1/2	414-008	420-008	414-008-4	420-008-4
1/4	1	1/4	2-1/2	414-010	420-010	414-010-4	420-010-4
1/4	1-1/8	1/4	2-1/2	-	421-082	-	421-082-4
1/4	1-1/8	1/4	3	415-014	421-014	415-014-4	421-014-4
1/4	1-1/4	1/4	3	-	421-084	-	421-084-4
1/4	1-1/2	1/4	3	-	421-086	-	421-086-4
1/4	3/8	1/4	4	-	421-088	-	421-088-4
1/4	3/4	1/4	4	-	421-090	-	421-090-4
1/4	1	1/4	4	415-016	421-016	415-016-4	421-016-4
1/4	1-1/2	1/4	4	415-018	421-018	415-018-4	421-018-4
1/4	2	1/4	4	-	421-092	-	421-092-4
1/4	1-1/2	1/4	6	415-020	421-020	415-020-4	421-020-4
9/32	7/16	5/16	2-1/2	-	422-020	-	422-020-4
9/32	13/16	5/16	2-1/2	-	420-044	-	420-044-4
5/16	7/16	5/16	2-1/2	-	422-022	-	422-022-4
5/16	1/2	5/16	2-1/2	-	422-024	-	422-024-4
5/16	3/4	5/16	2-1/2	414-012	420-012	414-012-4	420-012-4
5/16	13/16	5/16	2-1/2	-	420-046	-	420-046-4
5/16	1-1/8	5/16	2-1/2	-	421-094	-	421-094-4
5/16	1	5/16	3	414-014	420-014	414-014-4	420-014-4
5/16	1-1/8	5/16	3	415-022	421-022	415-022-4	421-022-4
5/16	1-1/4	5/16	3-1/2	-	421-096	-	421-096-4
5/16	1-1/2	5/16	3-1/2	-	421-098	-	421-098-4
5/16	7/16	5/16	4	-	421-100	-	421-100-4
5/16	13/16	5/16	4	-	421-102	-	421-102-4

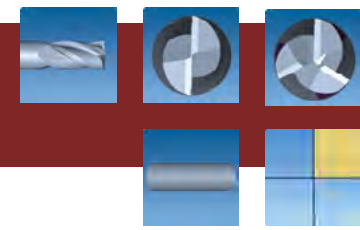
Square End AxMills



Non-Ferrous
& Aluminum
N

OD D1	LOC L1	SHK D2	OAL L2	Uncoated		PowerZ	
				2 Flute	3 Flute	2 Flute	3 Flute
5/16	1	5/16	4	415-024	421-024	415-024-4	421-024-4
5/16	1-5/8	5/16	4	415-026	421-026	415-026-4	421-026-4
5/16	2-1/8	5/16	4	-	421-104	-	421-104-4
5/16	1-1/2	5/16	6	415-028	421-028	415-028-4	421-028-4
11/32	1/2	3/8	2-1/2	-	422-026	-	422-026-4
11/32	1	3/8	2-1/2	-	420-048	-	420-048-4
3/8	1/2	3/8	2-1/2	-	422-028	-	422-028-4
3/8	5/8	3/8	2-1/2	-	422-030	-	422-030-4
3/8	3/4	3/8	2-1/2	-	420-050	-	420-050-4
3/8	7/8	3/8	2-1/2	414-016	420-016	414-016-4	420-016-4
3/8	1	3/8	2-1/2	414-018	420-018	414-018-4	420-018-4
3/8	1-1/8	3/8	3	415-030	421-030	415-030-4	421-030-4
3/8	1-1/4	3/8	3	-	421-106	-	421-106-4
3/8	1/2	3/8	4	-	421-108	-	421-108-4
3/8	1	3/8	4	-	421-110	-	421-110-4
3/8	1-1/2	3/8	4	-	421-112	-	421-112-4
3/8	1-3/4	3/8	4	415-032	421-032	415-032-4	421-032-4
3/8	2	3/8	4	415-034	421-034	415-034-4	421-034-4
3/8	1-1/2	3/8	6	415-036	421-036	415-036-4	421-036-4
3/8	2-1/2	3/8	6	-	421-114	-	421-114-4
3/8	3	3/8	6	415-038	421-038	415-038-4	421-038-4
13/32	9/16	7/16	2-3/4	-	422-032	-	422-032-4
13/32	1	7/16	2-3/4	-	420-052	-	420-052-4
7/16	1	7/16	2-1/2	414-020	420-020	414-020-4	420-020-4
7/16	9/16	7/16	2-3/4	-	422-034	-	422-034-4
7/16	1	7/16	2-3/4	-	420-054	-	420-054-4
7/16	1	7/16	4	415-040	421-040	415-040-4	421-040-4
7/16	2	7/16	4	415-042	421-042	415-042-4	421-042-4
7/16	1-1/2	7/16	6	415-044	421-044	415-044-4	421-044-4
7/16	3	7/16	6	415-046	421-046	415-046-4	421-046-4
15/32	5/8	1/2	3	-	422-036	-	422-036-4
15/32	1-1/4	1/2	3	-	420-056	-	420-056-4
1/2	5/8	1/2	3	-	422-038	-	422-038-4
1/2	3/4	1/2	3	-	420-058	-	420-058-4

Square End AxMills



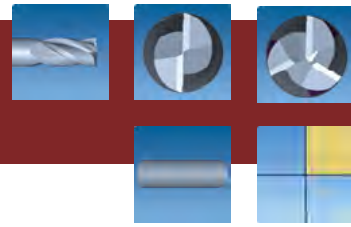
Non-Ferrous
& Aluminum
N

OD D1	LOC L1	SHK D2	OAL L2	Uncoated		PowerZ	
				2 Flute	3 Flute	2 Flute	3 Flute
1/2	1	1/2	3	414-022	420-022	414-022-4	420-022-4
1/2	1-1/4	1/2	3	414-024	420-024	414-024-4	420-024-4
1/2	5/8	1/2	4	-	421-116	-	421-116-4
1/2	1-1/2	1/2	4	-	421-118	-	421-118-4
1/2	2	1/2	4	415-052	421-052	415-052-4	421-052-4
1/2	1	1/2	4	415-048	421-048	415-048-4	421-048-4
1/2	5/8	1/2	6	-	421-120	-	421-120-4
1/2	1-1/4	1/2	6	-	421-122	-	421-122-4
1/2	1-1/2	1/2	6	415-050	421-050	415-050-4	421-050-4
1/2	2-1/4	1/2	6	-	421-124	-	421-124-4
1/2	2-1/2	1/2	6	-	421-126	-	421-126-4
1/2	3	1/2	6	415-054	421-054	415-054-4	421-054-4
1/2	3-1/4	1/2	6	-	421-128	-	421-128-4
1/2	4	1/2	8	-	421-130	-	421-130-4
9/16	1-1/4	9/16	3	414-026	420-026	414-026-4	420-026-4
5/8	3/4	5/8	3-1/2	-	422-040	-	422-040-4
5/8	1-1/4	5/8	3-1/2	414-028	420-028	414-028-4	420-028-4
5/8	1-5/8	5/8	3-1/2	414-030	420-030	414-030-4	420-030-4
5/8	3/4	5/8	5	-	422-042	-	422-042-4
5/8	2	5/8	5	-	421-132	-	421-132-4
5/8	2-1/4	5/8	5	415-056	421-056	415-056-4	421-056-4
5/8	2-1/2	5/8	5	-	421-134	-	421-134-4
5/8	2-3/4	5/8	5	-	421-136	-	421-136-4
5/8	3/4	5/8	6	-	421-138	-	421-138-4
5/8	1-5/8	5/8	6	-	421-140	-	421-140-4
5/8	3	5/8	6	415-058	421-058	415-058-4	421-058-4
5/8	3-1/4	5/8	6	-	421-142	-	421-142-4
5/8	4	5/8	8	-	421-144	-	421-144-4
3/4	1	3/4	4	-	420-060	-	420-060-4
3/4	1-1/2	3/4	4	414-032	420-032	414-032-4	420-032-4
3/4	1-5/8	3/4	4	-	420-062	-	420-062-4
3/4	1-3/4	3/4	4	414-034	420-034	414-034-4	420-034-4
3/4	1	3/4	5	-	421-146	-	421-146-4
3/4	2	3/4	5	-	421-148	-	421-148-4

HP
Endmills



Square End AxMills

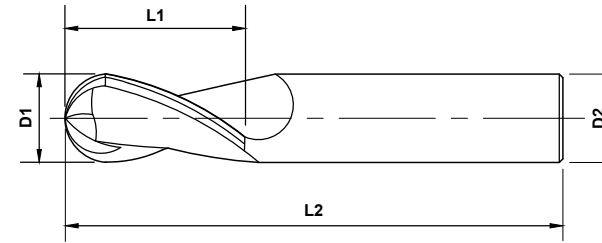


Non-Ferrous & Aluminum
N

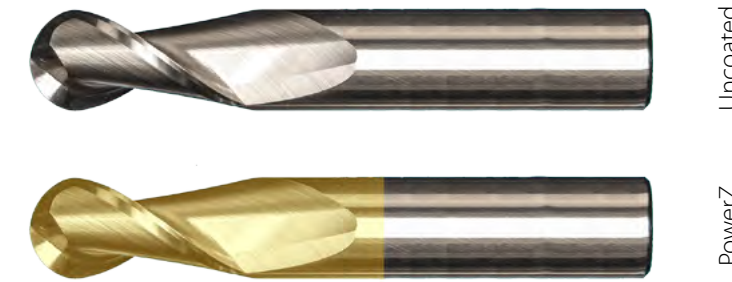
OD D1	LOC L1	SHK D2	OAL L2	Uncoated		PowerZ	
				2 Flute	3 Flute	2 Flute	3 Flute
3/4	2-1/4	3/4	5	415-060	421-060	415-060-4	421-060-4
3/4	2-1/2	3/4	5	-	421-150	-	421-150-4
3/4	1	3/4	6	-	421-152	-	421-152-4
3/4	1-5/8	3/4	6	-	421-154	-	421-154-4
3/4	3	3/4	6	415-062	421-062	415-062-4	421-062-4
3/4	3-1/4	3/4	6	-	421-156	-	421-156-4
3/4	3-1/2	3/4	6	-	421-158	-	421-158-4
3/4	4	3/4	7	-	421-160	-	421-160-4
3/4	5	3/4	8	-	421-162	-	421-162-4
1	1-1/2	1	4	414-036	420-036	414-036-4	420-036-4
1	1-1/4	1	5	-	421-164	-	421-164-4
1	1-1/2	1	5	-	421-166	-	421-166-4
1	2	1	5	-	421-168	-	421-168-4
1	2-1/2	1	5	-	421-170	-	421-170-4
1	1-1/4	1	6	-	421-172	-	421-172-4
1	2	1	6	415-064	421-064	415-064-4	421-064-4
1	3	1	6	415-068	421-068	415-068-4	421-068-4
1	3-1/2	1	6	-	421-174	-	421-174-4
1	4	1	6	415-066	421-066	415-066-4	421-066-4
1	1-1/4	1	7	-	421-176	-	421-176-4
1	2	1	7	-	421-178	-	421-178-4
1	4-1/8	1	7	-	421-180	-	421-180-4
1	5-1/2	1	8	-	421-182	-	421-182-4
1-1/4	1-1/4	1-1/4	4-1/2	-	420-064	-	420-064-4
1-1/4	2	1-1/4	4-1/2	-	421-184	-	421-184-4
1-1/4	3-1/4	1-1/4	6	-	421-186	-	421-186-4
1-1/4	5	1-1/4	7-1/2	-	421-188	-	421-188-4

Ball End AxMills

2 and 3 Flutes • Coated and Uncoated



- High Performance **A-Gr-SiV** submicron grain carbide
- Unique flute and relief angles for aluminum
- Faster speeds and feeds
- MAP certified quality

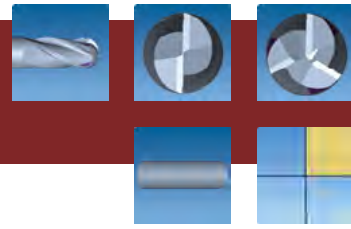


OD D1	LOC L1	SHK D2	OAL L2	Uncoated		PowerZ	
				2 Flute	3 Flute	2 Flute	3 Flute
1/8	1/2	1/8	1-1/2	414-202	420-202	414-202-4	420-202-4
1/8	5/8	1/8	2	415-202	421-202	415-202-4	421-202-4
1/8	3/4	1/8	2	415-204	421-204	415-204-4	421-204-4
1/8	1	1/8	3	415-206	421-206	415-206-4	421-206-4
5/32	9/16	5/32	2	414-204	420-204	414-204-4	420-204-4
3/16	3/4	3/16	2	414-206	420-206	414-206-4	420-206-4
3/16	3/4	3/16	2-1/2	415-208	421-208	415-208-4	421-208-4
3/16	1-1/8	3/16	3	415-210	421-210	415-210-4	421-210-4
3/16	1	3/16	4	415-212	421-212	415-212-4	421-212-4
1/4	3/8	1/4	2-1/2	-	422-216	-	422-216-4
1/4	3/4	1/4	2-1/2	414-208	420-208	414-208-4	420-208-4
1/4	1	1/4	2-1/2	414-210	420-210	414-210-4	420-210-4
1/4	1-1/8	1/4	3	415-214	421-214	415-214-4	421-214-4
1/4	1-1/4	1/4	3	-	421-284	-	421-284-4
1/4	3/8	1/4	4	-	421-288	-	421-288-4
1/4	1	1/4	4	415-216	421-216	415-216-4	421-216-4
1/4	1-1/2	1/4	4	415-218	421-218	415-218-4	421-218-4
1/4	1-1/2	1/4	6	415-220	421-220	415-220-4	421-220-4

Non-Ferrous & Aluminum
N

HP Endmills

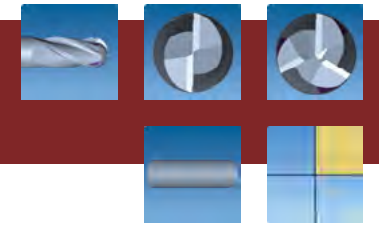
Ball End AxMills



Non-Ferrous
& Aluminum
N

OD	LOC	SHK	OAL	Uncoated		PowerZ	
				2 Flute	3 Flute	2 Flute	3 Flute
D1	L1	D2	L2				
5/16	7/16	5/16	2-1/2		422-222		422-222-4
5/16	3/4	5/16	2-1/2	414-212	420-212	414-212-4	420-212-4
5/16	13/16	5/16	2-1/2		420-246		420-246-4
5/16	1	5/16	3	414-214	420-214	414-214-4	420-214-4
5/16	1-1/8	5/16	3	415-222	421-222	415-222-4	421-222-4
5/16	1-1/4	5/16	3-1/2		421-296		421-296-4
5/16	7/16	5/16	4		421-300		421-300-4
5/16	1	5/16	4	415-224	421-224	415-224-4	421-224-4
5/16	1-5/8	5/16	4	415-226	421-226	415-226-4	421-226-4
5/16	1-1/2	5/16	6	415-228	421-228	415-228-4	421-228-4
3/8	1/2	3/8	2-1/2		422-228		422-228-4
3/8	7/8	3/8	2-1/2	414-216	420-216	414-216-4	420-216-4
3/8	1	3/8	2-1/2	414-218	420-218	414-218-4	420-218-4
3/8	1-1/8	3/8	3	415-230	421-230	415-230-4	421-230-4
3/8	1/2	3/8	4		421-308		421-308-4
3/8	1-1/2	3/8	4		421-312		421-312-4
3/8	1-3/4	3/8	4	415-232	421-232	415-232-4	421-232-4
3/8	2	3/8	4	415-234	421-234	415-234-4	421-234-4
3/8	1-1/2	3/8	6	415-236	421-236	415-236-4	421-236-4
3/8	3	3/8	6	415-238	421-238	415-238-4	421-238-4
7/16	1	7/16	2-1/2	414-220	420-220	414-220-4	420-220-4
7/16	9/16	7/16	2-3/4		422-234		422-234-4
7/16	1	7/16	2-3/4		420-254		420-254-4
7/16	1	7/16	4	415-240	421-240	415-240-4	421-240-4
7/16	2	7/16	4	415-242	421-242	415-242-4	421-242-4
7/16	1-1/2	7/16	6	415-244	421-244	415-244-4	421-244-4
7/16	3	7/16	6	415-246	421-246	415-246-4	421-246-4
1/2	5/8	1/2	3		422-238		422-238-4
1/2	1	1/2	3	414-222	420-222	414-222-4	420-222-4
1/2	1-1/4	1/2	3	414-224	420-224	414-224-4	420-224-4
1/2	5/8	1/2	4		421-316		421-316-4
1/2	1	1/2	4	415-248	421-248	415-248-4	421-248-4
1/2	2	1/2	4	415-252	421-252	415-252-4	421-252-4
1/2	5/8	1/2	6		421-320		421-320-4

Ball End AxMills



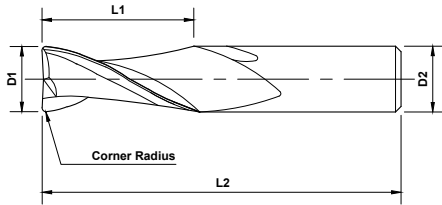
Non-Ferrous
& Aluminum
N

OD	LOC	SHK	OAL	Uncoated		PowerZ	
				2 Flute	3 Flute	2 Flute	3 Flute
D1	L1	D2	L2				
1/2	1-1/2	1/2	6	415-250	421-250	415-250-4	421-250-4
1/2	3	1/2	6	415-254	421-254	415-254-4	421-254-4
9/16	1-1/4	9/16	3	414-226	420-226	414-226-4	420-226-4
5/8	3/4	5/8	3-1/2		422-240		422-240-4
5/8	1-1/4	5/8	3-1/2	414-228	420-228	414-228-4	420-228-4
5/8	1-5/8	5/8	3-1/2	414-230	420-230	414-230-4	420-230-4
5/8	3/4	5/8	5		422-242		422-242-4
5/8	2-1/4	5/8	5	415-256	421-256	415-256-4	421-256-4
5/8	2-1/2	5/8	5		421-334		421-334-4
5/8	3/4	5/8	6		421-338		421-338-4
5/8	3	5/8	6	415-258	421-258	415-258-4	421-258-4
3/4	1	3/4	4		420-260		420-260-4
3/4	1-1/2	3/4	4	414-232	420-232	414-232-4	420-232-4
3/4	1-5/8	3/4	4		420-262		420-262-4
3/4	1-3/4	3/4	4	414-234	420-234	414-234-4	420-234-4
3/4	1	3/4	5		421-346		421-346-4
3/4	2-1/4	3/4	5	415-260	421-260	415-260-4	421-260-4
3/4	1	3/4	6		421-352		421-352-4
3/4	3	3/4	6	415-262	421-262	415-262-4	421-262-4
3/4	3-1/4	3/4	6		421-356		421-356-4
1	1-1/2	1	4	414-236	420-236	414-236-4	420-236-4
1	1-1/4	1	5		421-364		421-364-4
1	2	1	5		421-368		421-368-4
1	1-1/4	1	6		421-372		421-372-4
1	2	1	6	415-264	421-264	415-264-4	421-264-4
1	3	1	6	415-268	421-268	415-268-4	421-268-4
1	3-1/2	1	6		421-374		421-374-4
1	4	1	6	415-266	421-266	415-266-4	421-266-4
1	1-1/4	1	7		421-376		421-376-4

HP
Endmills

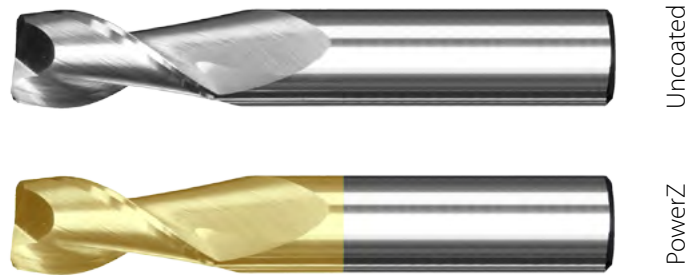
Corner Radius AxMills

2 and 3 Flutes • Coated and Uncoated



- High Performance **A-Gr-SiV** submicron grain carbide
- Unique flute and relief angles for aluminum
- Faster speeds and feeds
- MAP certified quality

Non-Ferrous & Aluminum
N



Uncoated
PowerZ

OD	LOC	SHK	OAL	Radius	Uncoated		PowerZ	
D1	L1	D2	L2	R	2 Flute	3 Flute	2 Flute	3 Flute
1/8	1/2	1/8	1-1/2	.015	414-401	420-401	414-401-4	420-401-4
1/8	1/2	1/8	1-1/2	.020	414-402	420-402	414-402-4	420-402-4
1/8	1/2	1/8	1-1/2	.030	414-403	420-403	414-403-4	420-403-4
1/8	1/2	1/8	1-1/2	.040	414-404	420-404	414-404-4	420-404-4
1/8	5/8	1/8	2	.015	415-401	421-401	415-401-4	421-401-4
1/8	5/8	1/8	2	.020	415-402	421-402	415-402-4	421-402-4
1/8	5/8	1/8	2	.030	415-403	421-403	415-403-4	421-403-4
1/8	5/8	1/8	2	.040	415-404	421-404	415-404-4	421-404-4
1/8	3/4	1/8	2	.015	415-411	421-411	415-411-4	421-411-4
1/8	3/4	1/8	2	.020	415-412	421-412	415-412-4	421-412-4
1/8	3/4	1/8	2	.030	415-413	421-413	415-413-4	421-413-4
1/8	3/4	1/8	2	.040	415-414	421-414	415-414-4	421-414-4
1/8	1	1/8	3	.015	415-421	421-421	415-421-4	421-421-4
1/8	1	1/8	3	.020	415-422	421-422	415-422-4	421-422-4
1/8	1	1/8	3	.030	415-423	421-423	415-423-4	421-423-4
1/8	1	1/8	3	.040	415-424	421-424	415-424-4	421-424-4
5/32	9/16	5/32	2	.015	414-411	420-411	414-411-4	420-411-4
5/32	9/16	5/32	2	.020	414-412	420-412	414-412-4	420-412-4

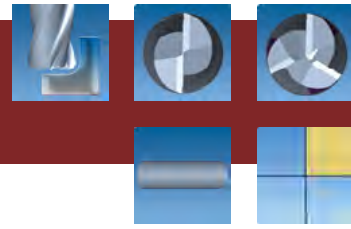
Corner Radius AxMills

Non-Ferrous & Aluminum
N

HP Endmills

OD	LOC	SHK	OAL	Radius	Uncoated		PowerZ	
D1	L1	D2	L2	R	2 Flute	3 Flute	2 Flute	3 Flute
5/32	9/16	5/32	2	.030	414-413	420-413	414-413-4	420-413-4
5/32	9/16	5/32	2	.040	414-414	420-414	414-414-4	420-414-4
3/16	3/4	3/16	2-1/2	.015	415-431	421-431	415-431-4	421-431-4
3/16	3/4	3/16	2-1/2	.020	415-432	421-432	415-432-4	421-432-4
3/16	3/4	3/16	2-1/2	.030	415-433	421-433	415-433-4	421-433-4
3/16	3/4	3/16	2-1/2	.040	415-434	421-434	415-434-4	421-434-4
3/16	3/4	3/16	2	.015	414-421	420-421	414-421-4	420-421-4
3/16	3/4	3/16	2	.020	414-422	420-422	414-422-4	420-422-4
3/16	3/4	3/16	2	.030	414-423	420-423	414-423-4	420-423-4
3/16	3/4	3/16	2	.040	414-424	420-424	414-424-4	420-424-4
3/16	1-1/8	3/16	3	.015	415-441	421-441	415-441-4	421-441-4
3/16	1-1/8	3/16	3	.020	415-442	421-442	415-442-4	421-442-4
3/16	1-1/8	3/16	3	.030	415-443	421-443	415-443-4	421-443-4
3/16	1-1/8	3/16	3	.040	415-444	421-444	415-444-4	421-444-4
3/16	1	3/16	4	.015	415-451	421-451	415-451-4	421-451-4
3/16	1	3/16	4	.020	415-452	421-452	415-452-4	421-452-4
3/16	1	3/16	4	.030	415-453	421-453	415-453-4	421-453-4
3/16	1	3/16	4	.040	415-454	421-454	415-454-4	421-454-4
1/4	3/8	1/4	2-1/2	.015	-	422-401	-	422-401-4
1/4	3/8	1/4	2-1/2	.020	-	422-402	-	422-402-4
1/4	3/8	1/4	2-1/2	.030	-	422-403	-	422-403-4
1/4	3/4	1/4	2-1/2	.015	414-431	420-431	414-431-4	420-431-4
1/4	3/4	1/4	2-1/2	.020	414-432	420-432	414-432-4	420-432-4
1/4	3/4	1/4	2-1/2	.030	414-433	420-433	414-433-4	420-433-4
1/4	3/4	1/4	2-1/2	.040	414-434	420-434	414-434-4	420-434-4
1/4	3/4	1/4	2-1/2	.060	414-425	420-425	414-425-4	420-425-4
1/4	1	1/4	2-1/2	.015	414-441	420-441	414-441-4	420-441-4
1/4	1	1/4	2-1/2	.020	414-442	420-442	414-442-4	420-442-4
1/4	1	1/4	2-1/2	.030	414-443	420-443	414-443-4	420-443-4
1/4	1	1/4	2-1/2	.040	414-444	420-444	414-444-4	420-444-4
1/4	1	1/4	2-1/2	.060	414-445	420-445	414-445-4	420-445-4
1/4	1-1/8	1/4	3	.015	415-461	421-461	415-461-4	421-461-4
1/4	1-1/8	1/4	3	.020	415-462	421-462	415-462-4	421-462-4
1/4	1-1/8	1/4	3	.030	415-463	421-463	415-463-4	421-463-4

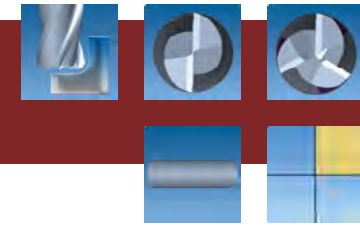
Corner Radius AxMills



Non-Ferrous
& Aluminum
N

OD D1	LOC L1	SHK D2	OAL L2	Radius R	Uncoated		PowerZ	
					2 Flute	3 Flute	2 Flute	3 Flute
1/4	1-1/8	1/4	3	.040	415-464	421-464	415-464-4	421-464-4
1/4	1-1/8	1/4	3	.060	415-465	421-465	415-465-4	421-465-4
1/4	1-1/2	1/4	4	.015	415-481	421-481	415-481-4	421-481-4
1/4	1-1/2	1/4	4	.020	415-482	421-482	415-482-4	421-482-4
1/4	1-1/2	1/4	4	.030	415-483	421-483	415-483-4	421-483-4
1/4	1-1/2	1/4	4	.040	415-484	421-484	415-484-4	421-484-4
1/4	1-1/2	1/4	4	.060	415-485	421-485	415-485-4	421-485-4
1/4	1	1/4	4	.015	415-471	421-471	415-471-4	421-471-4
1/4	1	1/4	4	.020	415-472	421-472	415-472-4	421-472-4
1/4	1	1/4	4	.030	415-473	421-473	415-473-4	421-473-4
1/4	1	1/4	4	.040	415-474	421-474	415-474-4	421-474-4
1/4	1	1/4	4	.060	415-475	421-475	415-475-4	421-475-4
1/4	1-1/2	1/4	6	.015	415-491	421-491	415-491-4	421-491-4
1/4	1-1/2	1/4	6	.020	415-492	421-492	415-492-4	421-492-4
1/4	1-1/2	1/4	6	.030	415-493	421-493	415-493-4	421-493-4
1/4	1-1/2	1/4	6	.040	415-494	421-494	415-494-4	421-494-4
1/4	1-1/2	1/4	6	.060	415-495	421-495	415-495-4	421-495-4
5/16	3/4	5/16	2-1/2	.015	414-451	420-451	414-451-4	420-451-4
5/16	3/4	5/16	2-1/2	.020	414-452	420-452	414-452-4	420-452-4
5/16	3/4	5/16	2-1/2	.030	414-453	420-453	414-453-4	420-453-4
5/16	3/4	5/16	2-1/2	.040	414-454	420-454	414-454-4	420-454-4
5/16	3/4	5/16	2-1/2	.060	414-455	420-455	414-455-4	420-455-4
5/16	1-1/8	5/16	3	.015	415-501	421-501	415-501-4	421-501-4
5/16	1-1/8	5/16	3	.020	415-502	421-502	415-502-4	421-502-4
5/16	1-1/8	5/16	3	.030	415-503	421-503	415-503-4	421-503-4
5/16	1-1/8	5/16	3	.040	415-504	421-504	415-504-4	421-504-4
5/16	1-1/8	5/16	3	.060	415-505	421-505	415-505-4	421-505-4
5/16	1	5/16	3	.015	414-461	420-461	414-461-4	420-461-4
5/16	1	5/16	3	.020	414-462	420-462	414-462-4	420-462-4
5/16	1	5/16	3	.030	414-463	420-463	414-463-4	420-463-4
5/16	1	5/16	3	.040	414-464	420-464	414-464-4	420-464-4
5/16	1	5/16	3	.060	414-465	420-465	414-465-4	420-465-4
5/16	1-5/8	5/16	4	.015	415-521	421-521	415-521-4	421-521-4
5/16	1-5/8	5/16	4	.020	415-522	421-522	415-522-4	421-522-4

Corner Radius AxMills

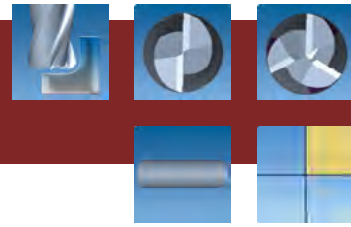


Non-Ferrous
& Aluminum
N

OD D1	LOC L1	SHK D2	OAL L2	Radius R	Uncoated		PowerZ	
					2 Flute	3 Flute	2 Flute	3 Flute
5/16	1-5/8	5/16	4	.030	415-523	421-523	415-523-4	421-523-4
5/16	1-5/8	5/16	4	.040	415-524	421-524	415-524-4	421-524-4
5/16	1-5/8	5/16	4	.060	415-525	421-525	415-525-4	421-525-4
5/16	1	5/16	4	.015	415-511	421-511	415-511-4	421-511-4
5/16	1	5/16	4	.020	415-512	421-512	415-512-4	421-512-4
5/16	1	5/16	4	.030	415-513	421-513	415-513-4	421-513-4
5/16	1	5/16	4	.040	415-514	421-514	415-514-4	421-514-4
5/16	1	5/16	4	.060	415-515	421-515	415-515-4	421-515-4
5/16	1-1/2	5/16	6	.015	415-531	421-531	415-531-4	421-531-4
5/16	1-1/2	5/16	6	.020	415-532	421-532	415-532-4	421-532-4
5/16	1-1/2	5/16	6	.030	415-533	421-533	415-533-4	421-533-4
5/16	1-1/2	5/16	6	.040	415-534	421-534	415-534-4	421-534-4
5/16	1-1/2	5/16	6	.060	415-535	421-535	415-535-4	421-535-4
3/8	1/2	3/8	2-1/2	.020	-	422-412	-	422-412-4
3/8	1/2	3/8	2-1/2	.030	-	422-413	-	422-413-4
3/8	1/2	3/8	2-1/2	.040	-	422-414	-	422-414-4
3/8	7/8	3/8	2-1/2	.010	414-471	420-471	414-471-4	420-471-4
3/8	7/8	3/8	2-1/2	.020	414-472	420-472	414-472-4	420-472-4
3/8	7/8	3/8	2-1/2	.030	414-473	420-473	414-473-4	420-473-4
3/8	7/8	3/8	2-1/2	.040	414-474	420-474	414-474-4	420-474-4
3/8	7/8	3/8	2-1/2	.060	414-475	420-475	414-475-4	420-475-4
3/8	1	3/8	2-1/2	.015	414-481	420-481	414-481-4	420-481-4
3/8	1	3/8	2-1/2	.020	414-482	420-482	414-482-4	420-482-4
3/8	1	3/8	2-1/2	.030	414-483	420-483	414-483-4	420-483-4
3/8	1	3/8	2-1/2	.040	414-484	420-484	414-484-4	420-484-4
3/8	1	3/8	2-1/2	.060	414-485	420-485	414-485-4	420-485-4
3/8	1-1/8	3/8	3	.015	415-541	421-541	415-541-4	421-541-4
3/8	1-1/8	3/8	3	.020	415-542	421-542	415-542-4	421-542-4
3/8	1-1/8	3/8	3	.030	415-543	421-543	415-543-4	421-543-4
3/8	1-1/8	3/8	3	.040	415-544	421-544	415-544-4	421-544-4
3/8	1-1/8	3/8	3	.060	415-545	421-545	415-545-4	421-545-4
3/8	1-3/4	3/8	4	.015	415-551	421-551	415-551-4	421-551-4
3/8	1-3/4	3/8	4	.020	415-552	421-552	415-552-4	421-552-4
3/8	1-3/4	3/8	4	.030	415-553	421-553	415-553-4	421-553-4

HP
Endmills

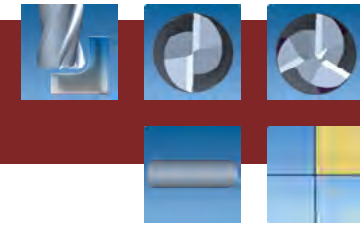
Corner Radius AxMills



Non-Ferrous
& Aluminum
N

OD D1	LOC L1	SHK D2	OAL L2	Radius R	Uncoated		PowerZ	
					2 Flute	3 Flute	2 Flute	3 Flute
3/8	1-3/4	3/8	4	.040	415-554	421-554	415-554-4	421-554-4
3/8	1-3/4	3/8	4	.060	415-555	421-555	415-555-4	421-555-4
3/8	2	3/8	4	.015	415-561	421-561	415-561-4	421-561-4
3/8	2	3/8	4	.020	415-562	421-562	415-562-4	421-562-4
3/8	2	3/8	4	.030	415-563	421-563	415-563-4	421-563-4
3/8	2	3/8	4	.040	415-564	421-564	415-564-4	421-564-4
3/8	2	3/8	4	.060	415-565	421-565	415-565-4	421-565-4
3/8	1-1/2	3/8	6	.015	415-571	421-571	415-571-4	421-571-4
3/8	1-1/2	3/8	6	.020	415-572	421-572	415-572-4	421-572-4
3/8	1-1/2	3/8	6	.030	415-573	421-573	415-573-4	421-573-4
3/8	1-1/2	3/8	6	.040	415-574	421-574	415-574-4	421-574-4
3/8	1-1/2	3/8	6	.060	415-575	421-575	415-575-4	421-575-4
3/8	3	3/8	6	.015	415-581	421-581	415-581-4	421-581-4
3/8	3	3/8	6	.020	415-582	421-582	415-582-4	421-582-4
3/8	3	3/8	6	.030	415-583	421-583	415-583-4	421-583-4
3/8	3	3/8	6	.040	415-584	421-584	415-584-4	421-584-4
3/8	3	3/8	6	.060	415-585	421-585	415-585-4	421-585-4
7/16	1	7/16	2-1/2	.015	414-491	420-491	414-491-4	420-491-4
7/16	1	7/16	2-1/2	.020	414-492	420-492	414-492-4	420-492-4
7/16	1	7/16	2-1/2	.030	414-493	420-493	414-493-4	420-493-4
7/16	1	7/16	2-1/2	.040	414-494	420-494	414-494-4	420-494-4
7/16	1	7/16	2-1/2	.060	414-495	420-495	414-495-4	420-495-4
7/16	1	7/16	4	.015	415-591	421-591	415-591-4	421-591-4
7/16	1	7/16	4	.020	415-592	421-592	415-592-4	421-592-4
7/16	1	7/16	4	.030	415-593	421-593	415-593-4	421-593-4
7/16	1	7/16	4	.040	415-594	421-594	415-594-4	421-594-4
7/16	1	7/16	4	.060	415-595	421-595	415-595-4	421-595-4
7/16	2	7/16	4	.015	415-601	421-601	415-601-4	421-601-4
7/16	2	7/16	4	.020	415-602	421-602	415-602-4	421-602-4
7/16	2	7/16	4	.030	415-603	421-603	415-603-4	421-603-4
7/16	2	7/16	4	.040	415-604	421-604	415-604-4	421-604-4
7/16	2	7/16	4	.060	415-605	421-605	415-605-4	421-605-4
7/16	1-1/2	7/16	6	.015	415-611	421-611	415-611-4	421-611-4
7/16	1-1/2	7/16	6	.020	415-612	421-612	415-612-4	421-612-4

Corner Radius AxMills

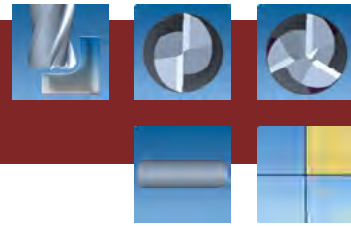


Non-Ferrous
& Aluminum
N

OD D1	LOC L1	SHK D2	OAL L2	Radius R	Uncoated		PowerZ	
					2 Flute	3 Flute	2 Flute	3 Flute
7/16	1-1/2	7/16	6	.030	415-613	421-613	415-613-4	421-613-4
7/16	1-1/2	7/16	6	.040	415-614	421-614	415-614-4	421-614-4
7/16	1-1/2	7/16	6	.060	415-615	421-615	415-615-4	421-615-4
7/16	3	7/16	6	.015	415-621	421-621	415-621-4	421-621-4
7/16	3	7/16	6	.020	415-622	421-622	415-622-4	421-622-4
7/16	3	7/16	6	.030	415-623	421-623	415-623-4	421-623-4
7/16	3	7/16	6	.040	415-624	421-624	415-624-4	421-624-4
7/16	3	7/16	6	.060	415-625	421-625	415-625-4	421-625-4
1/2	5/8	1/2	3	.020	-	422-422	-	422-422-4
1/2	5/8	1/2	3	.030	-	422-423	-	422-423-4
1/2	5/8	1/2	3	.060	-	422-425	-	422-425-4
1/2	5/8	1/2	3	.090	-	422-426	-	422-426-4
1/2	1-1/4	1/2	3	.015	414-511	420-511	414-511-4	420-511-4
1/2	1-1/4	1/2	3	.020	414-512	420-512	414-512-4	420-512-4
1/2	1-1/4	1/2	3	.030	414-513	420-513	414-513-4	420-513-4
1/2	1-1/4	1/2	3	.040	414-514	420-514	414-514-4	420-514-4
1/2	1-1/4	1/2	3	.060	414-515	420-515	414-515-4	420-515-4
1/2	1-1/4	1/2	3	.090	414-516	420-516	414-516-4	420-516-4
1/2	1-1/4	1/2	3	.120	414-517	420-517	414-517-4	420-517-4
1/2	1	1/2	3	.015	414-501	420-501	414-501-4	420-501-4
1/2	1	1/2	3	.020	414-502	420-502	414-502-4	420-502-4
1/2	1	1/2	3	.030	414-503	420-503	414-503-4	420-503-4
1/2	1	1/2	3	.040	414-504	420-504	414-504-4	420-504-4
1/2	1	1/2	3	.060	414-505	420-505	414-505-4	420-505-4
1/2	1	1/2	3	.090	414-506	420-506	414-506-4	420-506-4
1/2	1	1/2	3	.120	414-507	420-507	414-507-4	420-507-4
1/2	1	1/2	4	.015	415-631	421-631	415-631-4	421-631-4
1/2	1	1/2	4	.020	415-632	421-632	415-632-4	421-632-4
1/2	1	1/2	4	.030	415-633	421-633	415-633-4	421-633-4
1/2	1	1/2	4	.040	415-634	421-634	415-634-4	421-634-4
1/2	1	1/2	4	.060	415-635	421-635	415-635-4	421-635-4
1/2	1	1/2	4	.090	415-636	421-636	415-636-4	421-636-4
1/2	1	1/2	4	.120	415-637	421-637	415-637-4	421-637-4
1/2	2	1/2	4	.015	415-651	421-651	415-651-4	421-651-4

HP
Endmills

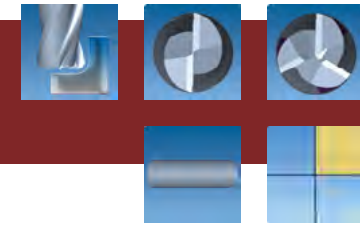
Corner Radius AxMills



Non-Ferrous
& Aluminum
N

OD D1	LOC L1	SHK D2	OAL L2	Radius R	Uncoated		PowerZ	
					2 Flute	3 Flute	2 Flute	3 Flute
1/2	2	1/2	4	.020	415-652	421-652	415-652-4	421-652-4
1/2	2	1/2	4	.030	415-653	421-653	415-653-4	421-653-4
1/2	2	1/2	4	.040	415-654	421-654	415-654-4	421-654-4
1/2	2	1/2	4	.060	415-655	421-655	415-655-4	421-655-4
1/2	2	1/2	4	.090	415-656	421-656	415-656-4	421-656-4
1/2	2	1/2	4	.120	415-657	421-657	415-657-4	421-657-4
1/2	1-1/2	1/2	6	.015	415-641	421-641	415-641-4	421-641-4
1/2	1-1/2	1/2	6	.020	415-642	421-642	415-642-4	421-642-4
1/2	1-1/2	1/2	6	.030	415-643	421-643	415-643-4	421-643-4
1/2	1-1/2	1/2	6	.040	415-644	421-644	415-644-4	421-644-4
1/2	1-1/2	1/2	6	.060	415-645	421-645	415-645-4	421-645-4
1/2	1-1/2	1/2	6	.090	415-646	421-646	415-646-4	421-646-4
1/2	1-1/2	1/2	6	.120	415-647	421-647	415-647-4	421-647-4
1/2	3	1/2	6	.015	415-661	421-661	415-661-4	421-661-4
1/2	3	1/2	6	.020	415-662	421-662	415-662-4	421-662-4
1/2	3	1/2	6	.030	415-663	421-663	415-663-4	421-663-4
1/2	3	1/2	6	.040	415-664	421-664	415-664-4	421-664-4
1/2	3	1/2	6	.060	415-665	421-665	415-665-4	421-665-4
1/2	3	1/2	6	.090	415-666	421-666	415-666-4	421-666-4
1/2	3	1/2	6	.120	415-667	421-667	415-667-4	421-667-4
9/16	1-1/4	9/16	3	.015	414-521	420-521	414-521-4	420-521-4
9/16	1-1/4	9/16	3	.020	414-522	420-522	414-522-4	420-522-4
9/16	1-1/4	9/16	3	.030	414-523	420-523	414-523-4	420-523-4
9/16	1-1/4	9/16	3	.040	414-524	420-524	414-524-4	420-524-4
9/16	1-1/4	9/16	3	.060	414-525	420-525	414-525-4	420-525-4
9/16	1-1/4	9/16	3	.090	414-526	420-526	414-526-4	420-526-4
9/16	1-1/4	9/16	3	.120	414-527	420-527	414-527-4	420-527-4
5/8	1-1/4	5/8	3-1/2	.015	414-531	420-531	414-531-4	420-531-4
5/8	1-1/4	5/8	3-1/2	.020	414-532	420-532	414-532-4	420-532-4
5/8	1-1/4	5/8	3-1/2	.030	414-533	420-533	414-533-4	420-533-4
5/8	1-1/4	5/8	3-1/2	.040	414-534	420-534	414-534-4	420-534-4
5/8	1-1/4	5/8	3-1/2	.060	414-535	420-535	414-535-4	420-535-4
5/8	1-1/4	5/8	3-1/2	.090	414-536	420-536	414-536-4	420-536-4
5/8	1-1/4	5/8	3-1/2	.120	414-537	420-537	414-537-4	420-537-4

Corner Radius AxMills

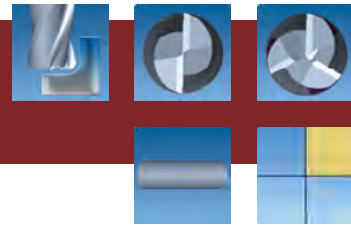


Non-Ferrous
& Aluminum
N

OD D1	LOC L1	SHK D2	OAL L2	Radius R	Uncoated		PowerZ	
					2 Flute	3 Flute	2 Flute	3 Flute
5/8	1-5/8	5/8	3-1/2	.015	414-541	420-541	414-541-4	420-541-4
5/8	1-5/8	5/8	3-1/2	.020	414-542	420-542	414-542-4	420-542-4
5/8	1-5/8	5/8	3-1/2	.030	414-543	420-543	414-543-4	420-543-4
5/8	1-5/8	5/8	3-1/2	.040	414-544	420-544	414-544-4	420-544-4
5/8	1-5/8	5/8	3-1/2	.060	414-545	420-545	414-545-4	420-545-4
5/8	1-5/8	5/8	3-1/2	.090	414-546	420-546	414-546-4	420-546-4
5/8	1-5/8	5/8	3-1/2	.120	414-547	420-547	414-547-4	420-547-4
5/8	2-1/4	5/8	5	.015	415-671	421-671	415-671-4	421-671-4
5/8	2-1/4	5/8	5	.020	415-672	421-672	415-672-4	421-672-4
5/8	2-1/4	5/8	5	.030	415-673	421-673	415-673-4	421-673-4
5/8	2-1/4	5/8	5	.040	415-674	421-674	415-674-4	421-674-4
5/8	2-1/4	5/8	5	.060	415-675	421-675	415-675-4	421-675-4
5/8	2-1/4	5/8	5	.090	415-676	421-676	415-676-4	421-676-4
5/8	2-1/4	5/8	5	.120	415-677	421-677	415-677-4	421-677-4
5/8	3	5/8	6	.015	415-681	421-681	415-681-4	421-681-4
5/8	3	5/8	6	.020	415-682	421-682	415-682-4	421-682-4
5/8	3	5/8	6	.030	415-683	421-683	415-683-4	421-683-4
5/8	3	5/8	6	.040	415-684	421-684	415-684-4	421-684-4
5/8	3	5/8	6	.060	415-685	421-685	415-685-4	421-685-4
5/8	3	5/8	6	.090	415-686	421-686	415-686-4	421-686-4
5/8	3	5/8	6	.120	415-687	421-687	415-687-4	421-687-4
3/4	1-1/2	3/4	4	.015	414-561	420-561	414-561-4	420-561-4
3/4	1-1/2	3/4	4	.020	414-562	420-562	414-562-4	420-562-4
3/4	1-1/2	3/4	4	.030	414-563	420-563	414-563-4	420-563-4
3/4	1-1/2	3/4	4	.040	414-564	420-564	414-564-4	420-564-4
3/4	1-1/2	3/4	4	.060	414-565	420-565	414-565-4	420-565-4
3/4	1-1/2	3/4	4	.090	414-566	420-566	414-566-4	420-566-4
3/4	1-1/2	3/4	4	.120	414-567	420-567	414-567-4	420-567-4
3/4	1-5/8	3/4	4	.015	414-571	420-571	414-571-4	420-571-4
3/4	1-5/8	3/4	4	.020	414-572	420-572	414-572-4	420-572-4
3/4	1-5/8	3/4	4	.030	414-573	420-573	414-573-4	420-573-4
3/4	1-5/8	3/4	4	.040	414-574	420-574	414-574-4	420-574-4
3/4	1-5/8	3/4	4	.060	414-575	420-575	414-575-4	420-575-4
3/4	1-5/8	3/4	4	.090	414-576	420-576	414-576-4	420-576-4

