VORTEX
TOOL COMPANY INC.

WHERE INDUSTRY TURNS FOR INNOVATION℠

OVER 30 YEARS

VORTEXTOOL.COM

American Owned And Operated

Dear Friends,

When we opened our doors in 1992, we realized our success would be based on our ability to provide the best products and services possible to our customers. Since that time, we have worked very hard to meet and exceed the needs of our customers. After more than 30 years in operation, we are proud to say that Vortex Tool is the largest "American Owned and Operated" producer of solid carbide router bits.

As our business grew, we listened to our customers, and spent time and resources developing new products and services. In 2004, Vortex Tool reached a milestone. We were awarded our industry's highest honor, The Challengers Award. This prestigious award, known throughout the world as the woodworking industry's highest honor, recognizes companies who have distinguished themselves by developing innovative technology in products, services, or manufacturing techniques. To us, it represents the acknowledgment of hard working, dedicated employees, who have a steadfast commitment to customer service.

Again, we have listened to our customers, and we are now introducing a new tooling line for the metal industry. Our metal tooling may be new to you, but it is not for us. We have been making metal tooling for our own machine shop for over 30 years.

Now that we have ventured beyond the norm, you may rest assured that we haven't lost sight of our most important goal, which is to provide our customers with the best products and services possible.

We hope you enjoy working with the new Vortex catalog, and we look forward to hearing from you soon.

The Serwas

Over the past three decades, Vortex Tool has built a reputation as an innovator, manufacturing high performance router and insert cutting tools for the woodworking and plastics industries. From our facility in Schofield, Wisconsin, Vortex produces tools with cutting edges in various grades of carbide, stellite, and polycrystalline diamond.

Vortex stands alone as an industry leader with many industry firsts. Our high quality tools, which provide higher operating speeds, significantly longer tool life than other manufacturers and long-term value, have built our customer base of over 6,000 companies.

Now we are bringing our decades of knowledge and experience to the metal industry. Vortex is introducing tools with cutting edges in various grades of carbide and coatings.

Custom Tooling

Many customers do not realize that Vortex Tool is more than solid carbide router bits — MUCH MORE!! A large part of our business is the design and manufacturing of insert tooling. Manufactured by Vortex Tool at our facility in Schofield, Wisconsin, both tool bodies and replacement inserts are produced on CNC machinery. Each tool is custom designed using AutoCAD or SOLIDWORKS, allowing for easy exchange of information between customers and Vortex.

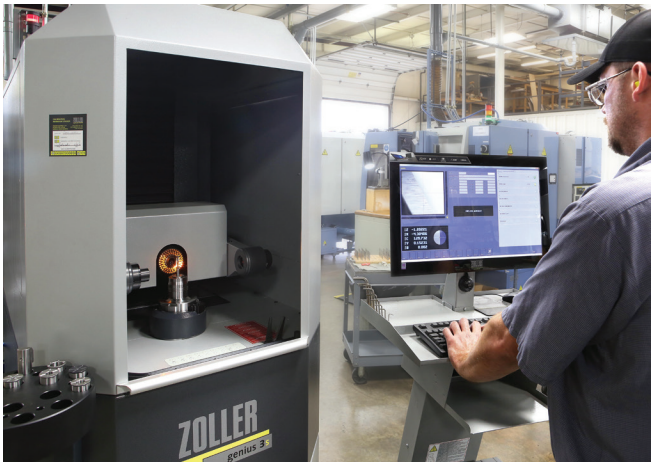
Insert designs vary depending on application. We not only manufacture router tooling, but bore type tooling as well. We always try to provide you with tool designs and insert types that are widely available so you aren't "tied" to one source for replacement items. Inserts are profile ground on state-of-the-art CNC grinders, then "lap" faced, producing the sharpest edge quality possible. Bodies and inserts are fully engineered in-house which assures future replacements to be accurate and exact.

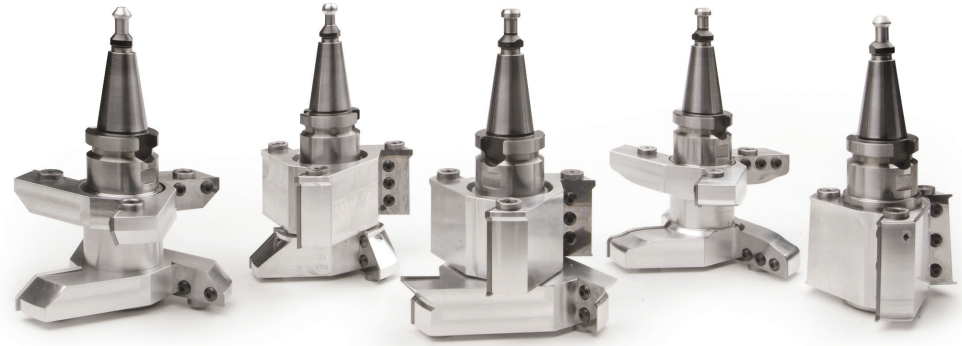
Custom Tooling (continued)

All tools are checked for accuracy on an optical comparator against the drawing created by our engineering department to ensure all angles and profiles are accurate, prior to shipping. A permanent record in the form of an "overlay" is kept ensuring repeat accuracy on all future orders. Average manufacturing time is 3 weeks for insert bodies and 1-2 weeks for replacement inserts, which will be accurately defined at time of quotation. Vortex can provide pricing based on AutoCAD drawings, wood samples, and many other forms of electronic data.

Solid Carbide Custom Tooling

In addition to our standard line of tooling, Vortex Tool also manufactures custom solid carbide tooling with special cutting edge lengths, profiles, etc. If you are unable to find a standard tool for your application, please call our sales department for a quotation. Manufacturing time on custom solid carbide tools is 7-10 working days or less and will be accurately defined at time of quotation.





Sharpening Services

When Vortex began its business in 1992, we did not manufacture solid carbide tooling, but were a service facility for sharpening and retipping services of solid carbide and carbide-tipped tooling. We had several customers tell us that their tools performed better after we had sharpened them than they did when they were new, and a few would have us sharpen their new tools with this special “Razor Edge” Technology.

Today, Vortex Tool continues to sharpen all types of solid carbide bits as well as carbide-tipped tooling for the woodworking and plastics industries. We can sharpen any manufacturer's brand. Our standard turnaround time for router bit sharpening is two days or less. The new tool diameter will be marked on the tool so you can easily adjust your tool offset. We can accommodate requests for matching tools in sets, maintaining tool diameters by cutting off and re-pointing the dull portion of the tool (popular in downcut tools), grinding to a specific diameter, etc.

Tools should be sent to:

Vortex Tool Company Inc.
5605 E. Jelinek Avenue
Schofield, WI 54476

Tools should be packaged tightly to prevent damage during shipping! Please include a business card or paperwork indicating your company name, address, and phone number.

In addition to sharpening solid carbide and carbide-tipped tooling, Vortex Tool will properly service your carbide-tipped saw blades. The staff at Vortex Tool have been trained to hammer and straighten saw blades, add tension to blades, and whatever else is needed to bring them to a “like new” condition. Prior to sharpening, all blades are cleaned and inspected for serviceability. Proper service of your tooling and saw blades can determine your profit.