HP
Endmills

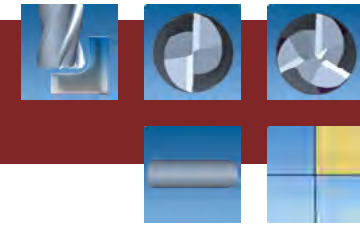
Corner Radius AxMills



Non-Ferrous
& Aluminum
N

OD D1	LOC L1	SHK D2	OAL L2	Radius R	Uncoated		PowerZ	
					2 Flute	3 Flute	2 Flute	3 Flute
3/4	1-5/8	3/4	4	.120	414-577	420-577	414-577-4	420-577-4
3/4	1-3/4	3/4	4	.015	414-581	420-581	414-581-4	420-581-4
3/4	1-3/4	3/4	4	.020	414-582	420-582	414-582-4	420-582-4
3/4	1-3/4	3/4	4	.030	414-583	420-583	414-583-4	420-583-4
3/4	1-3/4	3/4	4	.040	414-584	420-584	414-584-4	420-584-4
3/4	1-3/4	3/4	4	.060	414-585	420-585	414-585-4	420-585-4
3/4	1-3/4	3/4	4	.090	414-586	420-586	414-586-4	420-586-4
3/4	1-3/4	3/4	4	.120	414-587	420-587	414-587-4	420-587-4
3/4	1	3/4	4	.015	414-551	420-551	414-551-4	420-551-4
3/4	1	3/4	4	.020	414-552	420-552	414-552-4	420-552-4
3/4	1	3/4	4	.030	414-553	420-553	414-553-4	420-553-4
3/4	1	3/4	4	.040	414-554	420-554	414-554-4	420-554-4
3/4	1	3/4	4	.060	414-555	420-555	414-555-4	420-555-4
3/4	1	3/4	4	.090	414-556	420-556	414-556-4	420-556-4
3/4	1	3/4	4	.120	414-557	420-557	414-557-4	420-557-4
3/4	2-1/4	3/4	5	.015	415-691	421-691	415-691-4	421-691-4
3/4	2-1/4	3/4	5	.020	415-692	421-692	415-692-4	421-692-4
3/4	2-1/4	3/4	5	.030	415-693	421-693	415-693-4	421-693-4
3/4	2-1/4	3/4	5	.040	415-694	421-694	415-694-4	421-694-4
3/4	2-1/4	3/4	5	.060	415-695	421-695	415-695-4	421-695-4
3/4	2-1/4	3/4	5	.090	415-696	421-696	415-696-4	421-696-4
3/4	2-1/4	3/4	5	.120	415-697	421-697	415-697-4	421-697-4
3/4	3	3/4	6	.010	415-702	421-702	415-702-4	421-702-4
3/4	3	3/4	6	.015	415-701	421-701	415-701-4	421-701-4
3/4	3	3/4	6	.030	415-703	421-703	415-703-4	421-703-4
3/4	3	3/4	6	.040	415-704	421-704	415-704-4	421-704-4
3/4	3	3/4	6	.060	415-705	421-705	415-705-4	421-705-4
3/4	3	3/4	6	.090	415-706	421-706	415-706-4	421-706-4
3/4	3	3/4	6	.120	415-707	421-707	415-707-4	421-707-4
1	1-1/2	1	4	.015	414-591	420-591	414-591-4	420-591-4
1	1-1/2	1	4	.020	414-592	420-592	414-592-4	420-592-4
1	1-1/2	1	4	.030	414-593	420-593	414-593-4	420-593-4
1	1-1/2	1	4	.040	414-594	420-594	414-594-4	420-594-4
1	1-1/2	1	4	.060	414-595	420-595	414-595-4	420-595-4

Corner Radius AxMills



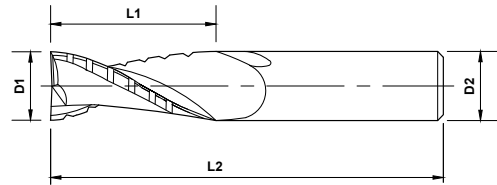
Non-Ferrous
& Aluminum
N

OD D1	LOC L1	SHK D2	OAL L2	Radius R	Uncoated		PowerZ	
					2 Flute	3 Flute	2 Flute	3 Flute
1	1-1/2	1	4	.090	414-596	420-596	414-596-4	420-596-4
1	1-1/2	1	4	.120	414-597	420-597	414-597-4	420-597-4
1	2	1	6	.015	415-711	421-711	415-711-4	421-711-4
1	2	1	6	.020	415-712	421-712	415-712-4	421-712-4
1	2	1	6	.030	415-713	421-713	415-713-4	421-713-4
1	2	1	6	.040	415-714	421-714	415-714-4	421-714-4
1	2	1	6	.060	415-715	421-715	415-715-4	421-715-4
1	2	1	6	.090	415-716	421-716	415-716-4	421-716-4
1	2	1	6	.120	415-717	421-717	415-717-4	421-717-4
1	3	1	6	.015	415-731	421-731	415-731-4	421-731-4
1	3	1	6	.020	415-732	421-732	415-732-4	421-732-4
1	3	1	6	.030	415-733	421-733	415-733-4	421-733-4
1	3	1	6	.040	415-734	421-734	415-734-4	421-734-4
1	3	1	6	.060	415-735	421-735	415-735-4	421-735-4
1	3	1	6	.090	415-736	421-736	415-736-4	421-736-4
1	3	1	6	.120	415-737	421-737	415-737-4	421-737-4
1	4	1	6	.015	415-721	421-721	415-721-4	421-721-4
1	4	1	6	.020	415-722	421-722	415-722-4	421-722-4
1	4	1	6	.030	415-723	421-723	415-723-4	421-723-4
1	4	1	6	.040	415-724	421-724	415-724-4	421-724-4
1	4	1	6	.060	415-725	421-725	415-725-4	421-725-4
1	4	1	6	.090	415-726	421-726	415-726-4	421-726-4
1	4	1	6	.120	415-727	421-727	415-727-4	421-727-4

HP
Endmills

Square End AxMills

Chipbreaker 2 and 3 Flutes • Coated and Uncoated



- High Performance **A-Gr-SiV** submicron grain carbide
- Unique flute and relief angles for aluminum
- Faster speeds and feeds
- MAP certified quality



Uncoated
PowerZ

OD D1	LOC L1	SHK D2	OAL L2	Uncoated		PowerZ	
				2 Flute	3 Flute	2 Flute	3 Flute
1/8	1/2	1/8	1-1/2	417-002	423-002	417-002-4	423-002-4
5/32	9/16	5/32	2	417-004	423-004	417-004-4	423-004-4
3/16	3/4	3/16	2	417-006	423-006	417-006-4	423-006-4
1/4	3/4	1/4	2-1/2	417-008	423-008	417-008-4	423-008-4
1/4	1	1/4	2-1/2	417-010	423-010	417-010-4	423-010-4
5/16	3/4	5/16	2-1/2	417-012	423-012	417-012-4	423-012-4
5/16	1	5/16	3	417-014	423-014	417-014-4	423-014-4
3/8	7/8	3/8	2-1/2	417-016	423-016	417-016-4	423-016-4
3/8	1	3/8	2-1/2	417-018	423-018	417-018-4	423-018-4
7/16	1	7/16	2-1/2	417-020	423-020	417-020-4	423-020-4
1/2	1	1/2	3	417-022	423-022	417-022-4	423-022-4
1/2	1-1/4	1/2	3	417-024	423-024	417-024-4	423-024-4
9/16	1-1/4	9/16	3	417-026	423-026	417-026-4	423-026-4
5/8	1-1/4	5/8	3-1/2	417-028	423-028	417-028-4	423-028-4
5/8	1-5/8	5/8	3-1/2	417-030	423-030	417-030-4	423-030-4
3/4	1-1/2	3/4	4	417-032	423-032	417-032-4	423-032-4
3/4	1-3/4	3/4	4	417-034	423-034	417-034-4	423-034-4
1	1-1/2	1	4	417-036	423-036	417-036-4	423-036-4

Non-Ferrous & Aluminum
N

Square End AxMills

Chipbreaker

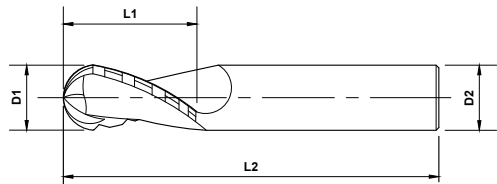
OD D1	LOC L1	SHK D2	OAL L2	Uncoated		PowerZ	
				2 Flute	3 Flute	2 Flute	3 Flute
1/8	5/8	1/8	2	418-002	424-002	418-002-4	424-002-4
1/8	3/4	1/8	2	418-004	424-004	418-004-4	424-004-4
1/8	1	1/8	3	418-006	424-006	418-006-4	424-006-4
3/16	3/4	3/16	2-1/2	418-008	424-008	418-008-4	424-008-4
3/16	1-1/8	3/16	3	418-010	424-010	418-010-4	424-010-4
3/16	1	3/16	4	418-012	424-012	418-012-4	424-012-4
1/4	1-1/8	1/4	3	418-014	424-014	418-014-4	424-014-4
1/4	1	1/4	4	418-016	424-016	418-016-4	424-016-4
1/4	1-1/2	1/4	4	418-018	424-018	418-018-4	424-018-4
1/4	1-1/2	1/4	6	418-020	424-020	418-020-4	424-020-4
5/16	1-1/8	5/16	3	418-022	424-022	418-022-4	424-022-4
5/16	1	5/16	4	418-024	424-024	418-024-4	424-024-4
5/16	1-5/8	5/16	4	418-026	424-026	418-026-4	424-026-4
5/16	1-1/2	5/16	6	418-028	424-028	418-028-4	424-028-4
3/8	1-1/8	3/8	3	418-030	424-030	418-030-4	424-030-4
3/8	1-3/4	3/8	4	418-032	424-032	418-032-4	424-032-4
3/8	2	3/8	4	418-034	424-034	418-034-4	424-034-4
3/8	1-1/2	3/8	6	418-036	424-036	418-036-4	424-036-4
3/8	3	3/8	6	418-038	424-038	418-038-4	424-038-4
7/16	1	7/16	4	418-040	424-040	418-040-4	424-040-4
7/16	2	7/16	4	418-042	424-042	418-042-4	424-042-4
7/16	1-1/2	7/16	6	418-044	424-044	418-044-4	424-044-4
7/16	3	7/16	6	418-046	424-046	418-046-4	424-046-4
1/2	1	1/2	4	418-048	424-048	418-048-4	424-048-4
1/2	1-1/2	1/2	6	418-050	424-050	418-050-4	424-050-4
1/2	2	1/2	4	418-052	424-052	418-052-4	424-052-4
1/2	3	1/2	6	418-054	424-054	418-054-4	424-054-4
5/8	2-1/4	5/8	5	418-056	424-056	418-056-4	424-056-4
5/8	3	5/8	6	418-058	424-058	418-058-4	424-058-4
3/4	2-1/4	3/4	5	418-060	424-060	418-060-4	424-060-4
3/4	3	3/4	6	418-062	424-062	418-062-4	424-062-4
1	2	1	6	418-064	424-064	418-064-4	424-064-4
1	4	1	6	418-066	424-066	418-066-4	424-066-4
1	3	1	6	418-068	424-068	418-068-4	424-068-4

Non-Ferrous & Aluminum
N

HP Endmills

Ball End AxMills

Chipbreaker 2 and 3 Flutes • Coated and Uncoated

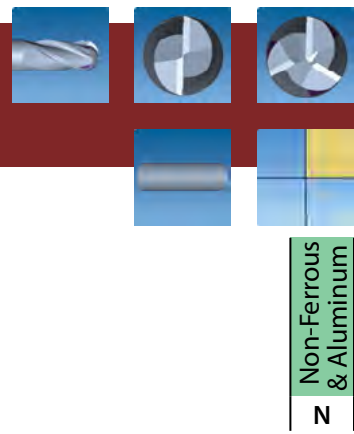


- High Performance **A-Gr-SiV** submicron grain carbide
- Unique flute and relief angles for aluminum
- Faster speeds and feeds
- MAP certified quality



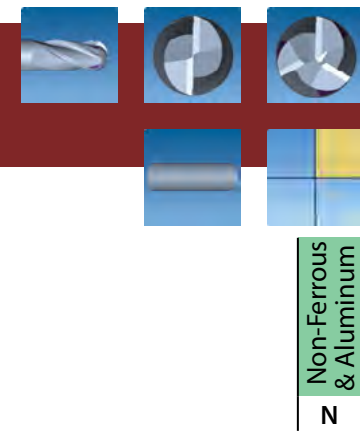
Uncoated
PowerZ

OD	LOC	SHK	OAL	Uncoated		PowerZ	
D1	L1	D2	L2	2 Flute	3 Flute	2 Flute	3 Flute
1/8	1/2	1/8	1-1/2	417-202	423-202	417-202-4	423-202-4
5/32	9/16	5/32	2	417-204	423-204	417-204-4	423-204-4
3/16	3/4	3/16	2	417-206	423-206	417-206-4	423-206-4
1/4	3/4	1/4	2-1/2	417-208	423-208	417-208-4	423-208-4
1/4	1	1/4	2-1/2	417-210	423-210	417-210-4	423-210-4
5/16	3/4	5/16	2-1/2	417-212	423-212	417-212-4	423-212-4
5/16	1	5/16	3	417-214	423-214	417-214-4	423-214-4
3/8	7/8	3/8	2-1/2	417-216	423-216	417-216-4	423-216-4
3/8	1	3/8	2-1/2	417-218	423-218	417-218-4	423-218-4
7/16	1	7/16	2-1/2	417-220	423-220	417-220-4	423-220-4
1/2	1	1/2	3	417-222	423-222	417-222-4	423-222-4
1/2	1-1/4	1/2	3	417-224	423-224	417-224-4	423-224-4
9/16	1-1/4	9/16	3	417-226	423-226	417-226-4	423-226-4
5/8	1-1/4	5/8	3-1/2	417-228	423-228	417-228-4	423-228-4
5/8	1-5/8	5/8	3-1/2	417-230	423-230	417-230-4	423-230-4
3/4	1-1/2	3/4	4	417-232	423-232	417-232-4	423-232-4
3/4	1-3/4	3/4	4	417-234	423-234	417-234-4	423-234-4
1	1-1/2	1	4	417-236	423-236	417-236-4	423-236-4



Ball End AxMills

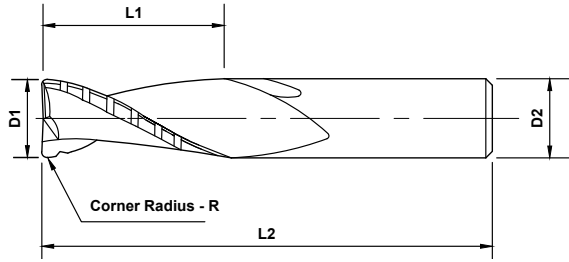
Chipbreaker



OD	LOC	SHK	OAL	Uncoated		PowerZ	
D1	L1	D2	L2	2 Flute	3 Flute	2 Flute	3 Flute
1/8	5/8	1/8	2	418-202	424-202	418-202-4	424-202-4
1/8	3/4	1/8	2	418-204	424-204	418-204-4	424-204-4
1/8	1	1/8	3	418-206	424-206	418-206-4	424-206-4
3/16	3/4	3/16	2-1/2	418-208	424-208	418-208-4	424-208-4
3/16	1-1/8	3/16	3	418-210	424-210	418-210-4	424-210-4
3/16	1	3/16	4	418-212	424-212	418-212-4	424-212-4
1/4	1-1/8	1/4	3	418-214	424-214	418-214-4	424-214-4
1/4	1	1/4	4	418-216	424-216	418-216-4	424-216-4
1/4	1-1/2	1/4	4	418-218	424-218	418-218-4	424-218-4
1/4	1-1/2	1/4	6	418-220	424-220	418-220-4	424-220-4
5/16	1-1/8	5/16	3	418-222	424-222	418-222-4	424-222-4
5/16	1	5/16	4	418-224	424-224	418-224-4	424-224-4
5/16	1-5/8	5/16	4	418-226	424-226	418-226-4	424-226-4
5/16	1-1/2	5/16	6	418-228	424-228	418-228-4	424-228-4
3/8	1-1/8	3/8	3	418-230	424-230	418-230-4	424-230-4
3/8	1-3/4	3/8	4	418-232	424-232	418-232-4	424-232-4
3/8	2	3/8	4	418-234	424-234	418-234-4	424-234-4
3/8	1-1/2	3/8	6	418-236	424-236	418-236-4	424-236-4
3/8	3	3/8	6	418-238	424-238	418-238-4	424-238-4
7/16	1	7/16	4	418-240	424-240	418-240-4	424-240-4
7/16	2	7/16	4	418-242	424-242	418-242-4	424-242-4
7/16	1-1/2	7/16	6	418-244	424-244	418-244-4	424-244-4
7/16	3	7/16	6	418-246	424-246	418-246-4	424-246-4
1/2	1	1/2	4	418-248	424-248	418-248-4	424-248-4
1/2	1-1/2	1/2	6	418-250	424-250	418-250-4	424-250-4
1/2	2	1/2	4	418-252	424-252	418-252-4	424-252-4
1/2	3	1/2	6	418-254	424-254	418-254-4	424-254-4
5/8	2-1/4	5/8	5	418-256	424-256	418-256-4	424-256-4
5/8	3	5/8	6	418-258	424-258	418-258-4	424-258-4
3/4	2-1/4	3/4	5	418-260	424-260	418-260-4	424-260-4
3/4	3	3/4	6	418-262	424-262	418-262-4	424-262-4
1	2	1	6	418-264	424-264	418-264-4	424-264-4
1	4	1	6	418-266	424-266	418-266-4	424-266-4
1	3	1	6	418-268	424-268	418-268-4	424-268-4

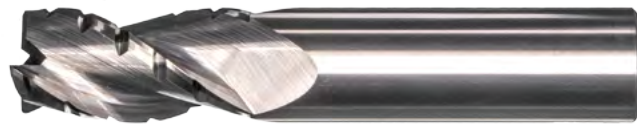
Corner Radius AxMills

Chipbreaker 2 and 3 Flutes • Coated and Uncoated



- High Performance **A-Gr-SiV** submicron grain carbide
- Unique flute and relief angles for aluminum
- Faster speeds and feeds
- MAP certified quality

Non-Ferrous & Aluminum
N



Uncoated

OD	LOC	SHK	OAL	Radius	Uncoated		PowerZ	
D1	L1	D2	L2	R	2 Flute	3 Flute	2 Flute	3 Flute
1/8	1/2	1/8	1-1/2	.015	417-401	423-401	417-401-4	423-401-4
1/8	1/2	1/8	1-1/2	.020	417-402	423-402	417-402-4	423-402-4
1/8	1/2	1/8	1-1/2	.030	417-403	423-403	417-403-4	423-403-4
1/8	1/2	1/8	1-1/2	.040	417-404	423-404	417-404-4	423-404-4
1/8	5/8	1/8	2	.015	418-401	424-401	418-401-4	424-401-4
1/8	5/8	1/8	2	.020	418-402	424-402	418-402-4	424-402-4
1/8	5/8	1/8	2	.030	418-403	424-403	418-403-4	424-403-4
1/8	5/8	1/8	2	.040	418-404	424-404	418-404-4	424-404-4
1/8	3/4	1/8	2	.015	418-411	424-411	418-411-4	424-411-4
1/8	3/4	1/8	2	.020	418-412	424-412	418-412-4	424-412-4
1/8	3/4	1/8	2	.030	418-413	424-413	418-413-4	424-413-4
1/8	3/4	1/8	2	.040	418-414	424-414	418-414-4	424-414-4
1/8	1	1/8	3	.015	418-421	424-421	418-421-4	424-421-4
1/8	1	1/8	3	.020	418-422	424-422	418-422-4	424-422-4
1/8	1	1/8	3	.030	418-423	424-423	418-423-4	424-423-4
1/8	1	1/8	3	.040	418-424	424-424	418-424-4	424-424-4
5/32	9/16	5/32	2	.015	417-411	423-411	417-411-4	423-411-4
5/32	9/16	5/32	2	.020	417-412	423-412	417-412-4	423-412-4

Corner Radius AxMills

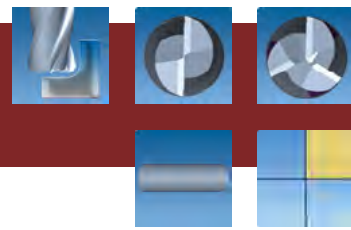
Chipbreaker

Non-Ferrous & Aluminum
N

OD	LOC	SHK	OAL	Radius	Uncoated		PowerZ	
D1	L1	D2	L2	R	2 Flute	3 Flute	2 Flute	3 Flute
5/32	9/16	5/32	2	.030	417-413	423-413	417-413-4	423-413-4
5/32	9/16	5/32	2	.040	417-414	423-414	417-414-4	423-414-4
3/16	3/4	3/16	2-1/2	.015	418-431	424-431	418-431-4	424-431-4
3/16	3/4	3/16	2-1/2	.020	418-432	424-432	418-432-4	424-432-4
3/16	3/4	3/16	2-1/2	.030	418-433	424-433	418-433-4	424-433-4
3/16	3/4	3/16	2-1/2	.040	418-434	424-434	418-434-4	424-434-4
3/16	3/4	3/16	2	.015	417-421	423-421	417-421-4	423-421-4
3/16	3/4	3/16	2	.020	417-422	423-422	417-422-4	423-422-4
3/16	3/4	3/16	2	.030	417-423	423-423	417-423-4	423-423-4
3/16	3/4	3/16	2	.040	417-424	423-424	417-424-4	423-424-4
3/16	1-1/8	3/16	3	.015	418-441	424-441	418-441-4	424-441-4
3/16	1-1/8	3/16	3	.020	418-442	424-442	418-442-4	424-442-4
3/16	1-1/8	3/16	3	.030	418-443	424-443	418-443-4	424-443-4
3/16	1-1/8	3/16	3	.040	418-444	424-444	418-444-4	424-444-4
3/16	1	3/16	4	.015	418-451	424-451	418-451-4	424-451-4
3/16	1	3/16	4	.020	418-452	424-452	418-452-4	424-452-4
3/16	1	3/16	4	.030	418-453	424-453	418-453-4	424-453-4
3/16	1	3/16	4	.040	418-454	424-454	418-454-4	424-454-4
1/4	3/4	1/4	2-1/2	.015	417-431	423-431	417-431-4	423-431-4
1/4	3/4	1/4	2-1/2	.020	417-432	423-432	417-432-4	423-432-4
1/4	3/4	1/4	2-1/2	.030	417-433	423-433	417-433-4	423-433-4
1/4	3/4	1/4	2-1/2	.040	417-434	423-434	417-434-4	423-434-4
1/4	3/4	1/4	2-1/2	.060	417-425	423-425	417-425-4	423-425-4
1/4	1	1/4	2-1/2	.015	417-441	423-441	417-441-4	423-441-4
1/4	1	1/4	2-1/2	.020	417-442	423-442	417-442-4	423-442-4
1/4	1	1/4	2-1/2	.030	417-443	423-443	417-443-4	423-443-4
1/4	1	1/4	2-1/2	.040	417-444	423-444	417-444-4	423-444-4
1/4	1	1/4	2-1/2	.060	417-445	423-445	417-445-4	423-445-4
1/4	1-1/8	1/4	3	.015	418-461	424-461	418-461-4	424-461-4
1/4	1-1/8	1/4	3	.020	418-462	424-462	418-462-4	424-462-4
1/4	1-1/8	1/4	3	.030	418-463	424-463	418-463-4	424-463-4
1/4	1-1/8	1/4	3	.040	418-464	424-464	418-464-4	424-464-4
1/4	1-1/8	1/4	3	.060	418-465	424-465	418-465-4	424-465-4
1/4	1-1/2	1/4	4	.015	418-481	424-481	418-481-4	424-481-4

Corner Radius AxMills

Chipbreaker

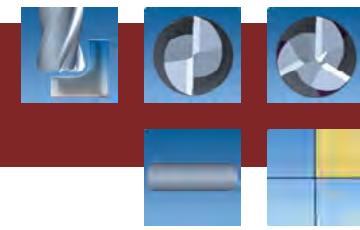


Non-Ferrous
& Aluminum
N

OD D1	LOC L1	SHK D2	OAL L2	Radius R	Uncoated		PowerZ	
					2 Flute	3 Flute	2 Flute	3 Flute
1/4	1-1/2	1/4	4	.020	418-482	424-482	418-482-4	424-482-4
1/4	1-1/2	1/4	4	.030	418-483	424-483	418-483-4	424-483-4
1/4	1-1/2	1/4	4	.040	418-484	424-484	418-484-4	424-484-4
1/4	1-1/2	1/4	4	.060	418-485	424-485	418-485-4	424-485-4
1/4	1	1/4	4	.015	418-471	424-471	418-471-4	424-471-4
1/4	1	1/4	4	.020	418-472	424-472	418-472-4	424-472-4
1/4	1	1/4	4	.030	418-473	424-473	418-473-4	424-473-4
1/4	1	1/4	4	.040	418-474	424-474	418-474-4	424-474-4
1/4	1	1/4	4	.060	418-475	424-475	418-475-4	424-475-4
1/4	1-1/2	1/4	6	.015	418-491	424-491	418-491-4	424-491-4
1/4	1-1/2	1/4	6	.020	418-492	424-492	418-492-4	424-492-4
1/4	1-1/2	1/4	6	.020	418-493	424-493	418-493-4	424-493-4
1/4	1-1/2	1/4	6	.040	418-494	424-494	418-494-4	424-494-4
1/4	1-1/2	1/4	6	.060	418-495	424-495	418-495-4	424-495-4
5/16	3/4	5/16	2-1/2	.015	417-451	423-451	417-451-4	423-451-4
5/16	3/4	5/16	2-1/2	.020	417-452	423-452	417-452-4	423-452-4
5/16	3/4	5/16	2-1/2	.030	417-453	423-453	417-453-4	423-453-4
5/16	3/4	5/16	2-1/2	.040	417-454	423-454	417-454-4	423-454-4
5/16	3/4	5/16	2-1/2	.060	417-455	423-455	417-455-4	423-455-4
5/16	1-1/8	5/16	3	.015	418-501	424-501	418-501-4	424-501-4
5/16	1-1/8	5/16	3	.020	418-502	424-502	418-502-4	424-502-4
5/16	1-1/8	5/16	3	.030	418-503	424-503	418-503-4	424-503-4
5/16	1-1/8	5/16	3	.040	418-504	424-504	418-504-4	424-504-4
5/16	1-1/8	5/16	3	.060	418-505	424-505	418-505-4	424-505-4
5/16	1	5/16	3	.015	417-461	423-461	417-461-4	423-461-4
5/16	1	5/16	3	.020	417-462	423-462	417-462-4	423-462-4
5/16	1	5/16	3	.030	417-463	423-463	417-463-4	423-463-4
5/16	1	5/16	3	.040	417-464	423-464	417-464-4	423-464-4
5/16	1	5/16	3	.060	417-465	423-465	417-465-4	423-465-4
5/16	1-5/8	5/16	4	.015	418-521	424-521	418-521-4	424-521-4
5/16	1-5/8	5/16	4	.020	418-522	424-522	418-522-4	424-522-4
5/16	1-5/8	5/16	4	.030	418-523	424-523	418-523-4	424-523-4
5/16	1-5/8	5/16	4	.040	418-524	424-524	418-524-4	424-524-4
5/16	1-5/8	5/16	4	.060	418-525	424-525	418-525-4	424-525-4

Corner Radius AxMills

Chipbreaker



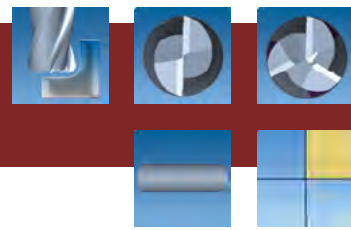
Non-Ferrous
& Aluminum
N

OD D1	LOC L1	SHK D2	OAL L2	Radius R	Uncoated		PowerZ	
					2 Flute	3 Flute	2 Flute	3 Flute
5/16	1	5/16	4	.015	418-511	424-511	418-511-4	424-511-4
5/16	1	5/16	4	.020	418-512	424-512	418-512-4	424-512-4
5/16	1	5/16	4	.030	418-513	424-513	418-513-4	424-513-4
5/16	1	5/16	4	.040	418-514	424-514	418-514-4	424-514-4
5/16	1	5/16	4	.060	418-515	424-515	418-515-4	424-515-4
5/16	1-1/2	5/16	6	.015	418-531	424-531	418-531-4	424-531-4
5/16	1-1/2	5/16	6	.020	418-532	424-532	418-532-4	424-532-4
5/16	1-1/2	5/16	6	.030	418-533	424-533	418-533-4	424-533-4
5/16	1-1/2	5/16	6	.040	418-534	424-534	418-534-4	424-534-4
5/16	1-1/2	5/16	6	.060	418-535	424-535	418-535-4	424-535-4
3/8	7/8	3/8	2-1/2	.010	417-471	423-471	417-471-4	423-471-4
3/8	7/8	3/8	2-1/2	.020	417-472	423-472	417-472-4	423-472-4
3/8	7/8	3/8	2-1/2	.030	417-473	423-473	417-473-4	423-473-4
3/8	7/8	3/8	2-1/2	.040	417-474	423-474	417-474-4	423-474-4
3/8	7/8	3/8	2-1/2	.060	417-475	423-475	417-475-4	423-475-4
3/8	1	3/8	2-1/2	.015	417-481	423-481	417-481-4	423-481-4
3/8	1	3/8	2-1/2	.020	417-482	423-482	417-482-4	423-482-4
3/8	1	3/8	2-1/2	.030	417-483	423-483	417-483-4	423-483-4
3/8	1	3/8	2-1/2	.040	417-484	423-484	417-484-4	423-484-4
3/8	1	3/8	2-1/2	.060	417-485	423-485	417-485-4	423-485-4
3/8	1-1/8	3/8	3	.015	418-541	424-541	418-541-4	424-541-4
3/8	1-1/8	3/8	3	.020	418-542	424-542	418-542-4	424-542-4
3/8	1-1/8	3/8	3	.030	418-543	424-543	418-543-4	424-543-4
3/8	1-1/8	3/8	3	.040	418-544	424-544	418-544-4	424-544-4
3/8	1-1/8	3/8	3	.060	418-545	424-545	418-545-4	424-545-4
3/8	1-3/4	3/8	4	.015	418-551	424-551	418-551-4	424-551-4
3/8	1-3/4	3/8	4	.020	418-552	424-552	418-552-4	424-552-4
3/8	1-3/4	3/8	4	.030	418-553	424-553	418-553-4	424-553-4
3/8	1-3/4	3/8	4	.040	418-554	424-554	418-554-4	424-554-4
3/8	1-3/4	3/8	4	.060	418-555	424-555	418-555-4	424-555-4
3/8	2	3/8	4	.015	418-561	424-561	418-561-4	424-561-4
3/8	2	3/8	4	.020	418-562	424-562	418-562-4	424-562-4
3/8	2	3/8	4	.030	418-563	424-563	418-563-4	424-563-4
3/8	2	3/8	4	.040	418-564	424-564	418-564-4	424-564-4

HP
Endmills

Corner Radius AxMills

Chipbreaker

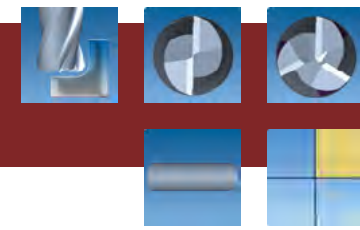


Non-Ferrous
& Aluminum
N

OD D1	LOC L1	SHK D2	OAL L2	Radius R	Uncoated		PowerZ	
					2 Flute	3 Flute	2 Flute	3 Flute
3/8	2	3/8	4	.060	418-565	424-565	418-565-4	424-565-4
3/8	1-1/2	3/8	6	.015	418-571	424-571	418-571-4	424-571-4
3/8	1-1/2	3/8	6	.020	418-572	424-572	418-572-4	424-572-4
3/8	1-1/2	3/8	6	.030	418-573	424-573	418-573-4	424-573-4
3/8	1-1/2	3/8	6	.040	418-574	424-574	418-574-4	424-574-4
3/8	1-1/2	3/8	6	.060	418-575	424-575	418-575-4	424-575-4
3/8	3	3/8	6	.015	418-581	424-581	418-581-4	424-581-4
3/8	3	3/8	6	.020	418-582	424-582	418-582-4	424-582-4
3/8	3	3/8	6	.030	418-583	424-583	418-583-4	424-583-4
3/8	3	3/8	6	.040	418-584	424-584	418-584-4	424-584-4
3/8	3	3/8	6	.060	418-585	424-585	418-585-4	424-585-4
7/16	1	7/16	2-1/2	.015	417-491	423-491	417-491-4	423-491-4
7/16	1	7/16	2-1/2	.020	417-492	423-492	417-492-4	423-492-4
7/16	1	7/16	2-1/2	.030	417-493	423-493	417-493-4	423-493-4
7/16	1	7/16	2-1/2	.040	417-494	423-494	417-494-4	423-494-4
7/16	1	7/16	2-1/2	.060	417-495	423-495	417-495-4	423-495-4
7/16	1	7/16	4	.015	418-591	424-591	418-591-4	424-591-4
7/16	1	7/16	4	.020	418-592	424-592	418-592-4	424-592-4
7/16	1	7/16	4	.030	418-593	424-593	418-593-4	424-593-4
7/16	1	7/16	4	.040	418-594	424-594	418-594-4	424-594-4
7/16	1	7/16	4	.060	418-595	424-595	418-595-4	424-595-4
7/16	2	7/16	4	.015	418-601	424-601	418-601-4	424-601-4
7/16	2	7/16	4	.020	418-602	424-602	418-602-4	424-602-4
7/16	2	7/16	4	.030	418-603	424-603	418-603-4	424-603-4
7/16	2	7/16	4	.040	418-604	424-604	418-604-4	424-604-4
7/16	2	7/16	4	.060	418-605	424-605	418-605-4	424-605-4
7/16	1-1/2	7/16	6	.015	418-611	424-611	418-611-4	424-611-4
7/16	1-1/2	7/16	6	.020	418-612	424-612	418-612-4	424-612-4
7/16	1-1/2	7/16	6	.030	418-613	424-613	418-613-4	424-613-4
7/16	1-1/2	7/16	6	.040	418-614	424-614	418-614-4	424-614-4
7/16	1-1/2	7/16	6	.060	418-615	424-615	418-615-4	424-615-4
7/16	3	7/16	6	.015	418-621	424-621	418-621-4	424-621-4
7/16	3	7/16	6	.020	418-622	424-622	418-622-4	424-622-4
7/16	3	7/16	6	.030	418-623	424-623	418-623-4	424-623-4

Corner Radius AxMills

Chipbreaker



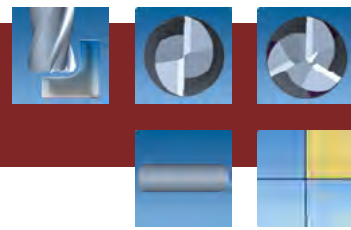
Non-Ferrous
& Aluminum
N

OD D1	LOC L1	SHK D2	OAL L2	Radius R	Uncoated		PowerZ	
					2 Flute	3 Flute	2 Flute	3 Flute
7/16	3	7/16	6	.040	418-624	424-624	418-624-4	424-624-4
7/16	3	7/16	6	.060	418-625	424-625	418-625-4	424-625-4
1/2	1-1/4	1/2	3	.015	417-511	423-511	417-511-4	423-511-4
1/2	1-1/4	1/2	3	.020	417-512	423-512	417-512-4	423-512-4
1/2	1-1/4	1/2	3	.030	417-513	423-513	417-513-4	423-513-4
1/2	1-1/4	1/2	3	.040	417-514	423-514	417-514-4	423-514-4
1/2	1-1/4	1/2	3	.060	417-515	423-515	417-515-4	423-515-4
1/2	1-1/4	1/2	3	.090	417-516	423-516	417-516-4	423-516-4
1/2	1-1/4	1/2	3	.120	417-517	423-517	417-517-4	423-517-4
1/2	1	1/2	3	.015	417-501	423-501	417-501-4	423-501-4
1/2	1	1/2	3	.020	417-502	423-502	417-502-4	423-502-4
1/2	1	1/2	3	.030	417-503	423-503	417-503-4	423-503-4
1/2	1	1/2	3	.040	417-504	423-504	417-504-4	423-504-4
1/2	1	1/2	3	.060	417-505	423-505	417-505-4	423-505-4
1/2	1	1/2	3	.090	417-506	423-506	417-506-4	423-506-4
1/2	1	1/2	3	.120	417-507	423-507	417-507-4	423-507-4
1/2	1	1/2	4	.015	418-631	424-631	418-631-4	424-631-4
1/2	1	1/2	4	.020	418-632	424-632	418-632-4	424-632-4
1/2	1	1/2	4	.030	418-633	424-633	418-633-4	424-633-4
1/2	1	1/2	4	.040	418-634	424-634	418-634-4	424-634-4
1/2	1	1/2	4	.060	418-635	424-635	418-635-4	424-635-4
1/2	1	1/2	4	.090	418-636	424-636	418-636-4	424-636-4
1/2	1	1/2	4	.120	418-637	424-637	418-637-4	424-637-4
1/2	2	1/2	4	.015	418-651	424-651	418-651-4	424-651-4
1/2	2	1/2	4	.020	418-652	424-652	418-652-4	424-652-4
1/2	2	1/2	4	.030	418-653	424-653	418-653-4	424-653-4
1/2	2	1/2	4	.040	418-654	424-654	418-654-4	424-654-4
1/2	2	1/2	4	.060	418-655	424-655	418-655-4	424-655-4
1/2	2	1/2	4	.090	418-656	424-656	418-656-4	424-656-4
1/2	2	1/2	4	.120	418-657	424-657	418-657-4	424-657-4
1/2	1-1/2	1/2	6	.015	418-641	424-641	418-641-4	424-641-4
1/2	1-1/2	1/2	6	.020	418-642	424-642	418-642-4	424-642-4
1/2	1-1/2	1/2	6	.030	418-643	424-643	418-643-4	424-643-4
1/2	1-1/2	1/2	6	.040	418-644	424-644	418-644-4	424-644-4

HP
Endmills

Corner Radius AxMills

Chipbreaker

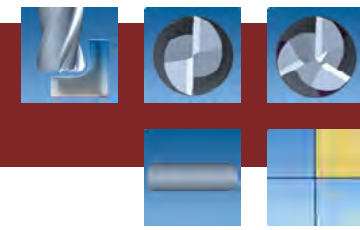


Non-Ferrous
& Aluminum
N

OD D1	LOC L1	SHK D2	OAL L2	Radius R	Uncoated		PowerZ	
					2 Flute	3 Flute	2 Flute	3 Flute
1/2	1-1/2	1/2	6	.060	418-645	424-645	418-645-4	424-645-4
1/2	1-1/2	1/2	6	.090	418-646	424-646	418-646-4	424-646-4
1/2	1-1/2	1/2	6	.120	418-647	424-647	418-647-4	424-647-4
1/2	3	1/2	6	.015	418-661	424-661	418-661-4	424-661-4
1/2	3	1/2	6	.020	418-662	424-662	418-662-4	424-662-4
1/2	3	1/2	6	.030	418-663	424-663	418-663-4	424-663-4
1/2	3	1/2	6	.040	418-664	424-664	418-664-4	424-664-4
1/2	3	1/2	6	.060	418-665	424-665	418-665-4	424-665-4
1/2	3	1/2	6	.090	418-666	424-666	418-666-4	424-666-4
1/2	3	1/2	6	.120	418-667	424-667	418-667-4	424-667-4
9/16	1-1/4	9/16	3	.015	417-521	423-521	417-521-4	423-521-4
9/16	1-1/4	9/16	3	.020	417-522	423-522	417-522-4	423-522-4
9/16	1-1/4	9/16	3	.030	417-523	423-523	417-523-4	423-523-4
9/16	1-1/4	9/16	3	.040	417-524	423-524	417-524-4	423-524-4
9/16	1-1/4	9/16	3	.060	417-525	423-525	417-525-4	423-525-4
9/16	1-1/4	9/16	3	.090	417-526	423-526	417-526-4	423-526-4
9/16	1-1/4	9/16	3	.120	417-527	423-527	417-527-4	423-527-4
5/8	1-1/4	5/8	3-1/2	.015	417-531	423-531	417-531-4	423-531-4
5/8	1-1/4	5/8	3-1/2	.020	417-532	423-532	417-532-4	423-532-4
5/8	1-1/4	5/8	3-1/2	.030	417-533	423-533	417-533-4	423-533-4
5/8	1-1/4	5/8	3-1/2	.040	417-534	423-534	417-534-4	423-534-4
5/8	1-1/4	5/8	3-1/2	.060	417-535	423-535	417-535-4	423-535-4
5/8	1-1/4	5/8	3-1/2	.090	417-536	423-536	417-536-4	423-536-4
5/8	1-1/4	5/8	3-1/2	.120	417-537	423-537	417-537-4	423-537-4
5/8	1-5/8	5/8	3-1/2	.015	417-541	423-541	417-541-4	423-541-4
5/8	1-5/8	5/8	3-1/2	.020	417-542	423-542	417-542-4	423-542-4
5/8	1-5/8	5/8	3-1/2	.030	417-543	423-543	417-543-4	423-543-4
5/8	1-5/8	5/8	3-1/2	.040	417-544	423-544	417-544-4	423-544-4
5/8	1-5/8	5/8	3-1/2	.060	417-545	423-545	417-545-4	423-545-4
5/8	1-5/8	5/8	3-1/2	.090	417-546	423-546	417-546-4	423-546-4
5/8	1-5/8	5/8	3-1/2	.120	417-547	423-547	417-547-4	423-547-4
5/8	2-1/4	5/8	5	.015	418-671	424-671	418-671-4	424-671-4
5/8	2-1/4	5/8	5	.020	418-672	424-672	418-672-4	424-672-4
5/8	2-1/4	5/8	5	.030	418-673	424-673	418-673-4	424-673-4

Corner Radius AxMills

Chipbreaker



Non-Ferrous
& Aluminum
N

OD D1	LOC L1	SHK D2	OAL L2	Radius R	Uncoated		PowerZ	
					2 Flute	3 Flute	2 Flute	3 Flute
5/8	2-1/4	5/8	5	.040	418-674	424-674	418-674-4	424-674-4
5/8	2-1/4	5/8	5	.060	418-675	424-675	418-675-4	424-675-4
5/8	2-1/4	5/8	5	.090	418-676	424-676	418-676-4	424-676-4
5/8	2-1/4	5/8	5	.120	418-677	424-677	418-677-4	424-677-4
5/8	3	5/8	6	.015	418-681	424-681	418-681-4	424-681-4
5/8	3	5/8	6	.020	418-682	424-682	418-682-4	424-682-4
5/8	3	5/8	6	.030	418-683	424-683	418-683-4	424-683-4
5/8	3	5/8	6	.040	418-684	424-684	418-684-4	424-684-4
5/8	3	5/8	6	.060	418-685	424-685	418-685-4	424-685-4
5/8	3	5/8	6	.090	418-686	424-686	418-686-4	424-686-4
5/8	3	5/8	6	.120	418-687	424-687	418-687-4	424-687-4
3/4	1-1/2	3/4	4	.015	417-561	423-561	417-561-4	423-561-4
3/4	1-1/2	3/4	4	.020	417-562	423-562	417-562-4	423-562-4
3/4	1-1/2	3/4	4	.030	417-563	423-563	417-563-4	423-563-4
3/4	1-1/2	3/4	4	.040	417-564	423-564	417-564-4	423-564-4
3/4	1-1/2	3/4	4	.060	417-565	423-565	417-565-4	423-565-4
3/4	1-1/2	3/4	4	.090	417-566	423-566	417-566-4	423-566-4
3/4	1-1/2	3/4	4	.120	417-567	423-567	417-567-4	423-567-4
3/4	1-5/8	3/4	4	.015	417-571	423-571	417-571-4	423-571-4
3/4	1-5/8	3/4	4	.020	417-572	423-572	417-572-4	423-572-4
3/4	1-5/8	3/4	4	.030	417-573	423-573	417-573-4	423-573-4
3/4	1-5/8	3/4	4	.040	417-574	423-574	417-574-4	423-574-4
3/4	1-5/8	3/4	4	.060	417-575	423-575	417-575-4	423-575-4
3/4	1-5/8	3/4	4	.090	417-576	423-576	417-576-4	423-576-4
3/4	1-5/8	3/4	4	.120	417-577	423-577	417-577-4	423-577-4
3/4	1-3/4	3/4	4	.015	417-581	423-581	417-581-4	423-581-4
3/4	1-3/4	3/4	4	.020	417-582	423-582	417-582-4	423-582-4
3/4	1-3/4	3/4	4	.030	417-583	423-583	417-583-4	423-583-4
3/4	1-3/4	3/4	4	.040	417-584	423-584	417-584-4	423-584-4
3/4	1-3/4	3/4	4	.060	417-585	423-585	417-585-4	423-585-4
3/4	1-3/4	3/4	4	.090	417-586	423-586	417-586-4	423-586-4
3/4	1-3/4	3/4	4	.120	417-587	423-587	417-587-4	423-587-4
3/4	1	3/4	4	.015	417-551	423-551	417-551-4	423-551-4
3/4	1	3/4	4	.020	417-552	423-552	417-552-4	423-552-4

HP
Endmills

Corner Radius AxMills

Chipbreaker

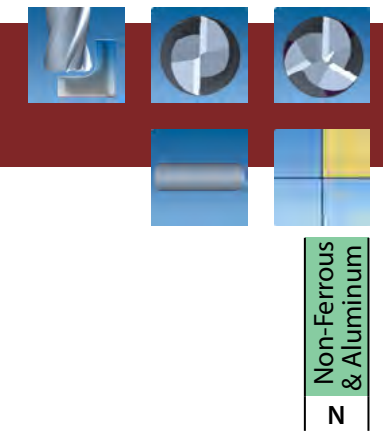


Non-Ferrous
& Aluminum
N

OD D1	LOC L1	SHK D2	OAL L2	Radius R	Uncoated		PowerZ	
					2 Flute	3 Flute	2 Flute	3 Flute
3/4	1	3/4	4	.030	417-553	423-553	417-553-4	423-553-4
3/4	1	3/4	4	.040	417-554	423-554	417-554-4	423-554-4
3/4	1	3/4	4	.060	417-555	423-555	417-555-4	423-555-4
3/4	1	3/4	4	.090	417-556	423-556	417-556-4	423-556-4
3/4	1	3/4	4	.120	417-557	423-557	417-557-4	423-557-4
3/4	2-1/4	3/4	5	.015	418-691	424-691	418-691-4	424-691-4
3/4	2-1/4	3/4	5	.020	418-692	424-692	418-692-4	424-692-4
3/4	2-1/4	3/4	5	.030	418-693	424-693	418-693-4	424-693-4
3/4	2-1/4	3/4	5	.040	418-694	424-694	418-694-4	424-694-4
3/4	2-1/4	3/4	5	.060	418-695	424-695	418-695-4	424-695-4
3/4	2-1/4	3/4	5	.090	418-696	424-696	418-696-4	424-696-4
3/4	2-1/4	3/4	5	.120	418-697	424-697	418-697-4	424-697-4
3/4	3	3/4	6	.010	418-702	424-702	418-702-4	424-702-4
3/4	3	3/4	6	.015	418-701	424-701	418-701-4	424-701-4
3/4	3	3/4	6	.030	418-703	424-703	418-703-4	424-703-4
3/4	3	3/4	6	.040	418-704	424-704	418-704-4	424-704-4
3/4	3	3/4	6	.060	418-705	424-705	418-705-4	424-705-4
3/4	3	3/4	6	.090	418-706	424-706	418-706-4	424-706-4
3/4	3	3/4	6	.120	418-707	424-707	418-707-4	424-707-4
1	1-1/2	1	4	.015	417-591	423-591	417-591-4	423-591-4
1	1-1/2	1	4	.020	417-592	423-592	417-592-4	423-592-4
1	1-1/2	1	4	.030	417-593	423-593	417-593-4	423-593-4
1	1-1/2	1	4	.040	417-594	423-594	417-594-4	423-594-4
1	1-1/2	1	4	.060	417-595	423-595	417-595-4	423-595-4
1	1-1/2	1	4	.090	417-596	423-596	417-596-4	423-596-4
1	1-1/2	1	4	.120	417-597	423-597	417-597-4	423-597-4
1	2	1	6	.015	418-711	424-711	418-711-4	424-711-4
1	2	1	6	.020	418-712	424-712	418-712-4	424-712-4
1	2	1	6	.030	418-713	424-713	418-713-4	424-713-4
1	2	1	6	.040	418-714	424-714	418-714-4	424-714-4
1	2	1	6	.060	418-715	424-715	418-715-4	424-715-4
1	2	1	6	.090	418-716	424-716	418-716-4	424-716-4
1	2	1	6	.120	418-717	424-717	418-717-4	424-717-4
1	3	1	6	.015	418-731	424-731	418-731-4	424-731-4

Corner Radius End AxMills

Chipbreaker

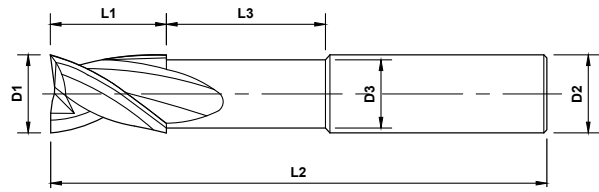
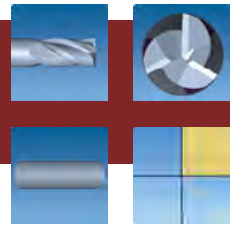


Non-Ferrous
& Aluminum
N

OD D1	LOC L1	SHK D2	OAL L2	Radius R	Uncoated		PowerZ	
					2 Flute	3 Flute	2 Flute	3 Flute
1	3	1	6	.020	418-732	424-732	418-732-4	424-732-4
1	3	1	6	.030	418-733	424-733	418-733-4	424-733-4
1	3	1	6	.040	418-734	424-734	418-734-4	424-734-4
1	3	1	6	.060	418-735	424-735	418-735-4	424-735-4
1	3	1	6	.090	418-736	424-736	418-736-4	424-736-4
1	3	1	6	.120	418-737	424-737	418-737-4	424-737-4
1	4	1	6	.015	418-721	424-721	418-721-4	424-721-4
1	4	1	6	.020	418-722	424-722	418-722-4	424-722-4
1	4	1	6	.030	418-723	424-723	418-723-4	424-723-4
1	4	1	6	.040	418-724	424-724	418-724-4	424-724-4
1	4	1	6	.060	418-725	424-725	418-725-4	424-725-4
1	4	1	6	.090	418-726	424-726	418-726-4	424-726-4
1	4	1	6	.120	418-727	424-727	418-727-4	424-727-4