Tool Coating Guide

	ZRN	TiN	AlTiN	MpC4
Composition	Zirconium Nitride	Titanium Nitride	Aluminum Titanium Nitride	Nano-Layer AlCrN Based
Hardness In Vickers +/- 400 (HV)	2800	2700	3700	3200
Color	14K Gold/Brass	Gold	Grey	Grey
Coating Thickness (microns)	2 to 5	2 to 5	2 to 5	2 to 5
Oxidation Temperature Deg. F	900	900	1450	1650
Deposition Temperature Deg. F	400-800	400-800	600-800	600-800
Friction Coefficent	0.3-0.40	0.45	0.45	0.4
Common Applications	General Purpose Machining, Piercing, Forming, Punching, And Medical	Low Speed Machining, Light Forming, And Molding Decorative	High Speed Machining Of Medium Hard Materials. Stainless Steel Machining	General Purpose Coating For Machining All Steels At Medium To High Speeds.

General Policy for Returns/Exchanges

If you have items you need to return for credit, please contact our sales department for an RMA (Return Materials Authorization) form. This form must be included inside the box when returning tools to ensure proper credit.

When returning product, we strongly recommend the use of a carrier that can track packages. You are responsible for insuring the package for any possible shipping loss or damage. All items must be returned in their original unused condition and packaging, and must include any accessories that accompanied the original purchase. The shipping fee is nonrefundable. Buyer is responsible for return shipping costs and insurance. Please allow 2-7 days for processing of your return. Please note that not all items are covered under our return policy.

We cannot accept returns of certain items for a refund, including:

- Any item that is returned more than 90 days after receipt.
- Any perishable tooling that has been used for production or test cutting.
- Any perishable tooling that has been chucked or mounted in a machine.
- Any item that is not in its original condition, is physically damaged, or modified from its original manufactured specs.
- Any perishable tooling that has been reconditioned or serviced in any way.
- Any custom made perishable tooling manufactured to customer specs.

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Series 20000

FOUR FLUTE END MILL

- ▼Solid Carbide
- ▼Center Cutting
- ▼30° Helix
- ▼Square End
- ▼Slotting, Roughing, And Finishing

PART #	CED	CEL	SHK DIA	OAL	# OF FLUTES
20020	.250	.500	.250	3.250	4
20023	.250	.750	.250	3.250	4
20026	.250	1.125	.250	3.250	4
20030	.3125	.625	.3125	3	4
20036	.3125	1.125	.3125	3	4
20040	.375	.500	.375	3	4
20044	.375	.750	.375	3	4
20046	.375	1.250	.375	3	4
20052	.500	.750	.500	3	4
20054	.500	1.500	.500	3	4
20056	.500	2.250	.500	4	4
20058	.500	2.500	.500	4	4
20076	.750	2.500	.750	5	4

Series 20000-ZrN

FOUR FLUTE END MILL

PART #	CED	CEL	SHK DIA	OAL	# OF FLUTES
20020-ZrN	.250	.500	.250	3.250	4
20023-ZrN	.250	.750	.250	3.250	4
20026-ZrN	.250	1.125	.250	3.250	4
20030-ZrN	.3125	.625	.3125	3	4
20036-ZrN	.3125	1.125	.3125	3	4
20040-ZrN	.375	.500	.375	3	4
20044-ZrN	.375	.750	.375	3	4
20046-ZrN	.375	1.250	.375	3	4
20052-ZrN	.500	.750	.500	3	4
20054-ZrN	.500	1.500	.500	3	4
20056-ZrN	.500	2.250	.500	4	4
20058-ZrN	.500	2.500	.500	4	4
20076-ZrN	.750	2.500	.750	5	4

CED = Cutting Edge Diameter, **CEL** = Cutting Edge Length, **SHK DIA** = Shank Diameter, **OAL** = Overall Length,
P = Steel, **M** = Stainless Steels, **K** = Cast Iron, **N** = Non-Ferrous Materials, **S** = Super Alloys, **H** = Hardened Materials

Series 20000-TiN

FOUR FLUTE END MILL

PART #	CED	CEL	SHK DIA	OAL	# OF FLUTES
20020-TiN	.250	.500	.250	3.250	4
20023-TiN	.250	.750	.250	3.250	4
20026-TiN	.250	1.125	.250	3.250	4
20030-TiN	.3125	.625	.3125	3	4
20036-TiN	.3125	1.125	.3125	3	4
20040-TiN	.375	.500	.375	3	4
20044-TiN	.375	.750	.375	3	4
20046-TiN	.375	1.250	.375	3	4
20052-TiN	.500	.750	.500	3	4
20054-TiN	.500	1.500	.500	3	4
20056-TiN	.500	2.250	.500	4	4
20058-TiN	.500	2.500	.500	4	4
20076-TiN	.750	2.500	.750	5	4

Series 20000-AlTiN

FOUR FLUTE END MILL

PART #	CED	CEL	SHK DIA	OAL	# OF FLUTES
20020-AlTiN	.250	.500	.250	3.250	4
20023-AlTiN	.250	.750	.250	3.250	4
20026-AlTiN	.250	1.125	.250	3.250	4
20030-AlTiN	.3125	.625	.3125	3	4
20036-AlTiN	.3125	1.125	.3125	3	4
20040-AlTiN	.375	.500	.375	3	4
20044-AlTiN	.375	.750	.375	3	4
20046-AlTiN	.375	1.250	.375	3	4
20052-AlTiN	.500	.750	.500	3	4
20054-AlTiN	.500	1.500	.500	3	4
20056-AlTiN	.500	2.250	.500	4	4
20058-AlTiN	.500	2.500	.500	4	4
20076-AlTiN	.750	2.500	.750	5	4

CED = Cutting Edge Diameter, **CEL** = Cutting Edge Length, **SHK DIA** = Shank Diameter, **OAL** = Overall Length,
P = Steel, **M** = Stainless Steels, **K** = Cast Iron, **N** = Non-Ferrous Materials, **S** = Super Alloys, **H** = Hardened Materials

Series 20000-MpC4

FOUR FLUTE END MILL

PART #	CED	CEL	SHK DIA	OAL	# OF FLUTES
20020-MpC4	.250	.500	.250	3.250	4
20023-MpC4	.250	.750	.250	3.250	4
20026-MpC4	.250	1.125	.250	3.250	4
20030-MpC4	.3125	.625	.3125	3	4
20036-MpC4	.3125	1.125	.3125	3	4
20040-MpC4	.375	.500	.375	3	4
20044-MpC4	.375	.750	.375	3	4
20046-MpC4	.375	1.250	.375	3	4
20052-MpC4	.500	.750	.500	3	4
20054-MpC4	.500	1.500	.500	3	4
20056-MpC4	.500	2.250	.500	4	4
20058-MpC4	.500	2.500	.500	4	4
20076-MpC4	.750	2.500	.750	5	4

Series 20000R

FOUR FLUTE CORNER RADIUS END MILL

- ▼Solid Carbide
- ▼Center Cutting
- ▼30° Helix
- ▼Corner Radius
- ▼Slotting, Roughing, And Finishing

PART #	CED	CEL	SHK DIA	OAL	C/R	# OF FLUTES
20020R	.250	.500	.250	3.250	.030	4
20023R	.250	.750	.250	3.250	.030	4
20026R	.250	1.125	.250	3.250	.030	4
20030R	.3125	.625	.3125	3	.030	4
20036R	.3125	1.125	.3125	3	.030	4
20040R	.375	.500	.375	3	.030	4
20044R	.375	.750	.375	3	.030	4
20046R	.375	1.250	.375	3	.030	4
20052R	.500	.750	.500	3	.030	4
20054R	.500	1.500	.500	3	.030	4
20056R	.500	2.250	.500	4	.030	4
20058R	.500	2.500	.500	4	.030	4
20076R	.750	2.500	.750	5	.030	4

CED = Cutting Edge Diameter, **CEL** = Cutting Edge Length, **SHK DIA** = Shank Diameter, **OAL** = Overall Length, **C/R** = Corner Radius, **P** = Steel, **M** = Stainless Steels, **K** = Cast Iron, **N** = Non-Ferrous Materials, **S** = Super Alloys, **H** = Hardened Materials

Series 20000R-ZrN

FOUR FLUTE CORNER RADIUS END MILL

PART #	CED	CEL	SHK DIA	OAL	C/R	# OF FLUTES
20020R-ZrN	.250	.500	.250	3.250	.030	4
20023R-ZrN	.250	.750	.250	3.250	.030	4
20026R-ZrN	.250	1.125	.250	3.250	.030	4
20030R-ZrN	.3125	.625	.3125	3	.030	4
20036R-ZrN	.3125	1.125	.3125	3	.030	4
20040R-ZrN	.375	.500	.375	3	.030	4
20044R-ZrN	.375	.750	.375	3	.030	4
20046R-ZrN	.375	1.250	.375	3	.030	4
20052R-ZrN	.500	.750	.500	3	.030	4
20054R-ZrN	.500	1.500	.500	3	.030	4
20056R-ZrN	.500	2.250	.500	4	.030	4
20058R-ZrN	.500	2.500	.500	4	.030	4
20076R-ZrN	.750	2.500	.750	5	.030	4

Series 20000R-TiN

FOUR FLUTE CORNER RADIUS END MILL

PART #	CED	CEL	SHK DIA	OAL	C/R	# OF FLUTES
20020R-TiN	.250	.500	.250	3.250	.030	4
20023R-TiN	.250	.750	.250	3.250	.030	4
20026R-TiN	.250	1.125	.250	3.250	.030	4
20030R-TiN	.3125	.625	.3125	3	.030	4
20036R-TiN	.3125	1.125	.3125	3	.030	4
20040R-TiN	.375	.500	.375	3	.030	4
20044R-TiN	.375	.750	.375	3	.030	4
20046R-TiN	.375	1.250	.375	3	.030	4
20052R-TiN	.500	.750	.500	3	.030	4
20054R-TiN	.500	1.500	.500	3	.030	4
20056R-TiN	.500	2.250	.500	4	.030	4
20058R-TiN	.500	2.500	.500	4	.030	4
20076R-TiN	.750	2.500	.750	5	.030	4

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Series 20000R-AlTiN

FOUR FLUTE CORNER RADIUS END MILL

PART #	CED	CEL	SHK DIA	OAL	C/R	# OF FLUTES
20020R-AlTiN	.250	.500	.250	3.250	.030	4
20023R-AlTiN	.250	.750	.250	3.250	.030	4
20026R-AlTiN	.250	1.125	.250	3.250	.030	4
20030R-AlTiN	.3125	.625	.3125	3	.030	4
20036R-AlTiN	.3125	1.125	.3125	3	.030	4
20040R-AlTiN	.375	.500	.375	3	.030	4
20044R-AlTiN	.375	.750	.375	3	.030	4
20046R-AlTiN	.375	1.250	.375	3	.030	4
20052R-AlTiN	.500	.750	.500	3	.030	4
20054R-AlTiN	.500	1.500	.500	3	.030	4
20056R-AlTiN	.500	2.250	.500	4	.030	4
20058R-AlTiN	.500	2.500	.500	4	.030	4
20076R-AlTiN	.750	2.500	.750	5	.030	4

Series 20000R-MpC4

FOUR FLUTE CORNER RADIUS END MILL

PART #	CED	CEL	SHK DIA	OAL	C/R	# OF FLUTES
20020R-MpC4	.250	.500	.250	3.250	.030	4
20023R-MpC4	.250	.750	.250	3.250	.030	4
20026R-MpC4	.250	1.125	.250	3.250	.030	4
20030R-MpC4	.3125	.625	.3125	3	.030	4
20036R-MpC4	.3125	1.125	.3125	3	.030	4
20040R-MpC4	.375	.500	.375	3	.030	4
20044R-MpC4	.375	.750	.375	3	.030	4
20046R-MpC4	.375	1.250	.375	3	.030	4
20052R-MpC4	.500	.750	.500	3	.030	4
20054R-MpC4	.500	1.500	.500	3	.030	4
20056R-MpC4	.500	2.250	.500	4	.030	4
20058R-MpC4	.500	2.500	.500	4	.030	4
20076R-MpC4	.750	2.500	.750	5	.030	4

CED = Cutting Edge Diameter, **CEL** = Cutting Edge Length, **SHK DIA** = Shank Diameter, **OAL** = Overall Length, **C/R** = Corner Radius, **P** = Steel, **M** = Stainless Steels, **K** = Cast Iron, **N** = Non-Ferrous Materials, **S** = Super Alloys, **H** = Hardened Materials

Series 20100

THREE FLUTE END MILL

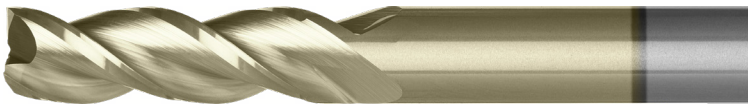
- ▼Solid Carbide
- ▼Center Cutting
- ▼37° Helix
- ▼Square End
- ▼Slotting, Roughing, And Finishing

PART #	CED	CEL	SHK DIA	OAL	# OF FLUTES
20120	.250	.500	.250	3	3
20123	.250	.750	.250	3	3
20144	.375	.750	.375	3	3
20146	.375	1.250	.375	3	3
20152	.500	.750	.500	3	3
20153	.500	1.250	.500	3	3
20176	.750	2.500	.750	5	3