HP
Endmills

Square End Necked AxMills



3 Flutes • Coated and Uncoated

- High Performance **A-Gr-SiV** submicron grain carbide
- For improved reach
- Unique flute and relief angles for aluminum
- Faster speeds and feeds
- MAP certified quality

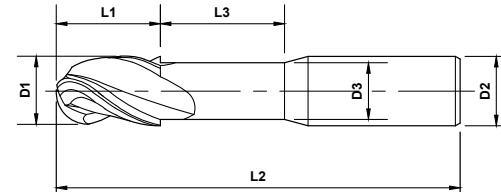
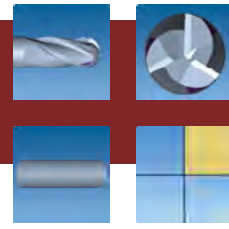
Non-Ferrous & Aluminum
N



Uncoated

OD	LOC	SHK	OAL	Neck OD	Neck L	Uncoated	PowerZ
D1	L1	D2	L2	D3	L3	3 Flute	3 Flute
1/8	1/4	1/8	1-1/2	.115	1/4	426-002	426-002-4
1/8	1/4	1/8	3	.115	1-1/8	427-002	427-002-4
3/16	5/16	3/16	2	.175	3/16	426-004	426-004-4
3/16	5/16	3/16	3	.175	1-1/16	427-004	427-004-4
1/4	3/8	1/4	2-1/2	.235	3/4	426-006	426-006-4
1/4	3/8	1/4	4	.235	1-3/4	427-006	427-006-4
1/4	3/4	1/4	4	.235	1-3/8	427-008	427-008-4
5/16	7/16	5/16	2-1/2	.291	11/16	426-008	426-008-4
5/16	7/16	5/16	4	.291	1-11/16	427-010	427-010-4
5/16	13/16	5/16	4	.291	1-5/16	427-012	427-012-4
3/8	1/2	3/8	2-1/2	.355	5/8	426-010	426-010-4
3/8	1/2	3/8	4	.355	1-5/8	427-014	427-014-4
3/8	1	3/8	4	.355	1-1/8	427-016	427-016-4
1/2	5/8	1/2	3	.475	3/4	426-012	426-012-4
1/2	5/8	1/2	4	.475	1-3/4	427-018	427-018-4
1/2	5/8	1/2	6	.475	2-3/4	427-020	427-020-4
1/2	1-1/4	1/2	6	.475	2-1/8	427-022	427-022-4
5/8	3/4	5/8	3-1/2	.519	7/8	426-014	426-014-4
5/8	3/4	5/8	5	.519	1-5/8	427-024	427-024-4
5/8	3/4	5/8	6	.519	2-5/8	427-026	427-026-4
5/8	1-5/8	5/8	6	.519	1-3/4	427-028	427-028-4
3/4	1	3/4	4	.715	5/8	426-016	426-016-4
3/4	1	3/4	5	.715	1-1/2	427-030	427-030-4
3/4	1-5/8	3/4	6	.715	1-3/4	427-034	427-034-4
3/4	1	3/4	6	.715	2-3/8	427-032	427-032-4
1	1-1/4	1	5	.960	7/8	426-018	426-018-4
1	2	1	5	.960	1/8	427-040	427-040-4
1	1-1/4	1	6	.960	2-1/8	427-036	427-036-4
1	1-1/4	1	7	.960	3-1/8	427-038	427-038-4

Ball End Necked AxMills



3 Flutes • Coated and Uncoated

- High Performance **A-Gr-SiV** submicron grain carbide
- Unique flute and relief angles for aluminum
- Faster speeds and feeds
- MAP certified quality

Non-Ferrous & Aluminum
N

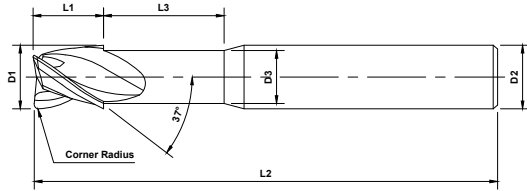


Uncoated

OD	LOC	SHK	OAL	Neck OD	Neck L	Uncoated	PowerZ
D1	L1	D2	L2	D3	L3	3 Flute	3 Flute
1/8	1/4	1/8	1-1/2	.115	1/4	426-202	426-202-4
1/8	1/4	1/8	3	.115	1-1/8	427-202	427-202-4
3/16	5/16	3/16	2	.175	3/16	426-204	426-204-4
3/16	5/16	3/16	3	.175	1-1/16	427-204	427-204-4
1/4	3/8	1/4	2-1/2	.235	3/4	426-206	426-206-4
1/4	3/8	1/4	4	.235	1-3/4	427-206	427-206-4
1/4	3/4	1/4	4	.235	1-3/8	427-208	427-208-4
5/16	7/16	5/16	2-1/2	.291	11/16	426-208	426-208-4
5/16	7/16	5/16	4	.291	1-11/16	427-210	427-210-4
3/8	1/2	3/8	2-1/2	.355	5/8	426-210	426-210-4
3/8	1/2	3/8	4	.355	1-5/8	427-214	427-214-4
3/8	1	3/8	4	.355	1-1/8	427-216	427-216-4
1/2	5/8	1/2	3	.475	1/2	426-212	426-212-4
1/2	5/8	1/2	4	.475	1-3/4	427-218	427-218-4
1/2	5/8	1/2	6	.475	2-3/4	427-220	427-220-4
1/2	1-1/4	1/2	6	.475	2-1/8	427-222	427-222-4
5/8	3/4	5/8	3-1/2	.519	7/8	426-214	426-214-4
5/8	3/4	5/8	5	.519	1-5/8	427-224	427-224-4
5/8	3/4	5/8	6	.519	2-5/8	427-226	427-226-4
5/8	1-5/8	5/8	6	.519	1-3/4	427-228	427-228-4
3/4	1	3/4	4	.715	5/8	426-216	426-216-4
3/4	1	3/4	5	.715	1-1/2	427-230	427-230-4
3/4	1-5/8	3/4	6	.715	1-3/4	427-234	427-234-4
3/4	1	3/4	6	.715	2-3/8	427-232	427-232-4
1	1-1/4	1	5	.960	7/8	426-218	426-218-4
1	2	1	5	.960	1/8	427-240	427-240-4
1	1-1/4	1	6	.960	2-1/8	427-236	427-236-4
1	1-1/4	1	7	.960	3-1/8	427-238	427-238-4

Corner Radius AxMills

Necked 3 Flutes • Coated and Uncoated



- High Performance **A-Gr-SiV** submicron grain carbide
- Unique flute and relief angles for aluminum
- Faster speeds and feeds
- MAP certified quality

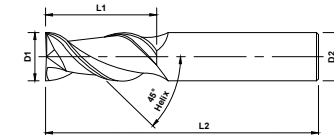
Non-Ferrous & Aluminum
N



Uncoated

OD D1	LOC L2	SHK D2	OAL L2	Neck OD D3	Neck L L3	Radius R	Uncoated 3 Flute	PowerZ 3 Flute
1/8	1/4	1/8	1-1/2	.115	1/4	.015	426-401	426-401-4
1/8	1/4	1/8	3	.115	1-1/8	.015	427-401	427-401-4
3/16	5/16	3/16	2	.175	3/16	.020	426-412	426-412-4
3/16	5/16	3/16	3	.175	1-1/16	.020	427-412	427-412-4
1/4	3/8	1/4	2-1/2	.235	3/4	.020	426-422	426-422-4
1/4	3/8	1/4	4	.235	1-3/4	.020	427-422	427-422-4
1/4	3/4	1/4	4	.235	1-3/8	.020	427-432	427-432-4
3/8	1/2	3/8	2-1/2	.355	11/16	.030	426-433	426-433-4
3/8	1/2	3/8	4	.355	1-11/16	.030	427-443	427-443-4
1/2	5/8	1/2	3	.291	1-5/16	.030	426-443	426-443-4
1/2	5/8	1/2	4	.355	5/8	.030	427-453	427-453-4
1/2	5/8	1/2	6	.355	1-5/8	.030	427-463	427-463-4
1/2	1-1/4	1/2	6	.355	1-1/8	.030	427-473	427-473-4
5/8	3/4	5/8	3-1/2	.475	3/4	.030	426-453	426-453-4
5/8	3/4	5/8	5	.475	1-3/4	.030	427-483	427-483-4
5/8	3/4	5/8	6	.475	2-3/4	.030	427-493	427-493-4
5/8	1-5/8	5/8	6	.475	2-1/8	.030	427-503	427-503-4
3/4	1	3/4	4	.519	7/8	.030	426-463	426-463-4
3/4	1	3/4	5	.519	1-5/8	.030	427-513	427-513-4
3/4	1-5/8	3/4	6	.519	1-3/4	.030	427-533	427-533-4
3/4	1	3/4	6	.519	2-5/8	.030	427-523	427-523-4
1	1-1/4	1	5	.715	5/8	.030	426-473	426-473-4
1	2	1	5	.715	1-3/4	.030	427-563	427-563-4
1	1-1/4	1	6	.715	1-1/2	.030	427-543	427-543-4
1	1-1/4	1	7	.715	2-3/8	.030	427-553	427-553-4

45° Helix Square HyperMills



2 Flutes • Coated and Uncoated



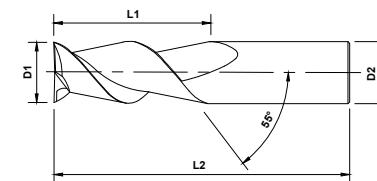
PowerZ

- High Performance **A-Gr-SiV** submicron grain carbide
- Proven performer in aluminum
- MAP certified quality

Non-Ferrous & Aluminum
N

OD D1	LOC L1	SHK D2	OAL L2	Uncoated 2 Flute	PowerA 2 Flute	PowerZ 2 Flute
1/4	1	1/4	2-1/2	428-002	428-002-1	428-002-4
5/16	1	5/16	3	428-004	428-004-1	428-004-4
3/8	1	3/8	2-1/2	428-006	428-006-1	428-006-4
1/2	1-1/4	1/2	3	428-008	428-008-1	428-008-4
5/8	1-5/8	5/8	3-1/2	428-010	428-010-1	428-010-4
3/4	1-3/4	3/4	4	428-012	428-012-1	428-012-4
1	1-1/2	1	4	428-014	428-014-1	428-014-4

55° Helix Square AlumaZips



2 Flutes • Coated and Uncoated



Uncoated

- High Performance **A-Gr-SiV** submicron grain carbide
- Unique design for speed and finish in aluminum

Non-Ferrous & Aluminum
N











OD D1	LOC L1	SHK D2	OAL L2	Uncoated 2 Flute	PowerA 2 Flute
1/8	1/2	1/8	1-1/2	428-202	428-202-1
5/32	9/16	5/32	2	428-204	428-204-1
3/16	3/4	3/16	2	428-206	428-206-1
1/4	3/4	1/4	2-1/2	428-208	428-208-1
5/16	3/4	5/16	2-1/2	428-210	428-210-1
3/8	7/8	3/8	2-1/2	428-212	428-212-1
1/2	1	1/2	3	428-214	428-214-1
9/16	1-1/4	9/16	3	428-216	428-216-1
5/8	1-1/4	5/8	3-1/2	428-218	428-218-1
3/4	1-1/2	3/4	4	428-220	428-220-1
1	1-1-2	1	4	428-222	428-222-1

Ultra Performance Endmills









- V4 Ultra
- V5 Ultra
- F45 Ultra
- HY5 Ultra





Table of Contents

	V4 Ultra Square Endmills	134
	V4 Ultra Ball Endmills	135
	V4 Ultra Corner Radius Endmills.	136
	V5 Ultra Square Endmills	137
	V5 Ultra Ball Endmills	138
	V5 Ultra Corner Radius Endmills.	139
	F45 Ultra Square Endmills.	140
	F45 Ultra Corner Radius Endmills	141
	HY5 Ultra Square Endmills	142
	HY5 Ultra Corner Radius Endmills.	143

Features Legend

	4 Flutes		Plain shank
	5 Flutes		Flat Shank
	6 Flutes		Corner Radius
	Ball End		Square End

Coatings Legend

	Power N Coating
	Power NR Coating

Mastercut's Superior Carbide Blend – *A-Gr-SiV* (Active Grain Sized Volume)
 Our superior tungsten carbide gives you the ability to be **aggressive** when you need to be. Growth inhibitors in our submicron carbide blanks maintain the most consistent grain size available, giving you superior hardness AND toughness.

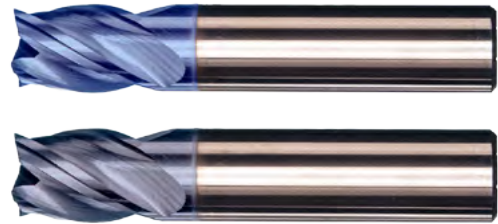
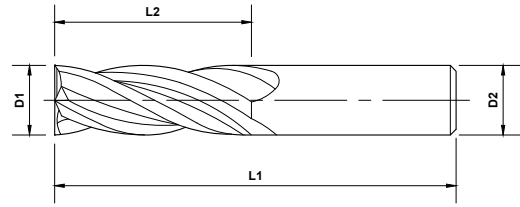
Please contact us for our full line of metric products.

Email: sales@mastercuttool.com
www.mastercuttool.com



V4 Ultra Square Endmill

4 Flutes • Coated with and without Flat



PowerN
PowerNR

- Ultra performance **A-Gr-SiV** submicron grain carbide
- Unique variable design, coating, and edge quality
- Best performance and finish on wide range of materials
- MAP certified quality

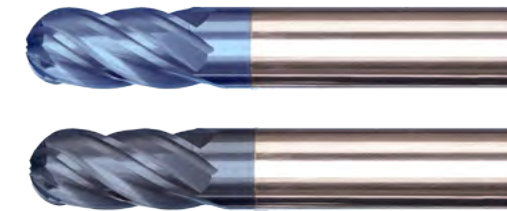
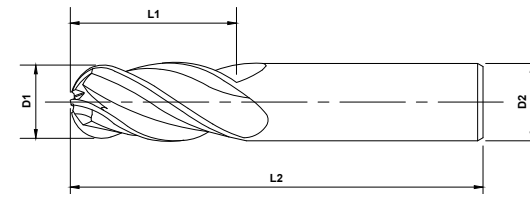
Cermet	Hardened	Cast Iron	Titanium	Stainless	Steel
H	K	S	M	P	

OD D1	LOC L1	SHK D2	OAL L2	PowerN		PowerNR	
				No Flat	With Flat	No Flat	With Flat
1/8	1/4	1/8	1-1/2	452-004-5	452-004W-5	452-004-8	452-004W-8
1/8	3/8	1/8	1-1/2	450-002-5	450-002W-5	450-002-8	450-002W-8
3/16	3/8	3/16	2	452-006-5	452-006W-5	452-006-8	452-006W-8
3/16	7/16	3/16	2	450-006-5	450-006W-5	450-006-8	450-006W-8
1/4	1/2	1/4	2	452-010-5	452-010W-5	452-010-8	452-010W-8
1/4	5/8	1/4	2-1/2	450-010-5	450-010W-5	450-010-8	450-010W-8
1/4	1-1/8	1/4	3	451-002-5	451-002W-5	451-002-8	451-002W-8
5/16	1/2	5/16	2	452-012-5	452-012W-5	452-012-8	452-012W-8
5/16	13/16	5/16	2-1/2	450-012-5	450-012W-5	450-012-8	450-012W-8
5/16	1-1/8	5/16	3	451-004-5	451-004W-5	451-004-8	451-004W-8
3/8	5/8	3/8	2	452-014-5	452-014W-5	452-014-8	452-014W-8
3/8	7/8	3/8	2-1/2	450-016-5	450-016W-5	450-016-8	450-016W-8
1/2	5/8	1/2	2-1/2	452-018-5	452-018W-5	452-018-8	452-018W-8
1/2	1	1/2	3	450-022-5	450-022W-5	450-022-8	450-022W-8
1/2	1-1/4	1/2	3	450-024-5	450-024W-5	450-024-8	450-024W-8
1/2	2	1/2	4	451-008-5	451-008W-5	451-008-8	451-008W-8
5/8	3/4	5/8	3	452-020-5	452-020W-5	452-020-8	452-020W-8
5/8	1-1/4	5/8	3-1/2	450-028-5	450-028W-5	450-028-8	450-028W-8
5/8	2-1/4	5/8	5	451-010-5	451-010W-5	451-010-8	451-010W-8
3/4	1	3/4	3	452-024-5	452-024W-5	452-024-8	452-024W-8
3/4	1-1/2	3/4	4	450-030-5	450-030W-5	450-030-8	450-030W-8
3/4	4	3/4	6	451-016-5	451-016W-5	451-016-8	451-016W-8
1	1-1/2	1	4	450-034-5	450-034W-5	450-034-8	450-034W-8
1	3	1	6	451-020-5	451-020W-5	451-020-8	451-020W-8

We manufacture a full range of cutting diameters. Please call for availability.

V4 Ultra Ball Endmill

4 Flutes • Coated with and without Flat



PowerN
PowerNR

- Ultra performance **A-Gr-SiV** submicron grain carbide
- Unique variable design, coating, and edge quality
- Best performance and finish on wide range of materials
- MAP certified quality

Cermet	Hardened	Cast Iron	Titanium	Stainless	Steel
H	K	S	M	P	

OD D1	LOC L1	SHK D2	OAL L2	PowerN		PowerNR	
				No Flat	With Flat	No Flat	With Flat
1/8	1/4	1/8	1-1/2	452-204-5	452-204W-5	452-204-8	452-204W-8
1/8	3/8	1/8	1-1/2	450-202-5	450-202W-5	450-202-8	450-202W-8
3/16	3/8	3/16	2	452-206-5	452-206W-5	452-206-8	452-206W-8
3/16	7/16	3/16	2	450-206-5	450-206W-5	450-206-8	450-206W-8
1/4	1/2	1/4	2	452-210-5	452-210W-5	452-210-8	452-210W-8
1/4	5/8	1/4	2-1/2	450-210-5	450-210W-5	450-210-8	450-210W-8
1/4	1-1/8	1/4	3	451-202-5	451-202W-5	451-202-8	451-202W-8
5/16	1/2	5/16	2	452-212-5	452-212W-5	452-212-8	452-212W-8
5/16	13/16	5/16	2-1/2	450-212-5	450-212W-5	450-212-8	450-212W-8
5/16	1-1/8	5/16	3	451-204-5	451-204W-5	451-204-8	451-204W-8
3/8	5/8	3/8	2	452-214-5	452-214W-5	452-214-8	452-214W-8
3/8	7/8	3/8	2-1/2	450-216-5	450-216W-5	450-216-8	450-216W-8
1/2	5/8	1/2	2-1/2	452-218-5	452-218W-5	452-218-8	452-218W-8
1/2	1	1/2	3	450-222-5	450-222W-5	450-222-8	450-222W-8
1/2	1-1/4	1/2	3	450-224-5	450-224W-5	450-224-8	450-224W-8
1/2	2	1/2	4	451-208-5	451-208W-5	451-208-8	451-208W-8
5/8	3/4	5/8	3	452-220-5	452-220W-5	452-220-8	452-220W-8
5/8	1-1/4	5/8	3-1/2	450-228-5	450-228W-5	450-228-8	450-228W-8
5/8	2-1/4	5/8	5	451-210-5	451-210W-5	451-210-8	451-210W-8
3/4	1	3/4	3	452-224-5	452-224W-5	452-224-8	452-224W-8
3/4	1-1/2	3/4	4	450-230-5	450-230W-5	450-230-8	450-230W-8
3/4	4	3/4	6	451-216-5	451-216W-5	451-216-8	451-216W-8
1	1-1/2	1	4	450-234-5	450-234W-5	450-234-8	450-234W-8
1	3	1	6	451-220-5	451-220W-5	451-220-8	451-220W-8

We manufacture a full range of cutting diameters. Please call for availability.

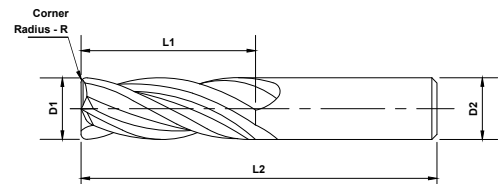
V4 Ultra Endmill

Corner Radius

4 Flutes • Coated with and without Flat



PowerN
PowerNR



- Ultra performance **A-Gr-SiV** submicron grain carbide
- Unique variable design, coating, and edge quality

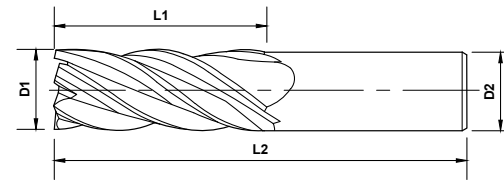
Cermet	Hardened	Cast Iron	Titanium	Stainless	Steel
H	K	S	M	P	

OD D1	LOC L1	SHK D2	OAL L2	Radius R	PowerN		PowerNR	
					No Flat	With Flat	No Flat	With Flat
1/8	1/4	1/8	1-1/2	.015	452-401-5	452-401W-5	452-401-8	452-401W-8
1/8	1/4	1/8	1-1/2	.020	452-402-5	452-402W-5	452-402-8	452-402W-8
3/16	3/8	3/16	2	.020	452-422-5	452-422W-5	452-422-8	452-422W-8
3/16	7/16	3/16	2	.020	450-412-5	450-412W-5	450-412-8	450-412W-8
1/4	1/2	1/4	2	.020	452-442-5	452-442W-5	452-442-8	452-442W-8
1/4	5/8	1/4	2-1/2	.020	450-422-5	450-422W-5	450-422-8	450-422W-8
1/4	1-1/8	1/4	3	.020	451-402-5	451-402W-5	451-402-8	451-402W-8
5/16	1/2	5/16	2	.030	452-453-5	452-453W-5	452-453-8	452-453W-8
5/16	13/16	5/16	2-1/2	.030	450-433-5	450-433W-5	450-433-8	450-433W-8
3/8	5/8	3/8	2	.030	452-463-5	452-463W-5	452-463-8	452-463W-8
3/8	7/8	3/8	2-1/2	.030	450-443-5	450-443W-5	450-443-8	450-443W-8
3/8	1-1/8	3/8	3	.030	451-423-5	451-423W-5	451-423-8	451-423W-8
1/2	5/8	1/2	2-1/2	.030	452-483-5	452-483W-5	452-483-8	452-483W-8
1/2	1	1/2	3	.030	450-463-5	450-463W-5	450-463-8	450-463W-8
1/2	1-1/4	1/2	3	.030	450-473-5	450-473W-5	450-473-8	450-473W-8
1/2	2	1/2	4	.030	451-433-5	451-433W-5	451-433-8	451-433W-8
5/8	3/4	5/8	3	.030	452-493-5	452-493W-5	452-493-8	452-493W-8
5/8	1-1/4	5/8	3-1/2	.030	450-493-5	450-493W-5	450-493-8	450-493W-8
5/8	2-1/4	5/8	5	.030	451-443-5	451-443W-5	451-443-8	451-443W-8
3/4	1	3/4	3	.030	452-503-5	452-503W-5	452-503-8	452-503W-8
3/4	7/8	3/4	3-1/2	.030	452-513-5	452-513W-5	452-513-8	452-513W-8
3/4	1-1/2	3/4	4	.030	450-503-5	450-503W-5	450-503-8	450-503W-8
3/4	1-5/8	3/4	4	.030	450-513-5	450-513W-5	450-513-8	450-513W-8
3/4	3	3/4	6	.030	451-463-5	451-463W-5	451-463-8	451-463W-8
3/4	4	3/4	6	.030	451-473-5	451-473W-5	451-473-8	451-473W-8
1	1-1/2	1	4	.045	450-524-5	450-524W-5	450-524-8	450-524W-8
1	2-1/4	1	5	.045	451-484-5	451-484W-5	451-484-8	451-484W-8
1	3	1	6	.045	451-494-5	451-494W-5	451-494-8	451-494W-8

We manufacture a full range of cutting diameters and Endcut Radii. Please call for availability.

V5 Ultra Square Endmill

5 Flutes • Coated with and without Flat



PowerN
PowerNR

- Ultra performance **A-Gr-SiV** submicron grain carbide
- Unique variable design, coating, and edge quality
- Best performance and finish on wide range of materials
- MAP certified quality

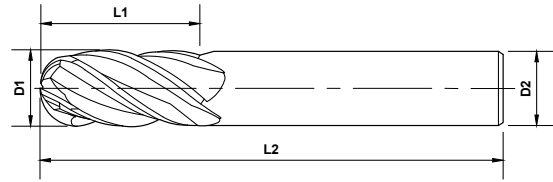
Cermet	Hardened	Cast Iron	Titanium	Stainless	Steel
H	K	S	M	P	

OD D1	LOC L1	SHK D2	OAL L2	PowerN		PowerNR	
				No Flat	With Flat	No Flat	With Flat
5/16	1/2	5/16	2	455-012-5	455-012W-5	455-012-8	455-012W-8
5/16	13/16	5/16	2-1/2	453-008-5	453-008W-5	453-008-8	453-008W-8
3/8	5/8	3/8	2	455-014-5	455-014W-5	455-014-8	455-014W-8
3/8	7/8	3/8	2-1/2	453-010-5	453-010W-5	453-010-8	453-010W-8
3/8	1-1/8	3/8	3	454-004-5	454-004W-5	454-004-8	454-004W-8
1/2	5/8	1/2	2-1/2	455-018-5	455-018W-5	455-018-8	455-018W-8
1/2	1	1/2	3	453-014-5	453-014W-5	453-014-8	453-014W-8
1/2	1-1/4	1/2	3	453-016-5	453-016W-5	453-016-8	453-016W-8
1/2	2	1/2	4	454-006-5	454-006W-5	454-006-8	454-006W-8
5/8	3/4	5/8	3	455-020-5	455-020W-5	455-020-8	455-020W-8
5/8	1-1/4	5/8	3-1/2	453-020-5	453-020W-5	453-020-8	453-020W-8
5/8	2-1/4	5/8	5	454-008-5	454-008W-5	454-008-8	454-008W-8
3/4	7/8	3/4	3-1/2	455-024-5	455-024W-5	455-024-8	455-024W-8
3/4	1	3/4	3	455-022-5	455-022W-5	455-022-8	455-022W-8
3/4	1-1/2	3/4	4	453-024-5	453-024W-5	453-024-8	453-024W-8
3/4	1-5/8	3/4	4	453-022-5	453-022W-5	453-022-8	453-022W-8
3/4	1-1/2	3/4	4	453-024-5	453-024W-5	453-024-8	453-024W-8
3/4	2-1/4	3/4	5	454-010-5	454-010W-5	454-010-8	454-010W-8
3/4	3	3/4	6	454-012-5	454-012W-5	454-012-8	454-012W-8
1	1-1/2	1	4	453-026-5	453-026W-5	453-026-8	453-026W-8
1	2-1/2	1	5	454-014-5	454-014W-5	454-014-8	454-014W-8
1	3	1	6	454-016-5	454-016W-5	454-016-8	454-016W-8
1	4	1	7	454-118-5	454-118W-5	454-118-8	454-118W-8

We manufacture a full range of cutting diameters. Please call for availability.

V5 Ultra Ball Endmill

5 Flutes • Coated with and without Flat



- Ultra performance **A-Gr-SiV** submicron grain carbide
- Unique variable design, coating, and edge quality
- Best performance and finish on wide range of materials
- MAP certified quality

Cermet	Hardened	Cast Iron	Titanium	Stainless	Steel
H	K	S	M	P	

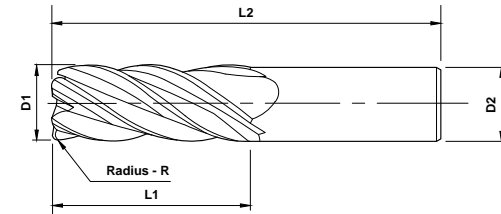


OD D1	LOC L1	SHK D2	OAL L2	PowerN		PowerNR	
				No Flat	With Flat	No Flat	With Flat
5/16	1/2	5/16	2	455-212-5	455-212W-5	455-212-8	455-212W-8
5/16	13/16	5/16	2-1/2	453-208-5	453-208W-5	453-208-8	453-208W-8
3/8	5/8	3/8	2	455-214-5	455-214W-5	455-214-8	455-214W-8
3/8	7/8	3/8	2-1/2	453-210-5	453-210W-5	453-210-8	453-210W-8
3/8	1-1/8	3/8	3	454-204-5	454-204W-5	454-204-8	454-204W-8
1/2	5/8	1/2	2-1/2	455-218-5	455-218W-5	455-218-8	455-218W-8
1/2	1	1/2	3	453-214-5	453-214W-5	453-214-8	453-214W-8
1/2	1-1/4	1/2	3	453-216-5	453-216W-5	453-216-8	453-216W-8
1/2	2	1/2	4	454-206-5	454-206W-5	454-206-8	454-206W-8
5/8	3/4	5/8	3	455-220-5	455-220W-5	455-220-8	455-220W-8
5/8	1-1/4	5/8	3-1/2	453-220-5	453-220W-5	453-220-8	453-220W-8
5/8	2-1/4	5/8	5	454-208-5	454-208W-5	454-208-8	454-208W-8
3/4	1	3/4	3	455-222-5	455-222W-5	455-222-8	455-222W-8
3/4	1-1/2	3/4	4	453-222-5	453-222W-5	453-222-8	453-222W-8
3/4	3	3/4	6	454-212-5	454-212W-5	454-212-8	454-212W-8
1	1-1/2	1	4	453-226-5	453-226W-5	453-226-8	453-226W-8
1	3	1	6	454-216-5	454-216W-5	454-216-8	454-216W-8

We manufacture a full range of cutting diameters. Please call for availability.

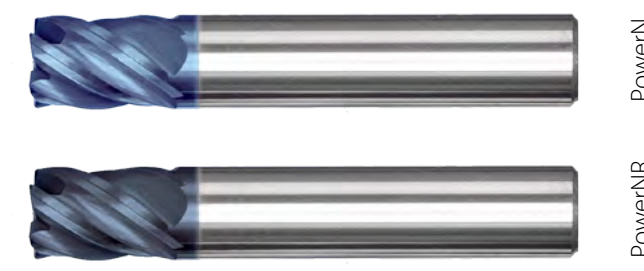
V5 Ultra Endmill

Corner Radius • 5 Flutes • Coated with and without Flat



- Ultra performance **A-Gr-SiV** submicron grain carbide
- Unique variable design, coating, and edge quality
- Best performance and finish on wide range of materials
- MAP certified quality

Cermet	Hardened	Cast Iron	Titanium	Stainless	Steel
H	K	S	M	P	



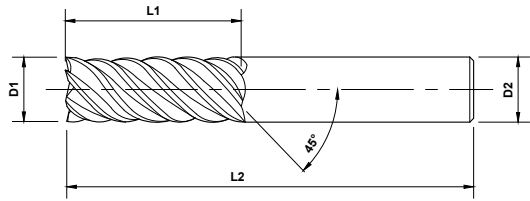
OD D1	LOC L1	SHK D2	OAL L2	Radius R	PowerN		PowerNR	
					No Flat	With Flat	No Flat	With Flat
5/16	1/2	5/16	2	.030	455-453-5	455-453W-5	455-453-8	455-453W-8
5/16	13/16	5/16	2-1/2	.030	453-433-5	453-433W-5	453-433-8	453-433W-8
3/8	7/8	3/8	2-1/2	.030	453-443-5	453-443W-5	453-443-8	453-443W-8
3/8	1-1/8	3/8	3	.030	454-413-5	454-413W-5	454-413-8	454-413W-8
1/2	5/8	1/2	2-1/2	.030	455-483-5	455-483W-5	455-483-8	455-483W-8
1/2	1	1/2	3	.030	453-463-5	453-463W-5	453-463-8	453-463W-8
1/2	2	1/2	4	.030	454-423-5	454-423W-5	454-423-8	454-423W-8
5/8	3/4	5/8	3	.030	455-493-5	455-493W-5	455-493-8	455-493W-8
5/8	1-1/4	5/8	3-1/2	.030	453-493-5	453-493W-5	453-493-8	453-493W-8
5/8	2-1/4	5/8	5	.030	454-433-5	454-433W-5	454-433-8	454-433W-8
3/4	1	3/4	3	.030	455-503-5	455-503W-5	455-503-8	455-503W-8
3/4	7/8	3/4	3-1/2	.030	455-513-5	455-513W-5	455-513-8	455-513W-8
3/4	1-1/2	3/4	4	.030	453-503-5	453-503W-5	453-503-8	453-503W-8
3/4	1-5/8	3/4	4	.030	453-513-5	453-513W-5	453-513-8	453-513W-8
3/4	3	3/4	6	.030	454-453-5	454-453W-5	454-453-8	454-453W-8
1	1-1/2	1	4	.030	453-523-5	453-523W-5	453-523-8	453-523W-8
1	3	1	6	.045	454-474-5	454-474W-5	454-474-8	454-474W-8

We manufacture a full range of cutting diameters. Please call for availability.



F45 Ultra Square Endmill

6 Flutes • Coated



- Ultra performance **A-Gr-SiV** submicron grain carbide
- Unique 45° 6 flute design, superior coating and edge quality
- Best performance and finish on wide range of materials
- MAP certified quality

Cermet	Hardened	Cast Iron	Titanium	Stainless	Steel
H	K	S	M	P	



PowerN



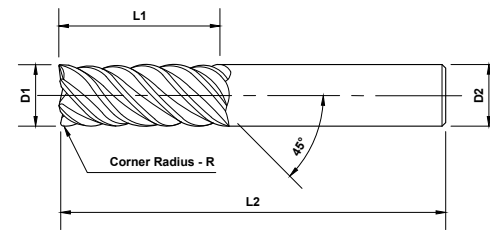
PowerNR

OD	LOC	SHK	OAL	PowerN	PowerNR
D1	L1	D2	L2		
3/16	5/8	3/16	2	459-002-5	459-002-8
1/4	3/4	1/4	2-1/2	459-004-5	459-004-8
5/16	7/8	5/16	2-1/2	459-006-5	459-006-8
3/8	1	3/8	2-1/2	459-008-5	459-008-8
7/16	1	7/16	2-1/2	459-010-5	459-010-8
1/2	1	1/2	3	459-012-5	459-012-8
9/16	1	9/16	3	459-014-5	459-014-8
5/8	1-1/4	5/8	3-1/2	459-016-5	459-016-8
3/4	1-1/2	3/4	4	459-018-5	459-018-8
7/8	1-1/2	7/8	4	459-020-5	459-020-8
1	1-1/2	1	4	459-022-5	459-022-8
1	2-1/4	1	5	459-024-5	459-024-8

We manufacture a full range of cutting diameters. Please call for availability.

F45 Ultra Endmill

Corner Radius 6 Flutes • Coated



- Ultra Performance **A-Gr-SiV** submicron grain carbide
- Unique 45° 6 flute design, superior coating and edge quality
- Best performance and finish on wide range of materials
- MAP certified quality

Cermet	Hardened	Cast Iron	Titanium	Stainless	Steel
H	K	S	M	P	



PowerN



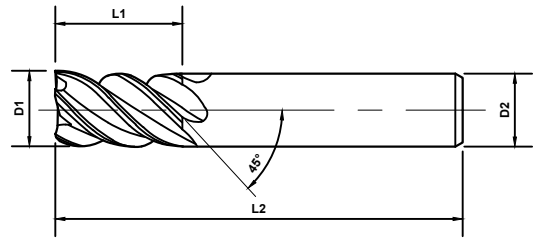
PowerNR

OD	LOC	SHK	OAL	Radius	PowerN	PowerNR
D1	L1	D2	L2	R		
1/4	3/4	1/4	2-1/2	.010	459-200-5	459-200-8
5/16	7/8	5/16	2-1/2	.012	459-210-5	459-210-8
3/8	1	3/8	2-1/2	.012	459-220-5	459-220-8
7/16	1	7/16	2-1/2	.015	459-231-5	459-231-8
1/2	1	1/2	3	.015	459-241-5	459-241-8
9/16	1	9/16	3	.020	459-252-5	459-252-8
5/8	1-1/4	5/8	3-1/2	.020	459-262-5	459-262-8
3/4	1-1/2	3/4	4	.030	459-273-5	459-273-8
7/8	1-1/2	7/8	4	.030	459-283-5	459-283-8
1	1-1/2	1	4	.030	459-293-5	459-293-8

We manufacture a full range of cutting diameters and endcut radii. Please call for availability.

HY5 Ultra Square Endmills

5 Flutes • Coated with and without Flat



Cermet	Hardened	Cast Iron	Titanium	Stainless	Steel
H	K	S	M	P	



PowerN

- Ultra performance **A-Gr-SiV** submicron grain carbide
- Unique 45° 5 flute design, superior coating and edge quality



PowerNR

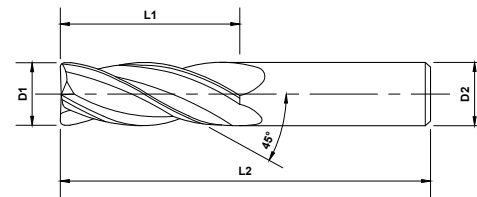
- Best performance and finish on wide range of materials
- MAP certified quality

OD D1	LOC L1	SHK D2	OAL L2	PowerN		PowerNR	
				No Flat	With Flat	No Flat	With Flat
1/8	1/4	1/8	1-1/2	458-004-5	458-004W-5	458-004-8	458-004W-8
1/8	1/2	1/8	1-1/2	456-002-5	456-002W-5	456-002-8	456-002W-8
3/16	3/8	3/16	2	458-006-5	458-006W-5	458-006-8	458-006W-8
3/16	9/16	3/16	2	456-006-5	456-006W-5	456-006-8	456-006W-8
1/4	1/2	1/4	2	458-010-5	458-010W-5	458-010-8	458-010W-8
1/4	3/4	1/4	2-1/2	456-010-5	456-010W-5	456-010-8	456-010W-8
1/4	1-1/8	1/4	3	457-002-5	457-002W-5	457-002-8	457-002W-8
5/16	1/2	5/16	2	458-012-5	458-012W-5	458-012-8	458-012W-8
5/16	13/16	5/16	2-1/2	456-012-5	456-012W-5	456-012-8	456-012W-8
5/16	1-1/8	5/16	3	457-004-5	457-004W-5	457-004-8	457-004W-8
3/8	5/8	3/8	2	458-014-5	458-014W-5	458-014-8	458-014W-8
3/8	7/8	3/8	2-1/2	456-016-5	456-016W-5	456-016-8	456-016W-8
3/8	1-1/8	3/8	3	457-006-5	457-006W-5	457-006-8	457-006W-8
1/2	5/8	1/2	2-1/2	458-018-5	458-018W-5	458-018-8	458-018W-8
1/2	1	1/2	3	456-022-5	456-022W-5	456-022-8	456-022W-8
1/2	1-1/4	1/2	3	456-024-5	456-024W-5	456-024-8	456-024W-8
1/2	2	1/2	4	457-008-5	457-008W-5	457-008-8	457-008W-8
5/8	3/4	5/8	3	458-020-5	458-020W-5	458-020-8	458-020W-8
5/8	1-1/4	5/8	3-1/2	456-028-5	456-028W-5	456-028-8	456-028W-8
3/4	1	3/4	3	458-024-5	458-024W-5	458-024-8	458-024W-8
3/4	1-1/2	3/4	4	456-030-5	456-030W-5	456-030-8	456-030W-8
1	1-1/2	1	4	456-034-5	456-034W-5	456-034-8	456-034W-8
1	3	1	6	452-020-5	452-020W-5	452-020-8	452-020W-8

We manufacture a full range of cutting diameters. Please call for availability.

HY5 Ultra Endmill

Corner Radius 5 Flutes • Coated with and without Flat



Cermet	Hardened	Cast Iron	Titanium	Stainless	Steel
H	K	S	M	P	



PowerN

- Ultra performance **A-Gr-SiV** submicron grain carbide
- Unique 45° 5 flute design, superior coating and edge quality



PowerNR

- Best performance and finish on wide range of materials
- MAP certified quality

OD D1	LOC L1	SHK D2	OAL L2	Radius R	PowerN		PowerNR	
					No Flat	With Flat	No Flat	With Flat
1/8	1/4	1/8	1-1/2	.020	458-402-5	458-402W-5	458-402-8	458-402W-8
3/16	3/8	3/16	2	.020	458-422-5	458-422W-5	458-422-8	458-422W-8
1/4	3/4	1/4	2-1/2	.015	456-421-5	456-421W-5	456-421-8	456-421W-8
1/4	1-1/8	1/4	3	.020	457-402-5	457-402W-5	457-447-8	457-447W-8
5/16	1/2	5/16	2	.030	458-453-5	458-453W-5	458-453-8	458-453W-8
5/16	13/16	5/16	2-1/2	.030	456-433-5	456-433W-5	456-433-8	456-433W-8
3/8	5/8	3/8	2	.030	458-463-5	458-463W-5	458-463-8	458-463W-8
3/8	7/8	3/8	2-1/2	.030	456-443-5	456-443W-5	456-443-8	456-443W-8
3/8	1-1/8	3/8	3	.030	457-423-5	457-423W-5	457-423-8	457-423W-8
1/2	5/8	1/2	2-1/2	.030	458-483-5	458-483W-5	458-483-8	458-483W-8
1/2	1	1/2	3	.030	456-463-5	456-463W-5	456-463-8	456-463W-8
1/2	1-1/4	1/2	3	.030	456-473-5	456-473W-5	456-473-8	456-473W-8
1/2	2	1/2	4	.030	457-433-5	457-433W-5	457-433-8	457-433W-8
5/8	3/4	5/8	3	.030	458-493-5	458-493W-5	458-493-8	458-493W-8
5/8	1-1/4	5/8	3-1/2	.030	456-493-5	456-493W-5	456-493-8	456-493W-8
5/8	2-1/4	5/8	5	.030	457-443-5	457-443W-5	457-443-8	457-443W-8
3/4	1	3/4	3	.030	458-503-5	458-503W-5	458-503-8	458-503W-8
3/4	7/8	3/4	3-1/2	.030	458-513-5	458-513W-5	458-513-8	458-513W-8
3/4	2-1/4	3/4	5	.030	457-453-5	457-453W-5	457-453-8	457-453W-8
3/4	3	3/4	6	.030	457-463-5	457-463W-5	457-463-8	457-463W-8
3/4	4	3/4	6	.030	457-473-5	457-473W-5	457-473-8	457-473W-8
1	1-1/2	1	4	.045	456-524-5	456-524W-5	456-524-8	456-524W-8
1	2-1/4	1	5	.045	457-484-5	457-484W-5	457-484-8	457-484W-8
1	3	1	6	.045	457-494-5	457-494W-5	457-494-8	457-494W-8






We manufacture a full range of cutting diameters and endcut radii. Please call for availability.

High Performance Routers




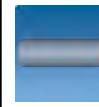



- Specially selected**
- Routers
 - O-Flute Routers
 - CFRP Routers with CVD Diamond Coating







Table of Contents

	Compression Routers	146
	4 Flute Fiberglass Mill End Routers	151
	Diamond Bur Fiberglass Finishers	152
	OFX - O-Flute Extreme Routers	153
	CVD Nano Crystalline Routers	154

Features Legend

	2 Flutes		Multi-Flute
	3 Flutes		Plain Shank
	4 Flutes		Corner Radius
	6 Flutes		

Coatings Legend

	PowerA Coating
	PowerZ Coating
	PowerN Coating
	PowerRD Coating

Mastercut's Superior Carbide Blend – *A-Gr-SiV* (Active Grain Sized Volume)
 Our superior tungsten carbide gives you the ability to be *aggressive* when you need to be. Growth inhibitors in our submicron carbide blanks maintain the most consistent grain size available, giving you superior hardness AND toughness.

Please contact us for our full line of metric products.