N

Series 20100-ZrN

THREE FLUTE END MILL

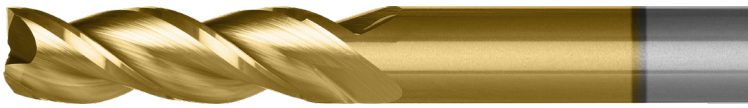


PART #	CED	CEL	SHK DIA	OAL	# OF FLUTES
20120-ZrN	.250	.500	.250	3	3
20123-ZrN	.250	.750	.250	3	3
20144-ZrN	.375	.750	.375	3	3
20146-ZrN	.375	1.250	.375	3	3
20152-ZrN	.500	.750	.500	3	3
20153-ZrN	.500	1.250	.500	3	3
20176-ZrN	.750	2.500	.750	5	3

N

Series 20100-TiN

THREE FLUTE END MILL



PART #	CED	CEL	SHK DIA	OAL	# OF FLUTES
20120-TiN	.250	.500	.250	3	3
20123-TiN	.250	.750	.250	3	3
20144-TiN	.375	.750	.375	3	3
20146-TiN	.375	1.250	.375	3	3
20152-TiN	.500	.750	.500	3	3
20153-TiN	.500	1.250	.500	3	3
20176-TiN	.750	2.500	.750	5	3

N

CED = Cutting Edge Diameter, **CEL** = Cutting Edge Length, **SHK DIA** = Shank Diameter, **OAL** = Overall Length,
N = Non-Ferrous Materials

Series 20100-AlTiN

THREE FLUTE END MILL

PART #	CED	CEL	SHK DIA	OAL	# OF FLUTES
20120-AlTiN	.250	.500	.250	3	3
20123-AlTiN	.250	.750	.250	3	3
20144-AlTiN	.375	.750	.375	3	3
20146-AlTiN	.375	1.250	.375	3	3
20152-AlTiN	.500	.750	.500	3	3
20153-AlTiN	.500	1.250	.500	3	3
20176-AlTiN	.750	2.500	.750	5	3

N

Series 20100-MpC4

THREE FLUTE END MILL

PART #	CED	CEL	SHK DIA	OAL	# OF FLUTES
20120-MpC4	.250	.500	.250	3	3
20123-MpC4	.250	.750	.250	3	3
20144-MpC4	.375	.750	.375	3	3
20146-MpC4	.375	1.250	.375	3	3
20152-MpC4	.500	.750	.500	3	3
20153-MpC4	.500	1.250	.500	3	3
20176-MpC4	.750	2.500	.750	5	3

N

Series 20100R

THREE FLUTE CORNER RADIUS END MILL

- Solid Carbide
- Center Cutting
- 37° Helix
- Corner Radius
- Slotting, Roughing, And Finishing

PART #	CED	CEL	SHK DIA	OAL	C/R	# OF FLUTES
20120R	.250	.500	.250	3	.030	3
20123R	.250	.750	.250	3	.030	3
20144R	.375	.750	.375	3	.030	3
20146R	.375	1.250	.375	3	.030	3
20152R	.500	.750	.500	3	.030	3
20153R	.500	1.250	.500	3	.030	3
20176R	.750	2.500	.750	5	.030	3

N

CED = Cutting Edge Diameter, **CEL** = Cutting Edge Length, **SHK DIA** = Shank Diameter, **OAL** = Overall Length, **C/R** = Corner Radius , **N** = Non-Ferrous Materials

Series 20100R-ZrN

THREE FLUTE CORNER RADIUS END MILL

PART #	CED	CEL	SHK DIA	OAL	C/R	# OF FLUTES
20120R-ZrN	.250	.500	.250	3	.030	3
20123R-ZrN	.250	.750	.250	3	.030	3
20144R-ZrN	.375	.750	.375	3	.030	3
20146R-ZrN	.375	1.250	.375	3	.030	3
20152R-ZrN	.500	.750	.500	3	.030	3
20153R-ZrN	.500	1.250	.500	3	.030	3
20176R-ZrN	.750	2.500	.750	5	.030	3

N

Series 20100R-TiN

THREE FLUTE CORNER RADIUS END MILL

PART #	CED	CEL	SHK DIA	OAL	C/R	# OF FLUTES
20120R-TiN	.250	.500	.250	3	.030	3
20123R-TiN	.250	.750	.250	3	.030	3
20144R-TiN	.375	.750	.375	3	.030	3
20146R-TiN	.375	1.250	.375	3	.030	3
20152R-TiN	.500	.750	.500	3	.030	3
20153R-TiN	.500	1.250	.500	3	.030	3
20176R-TiN	.750	2.500	.750	5	.030	3

N

Series 20100R-AlTiN

THREE FLUTE CORNER RADIUS END MILL

PART #	CED	CEL	SHK DIA	OAL	C/R	# OF FLUTES
20120R-AlTiN	.250	.500	.250	3	.030	3
20123R-AlTiN	.250	.750	.250	3	.030	3
20144R-AlTiN	.375	.750	.375	3	.030	3
20146R-AlTiN	.375	1.250	.375	3	.030	3
20152R-AlTiN	.500	.750	.500	3	.030	3
20153R-AlTiN	.500	1.250	.500	3	.030	3
20176R-AlTiN	.750	2.500	.750	5	.030	3

N

Series 20100R-MpC4

THREE FLUTE CORNER RADIUS END MILL

PART #	CED	CEL	SHK DIA	OAL	C/R	# OF FLUTES
20120R-MpC4	.250	.500	.250	3	.030	3
20123R-MpC4	.250	.750	.250	3	.030	3
20144R-MpC4	.375	.750	.375	3	.030	3
20146R-MpC4	.375	1.250	.375	3	.030	3
20152R-MpC4	.500	.750	.500	3	.030	3
20153R-MpC4	.500	1.250	.500	3	.030	3
20176R-MpC4	.750	2.500	.750	5	.030	3

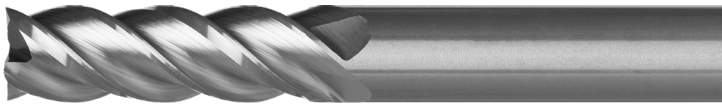
N

CED = Cutting Edge Diameter, **CEL** = Cutting Edge Length, **SHK DIA** = Shank Diameter, **OAL** = Overall Length, **C/R** = Corner Radius , **N** = Non-Ferrous Materials

Series 20200

FOUR VARI FLUTE END MILL

- Solid Carbide
- VARI Flute
- Center Cutting
- 41° Helix
- Square End
- Slotting, Roughing, And Finishing

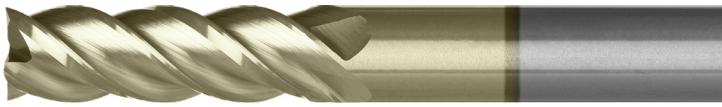


PART #	CED	CEL	SHK DIA	OAL	# OF FLUTES
20220	.250	.500	.250	3	4
20223	.250	.750	.250	3	4
20244	.375	.750	.375	3	4
20246	.375	1.250	.375	3	4
20252	.500	.750	.500	3	4
20253	.500	1.250	.500	3	4
20274	.750	2.250	.750	5	4

K S P M

Series 20200-ZrN

FOUR VARI FLUTE END MILL



PART #	CED	CEL	SHK DIA	OAL	# OF FLUTES
20220-ZrN	.250	.500	.250	3	4
20223-ZrN	.250	.750	.250	3	4
20244-ZrN	.375	.750	.375	3	4
20246-ZrN	.375	1.250	.375	3	4
20252-ZrN	.500	.750	.500	3	4
20253-ZrN	.500	1.250	.500	3	4
20274-ZrN	.750	2.250	.750	5	4

K S P M

Series 20200-TiN

FOUR VARI FLUTE END MILL

PART #	CED	CEL	SHK DIA	OAL	# OF FLUTES
20220-TiN	.250	.500	.250	3	4
20223-TiN	.250	.750	.250	3	4
20244-TiN	.375	.750	.375	3	4
20246-TiN	.375	1.250	.375	3	4
20252-TiN	.500	.750	.500	3	4
20253-TiN	.500	1.250	.500	3	4
20274-TiN	.750	2.250	.750	5	4

K S P M

CED = Cutting Edge Diameter, **CEL** = Cutting Edge Length, **SHK DIA** = Shank Diameter, **OAL** = Overall Length,
P = Steel, **M** = Stainless Steels, **K** = Cast Iron, **S** = Super Alloys

Series 20200-AlTiN

FOUR VARI FLUTE END MILL

PART #	CED	CEL	SHK DIA	OAL	# OF FLUTES
20220-AlTiN	.250	.500	.250	3	4
20223-AlTiN	.250	.750	.250	3	4
20244-AlTiN	.375	.750	.375	3	4
20246-AlTiN	.375	1.250	.375	3	4
20252-AlTiN	.500	.750	.500	3	4
20253-AlTiN	.500	1.250	.500	3	4
20274-AlTiN	.750	2.250	.750	5	4

K S P M

Series 20200-MpC4

FOUR VARI FLUTE END MILL

PART #	CED	CEL	SHK DIA	OAL	# OF FLUTES
20220-MpC4	.250	.500	.250	3	4
20223-MpC4	.250	.750	.250	3	4
20244-MpC4	.375	.750	.375	3	4
20246-MpC4	.375	1.250	.375	3	4
20252-MpC4	.500	.750	.500	3	4
20253-MpC4	.500	1.250	.500	3	4
20274-MpC4	.750	2.250	.750	5	4

K S P M

Series 20200R

FOUR VARI FLUTE CORNER RADIUS END MILL

- ▼Solid Carbide
- ▼VARI Flute
- ▼Center Cutting
- ▼41° Helix
- ▼Corner Radius
- ▼Slotting, Roughing, And Finishing

PART #	CED	CEL	SHK DIA	OAL	C/R	# OF FLUTES
20220R	.250	.500	.250	3	.030	4
20223R	.250	.750	.250	3	.030	4
20244R	.375	.750	.375	3	.030	4
20246R	.375	1.250	.375	3	.030	4
20252R	.500	.750	.500	3	.030	4
20253R	.500	1.250	.500	3	.030	4
20274R	.750	2.250	.750	5	.030	4

K S P M

CED = Cutting Edge Diameter, **CEL** = Cutting Edge Length, **SHK DIA** = Shank Diameter, **OAL** = Overall Length, **C/R** = Corner Radius, **P** = Steel, **M** = Stainless Steels, **K** = Cast Iron, **S** = Super Alloys

Series 20200R-ZrN

FOUR VARI FLUTE CORNER RADIUS END MILL

PART #	CED	CEL	SHK DIA	OAL	C/R	# OF FLUTES
20220R-Zrn	.250	.500	.250	3	.030	4
20223R-Zrn	.250	.750	.250	3	.030	4
20244R-Zrn	.375	.750	.375	3	.030	4
20246R-Zrn	.375	1.250	.375	3	.030	4
20252R-Zrn	.500	.750	.500	3	.030	4
20253R-Zrn	.500	1.250	.500	3	.030	4
20274R-Zrn	.750	2.250	.750	5	.030	4

K S P M

Series 20200R-TiN

FOUR VARI FLUTE CORNER RADIUS END MILL

PART #	CED	CEL	SHK DIA	OAL	C/R	# OF FLUTES
20220R-TiN	.250	.500	.250	3	.030	4
20223R-TiN	.250	.750	.250	3	.030	4
20244R-TiN	.375	.750	.375	3	.030	4
20246R-TiN	.375	1.250	.375	3	.030	4
20252R-TiN	.500	.750	.500	3	.030	4
20253R-TiN	.500	1.250	.500	3	.030	4
20274R-TiN	.750	2.250	.750	5	.030	4

K S P M

Series 20200R-AlTiN

FOUR VARI FLUTE CORNER RADIUS END MILL

PART #	CED	CEL	SHK DIA	OAL	C/R	# OF FLUTES
20220R-AlTiN	.250	.500	.250	3	.030	4
20223R-AlTiN	.250	.750	.250	3	.030	4
20244R-AlTiN	.375	.750	.375	3	.030	4
20246R-AlTiN	.375	1.250	.375	3	.030	4
20252R-AlTiN	.500	.750	.500	3	.030	4
20253R-AlTiN	.500	1.250	.500	3	.030	4
20274R-AlTiN	.750	2.250	.750	5	.030	4

K S P M

Series 20200R-MpC4

FOUR VARI FLUTE CORNER RADIUS END MILL

PART #	CED	CEL	SHK DIA	OAL	C/R	# OF FLUTES
20220R-MpC4	.250	.500	.250	3	.030	4
20223R-MpC4	.250	.750	.250	3	.030	4
20244R-MpC4	.375	.750	.375	3	.030	4
20246R-MpC4	.375	1.250	.375	3	.030	4
20252R-MpC4	.500	.750	.500	3	.030	4
20253R-MpC4	.500	1.250	.500	3	.030	4
20274R-MpC4	.750	2.250	.750	5	.030	4

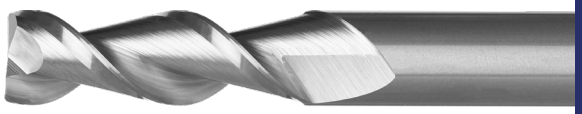
K S P M

CED = Cutting Edge Diameter, **CEL** = Cutting Edge Length, **SHK DIA** = Shank Diameter, **OAL** = Overall Length, **C/R** = Corner Radius, **P** = Steel, **M** = Stainless Steels, **K** = Cast Iron, **S** = Super Alloys

Series 20300

TWO FLUTE END MILL

- ▼Solid Carbide
- ▼Center Cutting
- ▼45° Helix
- ▼Square End
- ▼Finishing



PART #	CED	CEL	SHK DIA	OAL	# OF FLUTES
20323	.250	.750	.250	3	2
20326	.250	1.250	.250	3	2
20340	.375	.500	.375	4	2
20344	.375	.750	.375	3	2
20352	.500	.750	.500	3	2
20353	.500	1.250	.500	3	2
20376	.750	2.500	.750	5	2