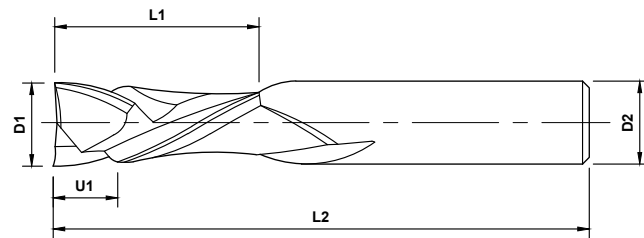
Email: sales@mastercuttool.com
www.mastercuttool.com



Routers

2 Flute Compression

2 Flutes • Coated and Uncoated



- High Performance **A-Gr-SiV** submicron grain carbide
- Unique right and left fluting, controls finish on both sides of work-piece
- Effective for wide range of materials
- MAP certified quality

- Fiberglass
- Graphite
- Composite
- Metal Matrix
- Carbon Fiber
- Honeycomb



Uncoated

OD	LOC	Ucut	SHK	OAL	Uncoated		PowerA		PowerZ	
D1	L1	U1	D2	L2	Standard	Mortise	Standard	Mortise	Standard	Mortise
1/4	7/8	.188	1/4	2-1/2	-	810-202	-	810-202-1	-	810-202-4
1/4	7/8	.2756	1/4	2-1/2	810-030	-	810-030-1	-	810-030-4	-
1/4	7/8	.385	1/4	2-1/2	810-020	-	810-020-1	-	810-020-4	-
3/8	7/8	.188	3/8	3	-	810-204	-	810-204-1	-	810-204-4
3/8	1	.3543	1/2	3	810-034	-	810-034-1	-	810-034-4	-
3/8	1	.440	1/2	3	810-024	-	810-024	-	810-024	-
3/8	1-1/8	.188	3/8	3	-	810-210	-	810-210-1	-	810-210-4
3/8	1-1/8	.188	3/8	3	-	810-212*	-	810-212-1*	-	810-212-4*
3/8	1-1/8	.3543	1/2	3	810-026	-	810-026-1	-	810-026-4	-
3/8	1-1/8	.495	3/8	3	810-002	-	810-002-1	-	810-002-4	-
3/8	1-1/4	.3543	3/8	3	810-032	-	810-032-1	-	810-032-4	-
1/2	7/8	.200	1/2	3	-	810-206	-	810-206-1	-	810-206-4
1/2	1	.440	1/2	3	810-004	-	810-004-1	-	810-004-4	-
1/2	1-1/8	.495	1/2	3	810-006	-	810-006-1	-	810-006-4	-
1/2	1-1/4	.250	1/2	3	-	810-214	-	810-214-1	-	810-214-4
1/2	1-5/16	.577	1/2	3	810-022	-	810-022-1	-	810-022-4	-
1/2	1-3/8	.200	1/2	3-1/2	-	810-208	-	810-208-1	-	810-208-4
1/2	1-3/8	.605	1/2	3-1/2	810-008	-	810-008-1	-	810-008-4	-
1/2	1-5/8	.433	1/2	3-1/2	810-028	-	810-028-1	-	810-028-4	-
1/2	1-5/8	.715	1/2	4	810-010	-	810-010-1	-	810-010-4	-
1/2	1-5/8	.715	1/2	4	810-012*	-	810-012-1*	-	810-012-4*	-
5/8	2-1/4	.990	5/8	5	810-014	-	810-014-1	-	810-014-4	-
3/4	1-7/8	.825	3/4	4	810-016	-	810-016-1	-	810-016-4	-
3/4	2-1/2	1.10	3/4	5	810-018	-	810-018-1	-		

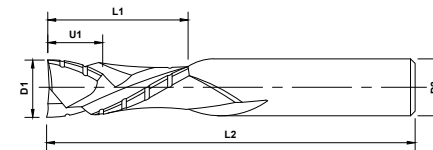
*Left Hand Cut

PowerNR Coating Available

Routers

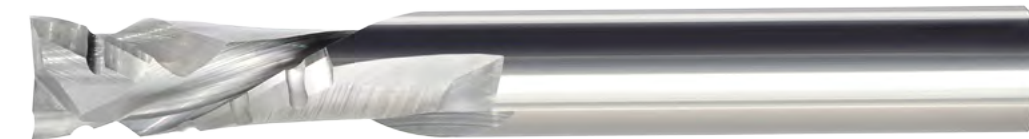
2 Flute Compression Chipbreaker Finisher

2 Flutes • Coated and Uncoated



- High Performance **A-Gr-SiV** submicron grain carbide
- Unique right and left fluting, controls finish on both sides of work-piece
- Effective for wide range of materials
- MAP certified quality

- Fiberglass
- Graphite
- Composite
- Metal Matrix
- Carbon Fiber
- Honeycomb



Uncoated

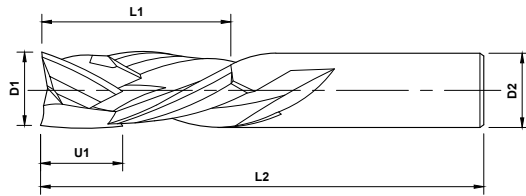
OD	LOC	Ucut	SHK	OAL	Uncoated	PowerA	PowerZ
D1	L1	U1	D2	L2	Standard		
3/8	7/8	.385	3/8	3	810-302	810-302-1	810-302-4
3/8	1-1/8	.495	3/8	3	810-304	810-304-1	810-304-4
1/2	7/8	.385	1/2	3	810-318	810-318-1	810-318-4
1/2	1	.440	1/2	3	810-306	810-306-1	810-306-4
1/2	1-1/8	.495	1/2	3	810-308	810-308-1	810-308-4
1/2	1-3/8	.605	1/2	3-1/2	810-310	810-310-1	810-310-4
1/2	1-5/8	.715	1/2	4	810-312	810-312-1	810-312-4
5/8	2-1/4	.990	5/8	5	810-314	810-314-1	810-314-4
3/4	1-7/8	.825	3/4	4	810-316	810-316-1	810-316-4

PowerNR Coating Available

Routers

3 Flute Compression

3 Flutes • Coated and Uncoated



- High Performance **A-Gr-SiV** submicron grain carbide
- Unique right and left fluting, controls finish on both sides of work-piece
- Effective for wide range of materials
- MAP certified quality



Uncoated

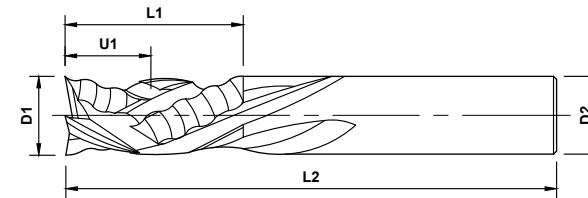
OD D1	LOC L1	Ucut U1	SHK D2	OAL L2	Uncoated		PowerA		PowerZ	
					Standard	Mortise	Standard	Mortise	Standard	Mortise
3/8	7/8	.200	3/8	3	-	818-202	-	818-202-1	-	818-202-4
3/8	1-1/8	.495	3/8	3	818-002	-	818-002-1	-	818-002-4	-
1/2	7/8	.200	1/2	3	-	818-204	-	818-204-1	-	818-204-4
1/2	1-1/8	.495	1/2	3	818-004	-	818-004-1	-	818-004-4	-
1/2	1-3/8	.200	1/2	3-1/2	-	818-206	-	818-206-1	-	818-206-4
1/2	1-5/8	.715	1/2	3-1/2	818-006	-	818-006-1	-	818-006-4	-
3/4	2	.200	3/4	4	-	818-208	-	818-208-1	-	818-208-4
3/4	2	.880	3/4	4	818-008	-	818-008-1	-	818-008-4	-

PowerNR Coating Available

Routers

4 Flute Combination Compression

4 Flutes • Coated and Uncoated



- High Performance **A-Gr-SiV** submicron grain carbide
- Unique right and left fluting, controls finish on both sides of work-piece
- Effective for wide range of materials
- MAP certified quality



Uncoated

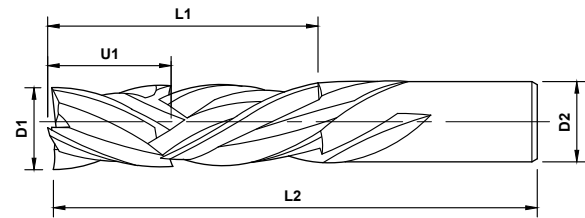
OD D1	LOC L1	Ucut U1	SHK D2	OAL L2	Uncoated		PowerA		PowerZ	
					Standard		Standard		Standard	
1/2	1	.440	1/2	3	820-202	-	820-202-1	-	820-202-4	-
1/2	1-1/8	.495	1/2	3	820-204	-	820-204-1	-	820-204-4	-
1/2	1-3/8	.605	1/2	3-1/2	820-206	-	820-206-1	-	820-206-4	-
1/2	1-5/8	.715	1/2	4	820-208	-	820-208-1	-	820-208-4	-
5/8	2-1/4	.990	5/8	5	820-210	-	820-210-1	-	820-210-4	-
3/4	1-7/8	.825	3/4	4	820-212	-	820-212-1	-	820-212-4	-
3/4	2-1/2	1.100	3/4	5	820-214	-	820-214-1	-	820-214-4	-

PowerNR Coating Available

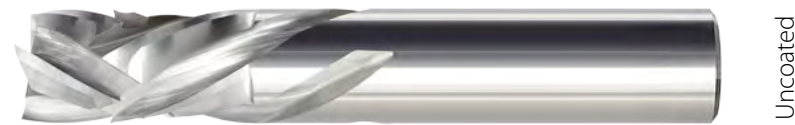
Routers

4 Flute Compression

Coated and Uncoated



- High Performance **A-Gr-SiV** submicron grain carbide
- Unique right and left fluting, controls finish on both sides of work-piece
- Effective for wide range of materials
- MAP certified quality



Uncoated

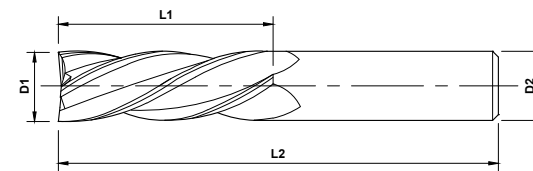
OD D1	LOC L1	Upcut U1	SHK D2	OAL L2	Uncoated		PowerA		PowerZ	
					Standard	Mortise	Standard	Mortise	Standard	Mortise
1/2	7/8	.200	1/2	3	-	821-102	-	821-102-1	-	821-402-4
1/2	1	.440	1/2	3	821-002	-	821-002-1	-	821-002-4	-
1/2	1-1/8	.495	1/2	3	821-004	-	821-004-1	-	821-004-4	-
1/2	1-3/8	.200	1/2	3-1/2	-	821-104	-	821-104-1	-	821-404-4
1/2	1-3/8	.605	1/2	3-1/2	821-006	-	821-006-1	-	821-006-4	-
1/2	1-5/8	.715	1/2	4	821-008	-	821-008-1	-	821-008-4	-
5/8	2-1/4	.990	5/8	5	821-010	-	821-010-1	-	821-010-4	-
3/4	1-7/8	.825	3/4	4	821-012	-	821-012-1	-	821-012-4	-
3/4	2-1/2	1.100	3/4	5	821-014	-	821-014-1	-	821-014-4	-

PowerNR Coating Available

Fiberglass Applications

4 Flute Fiberglass Mill End Router

Coated and Uncoated



- High Performance **A-Gr-SiV** submicron grain carbide
- Unique slow-spiral design for superb edge quality
- MAP certified quality

Fiberglass



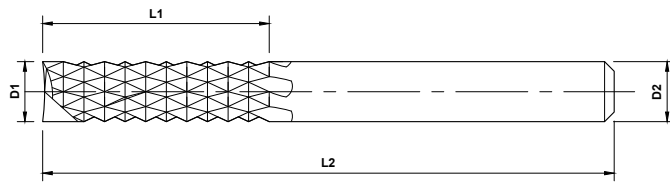
Uncoated

OD D1	LOC L1	SHK D2	OAL L2	Uncoated		PowerA		PowerZ	
				Upcut	Downcut	Upcut	Downcut	Upcut	Downcut
3/8	5/8	3/8	3	819-202	819-302	819-202-1	819-302-1	819-202-4	819-302-4
3/8	1-1/8	3/8	3	819-204	819-304	819-204-1	819-304-1	819-204-4	819-304-4
1/2	5/8	1/2	3-1/2	819-206	819-306	819-206-1	819-306-1	819-206-4	819-306-4
1/2	1-1/8	1/2	3-1/2	819-208	819-308	819-208-1	819-308-1	819-208-4	819-308-4

PowerNR Coating Available

Fiberglass Applications

Diamond Bur Fiberglass Finishers



- High Performance **A-Gr-SiV** submicron grain carbide
- Fast removal and superb finish in fiberglass
- MAP certified quality

Fiberglass



Standard

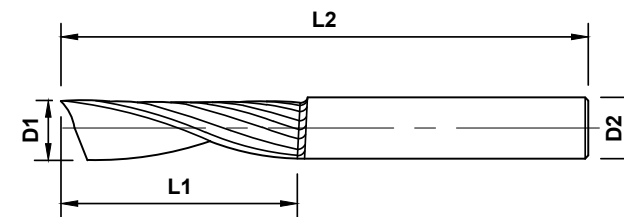
OD D1	LOC L1	SHK D2	OAL L2	Standard 0 Flute	Standard 2 Flute	Aramid 2/5 Flute
1/4	3/4	1/4	2-1/2	822-102	822-104	822-106
1/4	1	1/4	3	822-108	-	-
3/8	7/8	3/8	2-1/2	822-110	822-112	822-114
1/2	1	1/2	3	822-116	822-118	822-120

Note: Please see the bur section of our catalog for additional fiberglass router selections.

OFX

O-Flute Extreme Routers

High Polish • Upcut and Downcut



- High Performance **A-Gr-SiV** submicron grain carbide
- Polished flute for superior edge quality
- MAP certified quality
- Great on acrylics

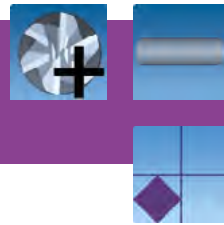
Aluminum
Plastics



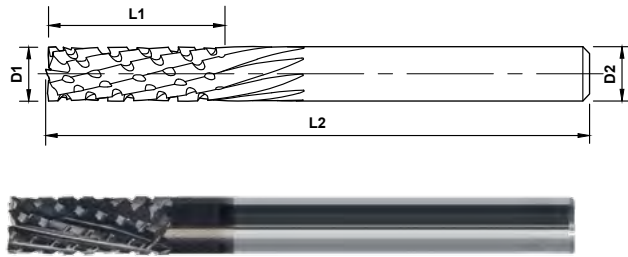
OD D1	LOC L1	SHK D2	OAL L2	Upcut 1 Flute	Downcut 1 Flute
1/16	1/4	1/8	2	823-002	823-102
1/8	1/4	1/8	2	823-004	823-104
1/8	1/4	1/4	2	823-006	823-106
1/8	1/2	1/8	2	823-008	823-108
1/8	1/2	1/4	2	823-010	823-110
5/32	9/16	1/4	2	823-012	823-112
3/16	3/8	3/16	2	823-014	823-114
3/16	5/8	3/16	2	823-016	823-116
3/16	3/8	1/4	2	823-018	823-118
3/16	1/2	1/4	2	823-020	823-120
3/16	5/8	1/4	2	823-022	823-122
7/32	3/4	1/4	2-1/2	823-024	823-124
1/4	5/8	1/4	2	823-026	823-126
1/4	3/4	1/4	2-1/2	823-028	823-128
1/4	1-1/4	1/4	3	823-030	823-130
3/8	1-1/8	3/8	3	823-032	823-132
1/2	1	1/2	3	823-034	823-134
1/2	2	1/2	4	823-036	823-136

HP Routers

CVD Nano Crystalline Routers



6-16 Flutes • Diamond Coated • Fine Pitched Nicked



- High Performance **A-Gr-SiV** submicron grain carbide
- Excellent performance on carbon graphite and carbon fiber panels
- MAP certified quality

Graphite
Composite
Carbon Fiber
Honeycomb

OD D1	LOC L1	SHK D2	OAL L2	Flutes	PowerRD		
					Plain End	Bur End	Mill End
1/8	1/4	1/8	1-1/2	6	824-002	824-102	824-202
1/8	3/8	1/8	1-1/2	6	824-004	824-104	824-204
1/8	1/2	1/8	1-1/2	8	824-006	824-106	824-206
3/16	3/8	3/16	2	6	824-008	824-108	824-208
3/16	9/16	3/16	2	6	824-010	824-110	824-210
3/16	3/4	3/16	2	8	824-012	824-112	824-212
1/4	1/2	1/4	2-1/2	8	824-014	824-114	824-214
1/4	3/4	1/4	2-1/2	10	824-016	824-116	824-216
1/4	1	1/4	3	10	824-018	824-118	824-218
1/4	1-1/4	1/4	4	12	824-020	824-120	824-220
5/16	1	5/16	2-1/2	10	824-022	824-122	824-222
3/8	3/4	3/8	2-1/2	12	824-024	824-124	824-224
3/8	1-1/8	3/8	3	12	824-026	824-126	824-226
3/8	1-1/2	3/8	4	12	824-028	824-128	824-228
3/8	2	3/8	4	12	824-030	824-130	824-230
1/2	1	1/2	3	14	824-032	824-132	824-232
1/2	2	1/2	4	16	824-034	824-134	824-234

CVD Nano Crystalline Routers



4 Flutes • Diamond Coated • Herringbone Composite Surface Finisher



- High Performance **A-Gr-SiV** submicron grain carbide
- Excellent performance on carbon graphite and carbon fiber panels

Graphite
Composite
Carbon Fiber
Honeycomb

OD D1	LOC L1	SHK D2	OAL L2	PowerRD
1/4	3/4	1/4	2-1/2	825-004
3/8	1-1/8	3/8	3	825-006
1/2	1-1/8	1/2	3	825-008

CVD Nano Crystalline Routers



4-8 Flutes • Diamond Coated • Composite Rougher/Semi-Finisher



- High Performance **A-Gr-SiV** submicron grain carbide
- Excellent performance on carbon graphite and carbon fiber panels
- MAP certified quality

Graphite
Composite
Carbon Fiber
Honeycomb

OD D1	LOC L1	SHK D2	OAL L2	Flutes	PowerRD
1/4	1/2	1/4	2-1/2	4	826-004
1/4	3/4	1/4	2-1/2	4	826-006
11/32	1-1/8	3/8	3	6	826-008
23/64	1-1/8	3/8	3	6	826-010
3/8	3/4	3/8	3	6	826-012
3/8	1-1/2	3/8	3	6	826-014
7/16	1-1/2	1/2	3	8	826-016
31/64	1-1/2	1/2	3	8	826-018
1/2	1	1/2	3	8	826-020
1/2	1-1/2	1/2	3	8	826-022

CVD Nano Crystalline Routers



8-14 Flutes • Diamond Coated • Composite Finisher



- High Performance **A-Gr-SiV** submicron grain carbide
- Excellent performance on carbon graphite and carbon fiber panels
- MAP certified quality

Graphite
Composite
Carbon Fiber
Honeycomb

OD D1	LOC L1	SHK D2	OAL L2	Flutes	PowerRD
1/4	1	1/4	3	8	827-004
3/8	1-1/8	3/8	3	12	827-006
3/8	1-1/2	3/8	3	12	827-008
1/2	1-1/2	1/2	4	14	827-010
1/2	2	1/2	4	14	827-012

Carbide Drills

- Jobber Drills
- Stub Drills
- Straight Flute Drills
- Spade Drills
- Spotting Drills
- Drill and Countersinks
- Multiple Flute Countersinks
- Chamfer Tools






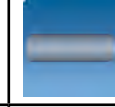


Table of Contents

	Jobber Drills	158
	Stub Drills.	163
	Straight Flute Drills.	167
	Spade Drills.	168
	NC Spotting Drills.	169
	Drill and Countersink / Center Drills	169
	Countersinks, Single Flute	170
	Countersinks, Three Flute.	170
	Countersinks, Six Flute	171
	Chamfer Tools	171

Mastercut's Superior Carbide Blend – A-Gr-SiV (Active Grain Sized Volume)
 Our superior tungsten carbide gives you the ability to be *aggressive* when you need to be. Growth inhibitors in our submicron carbide blanks maintain the most consistent grain size available, giving you superior hardness AND toughness.

See Reamers, Threadmills and Taps pages for additional tools.

Features Legend

	2 Flutes		6 Flutes
	3 Flutes		Plain shank
	4 Flutes		Double End Square

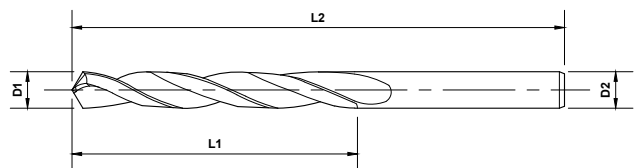
Coatings Legend

	PowerA Coating
---	----------------

Please contact us for our full line of metric products.

Jobber Drills

2 Flute 118° Four Facet Point • 3 Flute 130° High Performance Point
• Coated and Uncoated



- Genuine **A-Gr-SiV** submicron grain carbide
- Proven, versatile performance
- MAP certified quality

Cermet	Hardened	Cast Iron	Titanium	Non-Ferrous	Stainless	Steel
H	K	S	N	M	P	



Uncoated

OD D1	LOC L1	SHK D2	OAL L2	Wire Letter	Uncoated		PowerA	
					2 Flute	3 Flute	2 Flute	3 Flute
.0280	5/16	.0280	1-1/4	70	601-002	-	601-002-1	-
.0292	5/16	.0292	1-1/4	69	601-004	-	601-004-1	-
.0310	5/16	.0310	1-1/4	68	601-006	-	601-006-1	-
1/32	5/16	1/32	1-1/4		601-008	-	601-008-1	-
.0320	5/16	.0320	1-1/4	67	601-010	-	601-010-1	-
.0330	5/16	.0330	1-1/4	66	601-012	-	601-012-1	-
.0350	5/8	.0350	1-3/8	65	601-014	-	601-014-1	-
.0360	5/8	.0360	1-3/8	64	601-016	-	601-016-1	-
.0370	5/8	.0370	1-3/8	63	601-018	-	601-018-1	-
.0380	5/8	.0380	1-3/8	62	601-020	-	601-020-1	-
.0390	5/8	.0390	1-3/8	61	601-022	-	601-022-1	-
.0394	5/8	.0394	1-1/2		601-024	-	601-024-1	-
.0400	3/4	.0400	1-1/2	60	601-026	-	601-026-1	-
.0410	3/4	.0410	1-1/2	59	601-028	-	601-028-1	-
.0420	3/4	.0420	1-1/2	58	601-030	-	601-030-1	-
.0430	3/4	.0430	1-1/2	57	601-032	-	601-032-1	-
.0465	3/4	.0465	1-1/2	56	601-034	-	601-034-1	-
3/64	3/4	3/64	1-1/2		601-036	-	601-036-1	-
.0520	3/4	.0520	1-1/2	55	601-038	-	601-038-1	-
.0550	3/4	.0550	1-1/2	54	601-040	-	601-040-1	-
.0591	3/4	.0591	1-1/2		601-042	-	601-042-1	-
.0595	3/4	.0595	1-1/2	53	601-044	-	601-044-1	-
1/16	3/4	1/16	1-1/2		601-046	-	601-046-1	-
.0635	3/4	.0635	1-1/2	52	601-048	-	601-048-1	-

Jobber Drills

Cermet	Hardened	Cast Iron	Titanium	Non-Ferrous	Stainless	Steel
H	K	S	N	M	P	

OD D1	LOC L1	SHK D2	OAL L2	Wire Letter	Uncoated		PowerA	
					2 Flute	3 Flute	2 Flute	3 Flute
.0670	3/4	.0670	1-1/2	51	601-050	-	601-050-1	-
.0700	7/8	.0700	1-3/4	50	601-052	-	601-052-1	-
.0730	7/8	.0730	1-3/4	49	601-054	-	601-054-1	-
.0760	7/8	.0760	1-3/4	48	601-056	-	601-056-1	-
5/64	7/8	5/64	1-3/4		601-058	-	601-058-1	-
.0785	7/8	.0785	1-3/4	47	601-060	-	601-060-1	-
.0787	7/8	.0787	1-3/4		601-062	-	601-062-1	-
.0810	7/8	.0810	1-3/4	46	601-064	-	601-064-1	-
.0820	7/8	.0820	1-3/4	45	601-066	-	601-066-1	-
.0860	1	.0860	2	44	601-068	-	601-068-1	-
.0890	1	.0890	2	43	601-070	-	601-070-1	-
.0935	1	.0935	2	42	601-072	-	601-072-1	-
3/32	1	3/32	2		601-074	-	601-074-1	-
.0960	1	.0960	2	41	601-076	-	601-076-1	-
.0980	1	.0980	2	40	601-078	-	601-078-1	-
.0984	1	.0984	2		601-080	-	601-080-1	-
.0995	1-1/4	.0995	2-1/4	39	601-082	-	601-082-1	-
.1015	1-1/4	.1015	2-1/4	38	601-084	-	601-084-1	-
.1040	1-1/4	.1040	2-1/4	37	601-086	-	601-086-1	-
.1065	1-1/4	.1065	2-1/4	36	601-088	-	601-088-1	-
7/64	1-1/4	7/64	2-1/4		601-090	-	601-090-1	-
.1100	1-1/4	.1100	2-1/4	35	601-092	-	601-092-1	-
.1110	1-1/4	.1110	2-1/4	35	601-094	-	601-094-1	-
.1130	1-1/4	.1130	2-1/4	33	601-096	-	601-096-1	-
.1160	1-1/4	.1160	2-1/4	32	601-098	-	601-098-1	-
.1181	1-1/4	.1181	2-1/4		601-100	-	601-100-1	-
.1200	1-1/4	.1200	2-1/4	31	601-102	-	601-102-1	-
1/8	1-1/4	1/8	2-1/4		601-104	601-504	601-104-1	601-504-1
.1285	1-3/8	.1285	2-1/2	30	601-106	601-506	601-106-1	601-506-1
.1360	1-3/8	.1360	2-1/2	29	601-108	601-508	601-108-1	601-508-1
.1378	1-3/8	.1378	2-1/2		601-110	601-510	601-110-1	601-510-1
.1405	1-3/8	.1405	2-1/2	28	601-112	601-512	601-112-1	601-512-1
9/64	1-3/8	9/64	2-1/2		601-114	601-514	601-114-1	601-514-1
.1440	1-3/8	.1440	2-1/2	27	601-116	601-516	601-116-1	601-516-1

Carbide Drills

Jobber Drills



Cermet	Hardened	Cast Iron	Titanium	Non-Ferrous	Stainless	Steel
H	K	S	N	M	P	

OD D1	LOC L1	SHK D2	OAL L2	Wire Letter	Uncoated		PowerA	
					2 Flute	3 Flute	2 Flute	3 Flute
.1470	1-3/8	.1470	2-1/2	26	601-118	601-518	601-118-1	601-518-1
.1495	1-3/8	.1495	2-1/2	25	601-120	601-520	601-120-1	601-520-1
.1520	1-3/8	.1520	2-1/2	24	601-122	601-522	601-122-1	601-522-1
.1540	1-3/8	.1540	2-1/2	23	601-124	601-524	601-124-1	601-524-1
5/32	1-3/8	5/32	2-1/2		601-126	601-526	601-126-1	601-526-1
.1570	1-3/8	.1570	2-1/2	22	601-128	601-528	601-128-1	601-528-1
.1575	1-3/8	.1575	2-1/2		601-130	601-530	601-130-1	601-530-1
.1590	1-3/8	.1590	2-1/2	21	601-132	601-532	601-132-1	601-532-1
.1610	1-3/8	.1610	2-1/2	20	601-134	601-534	601-134-1	601-534-1
.1660	1-5/8	.1660	2-3/4	19	601-136	601-536	601-136-1	601-536-1
.1695	1-5/8	.1695	2-3/4	18	601-138	601-538	601-138-1	601-538-1
11/64	1-5/8	11/64	2-3/4		601-140	601-540	601-140-1	601-540-1
.1730	1-5/8	.1730	2-3/4	17	601-142	601-542	601-142-1	601-542-1
.1770	1-5/8	.1770	2-3/4	16	601-144	601-544	601-144-1	601-544-1
.1772	1-5/8	.1772	2-3/4		601-146	601-546	601-146-1	601-546-1
.1800	1-5/8	.1800	2-3/4	15	601-148	601-548	601-148-1	601-548-1
.1820	1-5/8	.1820	2-3/4	14	601-150	601-550	601-150-1	601-550-1
.1850	1-5/8	.1850	2-3/4	13	601-152	601-552	601-152-1	601-552-1
3/16	1-5/8	3/16	2-3/4		601-154	601-554	601-154-1	601-554-1
.1890	1-5/8	.1890	2-3/4	12	601-156	601-556	601-156-1	601-556-1
.1910	1-5/8	.1910	2-3/4	11	601-158	601-558	601-158-1	601-558-1
.1935	1-5/8	.1935	2-3/4	10	601-160	601-560	601-160-1	601-560-1
.1960	1-3/4	.1960	3	9	601-162	601-562	601-162-1	601-562-1
.1968	1-3/4	.1968	3		601-164	601-564	601-164-1	601-564-1
.1990	1-3/4	.1990	3	8	601-166	601-566	601-166-1	601-566-1
.2010	1-3/4	.2010	3	7	601-168	601-568	601-168-1	601-568-1
13/64	1-3/4	13/64	3		601-170	601-570	601-170-1	601-570-1
.2040	1-3/4	.2040	3	6	601-172	601-572	601-172-1	601-572-1
.2055	1-3/4	.2055	3	5	601-174	601-574	601-174-1	601-574-1
.2090	1-3/4	.2090	3	4	601-176	601-576	601-176-1	601-576-1
.2130	1-3/4	.2130	3	3	601-178	601-578	601-178-1	601-578-1
.2165	1-3/4	.2165	3		601-180	601-580	601-180-1	601-580-1
7/32	1-3/4	7/32	3		601-182	601-582	601-182-1	601-582-1
.2210	1-3/4	.2210	3	2	601-184	601-584	601-184-1	601-584-1

Jobber Drills



Cermet	Hardened	Cast Iron	Titanium	Non-Ferrous	Stainless	Steel
H	K	S	N	M	P	

OD D1	LOC L1	SHK D2	OAL L2	Wire Letter	Uncoated		PowerA	
					2 Flute	3 Flute	2 Flute	3 Flute
.2280	1-3/4	.2280	3	1	601-186	601-586	601-186-1	601-586-1
.2340	2	.2340	3-1/4	A	601-188	601-588	601-188-1	601-588-1
15/64	2	15/64	3-1/4		601-190	601-590	601-190-1	601-590-1
.2362	2	.2362	3-1/4		601-192	601-592	601-192-1	601-592-1
.2380	2	.2380	3-1/4	B	601-194	601-594	601-194-1	601-594-1
.2420	2	.2420	3-1/4	C	601-196	601-596	601-196-1	601-596-1
.2460	2	.2460	3-1/4	D	601-198	601-598	601-198-1	601-598-1
1/4	2	1/4	3-1/4	E	601-200	601-600	601-200-1	601-600-1
.2559	2	.2559	3-1/4		601-202	601-602	601-202-1	601-602-1
.2570	2	.2570	3-1/4	F	601-204	601-604	601-204-1	601-604-1
.2610	2-1/8	.2610	3-1/2	G	601-206	601-606	601-206-1	601-606-1
17/64	2-1/8	17/64	3-1/2		601-208	601-608	601-208-1	601-608-1
.2660	2-1/8	.2660	3-1/2	H	601-210	601-610	601-210-1	601-610-1
.2720	2-1/8	.2720	3-1/2	I	601-212	601-612	601-212-1	601-612-1
.2756	2-1/8	.2756	3-1/2		601-214	601-614	601-214-1	601-614-1
.2770	2-1/8	.2770	3-1/2	J	601-216	601-616	601-216-1	601-616-1
.2810	2-1/8	.2810	3-1/2	K	601-218	601-618	601-218-1	601-618-1
9/32	2-1/8	9/32	3-1/2		601-220	601-620	601-220-1	601-620-1
.2900	2-1/8	.2900	3-1/2	L	601-222	601-622	601-222-1	601-622-1
.2950	2-3/8	.2950	4	M	601-224	601-624	601-224-1	601-624-1
.2953	2-3/8	.2953	4		601-226	601-626	601-226-1	601-626-1
19/64	2-3/8	19/64	4		601-228	601-628	601-228-1	601-628-1
.3020	2-3/8	.3020	4	N	601-230	601-630	601-230-1	601-630-1
5/16	2-3/8	5/16	4		601-232	601-632	601-232-1	601-632-1
.3150	2-3/8	.3150	4		601-234	601-634	601-234-1	601-634-1
.3160	2-3/8	.3160	4	O	601-236	601-636	601-236-1	601-636-1
.3230	2-3/8	.3230	4	P	601-238	601-638	601-238-1	601-638-1
21/64	2-3/8	21/64	4		601-240	601-640	601-240-1	601-640-1
.3320	2-3/8	.3320	4	Q	601-242	601-642	601-242-1	601-642-1
.3346	2-3/8	.3346	4		601-244	601-644	601-244-1	601-644-1
.3390	2-3/8	.3390	4	R	601-246	601-646	601-246-1	601-646-1
11/32	2-3/8	11/32	4		601-248	601-648	601-248-1	601-648-1
.3480	2-3/8	.3480	4	S	601-250	601-650	601-250-1	601-650-1
.3543	2-3/4	.3543	4-1/4		601-252	601-652	601-252-1	601-652-1

Carbide Drills

Jobber Drills

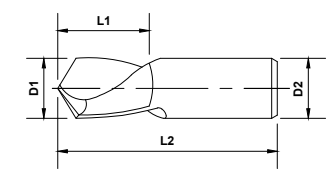


Cermet	Hardened	Cast Iron	Titanium	Non-Ferrous	Stainless	Steel
H	K	S	N	M	P	

OD D1	LOC L1	SHK D2	OAL L2	Wire Letter	Uncoated		PowerA	
					2 Flute	3 Flute	2 Flute	3 Flute
.3580	2-3/4	.3580	4-1/4	T	601-254	601-654	601-254-1	601-654-1
23/64	2-3/4	23/64	4-1/4		601-256	601-656	601-256-1	601-656-1
.3680	2-3/4	.3680	4-1/4	U	601-258	601-658	601-258-1	601-658-1
.3740	2-3/4	.3740	4-1/4		601-260	601-660	601-260-1	601-660-1
3/8	2-3/4	3/8	4-1/4		601-262	601-662	601-262-1	601-662-1
.3770	2-3/4	.3770	4-1/4	V	601-264	601-664	601-264-1	601-664-1
.3860	2-7/8	.3860	4-1/2	W	601-266	601-666	601-266-1	601-666-1
25/64	2-7/8	25/64	4-1/2		601-268	601-668	601-268-1	601-668-1
.3937	2-7/8	.3937	4-1/2		601-270	601-670	601-270-1	601-670-1
.3970	2-7/8	.3970	4-1/2	X	601-272	601-672	601-272-1	601-672-1
.4040	2-7/8	.4040	4-1/2	Y	601-274	601-674	601-274-1	601-674-1
13/32	2-7/8	13/32	4-1/2		601-276	601-676	601-276-1	601-676-1
.4130	2-7/8	.4130	4-1/2	Z	601-278	601-678	601-278-1	601-678-1
.4134	2-7/8	.4134	4-1/2		601-280	601-680	601-280-1	601-680-1
27/64	2-7/8	27/64	4-1/2		601-282	601-682	601-282-1	601-682-1
.4331	2-7/8	.4331	4-1/2		601-284	601-684	601-284-1	601-684-1
7/16	2-7/8	7/16	4-1/2		601-286	601-686	601-286-1	601-686-1
.4527	3	.4527	4-3/4		601-288	601-688	601-288-1	601-688-1
29/64	3	29/64	4-3/4		601-290	601-690	601-290-1	601-690-1
15/32	3	15/32	4-3/4		601-292	601-692	601-292-1	601-692-1
.4724	3	.4724	4-3/4		601-294	601-694	601-294-1	601-694-1
31/64	3	31/64	4-3/4		601-296	601-696	601-296-1	601-696-1
.4921	3	.4921	4-3/4		601-298	601-698	601-298-1	601-698-1
1/2	3	1/2	4-3/4		601-300	601-700	601-300-1	601-700-1
17/32	4	17/32	6		601-302	601-702	601-302-1	601-702-1
9/16	4	9/16	6		601-304	601-704	601-304-1	601-704-1
19/32	4	19/32	6		601-306	601-706	601-306-1	601-706-1
5/8	4	5/8	6		601-308	601-708	601-308-1	601-708-1
21/32	4	21/32	6		601-310	601-710	601-310-1	601-710-1
11/16	4	11/16	6		601-312	601-712	601-312-1	601-712-1
23/32	4	23/32	6		601-314	601-714	601-314-1	601-714-1
3/4	4	3/4	6		601-316	601-716	601-316-1	601-716-1
25/32	4	25/32	6		601-318	-	601-318-1	-
7/8	4	7/8	6		601-320	601-720	601-320-1	601-720-1
1	4	1	6		601-322	601-722	601-322-1	601-722-1

Stub Drills

2 Flute • 135° & 118° Four Facet Point • Uncoated



- Genuine **A-Gr-SiV** submicron grain carbide
- Proven, versatile performance
- MAP certified quality



Cermet	Hardened	Cast Iron	Titanium	Non-Ferrous	Stainless	Steel
H	K	S	N	M	P	



Uncoated

OD D1	LOC L1	SHK D2	OAL L2	Wire Letter	Point Angle	Uncoated 2 Flute
.0465	1/2	.0465	1-1/2	#56	135°	603-002
3/64	1/2	3/64	1-1/2		135°	603-004
.0520	1/2	.0520	1-1/2	#55	135°	603-006
.0550	1/2	.0550	1-1/2	#54	135°	603-008
.0595	1/2	.0595	1-1/2	#53	135°	603-010
1/16	5/8	1/16	2		118°	603-012
.0635	5/8	.0635	2	#52	118°	603-014
.0670	5/8	.0670	2	#51	118°	603-016
.0700	5/8	.0700	2	#50	118°	603-018
.0730	5/8	.0730	2	#49	118°	603-020
.0760	5/8	.0760	2	#48	118°	603-022
5/64	5/8	5/64	2		118°	603-024
.0785	5/8	.0785	2	#47	118°	603-026
.0810	5/8	.0810	2	#46	118°	603-028
.0820	5/8	.0820	2	#45	118°	603-030
.0860	5/8	.0860	2	#44	118°	603-032
.0890	5/8	.0890	2	#43	118°	603-034
.0935	5/8	.0935	2	#42	118°	603-036

Stub Drills



OD D1	LOC L1	SHK D2	OAL L2	Wire Letter	Point Angle	Uncoated 2 Flute
3/32	5/8	3/32	2		118°	603-038
.0960	5/8	.0960	2	#41	118°	603-040
.0980	5/8	.0980	2	#40	118°	603-042
.0995	5/8	.0995	2	#39	118°	603-044
.1015	5/8	.1015	2	#38	118°	603-046
.1040	5/8	.1040	2	#37	118°	603-048
.1065	5/8	.1065	2		118°	603-050
7/64	5/8	7/64	2		118°	603-052
.1100	5/8	.1100	2	#35	118°	603-054
.1110	5/8	.1110	2	#34	118°	603-056
.1130	5/8	.1130	2	#33	118°	603-058
.1160	5/8	.1160	2	#32	118°	603-060
.1200	5/8	.1200	2	#31	118°	603-062
1/8	5/8	1/8	2		118°	603-064
.1285	5/8	.1285	2	#30	118°	603-066
.1360	5/8	.1360	2		118°	603-068
.1405	5/8	.1405	2	#28	118°	603-070
9/64	5/8	9/64	2		118°	603-072
.1440	5/8	.1440	2	#27	118°	603-074
.1470	5/8	.1470	2	#26	118°	603-076
.1495	3/4	.1495	2-1/2		118°	603-078
.1520	3/4	.1520	2-1/2	#24	118°	603-080
.1540	3/4	.1540	2-1/2	#23	118°	603-082
5/32	3/4	5/32	2-1/2		118°	603-084
.1570	3/4	.1570	2-1/2		118°	603-086
.1590	3/4	.1590	2-1/2	#21	118°	603-088
.1610	3/4	.1610	2-1/2	#20	118°	603-090
.1660	3/4	.1660	2-1/2	#19	118°	603-092
.1695	3/4	.1695	2-1/2	#18	118°	603-094
11/64	3/4	11/64	2-1/2		118°	603-096
.1730	3/4	.1730	2-1/2	#17	118°	603-098
.1770	3/4	.1770	2-1/2	#16	118°	603-100
.1800	3/4	.1800	2-1/2	#15	118°	603-102
.1820	3/4	.1820	2-1/2	#14	118°	603-104

Stub Drills



OD D1	LOC L1	SHK D2	OAL L2	Wire Letter	Point Angle	Uncoated 2 Flute
.1850	3/4	.1850	2-1/2	#13	118°	603-106
3/16	3/4	3/16	2-1/2		118°	603-108
.1890	3/4	.1890	2-1/2	#12	118°	603-110
.1910	3/4	.1910	2-1/2	#11	118°	603-112
.1935	3/4	.1935	2-1/2	#10	118°	603-114
.1960	3/4	.1960	2-1/2	#9	118°	603-116
.1990	3/4	.1990	2-1/2	#8	118°	603-118
.2010	3/4	.2010	2-1/2	#7	118°	603-120
13/64	3/4	13/64	2-1/2		118°	603-122
.2040	3/4	.2040	2-1/2	#6	118°	603-124
.2055	3/4	.2055	2-1/2	#5	118°	603-126
.2090	3/4	.2090	2-1/2	#4	118°	603-128
.2130	1	.2130	2-1/2		118°	603-130
7/32	1	7/32	2-1/2		118°	603-132
.2210	1	.2210	2-1/2	#2	118°	603-134
.2280	1	.2280	2-1/2	#1	118°	603-136
.2340	1	.2340	2-1/2	A	118°	603-138
15/64	1	15/64	2-1/2		118°	603-140
.2380	1	.2380	2-1/2	B	118°	603-142
.2420	1	.2420	2-1/2	C	118°	603-144
.2460	1	.2460	2-1/2	D	118°	603-146
1/4	1	1/4	2-1/2		118°	603-148
.2570	1	.2570	2-1/2		118°	603-150
.2610	1	.2610	2-1/2	G	118°	603-152
17/64	1	17/64	2-1/2		118°	603-154
.2660	1	.2660	2-1/2	H	118°	603-156
.2720	1	.2720	2-1/2		118°	603-158
.2786	1-1/4	.2756	2-1/2		118°	603-160
.2770	1	.2770	2-1/2	J	118°	603-162
.2810	1	.2810	2-1/2	K	118°	603-164
9/32	1	9/32	2-1/2		118°	603-166
.2900	1	.2900	2-1/2	L	118°	603-168
.2950	1	.2950	2-1/2	M	118°	603-170
19/64	1-1/4	19/64	2-3/4		118°	603-172

Carbide Drills

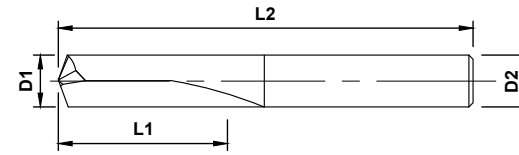
Stub Drills



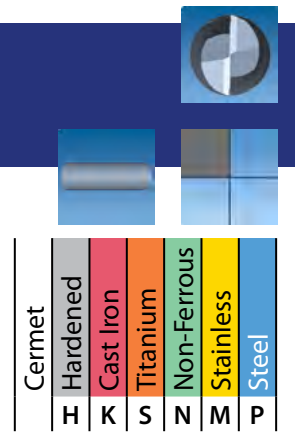
OD D1	LOC L1	SHK D2	OAL L2	Wire Letter	Point Angle	Uncoated 2 Flute
.3020	1-1/4	.3020	3	N	118°	603-174
5/16	1-1/4	5/16	2-3/4		118°	603-176
.3160	1-1/4	.3160	3	O	118°	603-178
.3230	1-1/4	.3230	3	P	118°	603-180
21/64	1-1/4	21/64	2-3/4		118°	603-182
.3320	1-1/4	.3320	3	Q	118°	603-184
.3390	1-1/4	.3390	3	R	118°	603-186
11/32	1-1/4	11/32	3		118°	603-188
.3480	1-1/4	.3480	3	S	118°	603-190
.3580	1-1/4	.3580	3	T	118°	603-192
23/64	1-1/4	23/64	3		118°	603-194
.3680	1-1/4	.3680	3	U	118°	603-196
3/8	1-1/4	3/8	3		118°	603-198
.3770	1-1/4	.3770	3	V	118°	603-200
.3860	1-1/4	.3860	3	W	118°	603-202
25/64	1-1/4	25/64	3		118°	603-204
.3970	1-1/4	.3970	3	X	118°	603-206
.4040	1-1/4	.4040	3	Y	118°	603-208
13/32	1-1/4	13/32	3		118°	603-210
.4130	1-1/4	.4130	3		118°	603-212
27/64	1-1/4	27/64	3		118°	603-214
7/16	1-1/4	7/16	3		118°	603-216
29/64	1-1/4	29/64	3		118°	603-218
15/32	1-1/4	15/32	3		118°	603-220
31/64	1-1/4	31/64	3		118°	603-222
1/2	1-1/4	1/2	3		118°	603-224
9/16	1-1/4	9/16	3-1/2		118°	603-226
5/8	1-1/2	5/8	3-1/2		118°	603-228
3/4	1-1/2	3/4	4		118°	603-230

Straight Flute Drills

2 Flute • Coated and Uncoated



- Genuine **A-Gr-SiV** submicron grain carbide
- Superb performance in hardened materials
- MAP certified quality

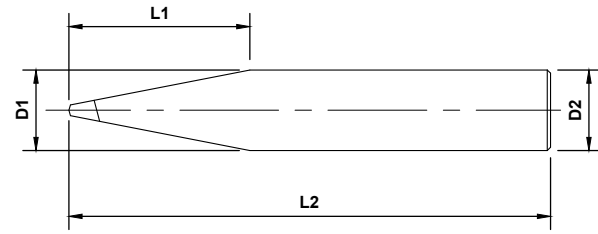


Uncoated

OD D1	LOC L1	SHK D2	OAL L2	Uncoated 2 Flute	PowerA 2 Flute
3/32	1/2	3/32	1-1/2	604-002	604-002-1
1/8	5/8	1/8	1-1/2	604-004	604-004-1
9/64	5/8	9/64	2	604-006	604-006-1
5/32	5/8	5/32	2	604-008	604-008-1
11/64	5/8	11/64	2	604-010	604-010-1
3/16	5/8	3/16	2	604-012	604-012-1
13/64	3/4	13/64	2	604-014	604-014-1
7/32	3/4	7/32	2	604-016	604-016-1
15/64	3/4	15/64	2	604-018	604-018-1
1/4	3/4	1/4	2	604-020	604-020-1
17/64	3/4	17/64	2-1/2	604-022	604-022-1
9/32	3/4	9/32	2-1/2	604-024	604-024-1
19/64	3/4	19/64	2-1/2	604-026	604-026-1
5/16	3/4	5/16	2-1/2	604-028	604-028-1
21/64	1	21/64	2-1/2	604-030	604-030-1
11/32	1	11/32	2-1/2	604-032	604-032-1
23/64	1	23/64	2-1/2	604-034	604-034-1
3/8	1	3/8	2-1/2	604-036	604-036-1
25/64	1	25/64	2-3/4	604-038	604-038-1
13/32	1	13/32	2-3/4	604-040	604-040-1
27/64	1	27/64	2-3/4	604-042	604-042-1
7/16	1	7/16	2-3/4	604-044	604-044-1
29/64	1	29/64	3	604-046	604-046-1
15/32	1	15/32	3	604-048	604-048-1
31/64	1	31/64	3	604-050	604-050-1
1/2	1	1/2	3	604-052	604-052-1

Spade Drills

2 Flute • 118° Point • Coated and Uncoated



- Genuine **A-Gr-SiV** submicron grain carbide
- Proven versatile performance
- MAP certified quality

Cermet	Hardened	Cast Iron	Titanium	Non-Ferrous	Stainless	Steel
H	K	S	N	M	P	

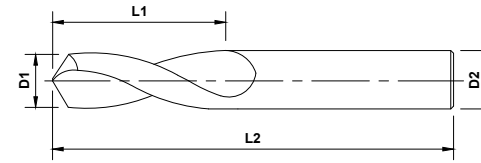


Uncoated

OD D1	LOC L1	SHK D2	OAL L2	Uncoated 2 Flute	PowerA 2 Flute
1/32	3/16	1/32	1-1/2	600-002	600-002-1
1/16	5/16	1/16	1-1/2	600-004	600-004-1
3/32	3/8	3/32	1-1/2	600-006	600-006-1
1/8	7/16	1/8	1-1/2	600-008	600-008-1
5/32	15/32	5/32	2	600-010	600-010-1
3/16	9/16	3/16	2	600-012	600-012-1
7/32	19/32	7/32	2	600-014	600-014-1
1/4	11/16	1/4	2	600-016	600-016-1
9/32	3/4	9/32	2-1/2	600-018	600-018-1
5/16	7/8	5/16	2-1/2	600-020	600-020-1
3/8	1	3/8	2-1/2	600-022	600-022-1
7/16	1-1/16	7/16	2-1/2	600-024	600-024-1
1/2	1-1/8	1/2	2-1/2	600-026	600-026-1

NC Spotting Drills

90°, 120° and 142° • Coated and Uncoated



- Genuine **A-Gr-SiV** submicron grain carbide
- Proven versatile performance
- MAP certified quality

Cermet	Hardened	Cast Iron	Titanium	Non-Ferrous	Stainless	Steel
H	K	S	N	M	P	



Uncoated

OD D1	LOC L1	SHK D2	OAL L2	Uncoated			PowerA		
				90°	120°	142°	90°	120°	142°
1/8	3/8	1/8	2	600-402	600-502	600-602	600-402-1	600-502-1	600-602-1
3/16	3/4	3/16	3	600-404	600-504	600-604	600-404-1	600-504-1	600-604-1
1/4	3/4	1/4	3	600-406	600-506	600-606	600-406-1	600-506-1	600-606-1
5/16	1	5/16	2-1/2	600-408	600-508	600-608	600-408-1	600-508-1	600-608-1
3/8	1	3/8	3	600-410	600-510	600-610	600-410-1	600-510-1	600-610-1
1/2	1	1/2	4	600-412	600-512	600-612	600-412-1	600-512-1	600-612-1

Drill and Countersink

118° point Center Drills • 60°, 82° and 90° Countersink
Coated and Uncoated



Uncoated

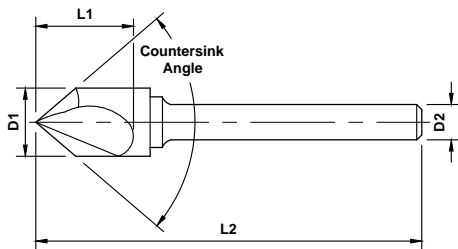


Cermet	Hardened	Cast Iron	Titanium	Non-Ferrous	Stainless	Steel
H	K	S	N	M	P	

OD D1	LOC L1	SHK D2	OAL L2	Uncoated			PowerA		
				60°	82°	90°	60°	82°	90°
3/64	3/64	1/8	1-1/2	600-304	600-104	600-204	600-304-1	600-104-1	600-204-1
5/64	5/64	3/16	2	600-306	600-106	600-206	600-306-1	600-106-1	600-206-1
7/64	7/64	1/4	2	600-308	600-108	600-208	600-308-1	600-108-1	600-208-1
1/8	1/8	5/16	2-1/8	600-310	600-110	600-210	600-310-1	600-110-1	600-210-1
3/16	3/16	7/16	2-3/4	600-312	600-112	600-212	600-312-1	600-112-1	600-212-1
7/32	7/32	1/2	3	600-314	600-114	600-214	600-314-1	600-114-1	600-214-1
1/4	1/4	5/8	3-1/8	600-316	600-116	600-216	600-316-1	600-116-1	600-216-1
5/16	5/16	3/4	3-3/8	600-318	600-118	600-218	600-318-1	600-118-1	600-218-1

Countersinks

Single Flute • 60°, 82° and 90° • Coated and Uncoated



- Genuine **A-Gr-SiV** submicron grain carbide
- Proven, versatile performance
- MAP certified quality

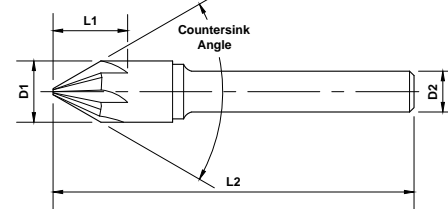


Uncoated

OD D1	SHK D2	OAL L2	Uncoated			PowerA		
			60°	82°	90°	60°	82°	90°
1/8	1/8	1-1/2	680-002	680-102	680-202	680-002-1	680-102-1	680-202-1
3/16	3/16	2	680-004	680-104	680-204	680-004-1	680-104-1	680-204-1
1/4	1/4	2	680-006	680-106	680-206	680-006-1	680-106-1	680-206-1
3/8	1/4	2-5/8	680-008	680-108	680-208	680-008-1	680-108-1	680-208-1
1/2	1/4	2-7/8	680-010	680-110	680-210	680-010-1	680-110-1	680-210-1
5/8	3/8	3	680-012	680-112	680-212	680-012-1	680-112-1	680-212-1
3/4	1/2	3	680-014	680-114	680-214	680-014-1	680-114-1	680-214-1
1	1/2	2-3/4	680-016	680-116	680-216	680-016-1	680-116-1	680-216-1

Countersinks

Six Flute • 60°, 82° and 90° • Coated and Uncoated



- Genuine **A-Gr-SiV** submicron grain carbide
- Proven, versatile performance
- MAP certified quality



Uncoated

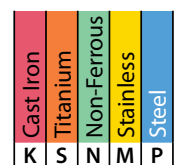
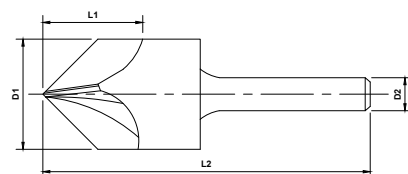
OD D1	SHK D2	OAL L2	Uncoated			PowerA		
			60°	82°	90°	60°	82°	90°
1/8	1/8	1-1/2	680-602	680-702	680-802	680-602-1	680-702-1	680-802-1
3/16	3/16	2	680-604	680-704	680-804	680-604-1	680-704-1	680-804-1
1/4	1/4	2	680-606	680-706	680-806	680-606-1	680-706-1	680-806-1
3/8	1/4	2-5/8	680-608	680-708	680-808	680-608-1	680-708-1	680-808-1
1/2	1/4	2-7/8	680-610	680-710	680-810	680-610-1	680-710-1	680-810-1
5/8	3/8	3	680-612	680-712	680-812	680-612-1	680-712-1	680-812-1
3/4	1/2	3	680-614	680-714	680-814	680-614-1	680-714-1	680-814-1
1	1/2	2-3/4	680-616	680-716	680-816	680-616-1	680-716-1	680-816-1

Countersinks

Three Flute • 60°, 82° and 90° • Coated and Uncoated



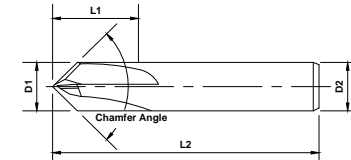
Uncoated



OD D1	SHK D2	OAL L2	Uncoated			PowerA		
			60°	82°	90°	60°	82°	90°
1/8	1/8	1-1/2	680-302	680-402	680-502	680-302-1	680-402-1	680-502-1
3/16	3/16	2	680-304	680-404	680-504	680-304-1	680-404-1	680-504-1
1/4	1/4	2	680-306	680-406	680-506	680-306-1	680-406-1	680-506-1
3/8	1/4	2-5/8	680-308	680-408	680-508	680-308-1	680-408-1	680-508-1
1/2	1/4	2-7/8	680-310	680-410	680-510	680-310-1	680-410-1	680-510-1
5/8	3/8	3	680-312	680-412	680-512	680-312-1	680-412-1	680-512-1
3/4	1/2	3	680-314	680-414	680-514	680-314-1	680-414-1	680-514-1
1	1/2	2-3/4	680-316	680-416	680-516	680-316-1	680-416-1	680-516-1

Chamfer Tools

Four Flute • 60°, 82° and 90° • Coated and Uncoated



- Genuine **A-Gr-SiV** submicron grain carbide
- Proven, versatile performance
- MAP certified quality



OD D1	SHK D2	OAL L2	Uncoated			PowerA		
			60°	82°	90°	60°	82°	90°
1/8	1/8	2	681-002	681-102	681-202	681-002-1	681-102-1	681-202-1
3/16	3/16	2	681-004	681-104	681-204	681-004-1	681-104-1	681-204-1
1/4	1/4	2-1/2	681-006	681-106	681-206	681-006-1	681-106-1	681-206-1
5/16	5/16	2-1/2	681-008	681-108	681-208	681-008-1	681-108-1	681-208-1
3/8	3/8	2-1/2	681-010	681-110	681-210	681-010-1	681-110-1	681-210-1
1/2	1/2	3	681-012	681-112	681-212	681-012-1	681-112-1	681-212-1




High Performance Drills

Hurricane Drill Series

- Solid Carbide
- Solid or Coolant Through



Table of Contents

	Hurricane 3XD Solid & Coolant Through. . .	174
	Hurricane 5XD Solid & Coolant Through. . .	179
	Hurricane 8XD Coolant Through	184

Features Legend

	2 FL Solid
	2 FL Coolant Through

Coatings Legend

	Plain shank		PowerA Coating
---	-------------	---	----------------

Mastercut's Superior Carbide Blend – A-Gr-SiV (Active Grain Sized Volume)

Our superior tungsten carbide gives you the ability to be *aggressive* when you need to be. Growth inhibitors in our submicron carbide blanks maintain the most consistent grain size available, giving you superior hardness AND toughness.

Hurricane High Performance Drill Features



- High performance drill with a common shank
- Coolant Through and Solid (Non-Coolant Through) styles available
- 3XD, 5XD, 8XD
- Uncoated and PowerA coating available
- Now also available in PowerNR coating (call for information)

Please contact us for our full line of metric products.

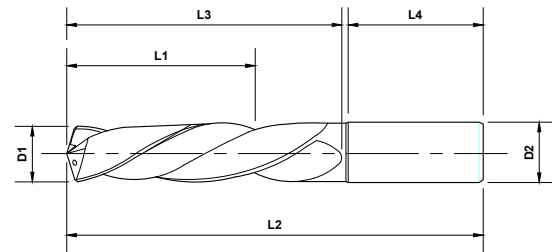
Email: sales@mastercuttool.com
www.mastercuttool.com



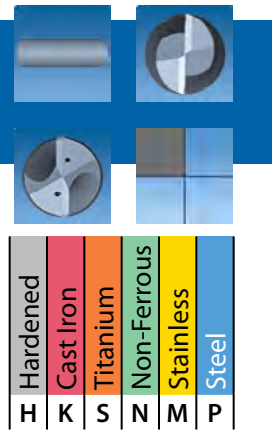
High Performance Drills

Hurricane Drills*

3XD, Solid and Coolant Through
2 FL, 140° Point and 30° Helix
Coated and Uncoated



- High Performance **A-Gr-SiV** submicron grain carbide
- Coolant and non-coolant through
- Rigid design for fast feed rates
- MAP certified quality



Uncoated
Coolant Through

PowerA
Coolant Through

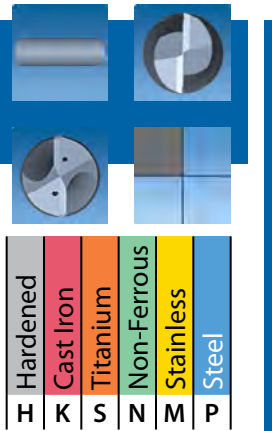
OD	LOC	LOF	SHK	SHK-L	OAL	Uncoated		PowerA	
D1	L1	L3	D2	L4	L2	Solid	Coolant Through	Solid	Coolant Through
.1181	0.5511	0.787	0.2362	1.417	2.44	650-002	-	650-002-1	-
.1220	0.5511	0.787	0.2362	1.417	2.44	650-004	-	650-004-1	-
.1248	0.5511	0.787	0.2362	1.417	2.44	650-006	-	650-006-1	-
1/8	0.5511	0.787	0.2362	1.417	2.44	650-008	-	650-008-1	-
.1260	0.5511	0.787	0.2362	1.417	2.44	650-010	-	650-010-1	-
.1280	0.5511	0.787	0.2362	1.417	2.44	650-012	-	650-012-1	-
.1299	0.5511	0.787	0.2362	1.417	2.44	650-014	-	650-014-1	-
.1339	0.5511	0.787	0.2362	1.417	2.44	650-016	650-516	650-016-1	650-516-1
.1378	0.5511	0.787	0.2362	1.417	2.44	650-018	650-518	650-018-1	650-518-1
9/64	0.5511	0.787	0.2362	1.417	2.44	650-020	650-520	650-020-1	650-520-1
.1417	0.5511	0.787	0.2362	1.417	2.44	650-024	650-524	650-024-1	650-524-1
.1457	0.5511	0.787	0.2362	1.417	2.44	650-026	650-526	650-026-1	650-526-1
.1496	0.6690	0.944	0.2362	1.417	2.59	650-028	650-528	650-028-1	650-528-1
.1535	0.6690	0.944	0.2362	1.417	2.59	650-030	650-530	650-030-1	650-530-1
5/32	0.6690	0.944	0.2362	1.417	2.59	650-034	650-534	650-034-1	650-534-1
.1575	0.6690	0.944	0.2362	1.417	2.59	650-036	650-536	650-036-1	650-536-1
.1614	0.6690	0.944	0.2362	1.417	2.59	650-038	650-538	650-038-1	650-538-1
.1654	0.6690	0.944	0.2362	1.417	2.59	650-040	650-540	650-040-1	650-540-1

* For extreme performance drilling, try our PowerNR coating. Use the uncoated part number and add -8.

High Performance Drills

Hurricane Drills

3XD, Solid and Coolant Through
2 FL, 140° Point and 30° Helix
Coated and Uncoated



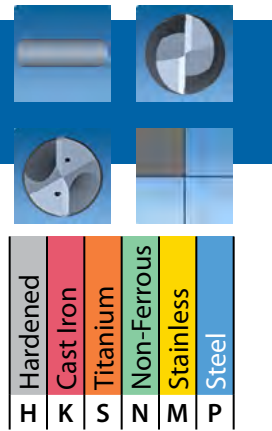
OD	LOC	LOF	SHK	SHK-L	OAL	Uncoated		PowerA	
D1	L1	L3	D2	L4	L2	Solid	Coolant Through	Solid	Coolant Through
.1693	0.6690	0.944	0.2362	1.417	2.59	650-042	650-542	650-042-1	650-542-1
11/64	0.6690	0.944	0.2362	1.417	2.59	650-044	650-544	650-044-1	650-544-1
.1720	0.6690	0.944	0.2362	1.417	2.59	650-046	650-546	650-046-1	650-546-1
.1732	0.6690	0.944	0.2362	1.417	2.59	650-048	650-548	650-048-1	650-548-1
.1772	0.6690	0.944	0.2362	1.417	2.59	650-050	650-550	650-050-1	650-550-1
.1811	0.6690	0.944	0.2362	1.417	2.59	650-052	650-552	650-052-1	650-552-1
.1831	0.6690	0.944	0.2362	1.417	2.59	650-054	650-554	650-054-1	650-554-1
.1850	0.6690	0.944	0.2362	1.417	2.59	650-056	650-556	650-056-1	650-556-1
.1874	0.7874	1.102	0.2362	1.417	2.59	650-058	650-558	650-058-1	650-558-1
3/16	0.7874	1.102	0.2362	1.417	2.59	650-060	650-560	650-060-1	650-560-1
.1890	0.7874	1.102	0.2362	1.417	2.59	650-062	650-562	650-062-1	650-562-1
.1929	0.7874	1.102	0.2362	1.417	2.59	650-064	650-564	650-064-1	650-564-1
.1969	0.7874	1.102	0.2362	1.417	2.59	650-066	650-566	650-066-1	650-566-1
.2008	0.7874	1.102	0.2362	1.417	2.59	650-068	650-568	650-068-1	650-568-1
13/64	0.7874	1.102	0.2362	1.417	2.59	650-072	650-572	650-072-1	650-572-1
.2047	0.7874	1.102	0.2362	1.417	2.59	650-074	650-574	650-074-1	650-574-1
.2087	0.7874	1.102	0.2362	1.417	2.59	650-076	650-576	650-076-1	650-576-1
.2126	0.7874	1.102	0.2362	1.417	2.59	650-078	650-578	650-078-1	650-578-1
.2165	0.7874	1.102	0.2362	1.417	2.59	650-080	650-580	650-080-1	650-580-1
.2185	0.7874	1.102	0.2362	1.417	2.59	650-082	650-582	650-082-1	650-582-1
7/32	0.7874	1.102	0.2362	1.417	2.59	650-084	650-584	650-084-1	650-584-1
.2189	0.7874	1.102	0.2362	1.417	2.59	650-086	650-586	650-086-1	650-586-1
.2205	0.7874	1.102	0.2362	1.417	2.59	650-088	650-588	650-088-1	650-588-1
.2244	0.7874	1.102	0.2362	1.417	2.59	650-090	650-590	650-090-1	650-590-1
.2283	0.7874	1.102	0.2362	1.417	2.59	650-092	650-592	650-092-1	650-592-1
.2323	0.7874	1.102	0.2362	1.417	2.59	650-094	650-594	650-094-1	650-594-1
.2343	0.7874	1.102	0.2362	1.417	2.59	650-096	650-596	650-096-1	650-596-1
15/64	0.7874	1.102	0.2362	1.417	2.59	650-098	650-598	650-098-1	650-598-1
.2362	0.7874	1.102	0.2362	1.417	2.59	650-100	650-600	650-100-1	650-600-1
.2402	0.9448	1.338	0.3150	1.417	3.11	650-102	650-602	650-102-1	650-602-1
.2441	0.9448	1.338	0.3150	1.417	3.11	650-104	650-604	650-104-1	650-604-1
.2480	0.9448	1.338	0.3150	1.417	3.11	650-106	650-606	650-106-1	650-606-1
1/4	0.9448	1.338	0.3150	1.417	3.11	650-108	650-608	650-108-1	650-608-1
.2520	0.9448	1.338	0.3150	1.417	3.11	650-110	650-610	650-110-1	650-610-1



High Performance Drills

Hurricane Drills

3XD, Solid and Coolant Through
2 FL, 140° Point and 30° Helix
Coated and Uncoated

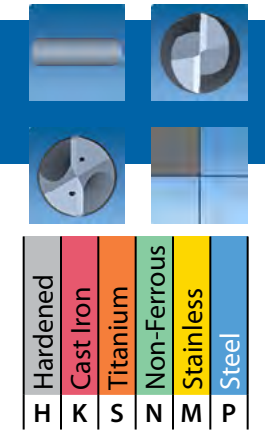


OD D1	LOC L1	LOF L3	SHK D2	SHK-L L4	OAL L2	Uncoated		PowerA	
						Solid	Coolant Through	Solid	Coolant Through
.2559	0.9448	1.338	0.3150	1.417	3.11	650-112	650-612	650-112-1	650-612-1
.2598	0.9448	1.338	0.3150	1.417	3.11	650-114	650-614	650-114-1	650-614-1
.2638	0.9448	1.338	0.3150	1.417	3.11	650-116	650-616	650-116-1	650-616-1
17/64	0.9448	1.338	0.3150	1.417	3.11	650-118	650-618	650-118-1	650-618-1
.2657	0.9448	1.338	0.3150	1.417	3.11	650-120	650-620	650-120-1	650-620-1
.2677	0.9448	1.338	0.3150	1.417	3.11	650-122	650-622	650-122-1	650-622-1
.2717	0.9448	1.338	0.3150	1.417	3.11	650-124	650-624	650-124-1	650-624-1
.2756	0.9448	1.338	0.3150	1.417	3.11	650-126	650-626	650-126-1	650-626-1
.2795	1.1410	1.614	0.3150	1.417	3.11	650-128	650-628	650-128-1	650-628-1
.2811	1.1410	1.614	0.3150	1.417	3.11	650-130	650-630	650-130-1	650-630-1
9/32	1.1410	1.614	0.3150	1.417	3.11	650-132	650-632	650-132-1	650-632-1
.2835	1.1410	1.614	0.3150	1.417	3.11	650-134	650-634	650-134-1	650-634-1
.2874	1.1410	1.614	0.3150	1.417	3.11	650-136	650-636	650-136-1	650-636-1
.2913	1.1410	1.614	0.3150	1.417	3.11	650-138	650-638	650-138-1	650-638-1
.2953	1.1410	1.614	0.3150	1.417	3.11	650-140	650-640	650-140-1	650-640-1
19/64	1.1410	1.614	0.3150	1.417	3.11	650-142	650-642	650-142-1	650-642-1
.2992	1.1410	1.614	0.3150	1.417	3.11	650-146	650-646	650-146-1	650-646-1
.3031	1.1410	1.614	0.3150	1.417	3.11	650-148	650-648	650-148-1	650-648-1
.3071	1.1410	1.614	0.3150	1.417	3.11	650-150	650-650	650-150-1	650-650-1
.3110	1.1410	1.614	0.3150	1.417	3.11	650-152	650-652	650-152-1	650-652-1
5/16	1.1410	1.614	0.3150	1.417	3.11	650-154	650-654	650-154-1	650-654-1
.3126	1.1410	1.614	0.3150	1.417	3.11	650-156	650-656	650-156-1	650-656-1
.3150	1.1410	1.614	0.3150	1.417	3.11	650-158	650-658	650-158-1	650-658-1
.3189	1.3770	1.850	0.3937	1.575	3.50	650-160	650-660	650-160-1	650-660-1
.3228	1.3770	1.850	0.3937	1.575	3.50	650-162	650-662	650-162-1	650-662-1
.3268	1.3770	1.850	0.3937	1.575	3.50	650-164	650-664	650-164-1	650-664-1
.3280	1.3770	1.850	0.3937	1.575	3.50	650-166	650-666	650-166-1	650-666-1
21/64	1.3770	1.850	0.3937	1.575	3.50	650-168	650-668	650-168-1	650-668-1
.3307	1.3770	1.850	0.3937	1.575	3.50	650-170	650-670	650-170-1	650-670-1
.3346	1.3770	1.850	0.3937	1.575	3.50	650-172	650-672	650-172-1	650-672-1
.3386	1.3770	1.850	0.3937	1.575	3.50	650-174	650-674	650-174-1	650-674-1
.3425	1.3770	1.850	0.3937	1.575	3.50	650-176	650-676	650-176-1	650-676-1
11/32	1.3770	1.850	0.3937	1.575	3.50	650-178	650-678	650-178-1	650-678-1
.3465	1.3770	1.850	0.3937	1.575	3.50	650-182	650-682	650-182-1	650-682-1

High Performance Drills

Hurricane Drills

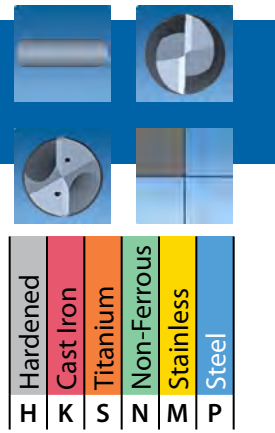
3XD, Solid and Coolant Through
2 FL, 140° Point and 30° Helix
Coated and Uncoated



OD D1	LOC L1	LOF L3	SHK D2	SHK-L L4	OAL L2	Uncoated		PowerA	
						Solid	Coolant Through	Solid	Coolant Through
.3504	1.3770	1.850	0.3937	1.575	3.50	650-184	650-684	650-184-1	650-684-1
.3543	1.3770	1.850	0.3937	1.575	3.50	650-186	650-686	650-186-1	650-686-1
.3583	1.3770	1.850	0.3937	1.575	3.50	650-188	650-688	650-188-1	650-688-1
23/64	1.3770	1.850	0.3937	1.575	3.50	650-192	650-692	650-192-1	650-692-1
.3622	1.3770	1.850	0.3937	1.575	3.50	650-194	650-694	650-194-1	650-694-1
.3642	1.3770	1.850	0.3937	1.575	3.50	650-196	650-696	650-196-1	650-696-1
.3661	1.3770	1.850	0.3937	1.575	3.50	650-198	650-698	650-198-1	650-698-1
.3701	1.3770	1.850	0.3937	1.575	3.50	650-200	650-700	650-200-1	650-700-1
.3740	1.3770	1.850	0.3937	1.575	3.50	650-202	650-702	650-202-1	650-702-1
.3748	1.3770	1.850	0.3937	1.575	3.50	650-204	650-704	650-204-1	650-704-1
3/8	1.3770	1.850	0.3937	1.575	3.50	650-206	650-706	650-206-1	650-706-1
.3780	1.3770	1.850	0.3937	1.575	3.50	650-208	650-708	650-208-1	650-708-1
.3819	1.3770	1.850	0.3937	1.575	3.50	650-210	650-710	650-210-1	650-710-1
.3858	1.3770	1.850	0.3937	1.575	3.50	650-212	650-712	650-212-1	650-712-1
.3898	1.3770	1.850	0.3937	1.575	3.50	650-214	650-714	650-214-1	650-714-1
25/64	1.3770	1.850	0.3937	1.575	3.50	650-216	650-716	650-216-1	650-716-1
.3937	1.3770	1.850	0.3937	1.575	3.50	650-220	650-720	650-220-1	650-720-1
.3976	1.5740	2.165	0.4724	1.772	4.01	650-222	650-722	650-222-1	650-722-1
.4016	1.5740	2.165	0.4724	1.772	4.01	650-224	650-724	650-224-1	650-724-1
.4055	1.5740	2.165	0.4724	1.772	4.01	650-226	650-726	650-226-1	650-726-1
13/32	1.5740	2.165	0.4724	1.772	4.01	650-230	650-730	650-230-1	650-730-1
.4094	1.5740	2.165	0.4724	1.772	4.01	650-232	650-732	650-232-1	650-732-1
.4134	1.5740	2.165	0.4724	1.772	4.01	650-234	650-734	650-234-1	650-734-1
.4173	1.5740	2.165	0.4724	1.772	4.01	650-236	650-736	650-236-1	650-736-1
.4213	1.5740	2.165	0.4724	1.772	4.01	650-238	650-738	650-238-1	650-738-1
27/64	1.5740	2.165	0.4724	1.772	4.01	650-240	650-740	650-240-1	650-740-1
.4252	1.5740	2.165	0.4724	1.772	4.01	650-242	650-742	650-242-1	650-742-1
.4291	1.5740	2.165	0.4724	1.772	4.01	650-244	650-744	650-244-1	650-744-1
.4331	1.5740	2.165	0.4724	1.772	4.01	650-246	650-746	650-246-1	650-746-1
.4370	1.5740	2.165	0.4724	1.772	4.01	650-248	650-748	650-248-1	650-748-1
.4374	1.5740	2.165	0.4724	1.772	4.01	650-250	650-750	650-250-1	650-750-1
7/16	1.5740	2.165	0.4724	1.772	4.01	650-252	650-752	650-252-1	650-752-1
.4409	1.5740	2.165	0.4724	1.772	4.01	650-254	650-754	650-254-1	650-754-1
.4449	1.5740	2.165	0.4724	1.772	4.01	650-256	650-756	650-256-1	650-756-1



High Performance Drills

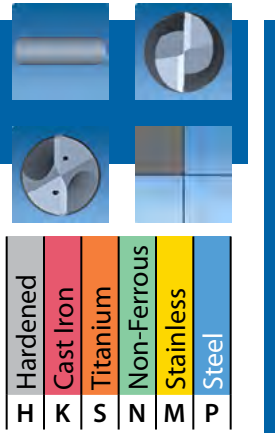


Hurricane Drills

3XD, Solid and Coolant Through
2 FL, 140° Point and 30° Helix
Coated and Uncoated

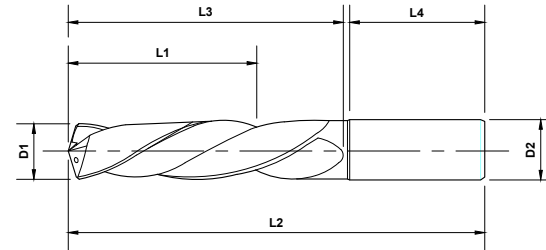
OD D1	LOC L1	LOF L3	SHK D2	SHK-L L4	OAL L2	Uncoated		PowerA	
						Solid	Coolant Through	Solid	Coolant Through
.4488	1.5740	2.165	0.4724	1.772	4.01	650-258	650-758	650-258-1	650-758-1
.4528	1.5740	2.165	0.4724	1.772	4.01	650-260	650-760	650-260-1	650-760-1
29/64	1.5740	2.165	0.4724	1.772	4.01	650-262	650-762	650-262-1	650-762-1
.4567	1.5740	2.165	0.4724	1.772	4.01	650-264	650-764	650-264-1	650-764-1
.4606	1.5740	2.165	0.4724	1.772	4.01	650-266	650-766	650-266-1	650-766-1
.4646	1.5740	2.165	0.4724	1.772	4.01	650-268	650-768	650-268-1	650-768-1
.4685	1.5740	2.165	0.4724	1.772	4.01	650-270	650-770	650-270-1	650-770-1
15/32	1.5740	2.165	0.4724	1.772	4.01	650-272	650-772	650-272-1	650-772-1
.4689	1.5740	2.165	0.4724	1.772	4.01	650-274	650-774	650-274-1	650-774-1
.4724	1.5740	2.165	0.4724	1.772	4.01	650-276	650-776	650-276-1	650-776-1
31/64	1.5740	2.165	0.5512	1.772	4.01	650-278	650-778	650-278-1	650-778-1
.4921	1.6920	2.362	0.5512	1.772	4.21	650-280	650-780	650-280-1	650-780-1
1/2	1.6920	2.362	0.5512	1.772	4.21	650-284	650-784	650-284-1	650-784-1
.5118	1.6920	2.362	0.5512	1.772	4.21	650-286	650-786	650-286-1	650-786-1
.5315	1.6920	2.362	0.5512	1.772	4.21	650-288	650-788	650-288-1	650-788-1
.5394	1.6920	2.362	0.5512	1.772	4.21	650-290	650-790	650-290-1	650-790-1
.5512	1.6920	2.362	0.5512	1.772	4.21	650-292	650-792	650-292-1	650-792-1
9/16	1.7710	2.559	0.6299	1.889	4.52	650-294	650-794	650-294-1	650-794-1
.5709	1.7710	2.559	0.6299	1.889	4.52	650-296	650-796	650-296-1	650-796-1
.5787	1.7710	2.559	0.6299	1.889	4.52	650-298	650-798	650-298-1	650-798-1
.5906	1.7710	2.559	0.6299	1.889	4.52	650-300	650-800	650-300-1	650-800-1
.6102	1.7710	2.559	0.6299	1.889	4.52	650-302	650-802	650-302-1	650-802-1
.6181	1.7710	2.559	0.6299	1.889	4.52	650-304	650-804	650-304-1	650-804-1
.6299	1.7710	2.559	0.6299	1.889	4.52	650-306	650-806	650-306-1	650-806-1
.6496	2.007	2.874	0.7087	1.889	4.84	650-308	650-808	650-308-1	650-808-1
.6693	2.007	2.874	0.7087	1.889	4.84	650-310	650-810	650-310-1	650-810-1
.6890	2.007	2.874	0.7087	1.889	4.84	650-312	650-812	650-312-1	650-812-1
.7087	2.007	2.874	0.7087	1.889	4.84	650-314	650-814	650-314-1	650-814-1
.7283	2.165	3.110	0.7874	1.969	5.15	650-316	650-816	650-316-1	650-816-1
.7480	2.165	3.110	0.7874	1.969	5.15	650-318	650-818	650-318-1	650-818-1
.7677	2.165	3.110	0.7874	1.969	5.15	650-320	650-820	650-320-1	650-820-1
.7874	2.165	3.110	0.7874	1.969	5.15	650-322	650-822	650-322-1	650-822-1

High Performance Drills

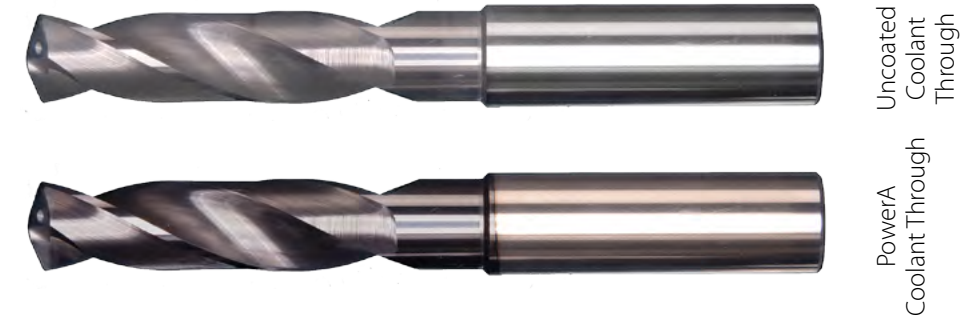


Hurricane Drills*

5XD, Solid and Coolant Through
2 FL, 140° Point and 30° Helix
Coated and Uncoated



- High Performance **A-Gr-SiV** submicron grain carbide
- Coolant and non-coolant through
- Rigid design for fast feed rates
- MAP certified quality



OD D1	LOC L1	LOF L3	SHK D2	SHK-L L4	OAL L2	Uncoated		PowerA	
						Solid	Coolant Through	Solid	Coolant Through
.1181	0.905	1.102	.2362	1.417	2.59	651-002	-	651-002-1	-
.1220	0.905	1.102	.2362	1.417	2.59	651-004	-	651-004-1	-
.1248	0.905	1.102	.2362	1.417	2.59	651-006	-	651-006-1	-
1/8	0.905	1.102	.2362	1.417	2.59	651-008	-	651-008-1	-
.1260	0.905	1.102	.2362	1.417	2.59	651-010	-	651-010-1	-
.1280	0.905	1.102	.2362	1.417	2.59	651-012	-	651-012-1	-
.1299	0.905	1.102	.2362	1.417	2.59	651-014	-	651-014-1	-
.1339	0.905	1.102	.2362	1.417	2.59	651-016	651-516	651-016-1	651-516-1
.1378	0.905	1.102	.2362	1.417	2.59	651-018	651-518	651-018-1	651-518-1
9/64	0.905	1.102	.2362	1.417	2.59	651-020	651-520	651-020-1	651-520-1
.1417	0.905	1.102	.2362	1.417	2.59	651-024	651-524	651-024-1	651-524-1
.1457	0.905	1.102	.2362	1.417	2.59	651-026	651-526	651-026-1	651-526-1
.1496	1.141	1.417	.2362	1.417	2.91	651-028	651-528	651-028-1	651-528-1
.1535	1.141	1.417	.2362	1.417	2.91	651-030	651-530	651-030-1	651-530-1
5/32	1.141	1.417	.2362	1.417	2.91	651-034	651-534	651-034-1	651-534-1
.1575	1.141	1.417	.2362	1.417	2.91	651-036	651-536	651-036-1	651-536-1
.1614	1.141	1.417	.2362	1.417	2.91	651-038	651-538	651-038-1	651-538-1
.1654	1.141	1.417	.2362	1.417	2.91	651-040	651-540	651-040-1	651-540-1

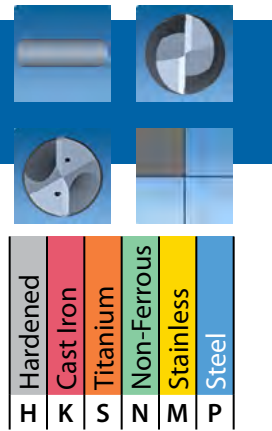
* For extreme performance drilling, try our PowerNR coating. Use the uncoated part number and add -8.



High Performance Drills

Hurricane Drills

5XD, Solid and Coolant Through
2 FL, 140° Point and 30° Helix
Coated and Uncoated

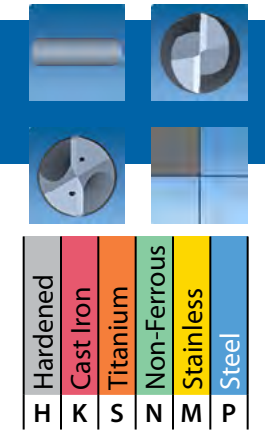


OD D1	LOC L1	LOF L3	SHK D2	SHK-L L4	OAL L2	Uncoated		PowerA	
						Solid	Coolant Through	Solid	Coolant Through
.1693	1.141	1.417	.2362	1.417	2.91	651-042	651-542	651-042-1	651-542-1
11/64	1.141	1.417	.2362	1.417	2.91	651-044	651-544	651-044-1	651-544-1
.1720	1.141	1.417	.2362	1.417	2.91	651-046	651-546	651-046-1	651-546-1
.1732	1.141	1.417	.2362	1.417	2.91	651-048	651-548	651-048-1	651-548-1
.1772	1.141	1.417	.2362	1.417	2.91	651-050	651-550	651-050-1	651-550-1
.1811	1.141	1.417	.2362	1.417	2.91	651-052	651-552	651-052-1	651-552-1
.1831	1.141	1.417	.2362	1.417	2.91	651-054	651-554	651-054-1	651-554-1
.1850	1.377	1.732	.2362	1.417	3.22	651-056	651-556	651-056-1	651-556-1
.1874	1.377	1.732	.2362	1.417	3.22	651-058	651-558	651-058-1	651-558-1
3/16	1.377	1.732	.2362	1.417	3.22	651-060	651-560	651-060-1	651-560-1
.1890	1.377	1.732	.2362	1.417	3.22	651-062	651-562	651-062-1	651-562-1
.1929	1.377	1.732	.2362	1.417	3.22	651-064	651-564	651-064-1	651-564-1
.1969	1.377	1.732	.2362	1.417	3.22	651-066	651-566	651-066-1	651-566-1
.2008	1.377	1.732	.2362	1.417	3.22	651-068	651-568	651-068-1	651-568-1
13/64	1.377	1.732	.2362	1.417	3.22	651-072	651-572	651-072-1	651-572-1
.2047	1.377	1.732	.2362	1.417	3.22	651-074	651-574	651-074-1	651-574-1
.2087	1.377	1.732	.2362	1.417	3.22	651-076	651-576	651-076-1	651-576-1
.2126	1.377	1.732	.2362	1.417	3.22	651-078	651-578	651-078-1	651-578-1
.2165	1.377	1.732	.2362	1.417	3.22	651-080	651-580	651-080-1	651-580-1
.2185	1.377	1.732	.2362	1.417	3.22	651-082	651-582	651-082-1	651-582-1
7/32	1.377	1.732	.2362	1.417	3.22	651-084	651-584	651-084-1	651-584-1
.2189	1.377	1.732	.2362	1.417	3.22	651-086	651-586	651-086-1	651-586-1
.2205	1.377	1.732	.2362	1.417	3.22	651-088	651-588	651-088-1	651-588-1
.2244	1.377	1.732	.2362	1.417	3.22	651-090	651-590	651-090-1	651-590-1
.2283	1.377	1.732	.2362	1.417	3.22	651-092	651-592	651-092-1	651-592-1
.2323	1.377	1.732	.2362	1.417	3.22	651-094	651-594	651-094-1	651-594-1
.2343	1.377	1.732	.2362	1.417	3.22	651-096	651-596	651-096-1	651-596-1
15/64	1.377	1.732	.2362	1.417	3.22	651-098	651-598	651-098-1	651-598-1
.2362	1.377	1.732	.2362	1.417	3.22	651-100	651-600	651-100-1	651-600-1
.2402	1.692	2.086	.3150	1.417	3.58	651-102	651-602	651-102-1	651-602-1
.2441	1.692	2.086	.3150	1.417	3.58	651-104	651-604	651-104-1	651-604-1
.2480	1.692	2.086	.3150	1.417	3.58	651-106	651-606	651-106-1	651-606-1
1/4	1.692	2.086	.3150	1.417	3.58	651-108	651-608	651-108-1	651-608-1
.2520	1.692	2.086	.3150	1.417	3.58	651-110	651-610	651-110-1	651-610-1

High Performance Drills

Hurricane Drills

5XD, Solid and Coolant Through
2 FL, 140° Point and 30° Helix
Coated and Uncoated



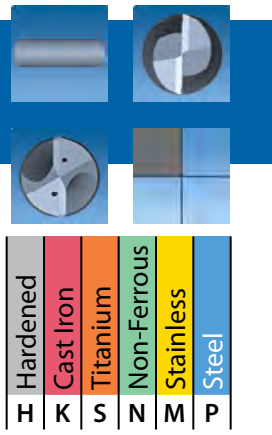
OD D1	LOC L1	LOF L3	SHK D2	SHK-L L4	OAL L2	Uncoated		PowerA	
						Solid	Coolant Through	Solid	Coolant Through
.2559	1.692	2.086	.3150	1.417	3.58	651-112	651-612	651-112-1	651-612-1
.2598	1.692	2.086	.3150	1.417	3.58	651-114	651-614	651-114-1	651-614-1
.2638	1.692	2.086	.3150	1.417	3.58	651-116	651-616	651-116-1	651-616-1
17/64	1.692	2.086	.3150	1.417	3.58	651-118	651-618	651-118-1	651-618-1
.2657	1.692	2.086	.3150	1.417	3.58	651-120	651-620	651-120-1	651-620-1
.2677	1.692	2.086	.3150	1.417	3.58	651-122	651-622	651-122-1	651-622-1
.2717	1.692	2.086	.3150	1.417	3.58	651-124	651-624	651-124-1	651-624-1
.2756	1.692	2.086	.3150	1.417	3.58	651-126	651-626	651-126-1	651-626-1
.2795	1.692	2.086	.3150	1.417	3.58	651-128	651-628	651-128-1	651-628-1
.2811	1.692	2.086	.3150	1.417	3.58	651-130	651-630	651-130-1	651-630-1
9/32	1.692	2.086	.3150	1.417	3.58	651-132	651-632	651-132-1	651-632-1
.2835	1.692	2.086	.3150	1.417	3.58	651-134	651-634	651-134-1	651-634-1
.2874	1.692	2.086	.3150	1.417	3.58	651-136	651-636	651-136-1	651-636-1
.2913	1.692	2.086	.3150	1.417	3.58	651-138	651-638	651-138-1	651-638-1
.2953	1.692	2.086	.3150	1.417	3.58	651-140	651-640	651-140-1	651-640-1
19/64	1.692	2.086	.3150	1.417	3.58	651-142	651-642	651-142-1	651-642-1
.2992	1.692	2.086	.3150	1.417	3.58	651-146	651-646	651-146-1	651-646-1
.3031	1.692	2.086	.3150	1.417	3.58	651-148	651-648	651-148-1	651-648-1
.3071	1.692	2.086	.3150	1.417	3.58	651-150	651-650	651-150-1	651-650-1
.3110	1.692	2.086	.3150	1.417	3.58	651-152	651-652	651-152-1	651-652-1
5/16	1.692	2.086	.3150	1.417	3.58	651-154	651-654	651-154-1	651-654-1
.3126	1.692	2.086	.3150	1.417	3.58	651-156	651-656	651-156-1	651-656-1
.3150	1.692	2.086	.3150	1.417	3.58	651-158	651-658	651-158-1	651-658-1
.3189	1.929	2.401	.3937	1.575	4.05	651-160	651-660	651-160-1	651-660-1
.3228	1.929	2.401	.3937	1.575	4.05	651-162	651-662	651-162-1	651-662-1
.3268	1.929	2.401	.3937	1.575	4.05	651-164	651-664	651-164-1	651-664-1
.3280	1.929	2.401	.3937	1.575	4.05	651-166	651-666	651-166-1	651-666-1
21/64	1.929	2.401	.3937	1.575	4.05	651-168	651-668	651-168-1	651-668-1
.3307	1.929	2.401	.3937	1.575	4.05	651-170	651-670	651-170-1	651-670-1
.3346	1.929	2.401	.3937	1.575	4.05	651-172	651-672	651-172-1	651-672-1
.3386	1.929	2.401	.3937	1.575	4.05	651-174	651-674	651-174-1	651-674-1
.3425	1.929	2.401	.3937	1.575	4.05	651-176	651-676	651-176-1	651-676-1
11/32	1.929	2.401	.3937	1.575	4.05	651-178	651-678	651-178-1	651-678-1
.3465	1.929	2.401	.3937	1.575	4.05	651-182	651-682	651-182-1	651-682-1



High Performance Drills

Hurricane Drills

5XD, Solid and Coolant Through
2 FL, 140° Point and 30° Helix
Coated and Uncoated

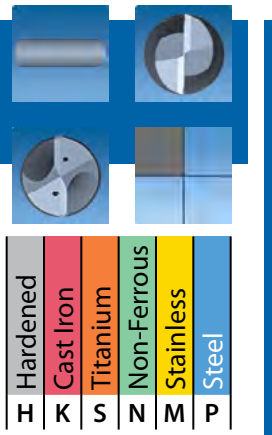


OD D1	LOC L1	LOF L3	SHK D2	SHK-L L4	OAL L2	Uncoated		PowerA	
						Solid	Coolant Through	Solid	Coolant Through
.3504	1.929	2.401	.3937	1.575	4.05	651-184	651-684	651-184-1	651-684-1
.3543	1.929	2.401	.3937	1.575	4.05	651-186	651-686	651-186-1	651-686-1
.3583	1.929	2.401	.3937	1.575	4.05	651-188	651-688	651-188-1	651-688-1
23/64	1.929	2.401	.3937	1.575	4.05	651-192	651-692	651-192-1	651-692-1
.3622	1.929	2.401	.3937	1.575	4.05	651-194	651-694	651-194-1	651-694-1
.3642	1.929	2.401	.3937	1.575	4.05	651-196	651-696	651-196-1	651-696-1
.3661	1.929	2.401	.3937	1.575	4.05	651-198	651-698	651-198-1	651-698-1
.3701	1.929	2.401	.3937	1.575	4.05	651-200	651-700	651-200-1	651-700-1
.3740	1.929	2.401	.3937	1.575	4.05	651-202	651-702	651-202-1	651-702-1
.3748	1.929	2.401	.3937	1.575	4.05	651-204	651-704	651-204-1	651-704-1
3/8	1.929	2.401	.3937	1.575	4.05	651-206	651-706	651-206-1	651-706-1
.3780	1.929	2.401	.3937	1.575	4.05	651-208	651-708	651-208-1	651-708-1
.3819	1.929	2.401	.3937	1.575	4.05	651-210	651-710	651-210-1	651-710-1
.3858	1.929	2.401	.3937	1.575	4.05	651-212	651-712	651-212-1	651-712-1
.3898	1.929	2.401	.3937	1.575	4.05	651-214	651-714	651-214-1	651-714-1
25/64	1.929	2.401	.3937	1.575	4.05	651-216	651-716	651-216-1	651-716-1
.3937	1.929	2.401	.3937	1.575	4.05	651-220	651-720	651-220-1	651-720-1
.3976	2.204	2.795	.4724	1.772	4.64	651-222	651-722	651-222-1	651-722-1
.4016	2.204	2.795	.4724	1.772	4.64	651-224	651-724	651-224-1	651-724-1
.4055	2.204	2.795	.4724	1.772	4.64	651-226	651-726	651-226-1	651-726-1
13/32	2.204	2.795	.4724	1.772	4.64	651-230	651-730	651-230-1	651-730-1
.4094	2.204	2.795	.4724	1.772	4.64	651-232	651-732	651-232-1	651-732-1
.4134	2.204	2.795	.4724	1.772	4.64	651-234	651-734	651-234-1	651-734-1
.4173	2.204	2.795	.4724	1.772	4.64	651-236	651-736	651-236-1	651-736-1
.4213	2.204	2.795	.4724	1.772	4.64	651-238	651-738	651-238-1	651-738-1
27/64	2.204	2.795	.4724	1.772	4.64	651-240	651-740	651-240-1	651-740-1
.4252	2.204	2.795	.4724	1.772	4.64	651-242	651-742	651-242-1	651-742-1
.4291	2.204	2.795	.4724	1.772	4.64	651-244	651-744	651-244-1	651-744-1
.4331	2.204	2.795	.4724	1.772	4.64	651-246	651-746	651-246-1	651-746-1
.4374	2.204	2.795	.4724	1.772	4.64	651-250	651-750	651-250-1	651-750-1
7/16	2.204	2.795	.4724	1.772	4.64	651-252	651-752	651-252-1	651-752-1
.4409	2.204	2.795	.4724	1.772	4.64	651-254	651-754	651-254-1	651-754-1
.4449	2.204	2.795	.4724	1.772	4.64	651-256	651-756	651-256-1	651-756-1
.4488	2.204	2.795	.4724	1.772	4.64	651-258	651-758	651-258-1	651-758-1

High Performance Drills

Hurricane Drills

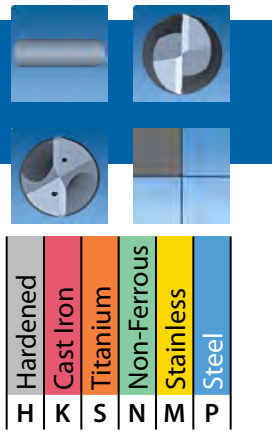
5XD, Solid and Coolant Through
2 FL, 140° Point and 30° Helix
Coated and Uncoated



OD D1	LOC L1	LOF L3	SHK D2	SHK-L L4	OAL L2	Uncoated		PowerA	
						Solid	Coolant Through	Solid	Coolant Through
.4528	2.204	2.795	.4724	1.772	4.64	651-260	651-760	651-260-1	651-760-1
29/64	2.204	2.795	.4724	1.772	4.64	651-262	651-762	651-262-1	651-762-1
.4567	2.204	2.795	.4724	1.772	4.64	651-264	651-764	651-264-1	651-764-1
.4606	2.204	2.795	.4724	1.772	4.64	651-266	651-766	651-266-1	651-766-1
.4646	2.204	2.795	.4724	1.772	4.64	651-268	651-768	651-268-1	651-768-1
15/32	2.204	2.795	.4724	1.772	4.64	651-272	651-772	651-272-1	651-772-1
.4689	2.204	2.795	.4724	1.772	4.64	651-274	651-774	651-274-1	651-774-1
.4724	2.204	2.795	.4724	1.772	4.64	651-276	651-776	651-276-1	651-776-1
31/64	2.362	2.795	.5512	1.772	4.64	651-278	651-778	651-278-1	651-778-1
.4921	2.362	3.031	.5512	1.772	4.88	651-280	651-780	651-280-1	651-780-1
1/2	2.362	3.031	.5512	1.772	4.88	651-284	651-784	651-284-1	651-784-1
.5118	2.362	3.031	.5512	1.772	4.88	651-286	651-786	651-286-1	651-786-1
17/32	2.362	3.03	.5512	1.772	4.88	651-288	651-788	651-288-1	651-788-1
.5315	2.362	3.031	.5512	1.772	4.88	651-290	651-790	651-290-1	651-790-1
.5394	2.362	3.031	.5512	1.772	4.88	651-292	651-792	651-292-1	651-792-1
.5512	2.362	3.031	.5512	1.772	4.88	651-296	651-796	651-296-1	651-796-1
9/16	2.480	3.267	.6299	1.889	5.23	651-302	651-802	651-302-1	651-802-1
.5709	2.480	3.267	.6299	1.889	5.23	651-304	651-804	651-304-1	651-804-1
37/64	2.480	3.267	.6299	1.889	5.23	651-306	651-806	651-306-1	651-806-1
.5787	2.480	3.267	.6299	1.889	5.23	651-308	651-808	651-308-1	651-808-1
.5906	2.480	3.267	.6299	1.889	5.23	651-310	651-810	651-310-1	651-810-1
39/64	2.480	3.267	.6299	1.889	5.23	651-312	651-812	651-312-1	651-812-1
.6102	2.480	3.267	.6299	1.889	5.23	651-314	651-814	651-314-1	651-814-1
.6181	2.480	3.267	.6299	1.889	5.23	651-316	651-816	651-316-1	651-816-1
5/8	2.480	3.267	.6299	1.889	5.23	651-318	651-818	651-318-1	651-818-1
.6299	2.480	3.267	.6299	1.889	5.23	651-320	651-820	651-320-1	651-820-1
.6496	2.795	3.661	.7087	1.889	5.62	651-322	651-822	651-322-1	651-822-1
.6693	2.795	3.661	.7087	1.889	5.62	651-324	651-824	651-324-1	651-824-1
.6890	2.795	3.661	.7087	1.889	5.62	651-326	651-826	651-326-1	651-826-1
.7087	2.795	3.661	.7087	1.889	5.62	651-328	651-828	651-328-1	651-828-1
.7283	3.031	3.976	.7874	1.969	6.02	651-330	651-830	651-330-1	651-830-1
.7480	3.031	3.976	.7874	1.969	6.02	651-332	651-832	651-332-1	651-832-1
.7677	3.031	3.976	.7874	1.969	6.02	651-334	651-834	651-334-1	651-834-1
.7874	3.031	3.976	.7874	1.969	6.02	651-336	651-836	651-336-1	651-836-1



High Performance Drills



Hurricane Drills *

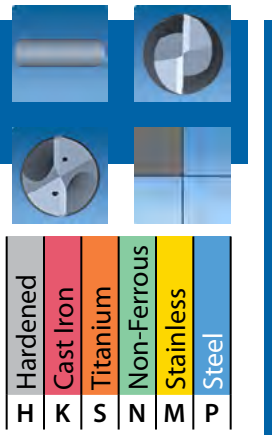
8XD, Coolant Through
2 FL, 140° Point and 30° Helix
Coated and Uncoated

- High Performance **A-Gr-SiV** submicron grain carbide
- Coolant through
- Rigid design for fast feed rates
- MAP certified quality

OD D1	LOC L1	LOF L3	SHK D2	SHK-L L4	OAL L2	Uncoated		PowerA	
						Solid	Coolant Through	Solid	Coolant Through
.1339	1.141	1.338	.2362	1.3386	2.83	-	652-512	-	652-512-1
.1378	1.141	1.338	.2362	1.3386	2.83	-	652-514	-	652-514-1
9/64	1.141	1.338	.2362	1.3386	2.83	-	652-516	-	652-516-1
.1417	1.141	1.338	.2362	1.3386	2.83	-	652-518	-	652-518-1
.1457	1.141	1.338	.2362	1.3386	2.83	-	652-520	-	652-520-1
.1496	1.417	1.692	.2362	1.3386	3.18	-	652-522	-	652-522-1
.1535	1.417	1.692	.2362	1.3386	3.18	-	652-524	-	652-524-1
5/32	1.417	1.692	.2362	1.3386	3.18	-	652-526	-	652-526-1
.1575	1.417	1.692	.2362	1.3386	3.18	-	652-528	-	652-528-1
.1614	1.417	1.692	.2362	1.3386	3.18	-	652-530	-	652-530-1
.1654	1.417	1.692	.2362	1.3386	3.18	-	652-532	-	652-532-1
.1693	1.417	1.692	.2362	1.3386	3.18	-	652-534	-	652-534-1
11/64	1.417	1.692	.2362	1.3386	3.18	-	652-536	-	652-536-1
.1732	1.417	1.692	.2362	1.3386	3.18	-	652-538	-	652-538-1
.1772	1.417	1.692	.2362	1.3386	3.18	-	652-540	-	652-540-1
.1811	1.417	1.692	.2362	1.3386	3.18	-	652-542	-	652-542-1
.1850	1.417	1.692	.2362	1.3386	3.18	-	652-544	-	652-544-1
3/16	1.417	1.692	.2362	1.3386	3.18	-	652-546	-	652-546-1
.1890	2.086	2.244	.2362	1.3386	3.74	-	652-548	-	652-548-1
.1929	2.086	2.244	.2362	1.3386	3.74	-	652-550	-	652-550-1
.1969	2.086	2.244	.2362	1.4173	3.74	-	652-552	-	652-552-1
.2008	2.086	2.244	.2362	1.4173	3.74	-	652-554	-	652-554-1
13/64	2.086	2.244	.2362	1.4173	3.74	-	652-556	-	652-556-1
.2047	2.086	2.244	.2362	1.4173	3.74	-	652-558	-	652-558-1
.2087	2.086	2.244	.2362	1.4173	3.74	-	652-560	-	652-560-1
.2126	2.086	2.244	.2362	1.4173	3.74	-	652-562	-	652-562-1
.2165	2.086	2.244	.2362	1.4173	3.74	-	652-564	-	652-564-1
7/32	2.086	2.244	.2362	1.4173	3.74	-	652-566	-	652-566-1
.2205	2.086	2.244	.2362	1.4173	3.74	-	652-568	-	652-568-1
.2244	2.086	2.244	.2362	1.4173	3.74	-	652-570	-	652-570-1
.2283	2.086	2.244	.2362	1.4173	3.74	-	652-572	-	652-572-1
.2323	2.086	2.244	.2362	1.4173	3.74	-	652-574	-	652-574-1
15/64	2.086	2.244	.2362	1.4173	3.74	-	652-576	-	652-576-1
.2362	2.086	2.244	.2362	1.4173	3.74	-	652-578	-	652-578-1

* For extreme performance drilling, try our PowerNR coating. Use the uncoated part number and add -8.