N

Series 20300-ZrN

TWO FLUTE END MILL

PART #	CED	CEL	SHK DIA	OAL	# OF FLUTES
20323-ZrN	.250	.750	.250	3	2
20326-ZrN	.250	1.250	.250	3	2
20340-ZrN	.375	.500	.375	4	2
20344-ZrN	.375	.750	.375	3	2
20352-ZrN	.500	.750	.500	3	2
20353-ZrN	.500	1.250	.500	3	2
20376-ZrN	.750	2.500	.750	5	2

N

Series 20300-TiN

TWO FLUTE END MILL

PART #	CED	CEL	SHK DIA	OAL	# OF FLUTES
20323-TiN	.250	.750	.250	3	2
20326-TiN	.250	1.250	.250	3	2
20340-TiN	.375	.500	.375	4	2
20344-TiN	.375	.750	.375	3	2
20352-TiN	.500	.750	.500	3	2
20353-TiN	.500	1.250	.500	3	2
20376-TiN	.750	2.500	.750	5	2

N

CED = Cutting Edge Diameter, **CEL** = Cutting Edge Length, **SHK DIA** = Shank Diameter, **OAL** = Overall Length,
N = Non-Ferrous Materials

Series 20300-AlTiN

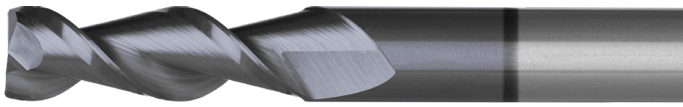
TWO FLUTE END MILL

PART #	CED	CEL	SHK DIA	OAL	# OF FLUTES
20323-AlTiN	.250	.750	.250	3	2
20326-AlTiN	.250	1.250	.250	3	2
20340-AlTiN	.375	.500	.375	4	2
20344-AlTiN	.375	.750	.375	3	2
20352-AlTiN	.500	.750	.500	3	2
20353-AlTiN	.500	1.250	.500	3	2
20376-AlTiN	.750	2.500	.750	5	2

N

Series 20300-MpC4

TWO FLUTE END MILL



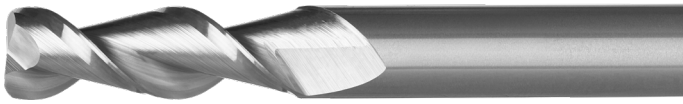
PART #	CED	CEL	SHK DIA	OAL	# OF FLUTES
20323-MpC4	.250	.750	.250	3	2
20326-MpC4	.250	1.250	.250	3	2
20340-MpC4	.375	.500	.375	4	2
20344-MpC4	.375	.750	.375	3	2
20352-MpC4	.500	.750	.500	3	2
20353-MpC4	.500	1.250	.500	3	2
20376-MpC4	.750	2.500	.750	5	2

N

Series 20300R

TWO FLUTE CORNER RADIUS END MILL

- Solid Carbide
- Center Cutting
- 45° Helix
- Corner Radius
- Finishing



PART #	CED	CEL	SHK DIA	OAL	C/R	# OF FLUTES
20323R	.250	.750	.250	3	.030	2
20326R	.250	1.250	.250	3	.030	2
20340R	.375	.500	.375	4	.030	2
20344R	.375	.750	.375	3	.030	2
20352R	.500	.750	.500	3	.030	2
20353R	.500	1.250	.500	3	.030	2
20376R	.750	2.500	.750	5	.030	2

N

CED = Cutting Edge Diameter, **CEL** = Cutting Edge Length, **SHK DIA** = Shank Diameter, **OAL** = Overall Length, **C/R** = Corner Radius, **N** = Non-Ferrous Materials

Series 20300R-ZrN

TWO FLUTE CORNER RADIUS END MILL

PART #	CED	CEL	SHK DIA	OAL	C/R	# OF FLUTES
20323R-ZrN	.250	.750	.250	3	.030	2
20326R-ZrN	.250	1.250	.250	3	.030	2
20340R-ZrN	.375	.500	.375	4	.030	2
20344R-ZrN	.375	.750	.375	3	.030	2
20352R-ZrN	.500	.750	.500	3	.030	2
20353R-ZrN	.500	1.250	.500	3	.030	2
20376R-ZrN	.750	2.500	.750	5	.030	2

N

Series 20300R-TiN

TWO FLUTE CORNER RADIUS END MILL

PART #	CED	CEL	SHK DIA	OAL	C/R	# OF FLUTES
20323R-TiN	.250	.750	.250	3	.030	2
20326R-TiN	.250	1.250	.250	3	.030	2
20340R-TiN	.375	.500	.375	4	.030	2
20344R-TiN	.375	.750	.375	3	.030	2
20352R-TiN	.500	.750	.500	3	.030	2
20353R-TiN	.500	1.250	.500	3	.030	2
20376R-TiN	.750	2.500	.750	5	.030	2

N

Series 20300R-AlTiN

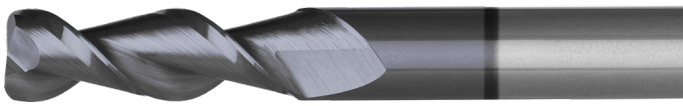
TWO FLUTE CORNER RADIUS END MILL

PART #	CED	CEL	SHK DIA	OAL	C/R	# OF FLUTES
20323R-AlTiN	.250	.750	.250	3	.030	2
20326R-AlTiN	.250	1.250	.250	3	.030	2
20340R-AlTiN	.375	.500	.375	4	.030	2
20344R-AlTiN	.375	.750	.375	3	.030	2
20352R-AlTiN	.500	.750	.500	3	.030	2
20353R-AlTiN	.500	1.250	.500	3	.030	2
20376R-AlTiN	.750	2.500	.750	5	.030	2

N

Series 20300R-MpC4

TWO FLUTE CORNER RADIUS END MILL



PART #	CED	CEL	SHK DIA	OAL	C/R	# OF FLUTES
20323R-MpC4	.250	.750	.250	3	.030	2
20326R-MpC4	.250	1.250	.250	3	.030	2
20340R-MpC4	.375	.500	.375	4	.030	2
20344R-MpC4	.375	.750	.375	3	.030	2
20352R-MpC4	.500	.750	.500	3	.030	2
20353R-MpC4	.500	1.250	.500	3	.030	2
20376R-MpC4	.750	2.500	.750	5	.030	2

N

CED = Cutting Edge Diameter, **CEL** = Cutting Edge Length, **SHK DIA** = Shank Diameter, **OAL** = Overall Length, **C/R** = Corner Radius, **N** = Non-Ferrous Materials

Series 20400

THREE FLUTE VARI HELIX END MILL

- Solid Carbide
- Center Cutting
- VARI Helix
- Square End
- Slotting, Roughing, And Finishing

PART #	CED	CEL	SHK DIA	OAL	# OF FLUTES
20423	.250	.750	.250	3	3
20426	.250	1.250	.250	3	3
20444	.375	.750	.375	3	3
20446	.375	1.250	.375	3	3
20452	.500	.750	.500	3	3
20453	.500	1.250	.500	3	3
20474	.750	2.250	.750	5	3

S P K M

Series 20400-ZrN

THREE FLUTE VARI HELIX END MILL

PART #	CED	CEL	SHK DIA	OAL	# OF FLUTES
20423-ZrN	.250	.750	.250	3	3
20426-ZrN	.250	1.250	.250	3	3
20444-ZrN	.375	.750	.375	3	3
20446-ZrN	.375	1.250	.375	3	3
20452-ZrN	.500	.750	.500	3	3
20453-ZrN	.500	1.250	.500	3	3
20474-ZrN	.750	2.250	.750	5	3

S P K M

Series 20400-TiN

THREE FLUTE VARI HELIX END MILL

PART #	CED	CEL	SHK DIA	OAL	# OF FLUTES
20423-TiN	.250	.750	.250	3	3
20426-TiN	.250	1.250	.250	3	3
20444-TiN	.375	.750	.375	3	3
20446-TiN	.375	1.250	.375	3	3
20452-TiN	.500	.750	.500	3	3
20453-TiN	.500	1.250	.500	3	3
20474-TiN	.750	2.250	.750	5	3

S P K M

CED = Cutting Edge Diameter, **CEL** = Cutting Edge Length, **SHK DIA** = Shank Diameter, **OAL** = Overall Length,
P = Steel, **M** = Stainless Steels, **K** = Cast Iron, **S** = Super Alloys

Series 20400-AlTiN

THREE FLUTE VARI HELIX END MILL

PART #	CED	CEL	SHK DIA	OAL	# OF FLUTES
20423-AlTiN	.250	.750	.250	3	3
20426-AlTiN	.250	1.250	.250	3	3
20444-AlTiN	.375	.750	.375	3	3
20446-AlTiN	.375	1.250	.375	3	3
20452-AlTiN	.500	.750	.500	3	3
20453-AlTiN	.500	1.250	.500	3	3
20474-AlTiN	.750	2.250	.750	5	3

S P K M

Series 20400-MpC4

THREE FLUTE VARI HELIX END MILL

PART #	CED	CEL	SHK DIA	OAL	# OF FLUTES
20423-MpC4	.250	.750	.250	3	3
20426-MpC4	.250	1.250	.250	3	3
20444-MpC4	.375	.750	.375	3	3
20446-MpC4	.375	1.250	.375	3	3
20452-MpC4	.500	.750	.500	3	3
20453-MpC4	.500	1.250	.500	3	3
20474-MpC4	.750	2.250	.750	5	3

S P K M

Series 20400R

THREE FLUTE VARI HELIX CORNER RADIUS END MILL

- Solid Carbide
- Center Cutting
- VARI Helix
- Corner Radius
- Slotting, Roughing, And Finishing

PART #	CED	CEL	SHK DIA	OAL	C/R	# OF FLUTES
20423R	.250	.750	.250	3	.030	3
20426R	.250	1.250	.250	3	.030	3
20444R	.375	.750	.375	3	.030	3
20446R	.375	1.250	.375	3	.030	3
20452R	.500	.750	.500	3	.030	3
20453R	.500	1.250	.500	3	.030	3
20474R	.750	2.250	.750	5	.030	3

S P K M

CED = Cutting Edge Diameter, **CEL** = Cutting Edge Length, **SHK DIA** = Shank Diameter, **OAL** = Overall Length, **C/R** = Corner Radius, **P** = Steel, **M** = Stainless Steels, **K** = Cast Iron, **S** = Super Alloys

Series 20400R-ZrN

THREE FLUTE VARI HELIX CORNER RADIUS END

PART #	CED	CEL	SHK DIA	OAL	C/R	# OF FLUTES
20423R-ZrN	.250	.750	.250	3	.030	3
20426R-ZrN	.250	1.250	.250	3	.030	3
20444R-ZrN	.375	.750	.375	3	.030	3
20446R-ZrN	.375	1.250	.375	3	.030	3
20452R-ZrN	.500	.750	.500	3	.030	3
20453R-ZrN	.500	1.250	.500	3	.030	3
20474R-ZrN	.750	2.250	.750	5	.030	3

S P K M

Series 20400R-TiN

THREE FLUTE VARI HELIX CORNER RADIUS END

PART #	CED	CEL	SHK DIA	OAL	C/R	# OF FLUTES
20423R-TiN	.250	.750	.250	3	.030	3
20426R-TiN	.250	1.250	.250	3	.030	3
20444R-TiN	.375	.750	.375	3	.030	3
20446R-TiN	.375	1.250	.375	3	.030	3
20452R-TiN	.500	.750	.500	3	.030	3
20453R-TiN	.500	1.250	.500	3	.030	3
20474R-TiN	.750	2.250	.750	5	.030	3

S P K M

Series 20400R-AlTiN

THREE FLUTE VARI HELIX CORNER RADIUS END

PART #	CED	CEL	SHK DIA	OAL	C/R	# OF FLUTES
20423R-AlTiN	.250	.750	.250	3	.030	3
20426R-AlTiN	.250	1.250	.250	3	.030	3
20444R-AlTiN	.375	.750	.375	3	.030	3
20446R-AlTiN	.375	1.250	.375	3	.030	3
20452R-AlTiN	.500	.750	.500	3	.030	3
20453R-AlTiN	.500	1.250	.500	3	.030	3
20474R-AlTiN	.750	2.250	.750	5	.030	3

S P K M

Series 20400R-MpC4

THREE FLUTE VARI HELIX CORNER RADIUS END

PART #	CED	CEL	SHK DIA	OAL	C/R	# OF FLUTES
20423R-MpC4	.250	.750	.250	3	.030	3
20426R-MpC4	.250	1.250	.250	3	.030	3
20444R-MpC4	.375	.750	.375	3	.030	3
20446R-MpC4	.375	1.250	.375	3	.030	3
20452R-MpC4	.500	.750	.500	3	.030	3
20453R-MpC4	.500	1.250	.500	3	.030	3
20474R-MpC4	.750	2.250	.750	5	.030	3

S P K M

CED = Cutting Edge Diameter, **CEL** = Cutting Edge Length, **SHK DIA** = Shank Diameter, **OAL** = Overall Length, **C/R** = Corner Radius, **P** = Steel, **M** = Stainless Steels, **K** = Cast Iron, **S** = Super Alloys

Series 20500

THREE/FOUR FLUTE BALLNOSE END MILL

- ▼Solid Carbide
- ▼Center Cutting
- ▼Ballnose
- ▼Slotting, Roughing, Finishing, and 3D Surfacing

PART #	CED	CEL	SHK DIA	OAL	C/R	# OF FLUTES
20523	.250	.750	.250	3.250	BALL	3
20526	.250	1.250	.250	3.250	BALL	3
20545	.375	.875	.375	3	BALL	4
20546	.375	1.250	.375	3	BALL	4
20553	.500	1.250	.500	3.500	BALL	4
20554	.500	1.500	.500	3.500	BALL	4
20556	.500	2.250	.500	4	BALL	4
20558	.500	2.500	.500	5	BALL	4