High Performance Drills



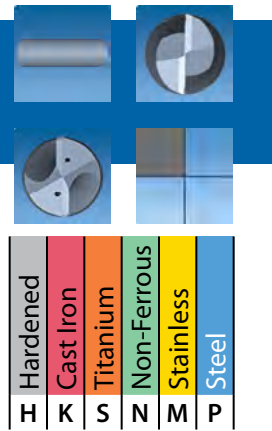
Hurricane Drills

8XD, Coolant Through
2 FL, 140° Point and 30° Helix
Coated and Uncoated

OD D1	LOC L1	LOF L3	SHK D2	SHK-L L4	OAL L2	Uncoated		PowerA	
						Solid	Coolant Through	Solid	Coolant Through
.2402	2.598	2.992	.3150	1.4173	4.48	-	652-580	-	652-580-1
.2441	2.598	2.992	.3150	1.4173	4.48	-	652-582	-	652-582-1
.2480	2.598	2.992	.3150	1.4173	4.48	-	652-584	-	652-584-1
1/4	2.598	2.992	.3150	1.4173	4.48	-	652-586	-	652-586-1
.2520	2.598	2.992	.3150	1.4173	4.48	-	652-588	-	652-588-1
.2559	2.598	2.992	.3150	1.4173	4.48	-	652-590	-	652-590-1
.2598	2.598	2.992	.3150	1.4173	4.48	-	652-592	-	652-592-1
.2638	2.598	2.992	.3150	1.4173	4.48	-	652-594	-	652-594-1
17/64	2.598	2.992	.3150	1.4173	4.48	-	652-596	-	652-596-1
.2677	2.598	2.992	.3150	1.4173	4.48	-	652-598	-	652-598-1
.2717	2.598	2.992	.3150	1.4173	4.48	-	652-600	-	652-600-1
.2756	2.598	2.992	.3150	1.4173	4.48	-	652-602	-	652-602-1
.2795	2.598	2.992	.3150	1.4173	4.48	-	652-604	-	652-604-1
9/32	2.598	2.992	.3150	1.4173	4.48	-	652-606	-	652-606-1
.2835	2.598	2.992	.3150	1.4173	4.48	-	652-608	-	652-608-1
.2874	2.598	2.992	.3150	1.4173	4.48	-	652-610	-	652-610-1
.2913	2.598	2.992	.3150	1.4173	4.48	-	652-612	-	652-612-1
.2953	2.598	2.992	.3150	1.4173	4.48	-	652-614	-	652-614-1
19/64	2.598	2.992	.3150	1.4173	4.48	-	652-616	-	652-616-1
.2992	2.598	2.992	.3150	1.4173	4.48	-	652-618	-	652-618-1
.3031	2.598	2.992	.3150	1.4173	4.48	-	652-620	-	652-620-1
.3071	2.598	2.992	.3150	1.4173	4.48	-	652-622	-	652-622-1
.3110	2.598	2.992	.3150	1.4173	4.48	-	652-624	-	652-624-1
5/16	2.598	2.992	.3150	1.4173	4.48	-	652-626	-	652-626-1
.3150	2.598	2.992	.3150	1.4173	4.48	-	652-628	-	652-628-1
.3189	3.346	3.740	.3937	1.771	5.59	-	652-630	-	652-630-1
.3228	3.346	3.740	.3937	1.771	5.59	-	652-632	-	652-632-1
.3268	3.346	3.740	.3937	1.771	5.59	-	652-634	-	652-634-1
21/64	3.346	3.740	.3937	1.771	5.59	-	652-636	-	652-636-1
.3307	3.346	3.740	.3937	1.771	5.59	-	652-638	-	652-638-1
.3346	3.346	3.740	.3937	1.771	5.59	-	652-640	-	652-640-1
.3386	3.346	3.740	.3937	1.771	5.59	-	652-642	-	652-642-1
.3425	3.346	3.740	.3937	1.771	5.59	-	652-644	-	652-644-1
11/32	3.346	3.740	.3937	1.771	5.59	-	652-646	-	652-646-1



High Performance Drills

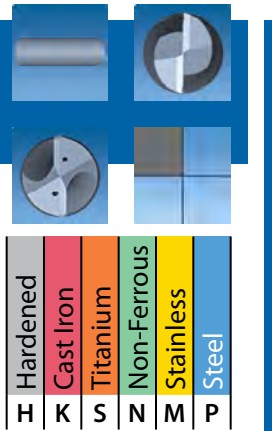


Hurricane Drills

8XD, Coolant Through
2 FL, 140° Point and 30° Helix
Coated and Uncoated

OD D1	LOC L1	LOF L3	SHK D2	SHK-L L4	OAL L2	Uncoated		PowerA	
						Solid	Coolant Through	Solid	Coolant Through
.3465	3.346	3.740	.3937	1.771	5.59	-	652-648	-	652-648-1
.3504	3.346	3.740	.3937	1.771	5.59	-	652-650	-	652-650-1
.3543	3.346	3.740	.3937	1.771	5.59	-	652-652	-	652-652-1
.3583	3.346	3.740	.3937	1.771	5.59	-	652-654	-	652-654-1
23/64	3.346	3.740	.3937	1.771	5.59	-	652-656	-	652-656-1
.3622	3.346	3.740	.3937	1.771	5.59	-	652-658	-	652-658-1
.3661	3.346	3.740	.3937	1.771	5.59	-	652-660	-	652-660-1
.3701	3.346	3.740	.3937	1.771	5.59	-	652-662	-	652-662-1
.3740	3.346	3.740	.3937	1.771	5.59	-	652-664	-	652-664-1
.3748	3.346	3.740	.3937	1.771	5.59	-	652-666	-	652-666-1
3/8	3.346	3.740	.3937	1.771	5.59	-	652-668	-	652-668-1
.3780	3.346	3.740	.3937	1.771	5.59	-	652-670	-	652-670-1
.3819	3.346	3.740	.3937	1.771	5.59	-	652-672	-	652-672-1
.3858	3.346	3.740	.3937	1.771	5.59	-	652-674	-	652-674-1
.3898	3.346	3.740	.3937	1.771	5.59	-	652-676	-	652-676-1
25/64	3.346	3.740	.3937	1.771	5.59	-	652-678	-	652-678-1
.3937	3.346	3.740	.3937	1.771	5.59	-	652-680	-	652-680-1
.3976	3.897	4.488	.4724	1.810	6.37	-	652-682	-	652-682-1
.4016	3.897	4.488	.4724	1.810	6.37	-	652-684	-	652-684-1
.4055	3.897	4.488	.4724	1.810	6.37	-	652-686	-	652-686-1
13/32	3.897	4.488	.4724	1.810	6.37	-	652-688	-	652-688-1
.4094	3.897	4.488	.4724	1.810	6.37	-	652-690	-	652-690-1
.4134	3.897	4.488	.4724	1.810	6.37	-	652-692	-	652-692-1
.4173	3.897	4.488	.4724	1.810	6.37	-	652-694	-	652-694-1
.4213	3.897	4.488	.4724	1.810	6.37	-	652-696	-	652-696-1
.4218	3.897	4.488	.4724	1.810	6.37	-	652-698	-	652-698-1
.4252	3.897	4.488	.4724	1.810	6.37	-	652-700	-	652-700-1
.4291	3.897	4.488	.4724	1.810	6.37	-	652-702	-	652-702-1
.4331	3.897	4.488	.4724	1.810	6.37	-	652-704	-	652-704-1
.4370	3.897	4.488	.4724	1.810	6.37	-	652-706	-	652-706-1
7/16	3.897	4.488	.4724	1.810	6.37	-	652-708	-	652-708-1
.4409	3.897	4.488	.4724	1.810	6.37	-	652-710	-	652-710-1
.4449	3.897	4.488	.4724	1.810	6.37	-	652-712	-	652-712-1
.4488	3.897	4.488	.4724	1.810	6.37	-	652-714	-	652-714-1

High Performance Drills



Hurricane Drills

8XD, Coolant Through
2 FL, 140° Point and 30° Helix
Coated and Uncoated

OD D1	LOC L1	LOF L3	SHK D2	SHK-L L4	OAL L2	Uncoated		PowerA	
						Solid	Coolant Through	Solid	Coolant Through
.4528	3.897	4.488	.4724	1.810	6.37	-	652-716	-	652-716-1
.4531	3.897	4.488	.4724	1.810	6.37	-	652-718	-	652-718-1
.4567	3.897	4.488	.4724	1.810	6.37	-	652-720	-	652-720-1
.4606	3.897	4.488	.4724	1.810	6.37	-	652-722	-	652-722-1
.4646	3.897	4.488	.4724	1.810	6.37	-	652-724	-	652-724-1
.4685	3.897	4.488	.4724	1.810	6.37	-	652-726	-	652-726-1
15/32	3.897	4.488	.4724	1.810	6.37	-	652-728	-	652-728-1
.4724	3.897	4.488	.4724	1.810	6.37	-	652-730	-	652-730-1
31/64	3.897	4.488	.5512	1.850	6.37	-	652-732	-	652-732-1
.4921	4.566	5.236	.5512	1.850	7.16	-	652-734	-	652-734-1
1/2	4.566	5.236	.5512	1.850	7.16	-	652-736	-	652-736-1
.5118	4.566	5.236	.5512	1.850	7.16	-	652-738	-	652-738-1
.5315	4.566	5.236	.5512	1.850	7.16	-	652-740	-	652-740-1
.5512	4.566	5.236	.5512	1.850	7.16	-	652-742	-	652-742-1
.5709	5.196	5.984	.6299	1.969	8.03	-	652-744	-	652-744-1
.5906	5.196	5.984	.6299	1.969	8.03	-	652-746	-	652-746-1
.6102	5.196	5.984	.6299	1.969	8.03	-	652-748	-	652-748-1
.6299	5.196	5.984	.6299	1.969	8.03	-	652-750	-	652-750-1
.6496	5.886	6.732	.7087	1.969	8.77	-	652-752	-	652-752-1
.6693	5.886	6.732	.7087	1.969	8.77	-	652-754	-	652-754-1
.6890	5.886	6.732	.7087	1.969	8.77	-	652-756	-	652-756-1
.7087	5.886	6.732	.7087	1.969	8.77	-	652-758	-	652-758-1
.7283	6.535	7.480	.7874	2.047	9.60	-	652-760	-	652-760-1
.7480	6.535	7.480	.7874	2.047	9.60	-	652-762	-	652-762-1
3/4	6.535	7.480	.7874	2.047	9.60	-	652-764	-	652-764-1
.7677	6.535	7.480	.7874	2.047	9.60	-	652-766	-	652-766-1
.7874	6.535	7.480	.7874	2.047	9.60	-	652-768	-	652-768-1

HP Drills



Reamers

- ## Solid Carbide
- 45° Corner
 - Four or Six Flutes

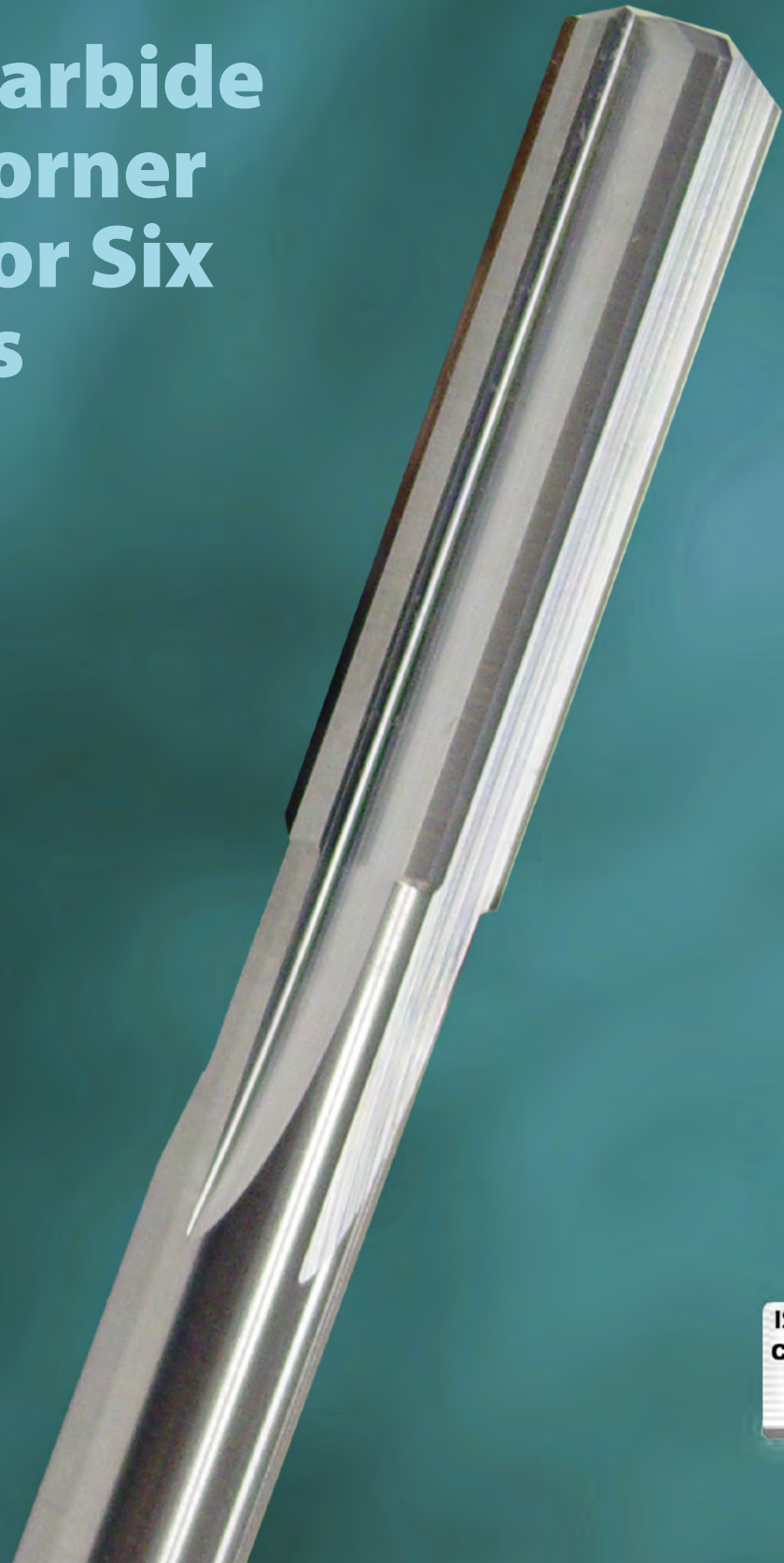







Table of Contents

-  Straight Flute Reamers - 4 Flute 190
-  Straight Flute Reamers - 6 Flute 191

See Carbide Drills and Threadmills pages for additional tools.

Features Legend

	4 Flutes
	6 Flutes
	Plain shank

Mastercut's Superior Carbide Blend – *A-Gr-SiV* (Active Grain Sized Volume)
Our superior tungsten carbide gives you the ability to be *aggressive* when you need to be. Growth inhibitors in our submicron carbide blanks maintain the most consistent grain size available, giving you superior hardness AND toughness.

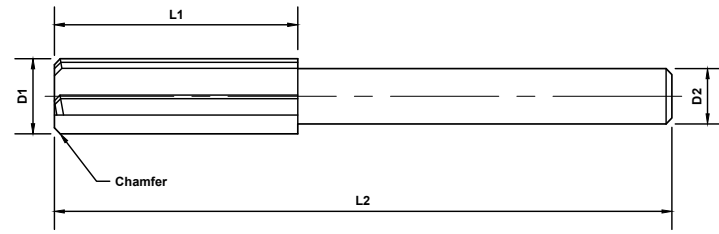
Please contact us for our full line of metric products.

Email: sales@mastercuttool.com
www.mastercuttool.com



Reamers - Straight Flute

45° Corner Chamfer



- Genuine **A-Gr-SiV** submicron grain carbide
- Proven, versatile performance
- MAP certified quality

Hardened	Cast Iron	Titanium	Non-Ferrous	Stainless	Steel
H	K	S	N	M	P



4 Flute



6 Flute

OD D1	LOC L1	SHK D2	OAL L2	Flutes	Uncoated
.1250	5/8	7/64	2-1/4	4	645-151
.1285	3/4	1/8	2-1/2	4	645-159
.1290	3/4	1/8	2-1/2	4	645-160
.1360	3/4	1/8	2-1/2	4	645-174
.1378	3/4	1/8	2-1/2	4	645-178
.1405	3/4	1/8	2-1/2	4	645-185
.1406	3/4	1/8	2-1/2	4	645-186
.1440	3/4	1/8	2-1/2	4	645-193
.1470	3/4	9/64	2-1/2	4	645-199
.1495	3/4	9/64	2-1/2	4	645-204
.1520	3/4	9/64	2-1/2	4	645-209
.1540	3/4	9/64	2-1/2	4	645-213
.1562	3/4	9/64	2-1/2	4	645-218
.1570	3/4	9/64	2-1/2	4	645-220
.1575	3/4	9/64	2-1/2	4	645-221

OD D1	LOC L1	SHK D2	OAL L2	Flutes	Uncoated
.1590	3/4	9/64	2-1/2	4	645-224
.1595	7/8	5/32	2-3/4	4	645-225
.1610	7/8	5/32	2-3/4	4	645-229
.1660	7/8	5/32	2-3/4	4	645-239
.1695	7/8	5/32	2-3/4	4	645-246
.1719	7/8	5/32	2-3/4	4	645-251
.1730	7/8	5/32	2-3/4	4	645-254
.1770	7/8	11/64	2-3/4	4	645-263
.1772	7/8	11/64	2-3/4	4	645-264
.1800	7/8	11/64	2-3/4	4	645-270
.1820	7/8	11/64	2-3/4	4	645-274
.1850	7/8	11/64	2-3/4	4	645-280
.1875	7/8	11/64	2-3/4	4	645-287
.1890	7/8	11/64	2-3/4	4	645-292
.1910	7/8	11/64	2-3/4	4	645-296

Call for other available sizes

Reamers - Straight Flute

45° Corner Chamfer

Hardened	Cast Iron	Titanium	Non-Ferrous	Stainless	Steel
H	K	S	N	M	P

OD D1	LOC L1	SHK D2	OAL L2	Flutes	Uncoated
.1935	1	3/16	3	6	645-301
.1960	1	3/16	3	6	645-306
.1968	1	3/16	3	6	645-308
.1990	1	3/16	3	6	645-313
.2010	1	3/16	3	6	645-317
.2031	1	3/16	3	6	645-322
.2040	1	3/16	3	6	645-324
.2055	1	3/16	3	6	645-327
.2090	1	3/16	3	6	645-334
.2130	1	3/16	3	6	645-342
.2165	1	3/16	3	6	645-349
.2188	1	3/16	3	6	645-355
.2210	1	3/16	3	6	645-360
.2280	1	7/32	3	6	645-374
.2340	1	7/32	3	6	645-386
.2344	1	7/32	3	6	645-387
.2362	1	7/32	3	6	645-392
.2380	1	7/32	3	6	645-396
.2420	1	7/32	3	6	645-405
.2460	1	7/32	3	6	645-413
.2500	1	7/32	3	6	645-421
.2559	1-1/8	1/4	3-1/4	6	645-435
.2570	1-1/8	1/4	3-1/4	6	645-438
.2610	1-1/8	1/4	3-1/4	6	645-446
.2656	1-1/8	1/4	3-1/4	6	645-456
.2660	1-1/8	1/4	3-1/4	6	645-457
.2720	1-1/8	1/4	3-1/4	6	645-469
.2756	1-1/8	1/4	3-1/4	6	645-477
.2770	1-1/8	1/4	3-1/4	6	645-480
.2810	1-1/8	1/4	3-1/4	6	645-488
.2812	1-1/8	1/4	3-1/4	6	645-489
.2900	1-1/8	9/32	3-1/4	6	645-509
.2950	1-1/8	9/32	3-1/4	6	645-519
.2953	1-1/8	9/32	3-1/4	6	645-520

OD D1	LOC L1	SHK D2	OAL L2	Flutes	Uncoated
.2969	1-1/8	9/32	3-1/4	6	645-524
.3020	1-1/8	9/32	3-1/4	6	645-535
.3125	1-1/8	9/32	3-1/4	6	645-556
.3150	1-1/8	9/32	3-1/4	6	645-561
.3160	1-1/8	9/32	3-1/4	6	645-563
.3230	1-1/4	5/16	3-1/2	6	645-578
.3281	1-1/4	5/16	3-1/2	6	645-589
.3320	1-1/4	5/16	3-1/2	6	645-597
.3346	1-1/4	5/16	3-1/2	6	645-603
.3390	1-1/4	5/16	3-1/2	6	645-612
.3438	1-1/4	5/16	3-1/2	6	645-622
.3480	1-1/4	5/16	3-1/2	6	645-631
.3580	1-1/4	11/32	3-1/2	6	645-652
.3594	1-1/4	11/32	3-1/2	6	645-655
.3680	1-1/4	11/32	3-1/2	6	645-674
.3740	1-1/4	11/32	3-1/2	6	645-686
.3750	1-1/4	11/32	3-1/2	6	645-688
.3770	1-1/4	11/32	3-1/2	6	645-692
.3840	1-1/2	3/8	4	6	645-706
.3860	1-1/2	3/8	4	6	645-710
25/64	1-1/2	3/8	4	6	645-719
.3937	1-1/2	3/8	4	6	645-720
.3960	1-1/2	3/8	4	6	645-721
13/32	1-1/2	3/8	4	6	645-722
.4134	1-1/2	13/32	4	6	645-723
27/64	1-1/2	13/32	4	6	645-724
.4331	1-1/2	13/32	4	6	645-725
7/16	1-1/2	13/32	4	6	645-726
.4528	1-1/2	7/16	4	6	645-727
29/64	1-1/2	7/16	4	6	645-728
15/32	1-1/2	7/16	4	6	645-729
.4724	1-1/2	7/16	4	6	645-730
31/64	1-1/2	15/32	4	6	645-732
1/2	1-1/2	15/32	4	6	645-734









Call for other available sizes

Threadmills

- Helical and Multi-Helix Fluting








Table of Contents

	Helical Internal UN	194
	Helical BSPP	195
	Helical BSPT	195
	Helical NPT	196
	Helical Metric	197
	Multi-Helix Internal UN	198
	Multi-Helix BSPP	199
	Multi-Helix BSPT.	199

See Carbide Drills and Reamers pages for additional tools.
Contact us for any Threadmill programming assistance.

Features Legend

	2 Flutes		5 Flutes
	3 Flutes		Plain shank
	4 Flutes		

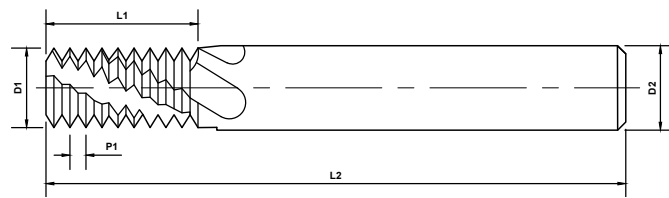
Coatings Legend

	Power A Coating
---	-----------------

Mastercut's Superior Carbide Blend – A-Gr-SiV (Active Grain Sized Volume)
Our superior tungsten carbide gives you the ability to be *aggressive* when you need to be. Growth inhibitors in our submicron carbide blanks maintain the most consistent grain size available, giving you superior hardness AND toughness.

Please contact us for our full line of metric products.

Helical Internal UN Threadmills



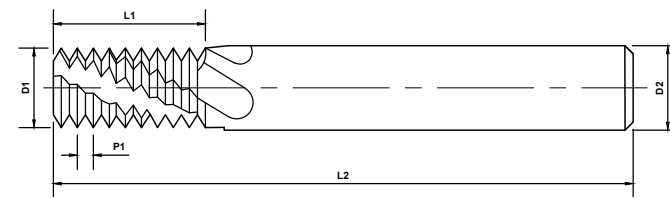
- Genuine **A-Gr-SiV** submicron grain carbide
- Proven, versatile performance
- MAP certified quality



PowerA

Size	Pitch P1	OD D1	LOC L1	SHK D2	OAL L2	Flute Count	Uncoated	PowerA
#6	32	.095	7/32	1/8	2	3	290-002	290-002-1
#8	32	.115	1/4	1/8	2	3	290-004	290-004-1
#8	36	.115	1/4	1/8	2	3	290-006	290-006-1
#10	24	.120	5/16	3/16	2	3	290-008	290-008-1
#10	32	.120	5/16	3/16	2	3	290-010	290-010-1
1/4	20	.180	1/2	3/16	2-1/2	3	290-012	290-012-1
1/4	28	.180	1/2	3/16	2-1/2	3	290-014	290-014-1
5/16	18	.240	5/8	1/4	2-1/2	3	290-016	290-016-1
5/16	24	.240	5/8	1/4	2-1/2	3	290-018	290-018-1
3/8	16	.290	3/4	5/16	3	4	290-020	290-020-1
3/8	24	.290	3/4	5/16	3	4	290-022	290-022-1
7/16	14	.340	7/8	3/8	3	4	290-024	290-024-1
7/16	20	.340	7/8	3/8	3	4	290-026	290-026-1
1/2	13	.350	7/8	3/8	3-1/2	4	290-028	290-028-1
1/2	20	.350	7/8	3/8	3-1/2	4	290-030	290-030-1
9/16	12	.370	7/8	1/2	3-1/2	4	290-032	290-032-1
9/16	18	.370	7/8	1/2	3-1/2	4	290-034	290-034-1
5/8	11	.470	1-1/4	1/2	3-1/2	5	290-036	290-036-1
5/8	18	.470	1-1/4	1/2	3-1/2	5	290-038	290-038-1
3/4	10	.495	1-1/4	1/2	3-1/2	5	290-040	290-040-1
3/4	12	.495	1-1/4	1/2	3-1/2	5	290-042	290-042-1
3/4	16	.495	1-1/4	1/2	3-1/2	5	290-044	290-044-1
7/8	9	.620	1-1/4	5/8	3-1/2	5	290-046	290-046-1
7/8	14	.620	1-1/4	5/8	3-1/2	5	290-048	290-048-1
1	8	.620	1-3/8	3/4	4	5	290-050	290-050-1
1	12	.620	1-3/8	3/4	4	5	290-052	290-052-1

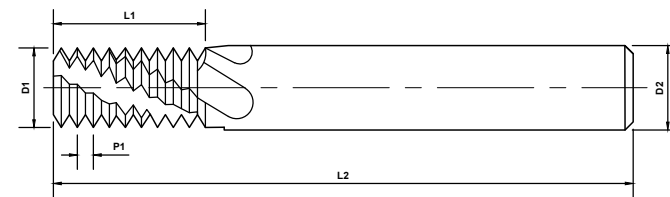
Helical BSPP Threadmills



- Genuine **A-Gr-SiV** submicron grain carbide
- Proven, versatile performance
- MAP certified quality

Size	Pitch P1	OD D1	LOC L1	SHK D2	OAL L2	Flute Count	Uncoated	PowerA
1/16, 1/8	28	.240	.572	1/4	2-1/2	3	290-102	290-102-1
1/4	19	.312	.737	5/16	3	4	290-104	290-104-1
1/2	14	.470	1.143	1/2	3-1/2	4	290-106	290-106-1
1	11	.620	1.546	5/8	4	5	290-108	290-108-1

Helical BSPT Threadmills

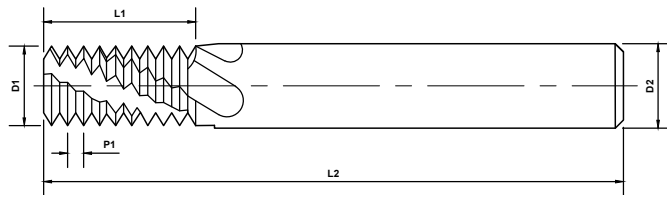
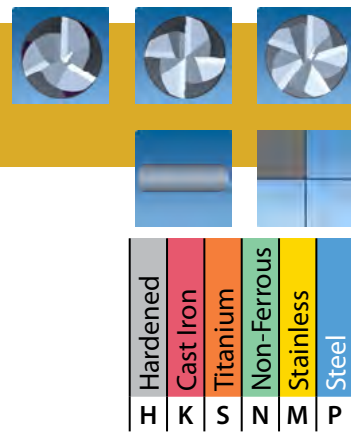


- Genuine **A-Gr-SiV** submicron grain carbide
- Proven, versatile performance
- MAP certified quality

Size	Pitch P1	OD D1	LOC L1	SHK D2	OAL L2	Flute Count	Uncoated	PowerA
1/16, 1/8	28	.240	.401	1/4	2-1/2	3	290-202	290-202-1
1/4	19	.312	.578	5/16	3	4	290-204	290-204-1
1/2	14	.470	.785	1/2	3-1/2	4	290-206	290-206-1
1	11	.620	1.546	5/8	4	5	290-208	290-208-1

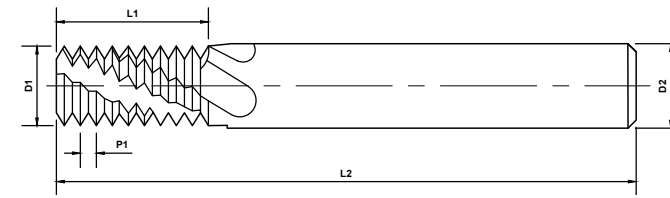
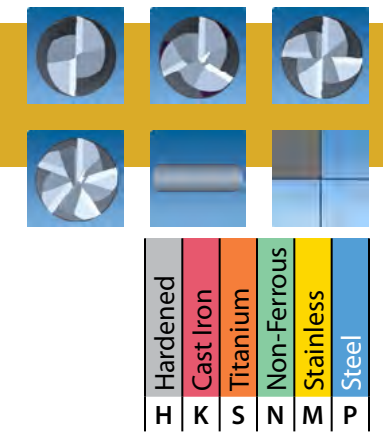
Threadmills

Helical NPT Threadmills



- Genuine **A-Gr-SiV** submicron grain carbide
- Proven, versatile performance
- MAP certified quality

Helical Metric Threadmills

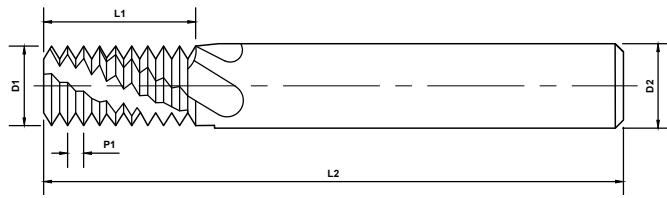
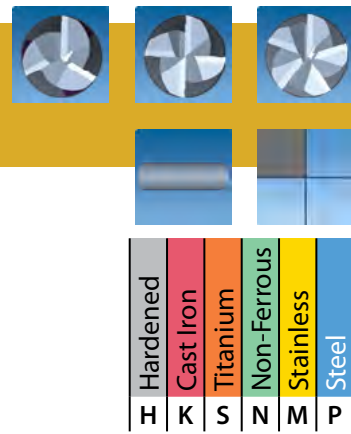


- Genuine **A-Gr-SiV** submicron grain carbide
- Proven, versatile performance
- MAP certified quality

Size	Pitch P1	OD D1	LOC L1	SHK D2	OAL L2	Flute Count	Uncoated	PowerA
1/16	27	.245	7/16	1/4	2-1/2	3	290-302	290-302-1
1/8	27	.310	7/16	5/16	2-1/2	4	290-304	290-304-1
1/4	18	.305	5/8	3/8	3	4	290-306	290-306-1
3/8	18	.305	5/8	3/8	3	4	290-308	290-308-1
1/2	14	.495	7/8	1/2	3-1/2	4	290-310	290-310-1
3/4	14	.495	7/8	1/2	3-1/2	4	290-312	290-312-1
1	11	.620	1-1/8	3/4	4	5	290-314	290-314-1

Size	Pitch P1	OD D1	LOC L1	SHK D2	OAL L2	Flute Count	Uncoated	PowerA
M4	0.70mm	.120	1/4	1/8	2	2	290-502	290-502-1
M4.5	0.75mm	.120	1/4	1/8	2	3	290-504	290-504-1
M5	0.80mm	.120	5/16	3/16	2	3	290-506	290-506-1
M6	1.00mm	.170	1/2	3/16	2-1/2	3	290-508	290-508-1
M8	0.75mm	.235	5/8	1/4	2-1/2	3	290-510	290-510-1
M8	1.00mm	.235	5/8	1/4	2-1/2	3	290-512	290-512-1
M8	1.25mm	.235	5/8	1/4	2-1/2	3	290-514	290-514-1
M10	1.25mm	.300	3/4	5/16	3	4	290-516	290-516-1
M10	1.50mm	.300	3/4	5/16	3	4	290-518	290-518-1
M12	1.00mm	.360	7/8	3/8	3-1/2	4	290-520	290-520-1
M12	1.25mm	.360	7/8	3/8	3-1/2	4	290-522	290-522-1
M12	1.75mm	.360	7/8	3/8	3-1/2	4	290-524	290-524-1
M14	1.50mm	.360	7/8	3/8	3-1/2	4	290-526	290-526-1
M16	2.00mm	.470	1-1/4	1/2	3-1/2	5	290-528	290-528-1
M18	2.50mm	.470	1-1/4	1/2	3-1/2	5	290-530	290-530-1
M20	3.00mm	.470	1-1/4	5/8	3-1/2	5	290-532	290-532-1

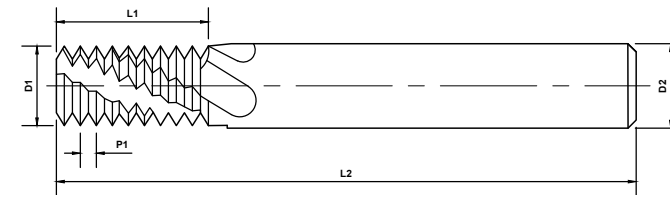
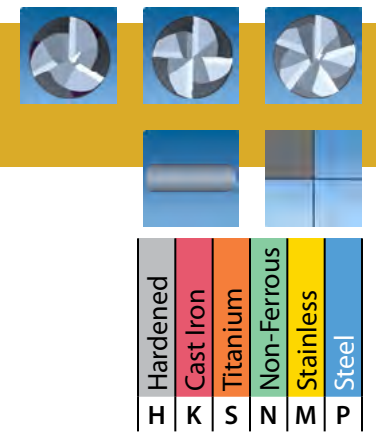
Multi-Helix Internal UN



- Genuine **A-Gr-SiV** submicron grain carbide
- Proven, versatile performance
- MAP certified quality

Size	Pitch P1	OD D1	LOC L1	SHK D2	OAL L2	Flute Count	PowerA
#6	32	.095	7/32	1/8	2	3	290-602-1
#8	32	.115	1/4	1/8	2	3	290-604-1
#8	36	.115	1/4	1/8	2	3	290-606-1
#10	24	.120	5/16	3/16	2	3	290-608-1
#10	32	.120	5/16	3/16	2	3	290-610-1
1/4	20	.180	1/2	3/16	2-1/2	3	290-612-1
1/4	28	.180	1/2	3/16	2-1/2	3	290-614-1
5/16	18	.240	5/8	1/4	2-1/2	3	290-616-1
5/16	24	.240	5/8	1/4	2-1/2	3	290-618-1
3/8	16	.290	3/4	5/16	3	4	290-620-1
3/8	24	.290	3/4	5/16	3	4	290-622-1
7/16	14	.340	7/8	3/8	3	4	290-624-1
7/16	20	.340	7/8	3/8	3	4	290-626-1
1/2	13	.350	7/8	3/8	3-1/2	4	290-628-1
1/2	20	.350	7/8	3/8	3-1/2	4	290-630-1
9/16	12	.370	7/8	1/2	3-1/2	4	290-632-1
9/16	18	.370	7/8	1/2	3-1/2	4	290-634-1
5/8	11	.470	1-1/4	1/2	3-1/2	5	290-636-1
5/8	18	.470	1-1/4	1/2	3-1/2	5	290-638-1
3/4	10	.495	1-1/4	1/2	3-1/2	5	290-640-1
3/4	12	.495	1-1/4	1/2	3-1/2	5	290-642-1
3/4	16	.495	1-1/4	1/2	3-1/2	5	290-644-1
7/8	9	.620	1-1/4	5/8	3-1/2	5	290-646-1
7/8	14	.620	1-1/4	5/8	3-1/2	5	290-648-1
1	8	.620	1-3/8	3/4	4	5	290-650-1

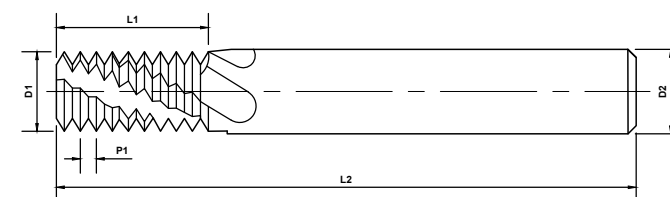
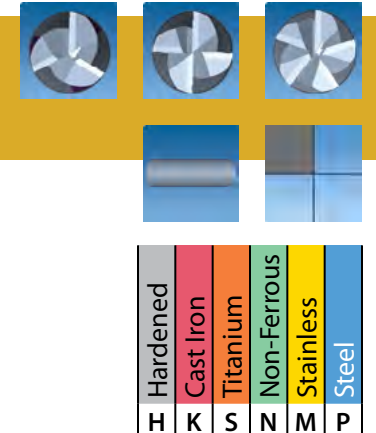
Multi-Helix BSPP Threadmills



- Genuine **A-Gr-SiV** submicron grain carbide
- Proven, versatile performance
- MAP certified quality

Size	Pitch P1	OD D1	LOC L1	SHK D2	OAL L2	Flute Count	PowerA
1/16, 1/8	28	.240	.572	1/4	2-1/2	3	290-702-1
1/4	19	.312	.737	5/16	3	4	290-704-1
1/2	14	.470	1.143	1/2	3-1/2	4	290-706-1
1	11	.620	1.546	5/8	4	5	290-708-1

Multi-Helix BSPT Threadmills



- Genuine **A-Gr-SiV** submicron grain carbide
- Proven, versatile performance
- MAP certified quality

Size	Pitch P1	OD D1	LOC L1	SHK D2	OAL L2	Flute Count	PowerA
1/16, 1/8	28	.240	.401	1/4	2-1/2	3	290-802-1
1/4	19	.312	.578	5/16	3	4	290-804-1
1/2	14	.470	.785	1/2	3-1/2	4	290-806-1
1	11	.620	1.546	5/8	4	5	290-808-1

Threadmills

Burs

- Full Line of Shapes and Cut Types
- Special Purpose and Custom Burs Available

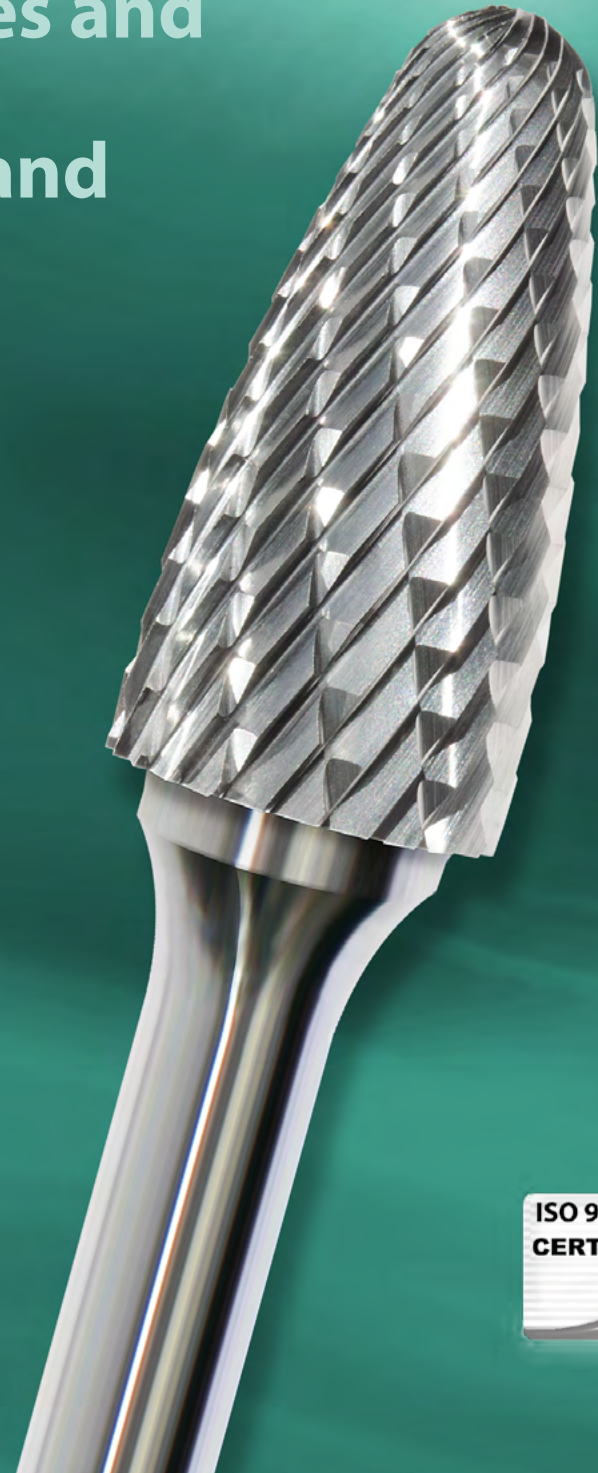






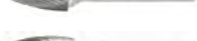













Table of Contents

	SA Burs - Cylindrical Shape, No Endcut . . .	202
	SB Burs - Cylindrical Shape with End Cut . . .	203
	SC Burs - Radius Cylindrical Shape	204
	SD Burs - Ball Shape	205
	SE Burs - Oval Shape	206
	SF Burs - Radius Tree Shape	207
	SG Burs - Pointed Tree Shape.	208
	SH Burs - Flame Shape	209
	SJ Burs - 60° Included Cone Shape	210
	SK Burs - 90° Included Cone Shape	211
	SL Burs - Radius Cone Shape	212
	SM Burs - Pointed Cone Shape.	213
	SN Burs - Inverted Cone Shape	214
	Die Mills	215
	Piloted Die Mills	215
	Fiberglass Routers	216
	Tire Burs.	217
	8-12 Piece Plastic Box Bur Sets	218
	3-5 Piece Power Pouch Bur Sets	218
	24 Piece Countertop Displays	219
	8-12 Piece Wood Box Bur Sets	219

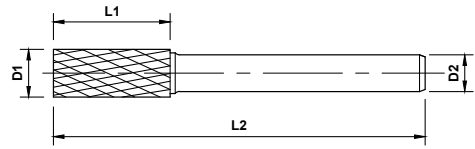


Please contact us for our full line of metric products.

Mastercut's Superior Carbide Blend – A-Gr-SiV (Active Grain Sized Volume)
 Our superior tungsten carbide gives you the ability to be *aggressive* when you need to be. Growth inhibitors in our submicron carbide blanks maintain the most consistent grain size available, giving you superior hardness AND toughness.