Series 20500-ZrN

THREE/FOUR FLUTE BALLNOSE END MILL

PART #	CED	CEL	SHK DIA	OAL	C/R	# OF FLUTES
20523-ZrN	.250	.750	.250	3.250	BALL	3
20526-ZrN	.250	1.250	.250	3.250	BALL	3
20545-ZrN	.375	.875	.375	3	BALL	4
20546-ZrN	.375	1.250	.375	3	BALL	4
20553-ZrN	.500	1.250	.500	3.500	BALL	4
20554-ZrN	.500	1.500	.500	3.500	BALL	4
20556-ZrN	.500	2.250	.500	4	BALL	4
20558-ZrN	.500	2.500	.500	5	BALL	4

Series 20500-TiN

THREE/FOUR FLUTE BALLNOSE END MILL

PART #	CED	CEL	SHK DIA	OAL	C/R	# OF FLUTES
20523-TiN	.250	.750	.250	3.250	BALL	3
20526-TiN	.250	1.250	.250	3.250	BALL	3
20545-TiN	.375	.875	.375	3	BALL	4
20546-TiN	.375	1.250	.375	3	BALL	4
20553-TiN	.500	1.250	.500	3.500	BALL	4
20554-TiN	.500	1.500	.500	3.500	BALL	4
20556-TiN	.500	2.250	.500	4	BALL	4
20558-TiN	.500	2.500	.500	5	BALL	4

CED = Cutting Edge Diameter, **CEL** = Cutting Edge Length, **SHK DIA** = Shank Diameter, **OAL** = Overall Length, **C/R** = Corner Radius, **P** = Steel, **M** = Stainless Steels, **K** = Cast Iron, **N** = Non-Ferrous Materials, **S** = Super Alloys, **H** = Hardened Materials

Series 20500-AlTiN

THREE/FOUR FLUTE BALLNOSE END MILL

PART #	CED	CEL	SHK DIA	OAL	C/R	# OF FLUTES
20523-AlTiN	.250	.750	.250	3.250	BALL	3
20526-AlTiN	.250	1.250	.250	3.250	BALL	3
20545-AlTiN	.375	.875	.375	3	BALL	4
20546-AlTiN	.375	1.250	.375	3	BALL	4
20553-AlTiN	.500	1.250	.500	3.500	BALL	4
20554-AlTiN	.500	1.500	.500	3.500	BALL	4
20556-AlTiN	.500	2.250	.500	4	BALL	4
20558-AlTiN	.500	2.500	.500	5	BALL	4

Series 20500-MpC4

THREE/FOUR FLUTE BALLNOSE END MILL

PART #	CED	CEL	SHK DIA	OAL	C/R	# OF FLUTES
20523-MpC4	.250	.750	.250	3.250	BALL	3
20526-MpC4	.250	1.250	.250	3.250	BALL	3
20545-MpC4	.375	.875	.375	3	BALL	4
20546-MpC4	.375	1.250	.375	3	BALL	4
20553-MpC4	.500	1.250	.500	3.500	BALL	4
20554-MpC4	.500	1.500	.500	3.500	BALL	4
20556-MpC4	.500	2.250	.500	4	BALL	4
20558-MpC4	.500	2.500	.500	5	BALL	4

CED = Cutting Edge Diameter, **CEL** = Cutting Edge Length, **SHK DIA** = Shank Diameter, **OAL** = Overall Length, **C/R** = Corner Radius, **P** = Steel, **M** = Stainless Steels, **K** = Cast Iron, **N** = Non-Ferrous Materials, **S** = Super Alloys, **H** = Hardened Materials

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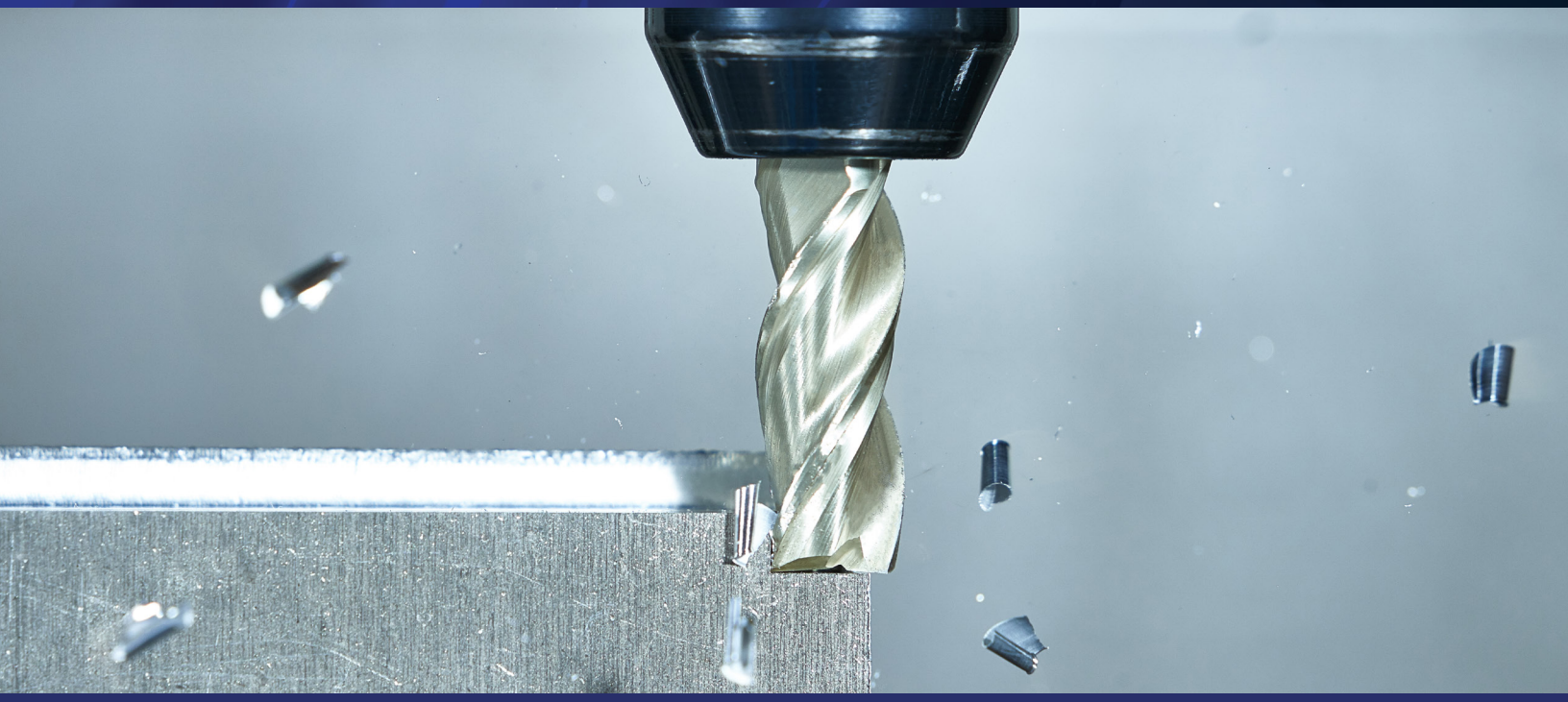

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