SA Burs - Cylindrical Shape

Without End Cut



Hardened	Cast Iron	Titanium	Stainless	Steel
H	K	S	M	P

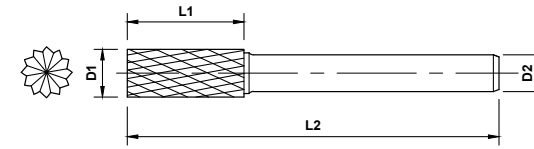


OD	LOC	SHK	OAL	Cut Type				
D1	L1	D2	L2	Singlecut	Doublecut	Alumacut	Diamondcut	Chipbreaker
1/16	1/4	1/8	1-1/2	SA-41SC*	SA-41DC*	SA-41FM*	SA-41DM*	SA-41CB*
3/32	7/16	1/8	1-1/2	SA-42SC*	SA-42DC*	SA-42FM*	SA-42DM*	SA-42CB*
1/8	9/16	1/8	1-1/2	SA-43SC*	SA-43DC*	SA-43FM*	SA-43DM*	SA-43CB*
1/4	1/2	1/8	2	SA-51SC	SA-51DC	SA-51FM	SA-51DM	SA-51CB
1/8	5/8	1/4	2	SA-12SC*	SA-12DC*	SA-12FM*	SA-12DM*	SA-12CB*
3/16	5/8	1/4	2	SA-14SC*	SA-14DC*	SA-14FM*	SA-14DM*	SA-14CB*
1/4	5/8	1/4	2	SA-1SC*	SA-1DC*	SA-1FM*	SA-1DM*	SA-1CB*
1/4	5/8	1/4	6-3/4	SA-1L6SC	SA-1L6DC	SA-1L6FM	SA-1L6DM	SA-1L6CB
5/16	3/4	1/4	2-1/2	SA-2SC	SA-2DC	SA-2FM	SA-2DM	SA-2CB
3/8	3/4	1/4	2-1/2	SA-3SC	SA-3DC	SA-3FM	SA-3DM	SA-3CB
3/8	3/4	1/4	6-3/4	SA-3L6SC	SA-3L6DC	SA-3L6FM	SA-3L6DM	SA-3L6CB
7/16	1	1/4	2-3/4	SA-4SC	SA-4DC	SA-4FM	SA-4DM	SA-4CB
1/2	1	1/4	2-3/4	SA-5SC	SA-5DC	SA-5FM	SA-5DM	SA-5CB
1/2	1	1/4	7	SA-5L6SC	SA-5L6DC	SA-5L6FM	SA-5L6DM	SA-5L6CB
5/8	1	1/4	2-3/4	SA-6SC	SA-6DC	SA-6FM	SA-6DM	SA-6CB
3/4	3/4	1/4	2-1/2	SA-16SC	SA-16DC	SA-16FM	SA-16DM	SA-16CB
3/4	1	1/4	2-3/4	SA-7SC	SA-7DC	SA-7FM	SA-7DM	SA-7CB
1	1	1/4	2-3/4	SA-9SC	SA-9DC	SA-9FM	SA-9DM	SA-9CB

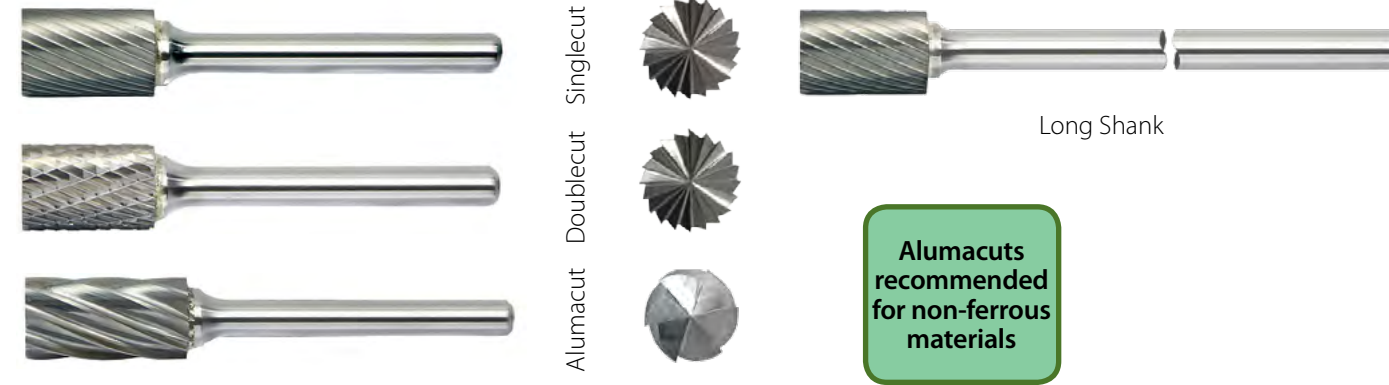
* Denotes Solid Carbide

SB Burs - Cylindrical Shape

With End Cut



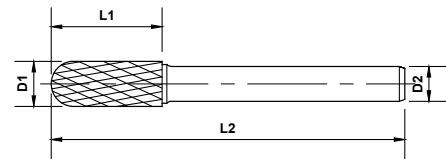
Hardened	Cast Iron	Titanium	Stainless	Steel
H	K	S	M	P



OD	LOC	SHK	OAL	Cut Type				
D1	L1	D2	L2	Singlecut	Doublecut	Alumacut	Diamondcut	Chipbreaker
1/16	1/4	1/8	1-1/2	SB-41SC*	SB-41DC*	SB-41FM*	SB-41DM*	SB-41CB*
3/32	7/16	1/8	1-1/2	SB-42SC*	SB-42DC*	SB-42FM*	SB-42DM*	SB-42CB*
1/8	9/16	1/8	1-1/2	SB-43SC*	SB-43DC*	SB-43FM*	SB-43DM*	SB-43CB*
1/4	3/16	1/8	2-15/16	SB-51SC	SB-51DC	SB-51FM	SB-51DM	SB-51CB
1/8	5/8	1/4	2	SB-12SC*	SB-12DC*	SB-12FM*	SB-12DM*	SB-12CB*
3/16	5/8	1/4	2	SB-14SC*	SB-14DC*	SB-14FM*	SB-14DM*	SB-14CB*
1/4	5/8	1/4	2	SB-1SC*	SB-1DC*	SB-1FM*	SB-1DM*	SB-1CB*
1/4	5/8	1/4	6-3/4	SB-1L6SC	SB-1L6DC	SB-1L6FM	SB-1L6DM	SB-1L6CB
5/16	3/4	1/4	2-1/2	SB-2SC	SB-2DC	SB-2FM	SB-2DM	SB-2CB
3/8	3/4	1/4	2-1/2	SB-3SC	SB-3DC	SB-3FM	SB-3DM	SB-3CB
3/8	3/4	1/4	6-3/4	SB-3L6SC	SB-3L6DC	SB-3L6FM	SB-3L6DM	SB-3L6CB
7/16	1	1/4	2-3/4	SB-4SC	SB-4DC	SB-4FM	SB-4DM	SB-4CB
1/2	1	1/4	2-3/4	SB-5SC	SB-5DC	SB-5FM	SB-5DM	SB-5CB
1/2	1	1/4	7	SB-5L6SC	SB-5L6DC	SB-5L6FM	SB-5L6DM	SB-5L6CB
5/8	1	1/4	2-3/4	SB-6SC	SB-6DC	SB-6FM	SB-6DM	SB-6CB
3/4	3/4	1/4	2-1/2	SB-16SC	SB-16DC	SB-16FM	SB-16DM	SB-16CB
3/4	1	1/4	2-3/4	SB-7SC	SB-7DC	SB-7FM	SB-7DM	SB-7CB
1	1	1/4	2-3/4	SB-9SC	SB-9DC	SB-9FM	SB-9DM	SB-9CB

* Denotes Solid Carbide

SC Burs - Radius Cylindrical Shape



Hardened	Cast Iron	Titanium	Stainless	Steel
H	K	S	M	P

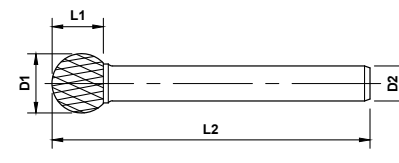


Alumacuts recommended for non-ferrous materials

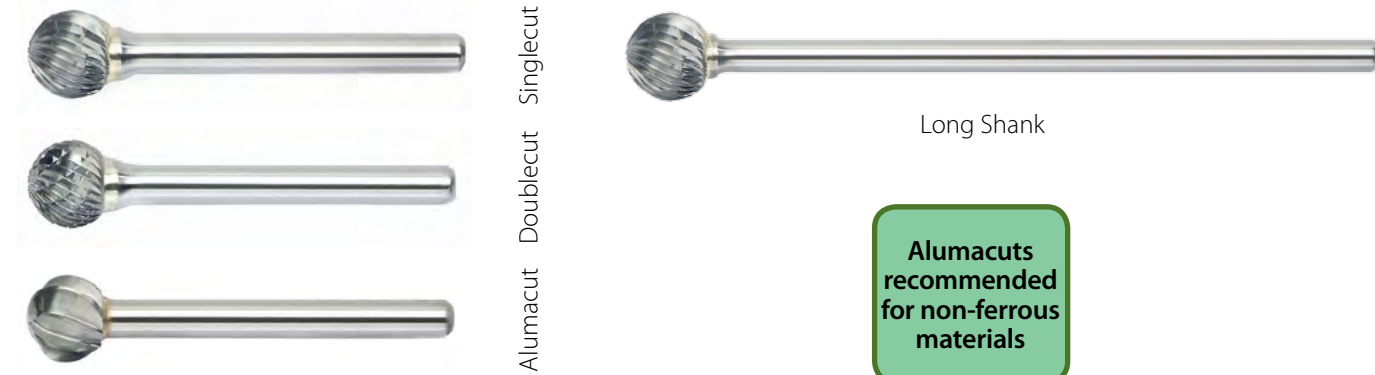
OD	LOC	SHK	OAL	Cut Type				
				Singlecut	Doublecut	Alumacut	Diamondcut	Chipbreaker
3/32	7/16	1/8	1-1/2	SC-41SC*	SC-41DC*	SC-41FM*	SC-41DM*	SC-41CB*
1/8	9/16	1/8	1-1/2	SC-42SC*	SC-42DC*	SC-42FM*	SC-42DM*	SC-42CB*
1/4	1/2	1/8	2	SC-51SC	SC-51DC	SC-51FM	SC-51DM	SC-51CB
1/8	5/8	1/4	2	SC-12SC*	SC-12DC*	SC-12FM*	SC-12DM*	SC-12CB*
3/16	5/8	1/4	2	SC-14SC*	SC-14DC*	SC-14FM*	SC-14DM*	SC-14CB*
1/4	5/8	1/4	2	SC-1SC*	SC-1DC*	SC-1FM*	SC-1DM*	SC-1CB*
1/4	5/8	1/4	6-3/4	SC-1L6SC	SC-1L6DC	SC-1L6FM	SC-1L6DM	SC-1L6CB
5/16	3/4	1/4	2-1/2	SC-2SC	SC-2DC	SC-2FM	SC-2DM	SC-2CB
3/8	3/4	1/4	2-1/2	SC-3SC	SC-3DC	SC-3FM	SC-3DM	SC-3CB
3/8	3/4	1/4	6-3/4	SC-3L6SC	SC-3L6DC	SC-3L6FM	SC-3L6DM	SC-3L6CB
7/16	1	1/4	2-3/4	SC-4SC	SC-4DC	SC-4FM	SC-4DM	SC-4CB
1/2	1	1/4	2-3/4	SC-5SC	SC-5DC	SC-5FM	SC-5DM	SC-5CB
1/2	1	1/4	7	SC-5L6SC	SC-5L6DC	SC-5L6FM	SC-5L6DM	SC-5L6CB
5/8	1	1/4	2-3/4	SC-6SC	SC-6DC	SC-6FM	SC-6DM	SC-6CB
5/8	1	1/4	7	SC-6L6SC	SC-6L6DC	SC-6L6FM	SC-6L6DM	SC-6L6CB
3/4	1	1/4	2-3/4	SC-7SC	SC-7DC	SC-7FM	SC-7DM	SC-7CB

* Denotes Solid Carbide

SD Burs - Ball Shape



Hardened	Cast Iron	Titanium	Stainless	Steel
H	K	S	M	P

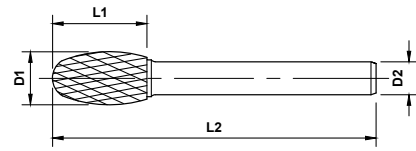


Alumacuts recommended for non-ferrous materials

OD	LOC	SHK	OAL	Cut Type				
				Singlecut	Doublecut	Alumacut	Diamondcut	Chipbreaker
3/32	3/32	1/8	1-1/2	SD-41SC*	SD-41DC*	SD-41FM*	SD-41DM*	SD-41CB*
1/8	1/8	1/8	1-1/2	SD-42SC*	SD-42DC*	SD-42FM*	SD-42DM*	SD-42CB*
1/4	7/32	1/8	1-3/4	SD-51SC	SD-51DC	SD-51FM	SD-51DM	SD-51CB
1/8	3/32	1/4	2	SD-12SC*	SD-12DC*	SD-12FM*	SD-12DM*	SD-12CB*
3/16	1/8	1/4	2	SD-14SC*	SD-14DC*	SD-14FM*	SD-14DM*	SD-14CB*
1/4	7/32	1/4	2	SD-1SC*	SD-1DC*	SD-1FM*	SD-1DM*	SD-1CB*
1/4	7/32	1/4	6-3/4	SD-1L6SC	SD-1L6DC	SD-1L6FM	SD-1L6DM	SD-1L6CB
5/16	1/4	1/4	2-1/16	SD-2SC	SD-2DC	SD-2FM	SD-2DM	SD-2CB
3/8	5/16	1/4	2-1/8	SD-3SC	SD-3DC	SD-3FM	SD-3DM	SD-3CB
3/8	5/16	1/4	6-3/8	SD-3L6SC	SD-3L6DC	SD-3L6FM	SD-3L6DM	SD-3L6CB
7/16	3/8	1/4	2-3/16	SD-4SC	SD-4DC	SD-4FM	SD-4DM	SD-4CB
1/2	7/16	1/4	2-1/4	SD-5SC	SD-5DC	SD-5FM	SD-5DM	SD-5CB
1/2	7/16	1/4	6-1/2	SD-5L6SC	SD-5L6DC	SD-5L6FM	SD-5L6DM	SD-5L6CB
5/8	9/16	1/4	2-3/8	SD-6SC	SD-6DC	SD-6FM	SD-6DM	SD-6CB
3/4	11/16	1/4	2-1/2	SD-7SC	SD-7DC	SD-7FM	SD-7DM	SD-7CB
1	15/16	1/4	2-3/4	SD-9SC	SD-9DC	SD-9FM	SD-9DM	SD-9CB

* Denotes Solid Carbide

SE Burs - Oval Shape



Hardened	Cast Iron	Titanium	Stainless	Steel
H	K	S	M	P



Alumacut Doublecut Singlecut



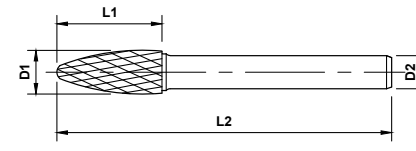
Long Shank

Alumacuts recommended for non-ferrous materials

OD	LOC	SHK	OAL	Cut Type				
D1	L1	D2	L2	Singlecut	Doublecut	Alumacut	Diamondcut	Chipbreaker
1/8	7/32	1/8	1-1/2	SE-41SC*	SE-41DC*	SE-41FM*	SE-41DM*	SE-41CB*
1/4	3/8	1/8	1-3/4	SE-51SC	SE-51DC	SE-51FM	SE-51DM	SE-51CB
1/4	3/8	1/4	2	SE-1SC*	SE-1DC*	SE-1FM*	SE-1DM*	SE-1CB*
1/4	3/8	1/4	6-3/4	SE-1L6SC	SE-1L6DC	SE-1L6FM	SE-1L6DM	SE-1L6CB
3/8	5/8	1/4	2-3/8	SE-3SC	SE-3DC	SE-3FM	SE-3DM	SE-3CB
3/8	5/8	1/4	6-5/8	SE-3L6SC	SE-3L6DC	SE-3L6FM	SE-3L6DM	SE-3L6CB
1/2	7/8	1/4	2-5/8	SE-5SC	SE-5DC	SE-5FM	SE-5DM	SE-5CB
1/2	7/8	1/4	6-7/8	SE-5L6SC	SE-5L6DC	SE-5L6FM	SE-5L6DM	SE-5L6CB
5/8	1	1/4	2-3/4	SE-6SC	SE-6DC	SE-6FM	SE-6DM	SE-6CB
3/4	1	1/4	2-3/4	SE-7SC	SE-7DC	SE-7FM	SE-7DM	SE-7CB

* Denotes Solid Carbide

SF Burs - Radius Tree Shape



Hardened	Cast Iron	Titanium	Stainless	Steel
H	K	S	M	P



Alumacut Doublecut Singlecut



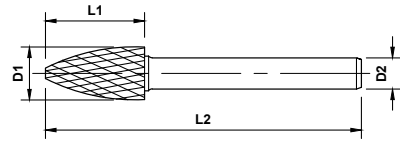
Long Shank

Alumacuts recommended for non-ferrous materials

OD	LOC	SHK	OAL	Cut Type				
D1	L1	D2	L2	Singlecut	Doublecut	Alumacut	Diamondcut	Chipbreaker
1/8	1/4	1/8	1-1/2	SF-41SC*	SF-41DC*	SF-41FM*	SF-41DM*	SF-41CB*
1/8	1/2	1/8	1-1/2	SF-42SC*	SF-42DC*	SF-42FM*	SF-42DM*	SF-42CB*
1/4	1/2	1/8	2	SF-51SC	SF-51DC	SF-51FM	SF-51DM	SF-51CB
1/8	1/2	1/4	2	SF-12SC*	SF-12DC*	SF-12FM*	SF-12DM*	SF-12CB*
1/4	5/8	1/4	2	SF-1SC*	SF-1DC*	SF-1FM*	SF-1DM*	SF-1CB*
1/4	5/8	1/4	6-3/4	SF-1L6SC	SF-1L6DC	SF-1L6FM	SF-1L6DM	SF-1L6CB
3/8	3/4	1/4	2-1/2	SF-3SC	SF-3DC	SF-3FM	SF-3DM	SF-3CB
3/8	3/4	1/4	6-3/4	SF-3L6SC	SF-3L6DC	SF-3L6FM	SF-3L6DM	SF-3L6CB
7/16	1	1/4	2-3/4	SF-4SC	SF-4DC	SF-4FM	SF-4DM	SF-4CB
1/2	3/4	1/4	2-1/2	SF-13SC	SF-13DC	SF-13FM	SF-13DM	SF-13CB
1/2	1	1/4	2-3/4	SF-5SC	SF-5DC	SF-5FM	SF-5DM	SF-5CB
1/2	1	1/4	7	SF-5L6SC	SF-5L6DC	SF-5L6FM	SF-5L6DM	SF-5L6CB
5/8	1	1/4	2-3/4	SF-6SC	SF-6DC	SF-6FM	SF-6DM	SF-6CB
3/4	1	1/4	2-3/4	SF-7SC	SF-7DC	SF-7FM	SF-7DM	SF-7CB
3/4	1-1/4	1/4	3	SF-14SC	SF-14DC	SF-14FM	SF-14DM	SF-14CB
3/4	1-1/2	1/4	3-1/4	SF-15SC	SF-15DC	SF-15FM	SF-15DM	SF-15CB

* Denotes Solid Carbide

SG Burs - Pointed Tree Shape



Hardened	Cast Iron	Titanium	Stainless	Steel
H	K	S	M	P

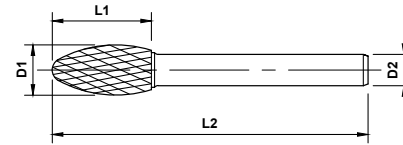


Alumacuts recommended for non-ferrous materials

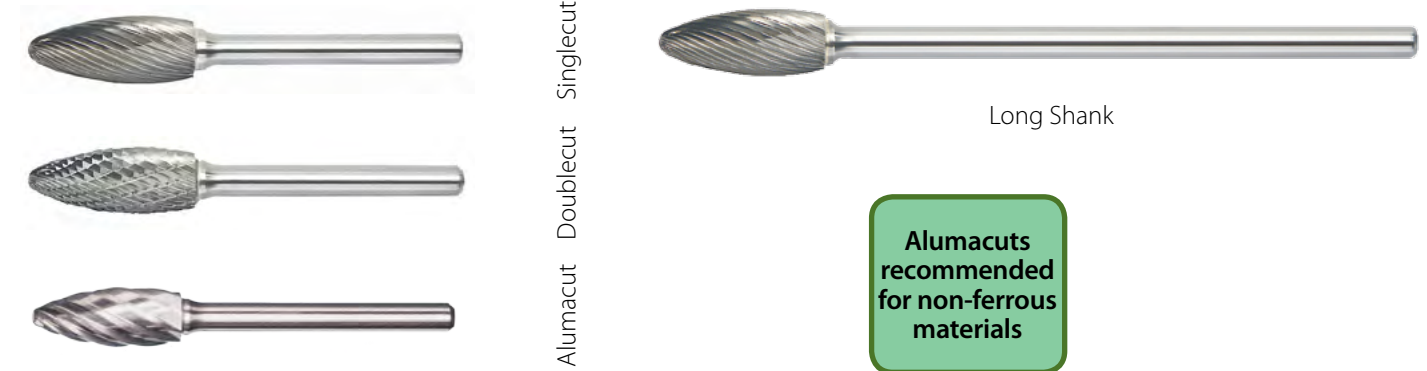
OD	LOC	SHK	OAL	Cut Type				
D1	L1	D2	L2	Singlecut	Doublecut	Alumacut	Diamondcut	Chipbreaker
1/8	1/4	1/8	1-1/2	SG-41SC*	SG-41DC*	SG-41FM*	SG-41DM*	SG-41CB*
1/8	3/8	1/8	1-1/2	SG-43SC*	SG-43DC*	SG-43FM*	SG-43DM*	SG-43CB*
1/8	1/2	1/8	1-1/2	SG-44SC*	SG-44DC*	SG-44FM*	SG-44DM*	SG-44CB*
1/4	1/2	1/8	2	SG-51SC	SG-51DC	SG-51FM	SG-51DM	SG-51CB
1/4	5/8	1/4	2	SG-1SC*	SG-1DC*	SG-1FM*	SG-1DM*	SG-1CB*
1/4	5/8	1/4	6-3/4	SG-1L6SC	SG-1L6DC	SG-1L6FM	SG-1L6DM	SG-1L6CB
5/16	3/4	1/4	2-1/2	SG-2SC	SG-2DC	SG-2FM	SG-2DM	SG-2CB
3/8	3/4	1/4	2-1/2	SG-3SC	SG-3DC	SG-3FM	SG-3DM	SG-3CB
3/8	3/4	1/4	6-3/4	SG-3L6SC	SG-3L6DC	SG-3L6FM	SG-3L6DM	SG-3L6CB
1/2	3/4	1/4	2-1/2	SG-13SC	SG-13DC	SG-13FM	SG-13DM	SG-13CB
1/2	1	1/4	2-3/4	SG-5SC	SG-5DC	SG-5FM	SG-5DM	SG-5CB
1/2	1	1/4	6-3/4	SG-5L6SC	SG-5L6DC	SG-5L6FM	SG-5L6DM	SG-5L6CB
5/8	1	1/4	2-3/4	SG-6SC	SG-6DC	SG-6FM	SG-6DM	SG-6CB
3/4	1	1/4	2-3/4	SG-7SC	SG-7DC	SG-7FM	SG-7DM	SG-7CB
3/4	1-1/2	1/4	3-1/4	SG-15SC	SG-15DC	SG-15FM	SG-15DM	SG-15CB

* Denotes Solid Carbide

SH Burs - Flame Shape



Hardened	Cast Iron	Titanium	Stainless	Steel
H	K	S	M	P

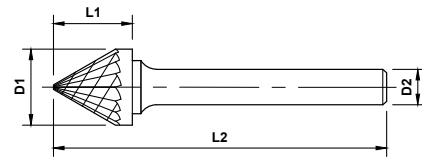


Alumacuts recommended for non-ferrous materials

OD	LOC	SHK	OAL	Cut Type				
D1	L1	D2	L2	Singlecut	Doublecut	Alumacut	Diamondcut	Chipbreaker
1/8	1/4	1/8	1-1/2	SH-41SC*	SH-41DC*	SH-41FM*	SH-41DM*	SH-41CB*
1/4	1/2	1/4	2	SH-1SC*	SH-1DC*	SH-1FM*	SH-1DM*	SH-1CB*
1/4	1/2	1/4	6-3/4	SH-1L6SC	SH-1L6DC	SH-1L6FM	SH-1L6DM	SH-1L6CB
5/16	3/4	1/4	2-1/2	SH-2SC	SH-2DC	SH-2FM	SH-2DM	SH-2CB
5/16	3/4	1/4	6	SH-2L6SC	SH-2L6DC	SH-2L6FM	SH-2L6DM	SH-2L6CB
1/2	1-1/4	1/4	3	SH-5SC	SH-5DC	SH-5FM	SH-5DM	SH-5CB
1/2	1-1/4	1/4	7-1/4	SH-5L6SC	SH-5L6DC	SH-5L6FM	SH-5L6DM	SH-5L6CB
5/8	1-7/16	1/4	3-3/16	SH-6SC	SH-6DC	SH-6FM	SH-6DM	SH-6CB
3/4	1-5/8	1/4	3-3/8	SH-7SC	SH-7DC	SH-7FM	SH-7DM	SH-7CB

* Denotes Solid Carbide

SJ Burs - 60° Included Cone Shape



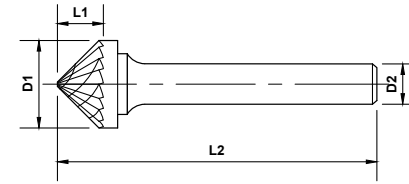
Hardened	Cast Iron	Titanium	Stainless	Steel
H	K	S	M	P



OD	LOC	SHK	OAL	Cut Type				
D1	L1	D2	L2	Singlecut	Doublecut	Alamacut	Diamondcut	Chipbreaker
1/8	3/32	1/8	1-1/2	SJ-42SC*	SJ-42DC*	SJ-42FM*	SJ-42DM*	SJ-42CB*
1/8	3/32	1/8	1-1/2	SJ-42DESC*^	SJ-42DEDC*^	SJ-42DEFM*^	SJ-42DEDM*^	SJ-42DECB*^
3/16	3/16	3/16	2	SJ-81SC*	SJ-81DC*	SJ-81FM*	SJ-81DM*	SJ-81CB
1/4	3/16	1/4	2	SJ-1SC*	SJ-1DC*	SJ-1FM*	SJ-1DM*	SJ-1CB*
1/4	3/16	1/4	2	SJ-1DESC*^	SJ-1DEDC*^	SJ-1DEFM*^	SJ-1DEDM*^	SJ-1DECB*^
5/16	5/16	1/4	2-1/16	SJ-2SC	SJ-2DC	SJ-2FM	SJ-2DM	SJ-2CB
3/8	5/16	1/4	2-1/16	SJ-3SC	SJ-3DC	SJ-3FM	SJ-3DM	SJ-3CB
1/2	7/16	1/4	2-3/16	SJ-5SC	SJ-5DC	SJ-5FM	SJ-5DM	SJ-5CB
5/8	9/16	1/4	2-5/16	SJ-6SC	SJ-6DC	SJ-6FM	SJ-6DM	SJ-6CB
3/4	11/16	1/4	2-7/16	SJ-7SC	SJ-7DC	SJ-7FM	SJ-7DM	SJ-7CB
1	15/16	1/4	2-9/16	SJ-9SC	SJ-9DC	SJ-9FM	SJ-9DM	SJ-9CB

* Denotes Solid Carbide; ^ Denotes Double End

SK Burs - 90° Included Cone Shape



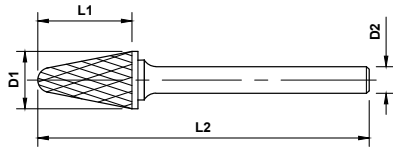
Hardened	Cast Iron	Titanium	Stainless	Steel
H	K	S	M	P



OD	LOC	SHK	OAL	Cut Type				
D1	L1	D2	L2	Singlecut	Doublecut	Alamacut	Diamondcut	Chipbreaker
1/8	1/16	1/8	1-1/2	SK-42SC*	SK-42DC*	SK-42FM*	SK-42DM*	SK-42CB*
1/8	1/16	1/8	1-1/2	SK-42DESC*^	SK-42DEDC*^	SK-42DEFM*^	SK-42DEDM*^	SK-42DECB*^
1/4	1/8	1/4	2	SK-1SC*	SK-1DC*	SK-1FM*	SK-1DM*	SK-1CB*
1/4	1/8	1/4	2	SK-1SCDE*^	SK-1DEDC*^	SK-1DEFM*^	SK-1DEDM*^	SK-1DECB*^
5/16	3/16	1/4	1-15/16	SK-2SC	SK-2DC	SK-2FM	SK-2DM	SK-2CB
3/8	3/16	1/4	1-15/16	SK-3SC	SK-3DC	SK-3FM	SK-3DM	SK-3CB
7/16	1/4	1/4	2	SK-4SC	SK-4DC	SK-4FM	SK-4DM	SK-4CB
1/2	1/4	1/4	2	SK-5SC	SK-5DC	SK-5FM	SK-5DM	SK-5CB
5/8	5/16	1/4	2-1/16	SK-6SC	SK-6DC	SK-6FM	SK-6DM	SK-6CB
3/4	3/8	1/4	2-1/8	SK-7SC	SK-7DC	SK-7FM	SK-7DM	SK-7CB
1	1/2	1/4	2-1/4	SK-9SC	SK-9DC	SK-9FM	SK-9DM	SK-9CB

* Denotes Solid Carbide; ^ Denotes Double End

SL Burs - Radius Cone Shape



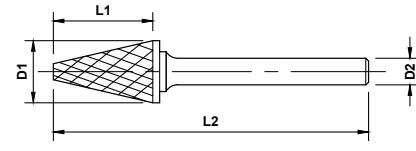
Hardened	Cast Iron	Titanium	Stainless	Steel
H	K	S	M	P



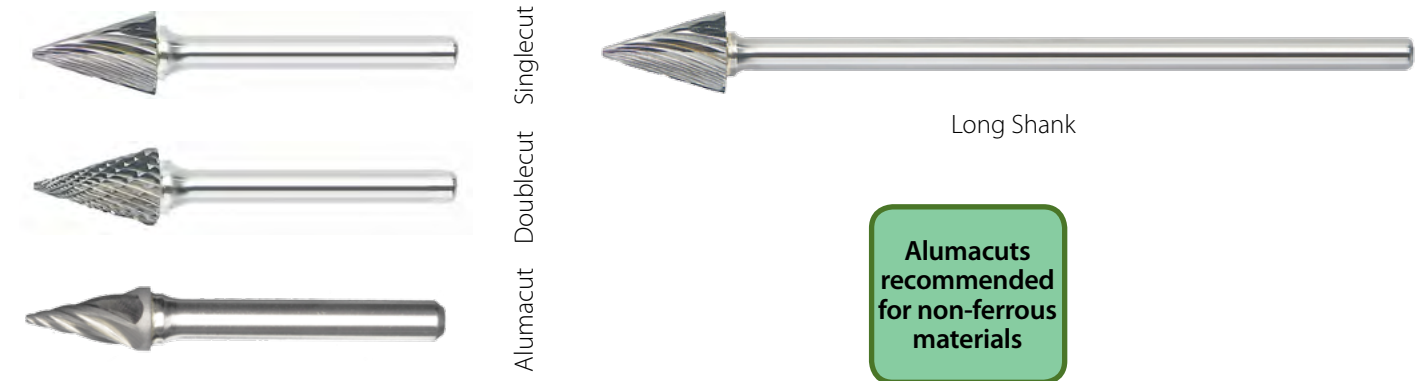
OD	LOC	SHK	OAL	Angle	Cut Type				
D1	L1	D2	L2	Deg	Singlecut	Doublecut	Alumacut	Diamondcut	Chipbreaker
1/8	3/8	1/8	1-1/2	8°	SL-41SC*	SL-41DC*	SL-41FM*	SL-41DM*	SL-41CB*
1/8	1/2	1/8	1-1/2	8°	SL-42SC*	SL-42DC*	SL-42FM*	SL-42DM*	SL-42CB*
1/4	5/8	1/4	2	14°	SL-1SC*	SL-1DC*	SL-1FM*	SL-1DM*	SL-1CB*
1/4	5/8	1/4	6-3/4	14°	SL-1L6SC	SL-1L6DC	SL-1L6FM	SL-1L6DM	SL-1L6CB
5/16	7/8	1/4	2-5/8	14°	SL-2SC	SL-2DC	SL-2FM	SL-2DM	SL-2CB
3/8	1-1/16	1/4	2-13/16	14°	SL-3SC	SL-3DC	SL-3FM	SL-3DM	SL-3CB
3/8	1-1/16	1/4	7-1/16	14°	SL-3L6SC	SL-3L6DC	SL-3L6FM	SL-3L6DM	SL-3L6CB
1/2	1-1/8	1/4	2-7/8	14°	SL-4SC	SL-4DC	SL-4FM	SL-4DM	SL-4CB
1/2	1-1/8	1/4	7-1/8	14°	SL-4L6SC	SL-4L6DC	SL-4L6FM	SL-4L6DM	SL-4L6CB
5/8	1-3/16	1/4	2-15/16	14°	SL-5SC	SL-5DC	SL-5FM	SL-5DM	SL-5CB
5/8	1-5/16	1/4	3-1/16	14°	SL-6SC	SL-6DC	SL-6FM	SL-6DM	SL-6CB
3/4	1-1/2	1/4	3-1/4	14°	SL-7SC	SL-7DC	SL-7FM	SL-7DM	SL-7CB

* Denotes Solid Carbide

SM Burs - Pointed Cone Shape



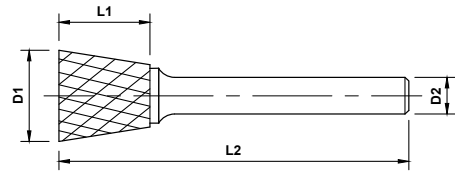
Hardened	Cast Iron	Titanium	Stainless	Steel
H	K	S	M	P



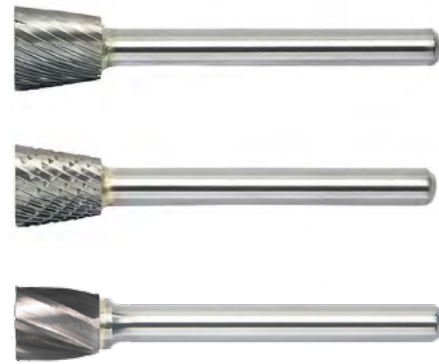
OD	LOC	SHK	OAL	Angle	Cut Type				
D1	L1	D2	L2	Deg	Singlecut	Doublecut	Alumacut	Diamondcut	Chipbreaker
1/8	11/32	1/8	1-1/2	12°	SM-41SC*	SM-41DC*	SM-41FM*	SM-41DM*	SM-41CB*
1/8	7/16	1/8	1-1/2	14°	SM-42SC*	SM-42DC*	SM-42FM*	SM-42DM*	SM-42CB*
1/8	5/8	1/8	1-1/2	7°	SM-43SC*	SM-43DC*	SM-43FM*	SM-43DM*	SM-43CB*
1/4	1/2	1/8	2-1/8	22°	SM-51SC	SM-51DC	SM-51FM	SM-51DM	SM-51CB
1/4	1/2	1/4	2	22°	SM-1SC*	SM-1DC*	SM-1FM*	SM-1DM*	SM-1CB*
1/4	1/2	1/4	6-3/4	14°	SM-1L6SC	SM-1L6DC	SM-1L6FM	SM-1L6DM	SM-1L6CB
1/4	3/4	1/4	2	14°	SM-2SC*	SM-2DC*	SM-2FM*	SM-2DM*	SM-2CB*
1/4	3/4	1/4	6-3/4	14°	SM-2L6SC	SM-2L6DC	SM-2L6FM	SM-2L6DM	SM-2L6CB
1/4	1	1/4	2	14°	SM-3SC*	SM-3DC*	SM-3FM*	SM-3DM*	SM-3CB*
3/8	5/8	1/4	2-1/2	14°	SM-4SC	SM-4DC	SM-4FM	SM-4DM	SM-4CB
3/8	5/8	1/4	6-5/8	14°	SM-4L6SC	SM-4L6DC	SM-4L6FM	SM-4L6DM	SM-4L6CB
1/2	7/8	1/4	2-5/8	14°	SM-5SC	SM-5DC	SM-5FM	SM-5DM	SM-5CB
1/2	7/8	1/4	6-7/8	14°	SM-5L6SC	SM-5L6DC	SM-5L6FM	SM-5L6DM	SM-5L6CB
5/8	1	1/4	2-3/4	14°	SM-6SC	SM-6DC	SM-6FM	SM-6DM	SM-6CB

* Denotes Solid Carbide

SN Burs - Inverted Cone Shape



Hardened	Cast Iron	Titanium	Stainless	Steel
H	K	S	M	P



Alumacut Doublecut Singlecut



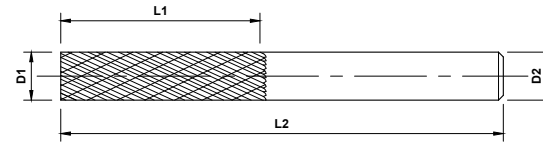
Long Shank

Alumacuts recommended for non-ferrous materials

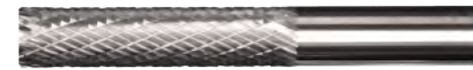
OD D1	LOC L1	SHK D2	OAL L2	Angle Deg	Cut Type				
					Singlecut	Doublecut	Alumacut	Diamondcut	Chipbreaker
3/32	1/8	1/8	1-1/2	10°	SN-41SC*	SN-41DC*	SN-41FM*	SN-41DM*	SN-41CB*
1/8	3/16	1/8	1-1/2	10°	SN-42SC*	SN-42DC*	SN-42FM*	SN-42DM*	SN-42CB*
1/4	1/4	1/8	1-3/4	10°	SN-51SC	SN-51DC	SN-51FM	SN-51DM	SN-51CB
1/4	5/16	1/4	2	10°	SN-1SC*	SN-1DC*	SN-1FM*	SN-1DM*	SN-1CB*
1/4	5/16	1/4	6-3/4	10°	SN-1L6SC	SN-1L6DC	SN-1L6FM	SN-1L6DM	SN-1L6CB
3/8	3/8	1/4	2-1/8	13°	SN-2SC	SN-2DC	SN-2FM	SN-2DM	SN-2CB
1/2	1/2	1/4	2-1/4	16°	SN-3SC	SN-3DC	SN-3FM	SN-3DM	SN-3CB
1/2	1/2	1/4	2-1/4	28°	SN-4SC	SN-4DC	SN-4FM	SN-4DM	SN-4CB
1/2	1/2	1/4	6-1/2	28°	SN-4L6SC	SN-4L6DC	SN-4L6FM	SN-4L6DM	SN-4L6CB
5/8	5/8	1/4	2-3/8	19°	SN-5SC	SN-5DC	SN-5FM	SN-5DM	SN-5CB
5/8	3/4	1/4	2-1/2	18°	SN-6SC	SN-6DC	SN-6FM	SN-6DM	SN-6CB
3/4	5/8	1/4	2-3/8	30°	SN-7SC	SN-7DC	SN-7FM	SN-7DM	SN-7CB

* Denotes Solid Carbide

Die Mills



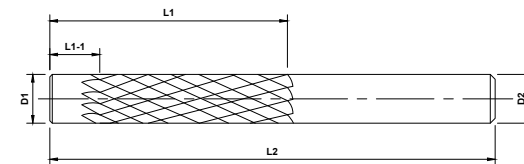
Hardened	Cast Iron	Titanium	Stainless	Steel
H	K	S	M	P



Diemill

OD D1	LOC L1	SHK D2	OAL L2	Cut Type	
				Standard	Coarse
1/8	1/2	1/8	1-1/2	28000	28020
5/32	1/2	3/16	2	28100	28120
3/16	5/8	3/16	2	28200	28220
1/4	3/4	1/4	2	28300	28320
5/16	13/16	5/16	2-1/2	28400	28420
3/8	1	3/8	2-1/2	28500	28520
7/16	1	7/16	3	28600	28620
1/2	1	1/2	3	28700	28720

Piloted Die Mills



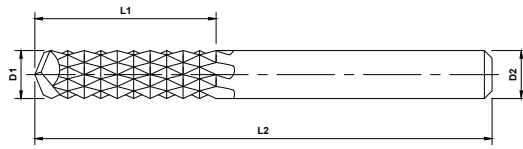
Hardened	Cast Iron	Titanium	Stainless	Steel
H	K	S	M	P



Piloted Diemill

OD D1	LOC L1	Pilot L1-1	SHK D2	OAL L2	Cut Type	
					Doublecut	Singlecut
1/8	1	1/8	1/8	3	22000	22001
3/16	2	3/16	3/16	3	22100	22101
1/4	1-1/4	1/4	1/4	3	22200	22201
3/8	2	3/8	3/8	4	22300	22301
1/2	2	1/2	1/2	4	22400	22401

Fiberglass Routers



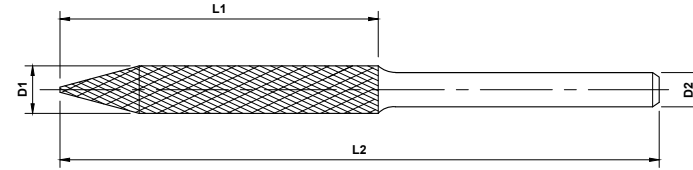
- High Performance **A-Gr-SiV** submicron grain carbide
- Diamond cut flute pattern
- Effective on laminate and fiberglass materials
- MAP certified quality

Fiberglass
Graphite
Composite
Carbon Fiber
Carbon & Honeycomb



OD	LOC	SHK	OAL	End Cut Type			
				Plain (A)	Burend (B)	Millend (C)	Drillend (D)
D1	L1	D2	L2				
1/16	3/16	1/8	1-1/2	FGR1A	FGR1B	FGR1C	FGR1D
3/32	3/8	1/8	1-1/2	FGR1-1A	FGR1-1B	FGR1-1C	FGR1-1D
1/8	1/2	1/8	1-1/2	FGR2A	FGR2B	FGR2C	FGR2D
3/16	5/8	3/16	2	FGR3A	FGR3B	FGR3C	FGR3D
3/16	5/8	1/4	2	FGR4A	FGR4B	FGR4C	FGR4D
1/4	3/4	1/4	2	FGR5A	FGR5B	FGR5C	FGR5D
1/4	3/4	1/4	2-1/2	FGR6A	FGR6B	FGR6C	FGR6D
1/4	1	1/4	2-1/2	FGR6-0A	FGR6-0B	FGR6-0C	FGR6-0D
1/4	3/4	1/4	3	FGR6-1A	FGR6-1B	FGR6-1C	FGR6-1D
1/4	1	1/4	3	FGR6-2A	FGR6-2B	FGR6-2C	FGR6-2D
5/16	1	5/16	2-1/2	FGR7A	FGR7B	FGR7C	FGR7D
3/8	1	3/8	2-1/2	FGR8A	FGR8B	FGR8C	FGR8D
1/2	1	1/2	3	FGR9A	FGR9B	FGR9C	FGR9D

Tire Burs



- High Performance **A-Gr-SiV** submicron grain carbide
- Solid carbide construction
- Superb for trimming and repairing steel belts
- MAP certified quality



OD	LOC	SHK	OAL	Shank Type	
				Round Shank	Tri-Shank
D1	L1	D2	L2		
3/16	1	3/16	2	STB-011	STB-011T
3/16	2	3/16	3	STB-012	STB-012T
7/32	2	1/4	3	STB-013	STB-013T
1/4	2	1/4	3	STB-014	STB-014T
5/16	1-1/2	5/16	3	STB-015	STB-015T
5/16	2	5/16	4	STB-016	STB-016T
3/8	3	3/8	4-1/2	STB-017	STB-017T
1/2	3	3/8	5	STB-018	STB-018T

Plastic Box Bur Sets



Alumacuts recommended for non-ferrous materials

Empty Cases	Empty Case Part ID
12 Piece Bur Set, Plastic Case 1/8" Holes	PLASTIC-SET1
12 Piece Bur Set, Plastic Case 1/4" Holes	PLASTIC-SET2

Plastic Box Bur Set						
Pieces	Burs Included	SD	Singlecut	Doublecut	Diamond Cut	Alumacut
12	SA-43, SA-42, SC-42, SC-41, SD-42, SE-41, SF-41, SG-41, SH-41, SJ-42, SL-42, SN-42	1/8"	SETM100PSC	SETM100PDC	SETM100PDM	—
12	SA-1, SA-14, SC-1, SC-14, SD-1, SE-1, SF-1, SG-1, SH-1, SJ-1, SM-1, SN-1	1/4"	SETM120PSC	SETM120PDC	SETM120PDM	—
9	SA-51, SB-51, SC-51, SD-51, SE-51, SF-51, SG-51, SM-51, SN-51	1/8"	SETM110PSC	SETM110PDC	SETM110PDM	SETM110PFM
8	SA-1, SA-3, SC-1, SC-3, SD-1, SD-3, SF-1, SF-3	1/4"	SETM130PSC	SETM130PDC	SETM130PDM	SETM130PFM
8	SB-1, SB-3, SC-1, SC-3, SD-1, SD-3, SF-1, SF-3	1/4"	SETM135PSC	SETM135PDC	SETM135PDM	SETM135PFM
8	SA-3, SA-5, SC-3, SC-5, SD-3, SD-5, SF-3, SF-5	1/4"	SETM140PSC	SETM140PDC	SETM140PDM	SETM140PFM
8	SB-3, SB5-, SC-3, SC-5, SD-3, SD-5, SF-3, SF-5	1/4"	SETM145PSC	SETM145PDC	SETM145PDM	SETM145PFM
8	SA-5, SC-3, SC-5, SD-5, SF-3, SF-5, SG-3, SL-4	1/4"	SETM150PSC	SETM150PDC	SETM150PDM	SETM150PFM
8	SB-5, SC-3, SC-5, SD-5, SF-3, SF-5, SG3-, SL-4	1/4"	SETM155PSC	SETM155PDC	SETM155PDM	SETM155PFM

SD= Shank Diameter

Power Pouch Bur Sets



Power Pouch Bur Sets	
Part ID	Description
POUCH-NL	Blue Nylon Pouch with Snap for Bur Sets (up to 5 Burs) 4" x 6" No Logo
POUCH-WL	Blue Nylon Pouch with Snap for Bur Sets (up to 5 Burs) 4" x 6" White Screen Printed Logo
POUCH-NL1DC	SF-5, SF-3, SF-1 3pc. Doublecut Set in Blue Wallet Pouch Without Logo
POUCH-NL1FM	SF-5, SF-3, SF-1 3pc. Alumacut Set in Blue Wallet Pouch Without Logo
POUCH-NL2DC	SC-5, SC-3, SF-5, SF-3 4pc. Doublecut Set in Blue Wallet Pouch Without Logo
POUCH-NL2FM	SC-5, SC-3, SF-5, SF-3 4pc. Alumacut Set in Blue Wallet Pouch Without Logo
POUCH-NL3DC	SA-1, SC-3, SF-3, SC-5, SF-5 5pc. Doublecut Set in Blue Wallet Pouch Without Logo
POUCH-NL3FM	SA-1, SC-3, SF-3, SC-5, SF-5 5pc. Alumacut Set in Blue Wallet Pouch Without Logo
POUCH-WL1DC	SF-5, SF-3, SF-1 3pc. Doublecut Set in Blue Wallet Pouch With Mastercut Logo
POUCH-WL1FM	SF-5, SF-3, SF-1 3pc. Alumacut Set in Blue Wallet Pouch With Mastercut Logo
POUCH-WL2DC	SC-5, SC-3, SF-5, SF-3 4pc. Doublecut Set in Blue Wallet Pouch With Mastercut Logo
POUCH-WL2FM	SC-5, SC-3, SF-5, SF-3 4pc. Alumacut Set in Blue Wallet Pouch With Mastercut Logo
POUCH-WL3DC	SA-1, SC-3, SF-3, SC-5, SF-5 5pc. Doublecut Set in Blue Wallet Pouch With Mastercut Logo
POUCH-WL3FM	SA-1, SC-3, SF-3, SC-5, SF-5 5pc. Alumacut Set in Blue Wallet Pouch With Mastercut Logo

All tools in these sets are 1/4" diameter shank.

Alumacuts recommended for non-ferrous materials

24 Piece Countertop Displays



Description	Burs Included	Part Number
24 Piece Bur Display	SA-1, SC-1, SD-1, SE-1, SF-1, SG-1, SL-1, SM-3, SA-3, SC-3, SD-3, SE-3, SF-3, SG-3, SL-3, SM-4, SA-5, SC-5, SD-5, SE-5, SF-5, SG-5, SL-4, SM-5	DISPLAY2-24
24 Piece Bur Set Without Plastic Display	Same as Above	DIS24-ND

All tools in these sets are 1/4" diameter shank.

Wood Box Bur Sets



Alumacuts recommended for non-ferrous materials

Wood Box Bur Sets			Cut Types			
Pieces	Burs included	SD	Singlecut	Doublecut	Diamondcut	Alumacut
12	SA-43, SA-42, SC-42, SC-41, SD-42, SE-41, SF-41, SG-41, SH-41, SJ-42, SL-42, SN-42	1/8"	SETM100WSC	SETM100WDC	SETM100WDM	—
9	SA-51, SB-51, SC-51, SD-51, SE-51, SF-51, SG-51, SM-51, SN-51	1/8"	SETM110WSC	SETM110WDC	SETM110WDM	—
12	SA-1, SA-14, SC-1, SC-14, SD-1, SE-1, SF-1, SG-1, SH-1, SJ-1, SM-1, SN-1	1/4"	SETM120WSC	SETM120WDC	SETM120WDM	—
8	SA-1, SA-3, SC-1, SC-3, SD-1, SD-3, SF-1, SF-3	1/4"	SETM130WSC	SETM130WDC	SETM130WDM	SETM130WFM
8	SB-1, SB-3, SC-1, SC-3, SD-1, SD-3, SF-1, SF-3	1/4"	SETM135WSC	SETM135WDC	SETM135WDM	SETM135WFM
8	SA-3, SA-5, SC-3, SC-5, SD-3, SD-5, SF-3, SF-5	1/4"	SETM140WSC	SETM140WDC	SETM140WDM	SETM140WFM
8	SB-3, SB-5, SC-3, SC-5, SD-3, SD-5, SF-3, SF-5	1/4"	SETM145WSC	SETM145WDC	SETM145WDM	SETM145WFM
8	SA-5, SC-3, SC-5, SD-5, SF-3, SF-5, SG-3, SL-4	1/4"	SETM150WSC	SETM150WDC	SETM150WDM	SETM150WFM
8	SB-5, SC-3, SC-5, SD-5, SF-3, SF-5, SG-3, SL-4	1/4"	SETM155WSC	SETM155WDC	SETM155WDM	SETM155WFM

SD = Shank Diameter

Burs

Engraving Blanks and Carbide Rod



- Engraving Blanks
- Carbide Rod



Table of Contents

	Engraving Blanks	222
	Carbide Rod	223

Features Legend

	Double End
	Plain Shank

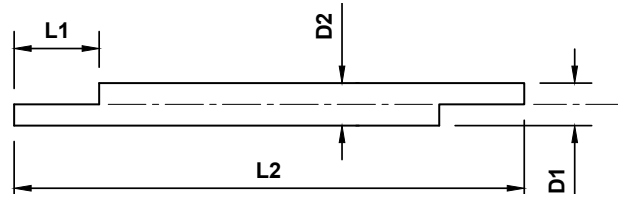
Please contact us for our full line of metric products.

Email: sales@mastercuttool.com
www.mastercuttool.com



Engraving Blanks

Single End and Double End Uncoated



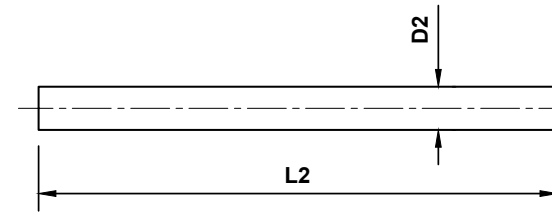
- Genuine **A-Gr-SiV** submicron grain carbide
- Centerless Ground to h6 Tolerance
- MAP certified quality

Cast Iron	Titanium	Non-Ferrous	Stainless	Steel
K	S	N	M	P



OD D1	LOC L1	SHK D2	OAL L2	Uncoated	
				Single End	Double End
1/8	3/8	1/8	1-1/2	218-102	218-002
1/8	3/8	1/8	2	218-104	218-004
3/16	1/2	3/16	2	218-106	218-006
1/4	1/2	1/4	2	218-108	218-008
1/4	1/2	1/4	2-1/2	218-110	218-010
1/4	1/2	1/4	3	218-112	218-012
5/16	1/2	5/16	2-1/2	218-114	218-014
3/8	1/2	3/8	2-1/2	218-116	218-016
7/16	1/2	7/16	3	218-118	218-018
1/2	1/2	1/2	3	218-120	218-020

Precision Ground Carbide Rod



- Genuine **A-Gr-SiV** submicron grain carbide
- Centerless Ground to h6 Tolerance
- MAP certified quality



OD D2	Length L2	Part ID
.0925	1-1/2	ROD.0925x1-1/2
3/32	1-1/2	ROD3/32x1-1/2
3/32	2	ROD3/32x2
1/8	1-1/2	ROD1/8x1-1/2
1/8	2	ROD1/8x2
1/8	3	ROD1/8x3
1/8	12	ROD1/8x12
3/16	2	ROD3/16x2

OD D2	Length L2	Part ID
1/4	2	ROD1/4x2
1/4	2-1/2	ROD1/4x2-1/2
1/4	3	ROD1/4x3
1/4	12	ROD1/4x12
5/16	2-1/2	ROD5/16x2-1/2
5/16	3	ROD5/16x3
3/8	2-1/2	ROD3/8x2-1/2
3/8	3	ROD3/8x3

OD D2	Length L2	Part ID
3/8	4	ROD3/8x4
1/2	3	ROD1/2x3
1/2	4	ROD1/2x4
1/2	6	ROD1/2x6
5/8	3-1/2	ROD5/8x3-1/2
5/8	6	ROD5/8x6
3/4	4	ROD3/4x4
3/4	6	ROD3/4x6

Engraving Blanks & Rod

High Speed Steel Drills

Drills:

- Jobber
 - Screw Machine
 - Reduced Shank
- ## Taps:
- Hand and Pipe
 - Combination Drill and Tap

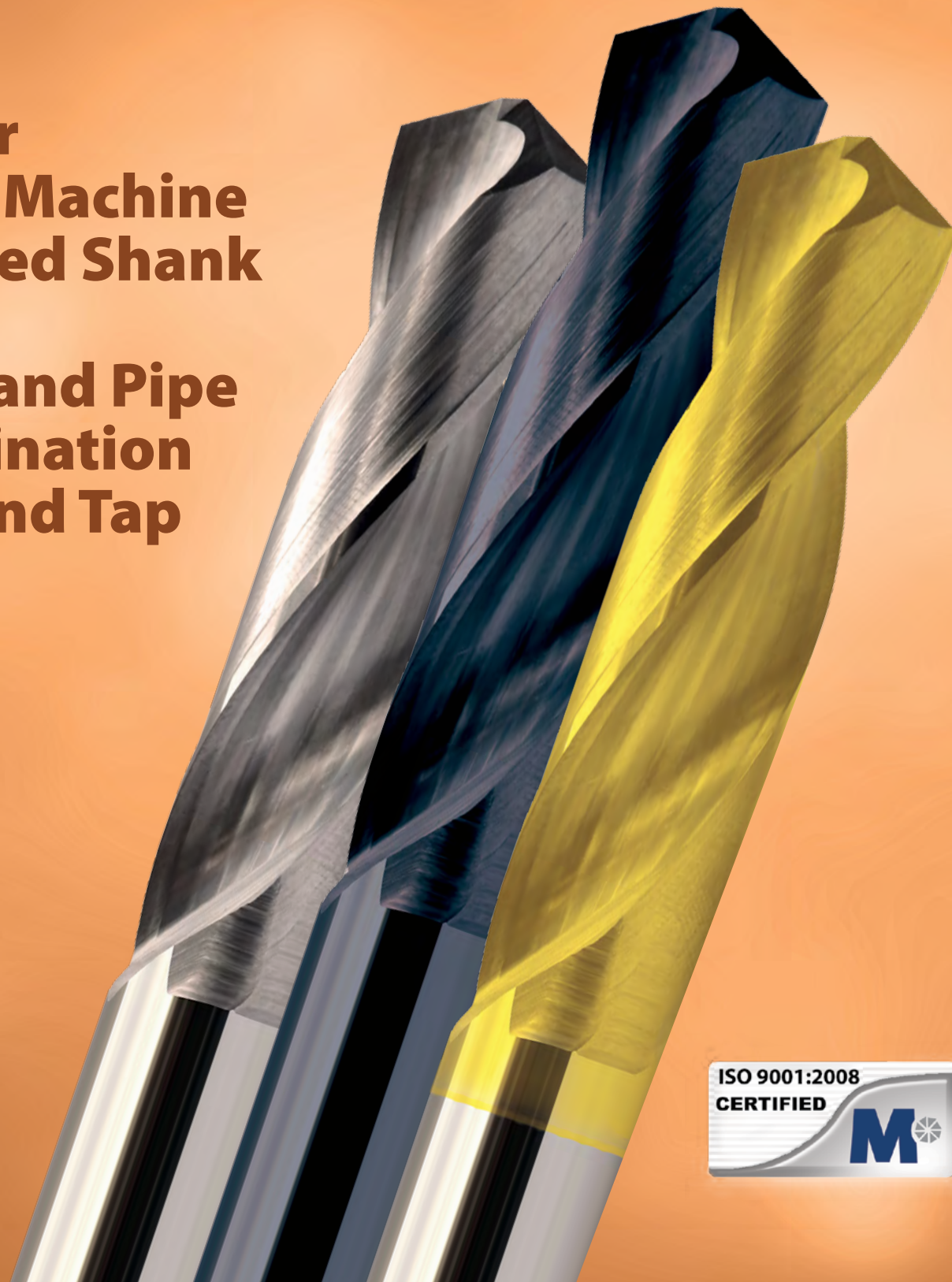









Table of Contents

Drills

	Jobber	226
	Screw Machine.	230
	Reduced Shank Jobber	234
	Hand Taps.	235
	Spiral Point Plug Taps	236
	Spiral Flute Taps	237
	Pipe Taps	237
	Combination Drills and Taps	238





Features Legend

	2 Flutes		Plain shank
---	----------	---	-------------

Mastercut's Superior Carbide Blend – A-Gr-SiV (Active Grain Sized Volume)

Our superior tungsten carbide gives you the ability to be *aggressive* when you need to be. Growth inhibitors in our submicron carbide blanks maintain the most consistent grain size available, giving you superior hardness AND toughness.

HSS Coatings Legend

	Black Oxide
	Black/Gold
	Straw Gold
	Uncoated

Packaging

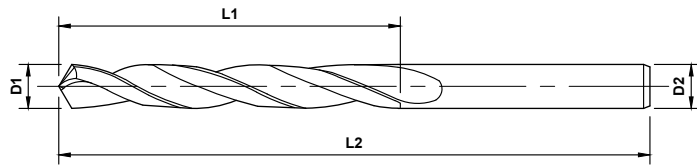
Qty	Sizes (OD)	Qty	Sizes (OD)
12	1/16" thru 19/64" Letters A thru N Numbers 1 thru 6	6	5/16" thru 1/2" Letters O thru Z

Qty indicates number of drills in each package.

Please contact us for our full line of metric products.

HSS Jobber Drills

118° Point General Purpose • 135° Split Point Heavy Duty
135° Cobalt Split Point Heavy Duty

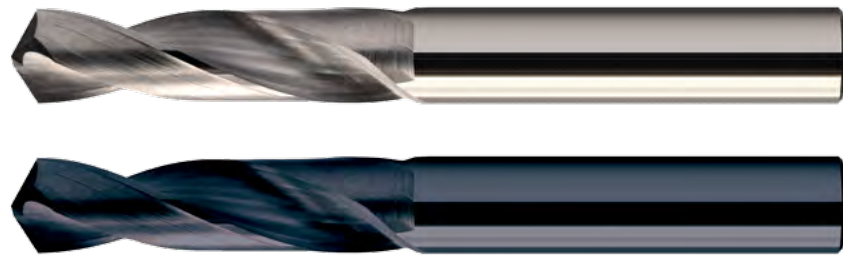


Packaging

Qty	Sizes (D1)	Qty	Sizes (D1)
12	1/16" thru 19/64" Letters A thru N Numbers 1 thru 6	6	5/16" thru 1/2" Letters O thru Z

Quantity indicates number of drills in each package.

- Superb quality HSS and M42 Cobalt
- All CNC ground flutes and relief angles
- MAP certified quality



Uncoated
Black Oxide

Cast Iron	Non-Ferrous	Steel
K	N	P

#	OD D1	LOC L1	SHK D2	OAL L2	HSS 118°		HSS 135°			135° Cobalt
					Uncoated	Black Oxide	Uncoated	Black Oxide	Black/Gold	Straw Gold
60	.0400	11/16	.0400	1-5/8	625-302	625-002	626-002	625-702		626-302
59	.0410	11/16	.0410	1-5/8	625-304	625-004	626-004	625-704		626-304
58	.0420	11/16	.0420	1-5/8	625-306	625-006	626-006	625-706		626-306
57	.0430	3/4	.0430	1-3/4	625-308	625-008	626-008	625-708		626-308
56	.0465	3/4	.0465	1-3/4	625-310	625-010	626-010	625-710		626-310
55	.0520	7/8	.0520	1-7/8	625-312	625-012	626-012	625-712		626-312
54	.0550	7/8	.0550	1-7/8	625-314	625-014	626-014	625-714		626-314
53	.0595	7/8	.0595	1-7/8	625-316	625-016	626-016	625-716		626-316
-	1/16	7/8	1/16	1-7/8	625-318	625-018	626-018	625-718	628-718	626-318
52	.0635	7/8	.0635	1-7/8	625-320	625-020	626-020	625-720		626-320
51	.0670	1	.0670	2	625-322	625-022	626-022	625-722		626-322
50	.0700	1	.0700	2	625-324	625-024	626-024	625-724		626-324
49	.0730	1	.0730	2	625-326	625-026	626-026	625-726		626-326
48	.0760	1	.0760	2	625-328	625-028	626-028	625-728		626-328
-	5/64	1	5/64	2	625-330	625-030	626-030	625-730	628-730	626-330
47	.0785	1	.0785	2	625-332	625-032	626-032	625-732		626-332
46	.0810	1-1/8	.0810	2-1/8	625-334	625-034	626-034	625-734		626-334

HSS Jobber Drills

Packaging

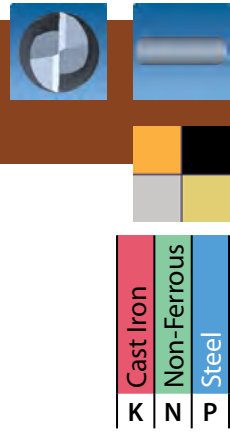
Qty	Sizes (D1)	Qty	Sizes (D1)
12	1/16" thru 19/64" Letters A thru N Numbers 1 thru 6	6	5/16" thru 1/2" Letters O thru Z

Quantity indicates number of drills in each package.

Cast Iron	Non-Ferrous	Steel
K	N	P

#	OD D1	LOC L1	SHK D2	OAL L2	HSS 118°		HSS 135°			135° Cobalt
					Uncoated	Black Oxide	Uncoated	Black Oxide	Black/Gold	Straw Gold
45	.0820	1-1/8	.0820	2-1/8	625-336	625-036	626-036	625-736		626-336
44	.0860	1-1/8	.0860	2-1/8	625-338	625-038	626-038	625-738		626-338
43	.0890	1-1/4	.0890	2-1/4	625-340	625-040	626-040	625-740		626-340
42	.0935	1-1/4	.0935	2-1/4	625-342	625-042	626-042	625-742		626-342
-	3/32	1-1/4	3/32	2-1/4	625-344	625-044	626-044	625-744	628-744	626-344
41	.0960	1-3/8	.0960	2-3/8	625-346	625-046	626-046	625-746		626-346
40	.0980	1-3/8	.0980	2-3/8	625-348	625-048	626-048	625-748		626-348
39	.0995	1-3/8	.0995	2-3/8	625-350	625-050	626-050	625-750		626-350
38	.1015	1-7/16	.1015	2-1/2	625-352	625-052	626-052	625-752		626-352
37	.1040	1-7/16	.1040	2-1/2	625-354	625-054	626-054	625-754		626-354
36	.1065	1-7/16	.1065	2-1/2	625-356	625-056	626-056	625-756		626-356
-	7/64	1-1/2	7/64	2-5/8	625-358	625-058	626-058	625-758	628-758	626-358
35	.1100	1-1/2	.1100	2-5/8	625-360	625-060	626-060	625-760		626-360
34	.1110	1-1/2	.1110	2-5/8	625-362	625-062	626-062	625-762		626-362
33	.1130	1-1/2	.1130	2-5/8	625-364	625-064	626-064	625-764		626-364
32	.1160	1-5/8	.1160	2-3/4	625-366	625-066	626-066	625-766		626-366
31	.1200	1-5/8	.1200	2-3/4	625-368	625-068	626-068	625-768		626-368
-	1/8	1-5/8	1/8	2-3/4	625-370	625-070	626-070	625-770	628-770	626-370
30	.1285	1-5/8	.1285	2-3/4	625-372	625-072	626-072	625-772		626-372
29	.1360	1-3/4	.1360	2-7/8	625-374	625-074	626-074	625-774		626-374
28	.1405	1-3/4	.1405	2-7/8	625-376	625-076	626-076	625-776		626-376
-	9/64	1-3/4	9/64	2-7/8	625-378	625-078	626-078	625-778	628-778	626-378
27	.1440	1-7/8	.1440	3	625-380	625-080	626-080	625-780		626-380
26	.1470	1-7/8	.1470	3	625-382	625-082	626-082	625-782		626-382
25	.1495	1-7/8	.1495	3	625-384	625-084	626-084	625-784		626-384
24	.1520	2	.1520	3-1/8	625-386	625-086	626-086	625-786		626-386
23	.1540	2	.1540	3-1/8	625-388	625-088	626-088	625-788		626-388
-	5/32	2	5/32	3-1/8	625-390	625-090	626-090	625-790	628-790	626-390
22	.1570	2	.1570	3-1/8	625-392	625-092	626-092	625-792		626-392
21	.1590	2-1/8	.1590	3-1/4	625-394	625-094	626-094	625-794		626-394
20	.1610	2-1/8	.1610	3-1/4	625-396	625-096	626-096	625-796		626-396
19	.1660	2-1/8	.1660	3-1/4	625-398	625-098	626-098	625-798		626-398
18	.1695	2-1/8	.1695	3-1/4	625-400	625-100	626-100	625-800		626-400

HSS Jobber Drills



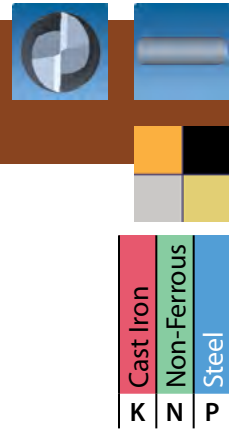
Packaging

Qty	Sizes (D1)	Qty	Sizes (D1)
12	1/16" thru 19/64" Letters A thru N Numbers 1 thru 6	6	5/16" thru 1/2" Letters O thru Z

Quantity indicates number of drills in each package.

#	OD D1	LOC L1	SHK D2	OAL L2	HSS 118°		HSS 135°			135° Cobalt
					Uncoated	Black Oxide	Uncoated	Black Oxide	Black/Gold	Straw Gold
-	11/64	2-1/8	11/64	3-1/4	625-402	625-102	626-102	625-802	628-802	626-402
17	.1730	2-3/16	.1730	3-3/8	625-404	625-104	626-104	625-804		626-404
16	.1770	2-3/16	.1770	3-3/8	625-406	625-106	626-106	625-806		626-406
15	.1800	2-3/16	.1800	3-3/8	625-408	625-108	626-108	625-808		626-408
14	.1820	2-3/16	.1820	3-3/8	625-410	625-110	626-110	625-810		626-410
13	.1850	2-5/16	.1850	3-1/2	625-412	625-112	626-112	625-812		626-412
-	3/16	2-5/16	3/16	3-1/2	625-414	625-114	626-114	625-814	628-814	626-414
12	.1890	2-5/16	.1890	3-1/2	625-416	625-116	626-116	625-816		626-416
11	.1910	2-5/16	.1910	3-1/2	625-418	625-118	626-118	625-818		626-418
10	.1935	2-7/16	.1935	3-5/8	625-420	625-120	626-120	625-820		626-420
-	.1960	2-7/16	.1960	3-5/8	625-422	625-122	626-122	625-822		626-422
8	.1990	2-7/16	.1990	3-5/8	625-424	625-124	626-124	625-824		626-424
7	.2010	2-7/16	.2010	3-5/8	625-426	625-126	626-126	625-826		626-426
-	13/64	2-7/16	13/64	3-5/8	625-428	625-128	626-128	625-828	628-828	626-428
6	.2040	2-1/2	.2040	3-3/4	625-430	625-130	626-130	625-830		626-430
5	.2055	2-1/2	.2055	3-3/4	625-432	625-132	626-132	625-832		626-432
4	.2090	2-1/2	.2090	3-3/4	625-434	625-134	626-134	625-834		626-434
3	.2130	2-1/2	.2130	3-3/4	625-436	625-136	626-136	625-836		626-436
-	7/32	2-1/2	7/32	3-3/4	625-438	625-138	626-138	625-838	628-838	626-438
2	.2210	2-5/8	.2210	3-7/8	625-440	625-140	626-140	625-840		626-440
1	.2280	2-5/8	.2280	3-7/8	625-442	625-142	626-142	625-842		626-442
A	.2340	2-5/8	.2340	3-7/8	625-444	625-144	626-144	625-844		626-444
-	15/64	2-5/8	15/64	3-7/8	625-446	625-146	626-146	625-846	628-846	626-446
B	.2380	2-3/4	.2380	4	625-448	625-148	626-148	625-848		626-448
C	.2420	2-3/4	.2420	4	625-450	625-150	626-150	625-850		626-450
D	.2460	2-3/4	.2460	4	625-452	625-152	626-152	625-852		626-452
E	1/4	2-3/4	1/4	4	625-454	625-154	626-154	625-854	628-854	626-454
F	.2570	2-7/8	.2570	4-1/8	625-456	625-156	626-156	625-856		626-456
G	.2610	2-7/8	.2610	4-1/8	625-458	625-158	626-158	625-858		626-458
-	17/64	2-7/8	17/64	4-1/8	625-460	625-160	626-160	625-860	628-860	626-460
H	.2660	2-7/8	.2660	4-1/8	625-462	625-162	626-162	625-862		626-462
I	.2720	2-7/8	.2720	4-1/8	625-464	625-164	626-164	625-864		626-464

HSS Jobber Drills



Packaging

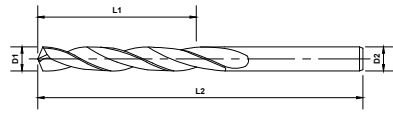
Qty	Sizes (D1)	Qty	Sizes (D1)
12	1/16" thru 19/64" Letters A thru N Numbers 1 thru 6	6	5/16" thru 1/2" Letters O thru Z

Quantity indicates number of drills in each package.

#	OD D1	LOC L1	SHK D2	OAL L2	HSS 118°		HSS 135°			135° Cobalt
					Uncoated	Black Oxide	Uncoated	Black Oxide	Black/Gold	Straw Gold
J	.2770	2-7/8	.2770	4-1/8	625-466	625-166	626-166	625-866		626-466
K	.2810	2-15/16	.2810	4-1/4	625-468	625-168	626-168	625-868		626-468
-	9/32	2-15/16	9/32	4-1/4	625-470	625-170	626-170	625-870	628-870	626-470
L	.2900	2-15/16	.2900	4-1/4	625-472	625-172	626-172	625-872		626-472
M	.2950	3-1/16	.2950	4-3/8	625-474	625-174	626-174	625-874		626-474
-	19/64	3-1/16	19/64	4-3/8	625-476	625-176	626-176	625-876	628-876	626-476
N	.3020	3-1/16	.3020	4-3/8	625-478	625-178	626-178	625-878		626-478
-	5/16	3-3/16	5/16	4-1/2	625-480	625-180	626-180	625-880	628-880	626-480
O	.3160	3-3/16	.3160	4-1/2	625-482	625-182	626-182	625-882		626-482
P	.3230	3-5/16	.3230	4-5/8	625-484	625-184	626-184	625-884		626-484
-	21/64	3-5/16	21/64	4-5/8	625-486	625-186	626-186	625-886	628-886	626-486
Q	.3320	3-7/16	.3320	4-3/4	625-488	625-188	626-188	625-888		626-488
R	.3390	3-7/16	.3390	4-3/4	625-490	625-190	626-190	625-890		626-490
-	11/32	3-7/16	11/32	4-3/4	625-492	625-192	626-192	625-892	628-892	626-492
S	.3480	3-1/2	.3480	4-7/8	625-494	625-194	626-194	625-894		626-494
T	.3580	3-1/2	.3580	4-7/8	625-496	625-196	626-196	625-896		626-496
-	23/64	3-1/2	23/64	4-7/8	625-498	625-198	626-198	625-898	628-898	626-498
U	.3680	3-5/8	.3680	5	625-500	625-200	626-200	625-900		626-500
-	3/8	3-5/8	3/8	5	625-502	625-202	626-202	625-902	628-902	626-502
V	.3770	3-5/8	.3770	5	625-504	625-204	626-204	625-904		626-504
W	.3860	3-3/4	.3860	5-1/8	625-506	625-206	626-206	625-906		626-506
-	25/64	3-3/4	25/64	5-1/8	625-508	625-208	626-208	625-908	628-908	626-508
X	.3970	3-3/4	.3970	5-1/8	625-510	625-210	626-210	625-910		626-510
Y	.4040	3-7/8	.4040	5-1/4	625-512	625-212	626-212	625-912		626-512
-	13/32	3-7/8	13/32	5-1/4	625-514	625-214	626-214	625-914	628-914	626-514
Z	.4130	3-7/8	.4130	5-1/4	625-516	625-216	626-216	625-916		626-516
-	27/64	3-15/16	27/64	5-3/8	625-518	625-218	626-218	625-918	628-918	626-518
-	7/16	4-1/16	7/16	5-1/2	625-520	625-220	626-220	625-920	628-920	626-520
-	29/64	4-3/16	29/64	5-5/8	625-522	625-222	626-222	625-922	628-922	626-522
-	15/32	4-5/16	15/32	5-3/4	625-524	625-224	626-224	625-924	628-924	626-524
-	31/64	4-3/8	31/64	5-7/8	625-526	625-226	626-226	625-926	628-926	626-526
-	1/2	4-1/2	1/2	6	625-528	625-228	626-228	625-928	628-928	626-528

HSS Screw Machine Drills

135° Split Point Heavy Duty • 135° Cobalt Split Point Heavy Duty



Packaging

Qty	Sizes (D1)	Qty	Sizes (D1)
12	1/16" thru 19/64" Letters A thru N Numbers 1 thru 6	6	5/16" thru 1/2" Letters O thru Z

Quantity indicates number of drills in each package.

- Superb quality HSS and M42 Cobalt
- All CNC ground flutes and relief angles
- MAP certified quality



Uncoated
Black Oxide

Cast Iron	Non-Ferrous	Steel
K	N	P

#	OD	LOC	SHK	OAL	HSS 135°		135° Cobalt
	D1	L1	D2	L2	Uncoated	Black Oxide	Straw Gold
60	.0400	1/2	.0400	1-3/8	627-002	626-602	627-302
59	.0410	1/2	.0410	1-3/8	627-004	626-604	627-304
58	.0420	1/2	.0420	1-3/8	627-006	626-606	627-306
57	.0430	1/2	.0430	1-3/8	627-008	626-608	627-308
56	.0465	1/2	.0465	1-3/8	627-010	626-610	627-310
55	.0520	5/8	.0520	1-5/8	627-012	626-612	627-312
54	.0550	5/8	.0550	1-5/8	627-014	626-614	627-314
53	.0595	5/8	.0595	1-5/8	627-016	626-616	627-316
-	1/16	5/8	1/16	1-5/8	627-018	626-618	627-318
52	.0635	11/16	.0635	1-11/16	627-020	626-620	627-320
51	.0670	11/16	.0670	1-11/16	627-022	626-622	627-322
50	.0700	11/16	.0700	1-11/16	627-024	626-624	627-324
49	.0730	11/16	.0730	1-11/16	627-026	626-626	627-326
48	.0760	11/16	.0760	1-11/16	627-028	626-628	627-328
	5/64	11/16	5/64	1-11/16	627-030	626-630	627-330
47	.0785	3/4	.0785	1-3/4	627-032	626-632	627-332
46	.0810	3/4	.0810	1-3/4	627-034	626-634	627-334

HSS Screw Machine Drills

Packaging

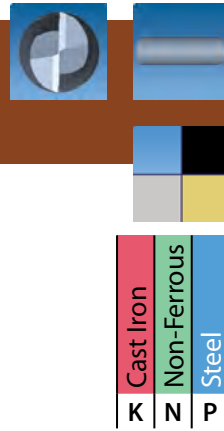
Qty	Sizes (D1)	Qty	Sizes (D1)
12	1/16" thru 19/64" Letters A thru N Numbers 1 thru 6	6	5/16" thru 1/2" Letters O thru Z

Quantity indicates number of drills in each package.

Cast Iron	Non-Ferrous	Steel
K	N	P

#	OD	LOC	SHK	OAL	HSS 135°		135° Cobalt
	D1	L1	D2	L2	Uncoated	Black Oxide	Straw Gold
45	.0820	3/4	.0820	1-3/4	627-036	626-636	627-336
44	.0860	3/4	.0860	1-3/4	627-038	626-638	627-338
43	.0890	3/4	.0890	1-3/4	627-040	626-640	627-340
42	.0935	3/4	.0935	1-3/4	627-042	626-642	627-342
	3/32	3/4	3/32	1-3/4	627-044	626-644	627-344
41	.0960	13/16	.0960	1-13/16	627-046	626-646	627-346
40	.0980	13/16	.0980	1-13/16	627-048	626-648	627-348
39	.0995	13/16	.0995	1-13/16	627-050	626-650	627-350
38	.1015	13/16	.1015	1-13/16	627-052	626-652	627-352
37	.1040	13/16	.1040	1-13/16	627-054	626-654	627-354
36	.1065	13/16	.1065	1-13/16	627-056	626-656	627-356
	7/64	13/16	7/64	1-13/16	627-058	626-658	627-358
35	.1100	7/8	.1100	1-7/8	627-060	626-660	627-360
34	.1110	7/8	.1110	1-7/8	627-062	626-662	627-362
33	.1130	7/8	.1130	1-7/8	627-064	626-664	627-364
32	.1160	7/8	.1160	1-7/8	627-066	626-666	627-366
31	.1200	7/8	.1200	1-7/8	627-068	626-668	627-368
	1/8	7/8	1/8	1-7/8	627-070	626-670	627-370
30	.1285	15/16	.1285	1-15/16	627-072	626-672	627-372
29	.1360	15/16	.1360	1-15/16	627-074	626-674	627-374
28	.1405	15/16	.1405	1-15/16	627-076	626-676	627-376
	9/64	15/16	9/64	1-15/16	627-078	626-678	627-378
27	.1440	1	.1440	2-1/16	627-080	626-680	627-380
26	.1470	1	.1470	2-1/16	627-082	626-682	627-382
25	.1495	1	.1495	2-1/16	627-084	626-684	627-384
24	.1520	1	.1520	2-1/16	627-086	626-686	627-386
23	.1540	1	.1540	2-1/16	627-088	626-688	627-388
	5/32	1	5/32	2-1/16	627-090	626-690	627-390
22	.1570	1-1/16	.1570	2-1/8	627-092	626-692	627-392
21	.1590	1-1/16	.1590	2-1/8	627-094	626-694	627-394
20	.1610	1-1/16	.1610	2-1/8	627-096	626-696	627-396
19	.1660	1-1/16	.1660	2-1/8	627-098	626-698	627-398
18	.1695	1-1/16	.1695	2-1/8	627-100	626-700	627-400

HSS Screw Machine Drills



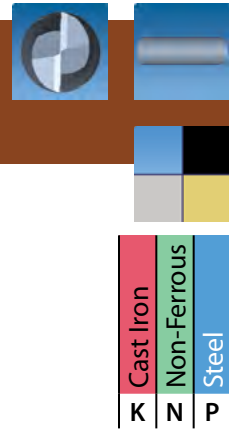
Packaging

Qty	Sizes (D1)	Qty	Sizes (D1)
12	1/16" thru 19/64" Letters A thru N Numbers 1 thru 6	6	5/16" thru 1/2" Letters O thru Z

Quantity indicates number of drills in each package.

#	OD	LOC	SHK	OAL	HSS 135°		135° Cobalt
	D1	L1	D2	L2	Uncoated	Black Oxide	Straw Gold
-	11/64	1-1/16	11/64	2-1/8	627-102	626-702	627-402
17	.1730	1-1/8	.1730	2-3/16	627-104	626-704	627-404
16	.1770	1-1/8	.1770	2-3/16	627-106	626-706	627-406
15	.1800	1-1/8	.1800	2-3/16	627-108	626-708	627-408
14	.1820	1-1/8	.1820	2-3/16	627-110	626-710	627-410
13	.1850	1-1/8	.1850	2-3/16	627-112	626-712	627-412
-	3/16	1-1/8	3/16	2-3/16	627-114	626-714	627-414
12	.1890	1-3/16	.1890	2-1/4	627-116	626-716	627-416
11	.1910	1-3/16	.1910	2-1/4	627-118	626-718	627-418
10	.1935	1-3/16	.1935	2-1/4	627-120	626-720	627-420
9	.1960	1-3/16	.1960	2-1/4	627-122	626-722	627-422
8	.1990	1-3/16	.1990	2-1/4	627-124	626-724	627-424
7	.2010	1-3/16	.2010	2-1/4	627-126	626-726	627-426
-	13/64	1-3/16	13/64	2-1/4	627-128	626-728	627-428
6	.2040	1-1/4	.2040	2-3/8	627-130	626-730	627-430
5	.2055	1-1/4	.2055	2-3/8	627-132	626-732	627-432
4	.2090	1-1/4	.2090	2-3/8	627-134	626-734	627-434
3	.2130	1-1/4	.2130	2-3/8	627-136	626-736	627-436
-	7/32	1-1/4	7/32	2-3/8	627-138	626-738	627-438
2	.2210	1-5/16	.2210	2-7/16	627-140	626-740	627-440
1	.2280	1-5/16	.2280	2-7/16	627-142	626-742	627-442
A	.2340	1-5/16	.2340	2-7/16	627-144	626-744	627-444
-	15/64	1-5/16	15/64	2-7/16	627-146	626-746	627-446
B	.2380	1-3/8	.2380	2-1/2	627-148	626-748	627-448
C	.2420	1-3/8	.2420	2-1/2	627-150	626-750	627-450
D	.2460	1-3/8	.2460	2-1/2	627-152	626-752	627-452
E	1/4	1-3/8	1/4	2-1/2	627-154	626-754	627-454
F	.2570	1-7/16	.2570	2-5/8	627-156	626-756	627-456
G	.2610	1-7/16	.2610	2-5/8	627-158	626-758	627-458
-	17/64	1-7/16	17/64	2-5/8	627-160	626-760	627-460
H	.2660	1-1/2	.2660	2-11/16	627-162	626-762	627-462
I	.2720	1-1/2	.2720	2-11/16	627-164	626-764	627-464
J	.2770	1-1/2	.2770	2-11/16	627-166	626-766	627-466

HSS Screw Machine Drills



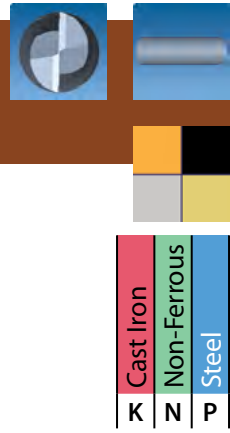
Packaging

Qty	Sizes (D1)	Qty	Sizes (D1)
12	1/16" thru 19/64" Letters A thru N Numbers 1 thru 6	6	5/16" thru 1/2" Letters O thru Z

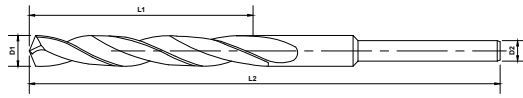
Quantity indicates number of drills in each package.

#	OD	LOC	SHK	OAL	HSS 135°		135° Cobalt
	D1	L1	D2	L2	Uncoated	Black Oxide	Straw Gold
K	.2810	1-1/2	.2810	2-11/16	627-168	626-768	627-468
-	9/32	1-1/2	9/32	2-11/16	627-170	626-770	627-470
L	.2900	1-9/16	.2900	2-3/4	627-172	626-772	627-472
M	.2950	1-9/16	.2950	2-3/4	627-174	626-774	627-474
-	19/64	1-9/16	19/64	2-3/4	627-176	626-776	627-476
N	.3020	1-5/8	.3020	2-13/16	627-178	626-778	627-478
-	5/16	1-5/8	5/16	2-13/16	627-180	626-780	627-480
O	.3160	1-11/16	.3160	2-15/16	627-182	626-782	627-482
P	.3230	1-11/16	.3230	2-15/16	627-184	626-784	627-484
-	21/64	1-11/16	21/64	2-15/16	627-186	626-786	627-486
Q	.3320	1-11/16	.3320	3	627-188	626-788	627-488
R	.3390	1-11/16	.3390	3	627-190	626-790	627-490
-	11/32	1-11/16	11/32	3	627-192	626-792	627-492
S	.3480	1-3/4	.3480	3-1/16	627-194	626-794	627-494
T	.3580	1-3/4	.3580	3-1/16	627-196	626-796	627-496
-	23/64	1-3/4	23/64	3-1/16	627-198	626-798	627-498
U	.3680	1-13/16	.3680	3-1/8	627-200	626-800	627-500
-	3/8	1-13/16	3/8	3-1/8	627-202	626-802	627-502
V	.3770	1-7/8	.3770	3-1/4	627-204	626-804	627-504
W	.3860	1-7/8	.3860	3-1/4	627-206	626-806	627-506
-	25/64	1-7/8	25/64	3-1/4	627-208	626-808	627-508
X	.3970	1-15/16	.3970	3-5/16	627-210	626-810	627-510
Y	.4040	1-15/16	.4040	3-5/16	627-212	626-812	627-512
-	13/32	1-15/16	13/32	3-5/16	627-214	626-814	627-514
Z	.4130	2	.4130	3-3/8	627-216	626-816	627-516
-	27/64	2	27/64	3-3/8	627-218	626-818	627-518
-	7/16	2-1/16	7/16	3-7/16	627-220	626-820	627-520
-	29/64	2-1/8	29/64	3-9/16	627-222	626-822	627-522
-	15/32	2-1/8	15/32	3-5/8	627-224	626-824	627-524
-	31/64	2-3/16	31/64	3-11/16	627-226	626-826	627-526
-	1/2	2-1/4	1/2	3-3/4	627-228	626-828	627-528

HSS Reduced Shank Jobber Drills



118° General Purpose • 135° Split Point Heavy Duty
135° Cobalt Split Point Heavy Duty



Packaging

Qty	Sizes (D1)	Qty	Sizes (D1)
12	1/16" thru 19/64" Letters A thru N Numbers 1 thru 6	6	5/16" thru 1/2" Letters O thru Z

Quantity indicates number of drills in each package.

- Superb quality HSS and M42 Cobalt
- All CNC ground flutes and relief angles
- MAP certified quality



Uncoated
Black Oxide

OD	LOC	SHK	OAL	HSS					135° Cobalt
				118°		135°			
D1	L1	D2	L2	Uncoated	Black Oxide	Uncoated	Black Oxide	Black/Gold	Straw Gold
25/64	3-3/4	3/8	5-1/8	627-802	627-702	628-102	628-018	628-002	627-602
13/32	3-7/8	3/8	5-1/4	627-804	627-704	628-104	628-020	628-004	627-604
27/64	3-15/16	3/8	5-3/8	627-806	627-706	628-106	628-022	628-006	627-606
7/16	4-1/16	3/8	5-1/2	627-808	627-708	628-108	628-024	628-008	627-608
29/64	4-3/16	3/8	5-5/8	627-810	627-710	628-110	628-026	628-010	627-610
15/32	4-5/16	3/8	5-3/4	627-812	627-712	628-112	628-028	628-012	627-612
31/64	4-3/8	3/8	5-7/8	627-814	627-714	628-114	628-030	628-014	627-614
1/2	4-1/2	3/8	6	627-816	627-716	628-116	628-032	628-016	627-616

HSS Hand Taps



- Superb quality High Speed Steel
- Solid reliable performance
- MAP certified quality

Hardened	Cast Iron	Titanium	Non-Ferrous	Stainless	Steel
H	K	S	N	M	P

Size	Pitch	Limit	Bottom	Plug	Taper	Set	Size	Pitch	Limit	Bottom	Plug	Taper	Set
#0	80	H1	640-001	640-101	640-201	640-301	7/8	14	H4	640-040	640-140	640-240	640-340
#1	64	H1	640-002	640-102	640-202	640-302	1	8	H4	640-041	640-141	640-241	640-341
#1	72	H1	640-003	640-103	640-203	640-303	1	12	H4	640-042	640-142	640-242	640-342
#2	56	H2	640-004	640-104	640-204	640-304	1	14	H4	640-043	640-143	640-243	640-343
#2	64	H2	640-005	640-105	640-205	640-305	1-1/8	7	H4	640-044	640-144	640-244	640-344
#3	48	H2	640-006	640-106	640-206	640-306	1-1/8	12	H4	640-045	640-145	640-245	640-345
#3	56	H2	640-007	640-107	640-207	640-307	1-1/4	7	H4	640-046	640-146	640-246	640-346
#4	36	H2	640-008	640-108	640-208	640-308	1-1/4	12	H4	640-047	640-147	640-247	640-347
#4	40	H2	640-009	640-109	640-209	640-309	1-3/8	6	H4	640-048	640-148	640-248	640-348
#4	48	H2	640-010	640-110	640-210	640-310	1-3/8	12	H4	640-049	640-149	640-249	640-349
#5	40	H2	640-011	640-111	640-211	640-311	1-1/2	6	H4	640-050	640-150	640-250	640-350
#5	44	H2	640-012	640-112	640-212	640-312	1-1/2	12	H4	640-051	640-151	640-251	640-351
#6	32	H3	640-013	640-113	640-213	640-313	M1.6	0.35	D3	640-052	640-152	640-252	640-352
#6	40	H2	640-014	640-114	640-214	640-314	M2	0.4	D3	640-053	640-153	640-253	640-353
#8	32	H3	640-015	640-115	640-215	640-315	M2.5	0.45	D3	640-054	640-154	640-254	640-354
#8	36	H2	640-016	640-116	640-216	640-316	M3	0.5	D3	640-055	640-155	640-255	640-355
#10	24	H3	640-017	640-117	640-217	640-317	M3.5	0.6	D4	640-056	640-156	640-256	640-356
#10	32	H3	640-018	640-118	640-218	640-318	M4	0.7	D4	640-057	640-157	640-257	640-357
#12	24	H3	640-019	640-119	640-219	640-319	M5	0.8	D4	640-058	640-158	640-258	640-358
#12	28	H3	640-020	640-120	640-220	640-320	M6	1.0	D5	640-059	640-159	640-259	640-359
1/4	20	H3	640-021	640-121	640-221	640-321	M7	1.0	D5	640-060	640-160	640-260	640-360
1/4	28	H3	640-022	640-122	640-222	640-322	M8	1.0	D5	640-061	640-161	640-261	640-361
5/16	18	H3	640-023	640-123	640-223	640-323	M8	1.25	D5	640-062	640-162	640-262	640-362
5/16	24	H3	640-024	640-124	640-224	640-324	M10	1.25	D5	640-063	640-163	640-263	640-363
3/8	16	H3	640-025	640-125	640-225	640-325	M10	1.5	D6	640-064	640-164	640-264	640-364
3/8	24	H3	640-026	640-126	640-226	640-326	M12	1.25	D6	640-065	640-165	640-265	640-365
7/16	14	H3	640-027	640-127	640-227	640-327	M12	1.75	D6	640-066	640-166	640-266	640-366
7/16	20	H3	640-028	640-128	640-228	640-328	M14	1.5	D6	640-067	640-167	640-267	640-367
1/2	13	H3	640-029	640-129	640-229	640-329	M14	2.0	D7	640-068	640-168	640-268	640-368
1/2	20	H3	640-030	640-130	640-230	640-330	M16	1.5	D6	640-069	640-169	640-269	640-369
9/16	12	H3	640-031	640-131	640-231	640-331	M16	2.0	D7	640-070	640-170	640-270	640-370
9/16	18	H3	640-032	640-132	640-232	640-332	M18	1.5	D6	640-071	640-171	640-271	640-371
5/8	11	H3	640-033	640-133	640-233	640-333	M18	2.5	D7	640-072	640-172	640-272	640-372
5/8	18	H3	640-034	640-134	640-234	640-334	M20	1.5	D6	640-073	640-173	640-273	640-373
11/16	11	H3	640-035	640-135	640-235	640-335	M20	2.5	D7	640-074	640-174	640-274	640-374
11/16	16	H3	640-036	640-136	640-236	640-336	M22	1.5	D6	640-075	640-175	640-275	640-375
3/4	10	H3	640-037	640-137	640-237	640-337	M22	2.5	D7	640-076	640-176	640-276	640-376
3/4	16	H3	640-038	640-138	640-238	640-338	M24	2.0	D7	640-077	640-177	640-277	640-377
7/8	9	H4	640-039	640-139	640-239	640-339	M24	3.0	D8	640-078	640-178	640-278	640-378

HSS Spiral Point Plug Taps



- Superb quality High Speed Steel
- Solid reliable performance
- MAP certified quality

Hardened	Cast Iron	Titanium	Non-Ferrous	Stainless	Steel
H	K	S	N	M	P

Size	Pitch	Limit	Plug	Size	Pitch	Limit	Plug	Size	Pitch	Limit	Plug
#0	80	H1	641-001	#10	32	H3	641-018	3/4	10	H3	641-035
#1	64	H1	641-002	#12	24	H3	641-019	3/4	16	H3	641-036
#1	72	H1	641-003	#12	28	H3	641-020	M2	0.4	D3	641-037
#2	56	H2	641-004	1/4	20	H3	641-021	M2.5	0.45	D3	641-038
#2	64	H2	641-005	1/4	28	H3	641-022	M3	0.5	D3	641-039
#3	48	H2	641-006	5/16	18	H3	641-023	M3.5	0.6	D4	641-040
#3	56	H2	641-007	5/16	24	H3	641-024	M4	0.7	D4	641-041
#4	36	H2	641-008	3/8	16	H3	641-025	M5	0.8	D4	641-042
#4	40	H2	641-009	3/8	24	H3	641-026	M6	1.0	D5	641-043
#4	48	H2	641-010	7/16	14	H3	641-027	M7	1.0	D5	641-044
#5	40	H2	641-011	7/16	20	H3	641-028	M8	1.25	D5	641-045
#5	44	H2	641-012	1/2	13	H3	641-029	M10	1.5	D6	641-046
#6	32	H3	641-013	1/2	20	H3	641-030	M12	1.75	D6	641-047
#6	40	H2	641-014	9/16	12	H3	641-031	M14	2.0	D7	641-048
#8	32	H3	641-015	9/16	18	H3	641-032	M16	2.0	D7	641-049
#8	36	H2	641-016	5/8	11	H3	641-033	M18	2.5	D7	641-050
#10	24	H3	641-017	5/8	18	H3	641-034	M20	2.5	D7	641-051

HSS Spiral Flute Taps



- Superb quality High Speed Steel
- Solid reliable performance
- MAP certified quality

Hardened	Cast Iron	Titanium	Non-Ferrous	Stainless	Steel
H	K	S	N	M	P

Size	Pitch	Limit	Bottom	Plug	Size	Pitch	Limit	Bottom	Plug
#3	48	H2	641-101	641-201	3/8	24	H3	641-114	641-214
#4	40	H2	641-102	641-202	7/16	14	H3	641-115	641-215
#5	40	H2	641-103	641-203	7/16	20	H3	641-116	641-216
#6	32	H3	641-104	641-204	1/2	13	H3	641-117	641-217
#8	32	H3	641-105	641-205	1/2	20	H3	641-118	641-218
10	24	H3	641-106	641-206	M3	0.5	D3	641-119	641-219
10	32	H3	641-107	641-207	M3.5	0.6	D4	641-120	641-220
12	24	H3	641-108	641-208	M4	0.7	D4	641-121	641-221
1/4	20	H3	641-109	641-209	M5	0.8	D4	641-122	641-222
1/4	28	H3	641-110	641-210	M6	1.0	D5	641-123	641-223
5/16	18	H3	641-111	641-211	M8	1.25	D5	641-124	641-224
5/16	24	H3	641-112	641-212	M10	1.5	D6	641-125	641-225
3/8	16	H3	641-113	641-213	M12	1.75	D6	641-126	641-226

HSS Pipe Taps



- Superb quality High Speed Steel
- Solid reliable performance
- MAP certified quality

Hardened	Cast Iron	Titanium	Non-Ferrous	Stainless	Steel
H	K	S	N	M	P

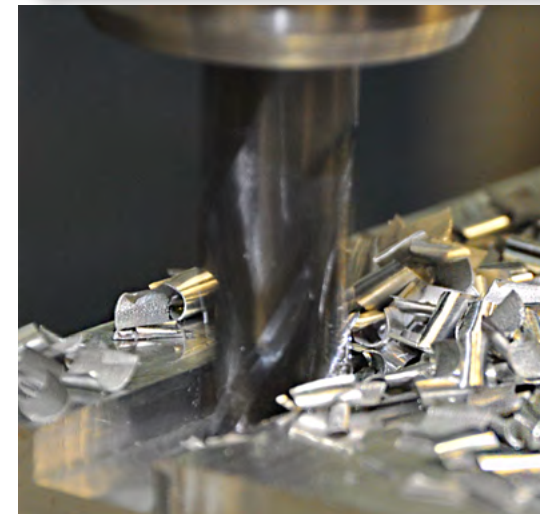
Size	Pitch	NPT	NPTF	Size	Pitch	NPT	NPTF
1/16	27	641-301	641-401	3/4	14	641-306	641-406
1/8	27	641-302	641-402	1	11-1/2	641-307	641-407
1/4	18	641-303	641-403	1-1/4	11-1/2	641-308	641-408
3/8	18	641-304	641-404	1-1/2	11-1/2	641-309	641-409
1/2	14	641-305	641-405	2	11-1/2	641-310	-

HSS Combination Drills and Taps

- Superb quality High Speed Steel
- Solid reliable performance
- MAP certified quality

Hardened	Cast Iron	Titanium	Non-Ferrous	Stainless	Steel
H	K	S	N	M	P

Size	Pitch	Drill Dia	Drill Length	Drill/Tap	Size	Pitch	Drill Dia	Drill Length	Drill/Tap
4	40	.091	1/4	641-501	5/16	18	.266	11/16	641-515
4	48	.0945	1/4	641-502	5/16	24	.277	11/16	641-516
5	40	.104	9/32	641-503	3/8	16	.3225	13/16	641-517
5	44	.106	9/32	641-504	3/8	24	.3395	13/16	641-518
6	32	.1115	5/16	641-505	7/16	14	.377	1	641-519
6	40	.117	5/16	641-506	7/16	20	.3955	1	641-520
8	32	.1375	3/8	641-507	1/2	13	.435	1	641-521
8	36	.1405	3/8	641-508	1/2	20	.458	1	641-522
10	24	.1545	13/32	641-509	M4	0.7	.134	3/8	641-523
10	32	.1635	13/32	641-510	M5	0.8	.17	13/32	641-524
12	24	.1805	15/32	641-511	M6	1.0	.203	17/32	641-525
12	28	.186	15/32	641-512	M8	1.25	.273	11/16	641-526
1/4	20	.208	17/32	641-513	M10	1.50	.344	13/16	641-527
1/4	28	.22	17/32	641-514	M12	1.75	.414	1	641-528



Notes

Terms and Conditions

To Order

Faxed or e-mailed orders are required. Please specify quantity and EDP/Part numbers.

Minimum Orders

\$50 for standard items, \$200 for special orders. Orders below \$50 are subject to a \$7.50 handling fee.

Standard Payment Terms

Overseas customers: Prepaid.

US customers: Net 30 Days, pending credit approval, past due after 30 days from billing date.

Freight

Freight is F.O.B. Origin. Mastercut Tool Corp. offers daily service with FedEx and UPS. Shipments made Pre-Pay & Add on Mastercut's FedEx or UPS accounts are subject to a \$2.50 handling fee for domestic shipments and a \$25.00 handling fee for international shipments. We are also happy to utilize any freight carrier when shipping on a collect or third-party account with no additional handling fee.

Return Policy

Standard items that Mastercut maintains in stock may be returned with a 25% restocking fee.

All returns must be received within 2 months of original ship date. We are unable to accept returns on non-stock items or specials.

Additional Offerings

Special Tooling for your Requirements

When you need a non-standard tool for a specific job, give us a call. Requirements for special tooling or modifications of existing standard items will be given prompt, expert attention.

Resharpening

Mastercut Tool Corp. employs skilled craftspersons and advanced equipment to provide excellent resharpening services. We can sharpen dull cutters, regardless of the manufacturer. This is an excellent and efficient way to get new tool performance at a fraction of the cost.



Mastercut Tool Corp. offers a full line of solid carbide tools:

Endmills, Drills, Reamers, Routers and Burs

Composites, exotic metals, acrylic, zirconium, wood, graphite or any other materials, Mastercut has the tools and technical support for your machining needs.



Mastercut Tool Corp.
965 Harbor Lake Dr.
Safety Harbor, FL 34695 USA
Tel: 001.727.726.5336
Fax: 001.727.725.2532
Email sales@mastercuttool.com
Web www.mastercuttool.com

Proudly Distributed By:

