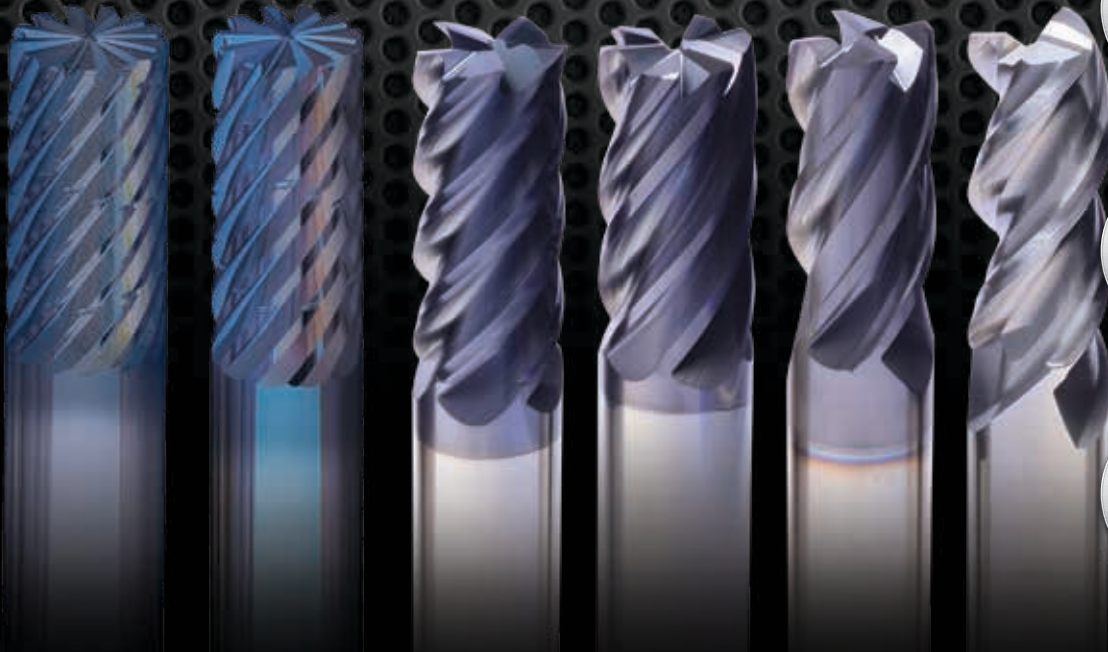




DESTINY TOOL

THE MARK OF PERFORMANCE

SOLID CARBIDE TOOLS



END MILLS
VARIABLE HELIX



MINIATURES
VARIABLE HELIX



CUTTING TOOLS
CARBIDE



SPECIAL TOOLS

Viper[™]
DVH
45° HELIX END MILLS

Diamond Back[™]
DVH
FLAT PROFILE ROUGHERS

Python[™]
DVH
45° HELIX END MILLS

Raptor[™]
DVH
38° HELIX SOLID CARBIDE END MILLS

Cobra[™]
DVH
37° HELIX END MILLS

PH: 800.527.TOOL

WWW.DESTINYTOOL.COM

Our Philosophy on End Mills

At Destiny Tool, we believe that an end mill is only as good as the engineering behind it.

We've cut our teeth in non-ferrous and hi-temp alloys for many years and we believe that our performance end mills are the best available for those specific material groups.

In our view, there are four major components that make up a performance end mill:

- Substrate
- Geometry
- Tolerance
- Coating

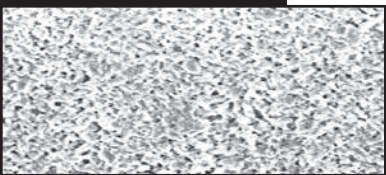
Substrate

The most commonly use term for carbide is "Micro-Grain"; however, this term does not fully encompass more recent advancements in technology. Terms such as fine grain, ultra-fine grain and sub micron grain have become popularized to better describe a tool's make up.

Two other commonly used terms are "toughness" and "wear resistance." We've found that neither term can be used as a proper gauge. Here's why:

- **Toughness** – Fracture toughness is not only a characteristic of the material but also a function of the loading conditions. Carbide rod is measured for "toughness" before geometry has been ground into the tool. A finished ground tool can vary as much as 300% in "fracture toughness" based upon geometry alone.
- **Wear Resistance** – Cutting tool wear is a result of complicated physical, chemical and thermo-mechanical actions. Mechanisms such as adhesion, abrasion, diffusion and oxidation act together within the CNC machine to cause tool wear. This is different from lab testing.

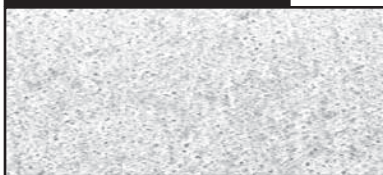
Destiny Tool



Ultra-Fine Micro Grain

H10-11 US10	TF15
Cobalt Percentage:	10%
Grain Size:	Less than .9 μm
Rockwell Hardness:	92.0
Transverse Rupture:	Avg. 580,000 psi
Density (GM/CC):	14.50

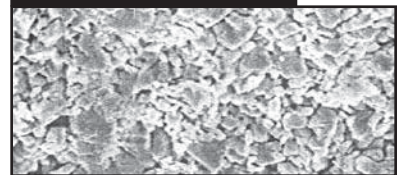
Destiny Tool



Super Sub Micro Grain

WA112	UF12
Cobalt Percentage:	12%
Grain Size:	Less than .6 μm
Rockwell Hardness:	92.0
Transverse Rupture:	Avg. 630,000 psi
Density (GM/CC):	13.90

Others



Standard Micro Grain

WA2	G2
Cobalt Percentage:	6%
Grain Size:	1.0 to 3.0 μm
Rockwell Hardness:	91.0
Transverse Rupture:	310,000 psi
Density (GM/CC):	14.97

Cemented Carbide is similar to cement in more than name only. Cobalt is the "lime" that holds the Carbide "gravel" together. If a large chunk of carbide is exposed at the cutting edge, it will fracture off like a piece of gravel on a cement walkway edge.

Bottom Line: At Destiny Tool, through over a decade of testing, we have selected substrates that work together with our tools for optimal tool life and performance in specific materials. Our substrates range from a transverse rupture strength of 580,000 – 630,000 psi and vary in cobalt content from 10 -12% based upon the specific tool application. You can trust that we've selected the correct substrate for your application material.



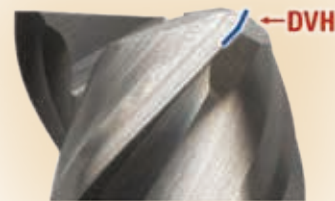
Geometry

Edge Strength

There are numerous variables that impact cutting tool performance and tool life. We designed the tools for use in different conditions and different machines. We've spent many years perfecting the length of the primary and secondary grind in combination with the eccentric relief on our tools. The Red arrow shows the direction of typical cutting tool forces. Our tools are engineered with greater edge strength than those of other companies in the market.

Double Variable Helix (DVH), Patented

Chatter has been a persistent problem in milling. Typically, most shops reduce the RPM and/or Feed to reduce the amount of chatter. Chatter is a result of natural harmonics built within the tool, which is operating at its own natural frequency. Because traditional end mills maintained a consistent helix angle along the length of the flute, the tools tended to get in "tune". Technically, it's called a Frequency Response Function (FRF).



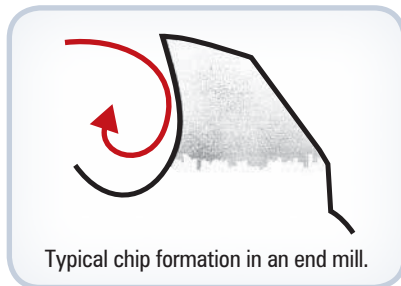
The Double Variable Helix design corrects this problem with a number of design elements that enable our tools to run at higher RPM chatter free:

Variable Flute Spacing – Each flute is unequally spaced around the circumference of the end mill, creating an out-of-phase cutting action.

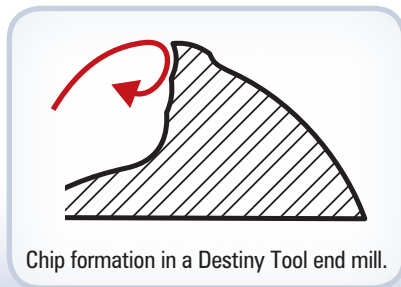
Double Variable Helix (DVH) – The helix angle changes along the cutting edge, which further creates an out-of-phase cutting action.

Heat Kills

With the exception of hard milling, it's common knowledge that the heat should be removed with the chip and the less heat transferred to the tool the longer the tool life.



We've taken a look at that very carefully and have designed our tools to form chips a bit differently. Our chips are formed in the outer rake face of the tools. Instead of the chip traveling all the way down into the gullet of the tools, which causes a lot of friction and heat, and then 6's & 9's formed against the core diameter, we have designed our tools to take a much heavier chip load that most competitors.



By taking a heavier chip load, the material is forced to turn on itself in the outer rake face and eject from the cut without traveling down the entire length of the rake face. Think of it like throwing a tennis ball to a point 10 feet in front of you vs throwing it directly between your feet.

Tolerance

When we talk about tolerance, we are actually referring to two components of our end mills. Of course our shank diameters are held tighter than standard h6 industry specifications of $-0.0001''$ $-0.0003''$. Our Viper and Diamond Back End Mills are held to $-0.0001''$ / $0.0003''$ on diameter AND shank. However, that is just part of the story...

We've concentrated a lot of time on the grinding tolerance as well. When you look at our competitors under a microscope, many times you will see that the primary and secondary grind finish looks like a washboard texture because of the wheel that was used to grind it with.

End Mill performance in high speed machining is dependent upon the surface roughness (topography) of the rake face and relief face of the end mill. Better, smoother ground surfaces reduce the co-efficient of friction and permit the tool to perform better "in the cut". As we talked about in the previous section with regard to geometry, we make every attempt to reduce the co-efficient of friction that a chip encounters as it is being formed into 6's & 9's in our end mills. We take special care to ensure that our wheels are re-dressed often to maintain consistent surface finish. And that has an impact on coating adhesion as well. We'll be discussing that below.

Coatings

We have spent a great deal of time ensuring that our coatings work in conjunction with all the other aspects of our end mills. We have primary coatings for our tools.

AlTiN — Aluminium Titanium Nitride. This PVD coating has a gradually increasing percentage of aluminum added as it goes through the coating process. It gradually increases in the amount of Aluminum from the substrate interface until it reaches the outer surface of the coating,

where there is a higher percentage (up to 65%) of aluminum in the film. As the tool heats up, the aluminum converts to aluminum oxide, staying in the film. This coating provides exceptional oxidation resistance and extreme hardness. AlTiN retains its hardness when the temperature is 800° to 930° C ($1,470^{\circ}$ to $1,700^{\circ}$ F). This coating is ideal for dry machining environments. Used exclusively on our Raptor products for all: P – Steels (blue), M – Stainless Steel (yellow), K – Cast Iron (red), and S – Hi-Temp Alloys Special Alloys & Titanium (brown) materials.

Please keep in mind that this coating CANNOT be used in Aluminum (N) machining because the Aluminum in it would have an affinity to itself and cause workpiece adhesion to the cutting tool.

X-Treme — Titanium Aluminium Nitride (TiAlN). This monolayer PVD coating has high hardness and excellent thermal stability that protects against premature tool wear. It also has excellent oxidation resistance, allowing for high speed and semi-dry or dry machining operations. Used for our

Cobra and Python series tools which are for all: P – Steels (blue), M – Stainless Steel (yellow), K – Cast Iron (red), and S – Hi-Temp Alloys Special Alloys & Titanium (brown) materials.

Black Stealth — Molybdenum Disulfide (MoS₂). The easiest way to understand our Stealth coating is to think of the coating as being 'clear' and not 'black.' As soon as the tool enters the cut many people comment that the color has "worn off." We can assure you that this is not the case. There's several physical and chemical changes that cause this visual change and

space does not permit here to explain the science.

That's part of the reason we call it "stealth" because you can't see it any more! What's important is that this coating has a lower co-efficient of friction than just about everything else on the market. Our geometry works ideally with this coating. Used for our Viper and Diamond Back series tools which are for all Non Ferrous Alloy milling: N (green) materials.

Tolerances:

Tolerance for Viper & Diamond Back

End Mill Diameter $-.0001''$ to $-.0003''$

Shank Diameter: $+.000''$ to $-.0003''$

Ball Nose: $+.001''$ to $-.001''$

Tolerance for Flat-Profile Roughers / Raptor

End Mill Diameter $-.000''$ to $-.002''$

Tolerances: AlTiN

Microhardness Hv: 3500

Friction Coefficient: 0.04

Max Temp C/F: 930C / 1700F

Tolerances: X-Treme

Microhardness Hv: 3500

Friction Coefficient: 0.04

Max Temp C/F: 800C / 1470F

Tolerances: Black Stealth

Microhardness Hv: NA

Friction Coefficient: 0.02

Max Temp C/F: 316C / 600F





How To Use This Catalog

We've developed several charts to help you better identify the best tool for your application. These charts are designed to assist you in the tool selection but keep in mind that factors such as material hardness, Toolholder TIR and workholding rigidity can impact tool performance.

Color Coding We've used the ISO 513 color coding system that you're already familiar with to help you find the best tool based upon the material you're cutting.

- P** – Steels (blue) all kinds of steel and cast steel, except rustproof steel with austenitic microstructure.
- M** – Stainless Steel (yellow) stainless austenitic and austenitic-ferritic steel and cast steel
- K** – Cast Iron (red) cast iron with flake graphite, cast iron with spherical graphite, annealed cast iron.
- N** – Non-Ferrous Alloys (green) aluminum and other non-ferrous metals, non-metal work materials.
- S** – Hi-Temp Alloys Special Alloys & Titanium (brown) high-temperature special alloys based upon iron, nickel and cobalt, titanium and titanium alloys
- H** – Hardened Materials (gray) hardened steel, hardened cast iron materials, chilled cast iron.

Common Used Definitions

A number of industry terms are found below. Some terms are interchangeable with others and are indicated by the "a.k.a." Items in **BOLD** are the standards used in the formulas.

- SFM** = Surface Feet per Minute
- RPM** = Revolutions Per Minute
- IPM** = Inches Per Minute
- IPT** = Inches Per Tooth (a.k.a. CLPT)
- CLPT** = Chip Load Per Tooth (a.k.a. IPT)

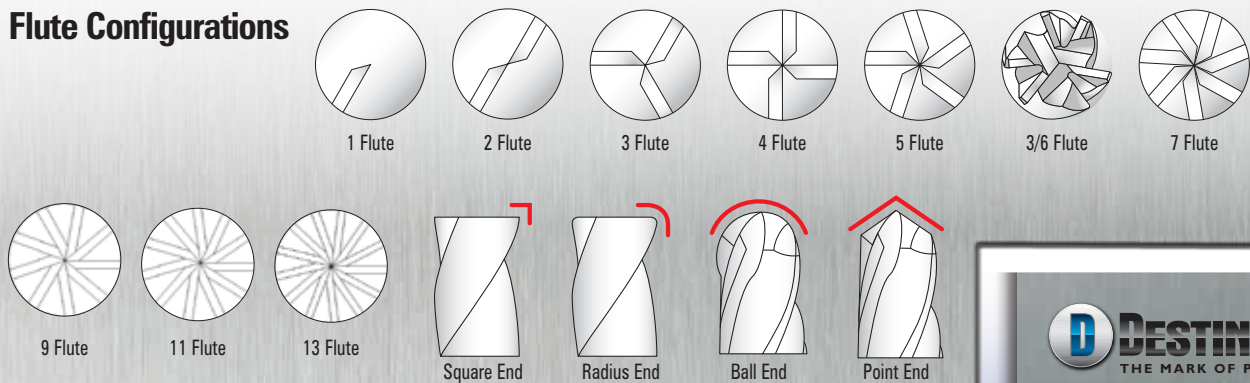
- CIM** = Cubic Inches per Minute (a.k.a. MRR)
- MRR** = Metal Removal Rate (a.k.a. CIM)
- HP** = Horsepower of the machine tool
- ADC** = Axial Depth of Cut (a.k.a. ADOC/DOC)
- RDC** = Radial Depth of Cut (a.k.a. RDOC/WOC)

Speed & Feed Formulas

- $SFM = RPM \times .262 \times \text{Tool Diameter}$
- $RPM = SFM \times 3.82 \div \text{Tool Diameter}$
- $IPM = RPM \times IPT \text{ (CLPT)} \times \text{Number of Flutes}$
- $IPT = IPM \div (RPM \times \text{Number of Flutes})$

- $MRR = RDC \times ADC \times IPM \text{ (a.k.a. CIM)}$
- $HP = KW \times 1.342$
- $\text{Torque (Full Load)} = 5252 \times HP \div RPM$

Flute Configurations





ABOUT THIS CATALOG

Standard Tools

This chart will help you quickly find the specific product you need. Please reference the individual product pages for a more detailed ranking of good, better and best within each material group.

	P Steel	M Stainless	K Cast Iron	N Aluminum	S High Temp	H Hard
Viper DVH	3A	3A		1	2	
Diamond Back	3A	3B		1	2	
Python	3	1	3	2	2	
Raptor DVH	3	1	3	3	1	3D
Raptor 3/6	3	1	3	3c	1	3D
Cobra Miniatures	3	3	3	3	3	3

- 1 Designed for this material
- 2 Works great but we have an application tool for this
- 3 Works great but performs best in other materials
- 3A Only for materials under <18 – 20 HRc (Brinell Hardness <223 – 217)
- 3B Only for materials under <35 – 38 HRc (Brinell Hardness <325 – 360)
- 3C Periphery & Side Milling only; NOT for deep slotting
- 3D Special request and edge prep required

General Purpose Tools

	P Steel	M Stainless	K Cast Iron	N Aluminum	S High Temp	H Hard
Chamfer Tools	✓	✓	✓	✓	✓	✓
Spot Drills	✓	✓	✓	✓	✓	✓
Countersinks	✓	✓	✓	✓	✓	✓
Helical Dovetails	✓	✓	✓	✓	✓	✓
Thread Mills	✓	✓	✓	✓	✓	✓



SFM: Surface Feet per Minute

This chart provides general operating parameters for calculating surface footage for Destiny End Mills. These are starting condition guidelines only. The machine tool, workholding/xturing, toolholding, partcon guration, and coolant capability may significantly influence your specific applications.

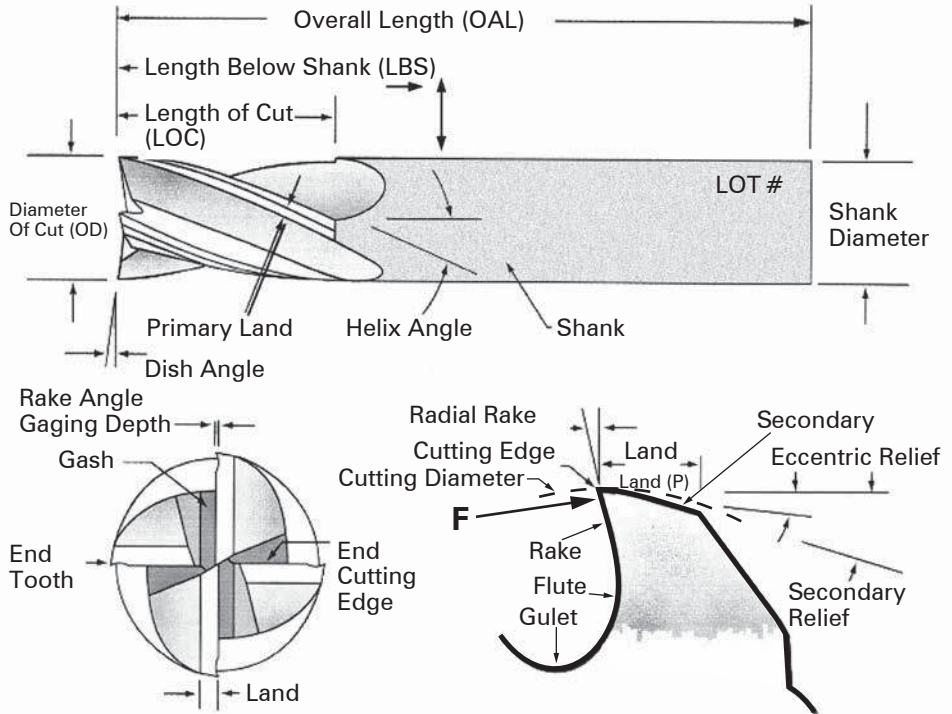
Material	Min SFM	Median SFM	Max SFM	Destiny Tool			
				1st Choice	Page #	2nd Choice	Page #
Aluminum	1200	65% Max RPM	Max RPM	Diamond Back	29-32	Viper	14-25
Aluminum Cast	1000	65% Max RPM	Max RPM	Diamond Back	29-32	Viper	14-25
Brass Yellow, Red	400	950	1500	Diamond Back	29-32	Viper	14-25
Bronze – Alum Bronze	250	625	1000	Diamond Back	29-32	Viper	14-25
Composites: CFRP; Aramid	200	300	400	Viper	14-25	Python	34-36
Composites: Honeycomb	200	300	400	Viper	14-25	Python	34-36
Composites: Phenolic	600	800	1000	Viper	14-25		
Copper	800	900	1000	Viper	14-25	Python	34-36
Delrin	800	1,050	1300	Viper	14-25		
Graphite	600	800	1000	Viper	14-25		
Plastics: Hard	500	800	1000	Viper	14-25		
Plastics: Soft	600	800	1000	Viper	14-25		
Cobalt Alloys Haynes 25, 188, Stellite	60	90	110	Raptor DVH	41-47	Raptor 3/6	50-53
Hastelloy	100	180	220	Raptor DVH	41-47	Raptor 3/6	50-53
Inconel 525, 700, 718, Rene 41, Nomonic, Waspaloy, Monel, Hastelloy, Astroloy, Udimet	65	158	250	Raptor DVH	41-47	Raptor 3/6	50-53
Invar	150	200	400	Raptor DVH	41-47	Raptor 3/6	50-53
Iron Alloys A-286, 16-25-6	150	200	400	Raptor DVH	41-47	Raptor 3/6	50-53
Kovar	250	375	500	Raptor DVH	41-47	Raptor 3/6	50-53
Nickel Alloys	75	150	180	Raptor DVH	41-47	Raptor 3/6	50-53
Notronic	100	180	220	Raptor DVH	41-47	Raptor 3/6	50-53
Titanium 4AL4V	100	180	220	Raptor DVH	41-47	Raptor 3/6	50-53
Titanium 6AL4V	160	280	400	Raptor DVH	41-47	Raptor 3/6	50-53
Titanium 6AL6V	160	280	400	Raptor DVH	41-47	Raptor 3/6	50-53
Titanium Comm Pure	80	290	500	Raptor DVH	41-47	Raptor 3/6	50-53
Stainless Austenitic 304L, 316L, 13-8	250	325	400	Raptor DVH	41-47	Raptor 3/6	50-53
Stainless Austenitic 303, 304	260	350	500	Raptor DVH	41-47	Raptor 3/6	50-53
Stainless Ferritic 430, 434	250	300	400	Raptor DVH	41-47	Raptor 3/6	50-53
Stainless Martensitic 17-4	250	425	600	Raptor DVH	41-47	Raptor 3/6	50-53
Stainless Martensitic 420, 440	200	300	400	Raptor DVH	41-47	Raptor 3/6	50-53
Stainless Martensitic 15-5	250	300	400	Raptor DVH	41-47	Raptor 3/6	50-53
Stainless Martensitic 410, 416	250	325	400	Raptor DVH	41-47	Raptor 3/6	50-53
Alloy Steel 4140, 4150, 4320, 5120, 6118, 6150, 8620	250	350	450	Raptor DVH	41-47	Raptor 3/6	50-53
Free Machining Steel 1111, 1115, 1140	300	450	600	Raptor DVH	41-47	Raptor 3/6	50-53
Low Carbon Steel 1010, 1018, 1020 12L14, A36	300	450	600	Raptor DVH	41-47	Raptor 3/6	50-53
Med Carbon Steel 1035, 1040, 1095, 1525, 1572	200	320	470	Raptor DVH	41-47	Raptor 3/6	50-53
Tool Steel A2, <35 R/c	150	300	450	Raptor DVH	41-47	Raptor 3/6	50-53
Tool Steel D2 <35 R/c	150	300	450	Raptor DVH	41-47	Raptor 3/6	50-53
Tool Steel P20, H13 <35 R/c	160	305	450	Raptor DVH	41-47	Raptor 3/6	50-53
Cast Iron Ductile A536	200	350	500	Raptor DVH	41-47	Raptor 3/6	50-53
Cast Iron Gray A48, Class 20 – 60	250	400	500	Raptor DVH	41-47	Raptor 3/6	50-53

NOTE: Reduce SFM when using long reach tools.

End Mill Nomenclature

Standard Center-Cutting Carbide End Mills

- Destiny Tool geometry, developed over years of experience, provides long tool life and increased productivity.
- CNC manufacturing environment yields tool-to-tool consistency.
- Rotary balanced chamfered.
- Minimal TIR, provides for extremely high speed and feed milling capabilities.
- Eccentric grind surface finishes yield sharper, longer-lasting cutting edges: Improved work piece finishes and lubricity with Black Stealth or AlTiN coating.



Custom Pricing

We are happy to make modifications to our standard tools and quote custom special tooling at your request.

CALL FOR DISTRIBUTOR PRICING

Custom Pricing

<i>Pricing for Corner Radius</i>	
Size of Radius	Add to List Price:
.001 to .045	\$10.00
.046 to .065	\$12.00
.066 to .125	\$18.00
.126 to .250	\$22.00

Add R plus size at end of part number for example: V33210R187

Additional pricing may apply if radius exceeds 20% of the diameter. Please call for quote.

<i>Pricing for Ball End Mills</i>	
Diameter	Add to List Price:
1/8, 3/16, 1/4, 5/16, 3/8"	40%
7/16, 1/2"	35%
5/8, 3/4"	35%
7/8, 1"	30%

Add B to beginning of part number for example: BP52416X

Custom Pricing

<i>Pricing for Weldon Flats</i>	
Diameter	Add to List Price:
3/8, 1/2, 5/8, 3/4"	\$10.00
7/8, 1"	\$16.00
1-1/4"	\$22.00

Add W at the end of part number for example: P52416W

<i>Pricing for Coolant Grooves</i>	
Diameter	Add to List Price:
1/2"	\$12.00
3/4"	\$16.00
1"	\$20.00
1-1/4"	\$30.00

<i>Pricing for Length Below Shank (LBS)</i>	
Diameter	Add to List Price:
1/2"	\$12.00
3/4"	\$16.00
1"	\$20.00
1-1/4"	\$30.00



Understanding Product Information

Use these diagrams to help you read product tables and order Destiny Tools.
Part number identification breaks down the structure of our part numbers.

Raptor Endmill: DVH

Part Number Identification

i.e. P/N # DVH4321017RC

DVH = Raptor Endmill: DVH
4 = Four (4) Flute
32 = Diameter (32/64" = 1/2")
10 = Length of Cut/LOC (10/16" = 5/8")
17 = Length Below Shank/LBS (17/8" = 2-1/8")
R = Radius
C = AlTiN Coating

Tolerance for Raptor
 Endmills Diameter + .000 - .002

Viper Endmill: 45° Helix

Part Number Identification

i.e. P/N # V2321017 (S)

V = Viper Endmill: 45° Helix
2 = Two (2) Flute
32 = Diameter (32/64" = 1/2")
10 = Length of Cut/LOC (10/16" = 5/8")
17 = Length Below Shank/LBS (17/8" = 2-1/8")
S = Black Stealth Coating

Tolerance for Viper
 Endmills Diameter = -.0001 -.0003

Raptor Endmill: DVH

Part Number Identification

i.e. P/N # R6321017RC

R = Raptor 3/6 Endmill: DVH
6 = Three / Six (3/6) Flute
32 = Diameter (32/64" = 1/2")
10 = Length of Cut/LOC (10/16" = 5/8")
17 = Length Below Shank/LBS (17/8" = 2-1/8")
R = Radius
C = AlTiN Coating

Tolerance for Raptor
 Endmills Diameter + .000 - .002

Diamond Back Rougher: 45° Helix

Part Number Identification

i.e. P/N # DR3321017R030 (S)

DR = Diamond Back Rougher: 45° Helix
3 = Three (3) Flute
32 = Diameter (32/64" = 1/2")
10 = Length of Cut/LOC (10/16" = 5/8")
17 = Length Below Shank/LBS (17/8" = 2-1/8")
R = Radius
030 = .030 Radius
S = Black Stealth Coating

Tolerance for Diamond Back
 Endmills Diameter = -.0001 -.0003



TABLE OF CONTENTS

► **Tool Selection Guide**
How to Use This Catalog 5



END MILLS FOR NON-FERROUS MATERIALS



► **VIPER DVH: 45 Degree Variable Helix – For high-speed machining of aluminum, plastics, and other non-ferrous materials including brass and bronze alloys**



2 Flute, Square End – Stub, Reg, Med, Long Length.....	14-15
2 Flute, Square End – Long Shank Series w/Reduced Neck, LBS, Long Shank Series, NNK.....	16-17
2 Flute, Radius.....	17
2 Flute, Ball & Ball Long Shank Series w/Reduced Neck, LBS.....	18-19
3 Flute, Square End – Stub, Reg, Med, Long.....	20-21
3 Flute, Square End – Long Shank Series w/Reduced Neck, LBS, Long Shank Series, NNK.....	22-23
3 Flute, Radius.....	24-25
3 Flute, Ball & Ball Long Shank Series w/Reduced Neck, LBS.....	25-26
4 Flute, Ball & Ball Long Shank Series w/Reduced Neck, LBS.....	27
Technical: Speeds & Feeds – Viper DVH	28-29



► **DIAMOND BACK DVH ROUGHERS: 45 Degree Variable Helix – For high-speed machining of aluminum**



2 Flute, Roughers – Stub, Reg, Med Length.....	31
2 Flute, Roughers – Long Shank Series w/Reduced Neck, LBS, Radius.....	31
2 Flute, Ball Roughers.....	32
2 Flute, Ball Roughers – Long Shank Series w/Reduced Neck, LBS.....	32
3 Flute, Roughers – Stub, Reg, Med Length.....	33
3 Flute, Roughers – Long Shank Series w/Reduced Neck, LBS, Radius.....	34
4 Flute, Roughers – Diamondback, 45 Degrees.....	34
Technical: Speeds & Feeds – Diamond Back Roughers	35



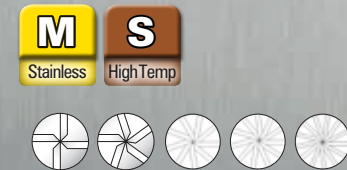
► **PYTHON: 45 Degree Helix, Variable Pitch – For high-speed machining of stainless steel and aluminum**



3, 5 & 7 Flute (Single & Double End).....	36-38
Technical: Speeds & Feeds – Python	39-41



END MILLS FOR HIGH-TEMPERATURE & EXOTIC MATERIALS



► **RAPTOR DVH: 38 Degree Variable Helix – For high efficiency slotting and heavy profiling in stainless steel, titanium, inconel and other high temp alloys including nickel alloys**



4 Flute, Square End – Stub, Reg, Med Length.....	43
4 Flute, Square End – Long Shank Series & 4 Flute Ball.....	44
4 Flute, Radius - Stub, Reg, Med Length.....	45
4 Flute, Additional Radius Sizes & Long Shank Series.....	46
4 Flute, Radius Long Shank Series w/Reduced Neck, LBS.....	47
4 Flute, Roughers w/Radius Stub, Reg, Med Length; Long Shank Series, NNK, and Long Shank Series w/Reduced Neck, LBS.....	47-48
5 Flute, Radius & Square End-Stub, Reg & Med Length.....	49-50
7 Flute, Radius Stub - Variable Helix, Reg & Med Length.....	50-52
9,11 & 13 Flute, Stub, Reg, Med Length.....	52-53
Technical: Speeds & Feeds – Raptor DVH	54-55





▶ **RAPTOR 3/6: 38 Degree Variable Helix** – For high efficiency slotting and heavy profiling in stainless steel, titanium, inconel and other high temp alloys including nickel alloys



3/6 Flute, Square End - Stub, Reg, Med Length	56
3/6 Flute, Square End - Long Shank Series w/ Reduced Neck, LBS, Radius	57-59
Technical: Speeds & Feeds – Raptor 3/6	60-61



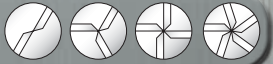
MINIATURES, VARIABLE HELIX



▶ Cobra Miniatures, Variable Helix	
2 & 4 Flute, 37° Helix - Stub, Length of Cut = 1-1/2 x Diameter	64
2 & 4 Flute, 37° Helix - Square End, Length of Cut = 3 x Diameter	64
▶ Raptor Miniatures, Variable Helix	
4 Flute, Raptor DVH, Long Shank Series with Reduced Neck, LBS*	64
▶ Raptor Miniatures, Variable Helix w/Radius – 38° Helix	
3 Flute, Raptor DVH, Square End w/Radius	65
▶ Raptor Miniatures, Variable Helix w/Radius - 3/16 Shank	
4 Flute, Raptor DVH, Square End w/Radius	65
▶ Viper Miniatures w/ 3/16 Shank	
2 & 3 Flute, Square End & 2 Flute Long Shank Series	66-67
▶ Viper Miniatures, w/ 1/4 Shank	
2 & 3 Flute, Square End & 2 Flute Long Shank Series	66-67
▶ Raptor Miniatures, Variable Helix w/ 1/4 & 1/8	
4 Flute, Raptor DVH, Long Shank Series with Reduced Neck, LBS*	68
Technical: Speeds & Feeds - Miniatures	69



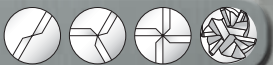
CHAMFER TOOLS, DRILL MILLS & COUNTERSINKS - CARBIDE



▶ Chamfer Tools - Carbide: 60°, 82°, 90°, 120°	
2, 3, 4 & 5 Flute (Single & Double End) & 2 Flute Long Shank Series	71-75
2 & 4 Flute (Single & Double End) 90° with Point	71-75
▶ Spot Drills – Carbide: 90°, 120°, 140°	75
▶ Drill Mills – Carbide, Variable Helix	76
▶ Countersinks – Carbide: 60°, 82°, 90°	76



DOVETAILS, SPECIAL TOOLS & TOOL RECONDITIONING



▶ Thread Mills, Single Profile & Helical	78
▶ Thread Mills, Side Coolant & Straight Coolant	79
▶ Engraving Cutters & Corner Rounding End Mills	80
▶ Dovetails, Helical (0 rings 1/16" – 3/8")	81-82



RESOURCE, GENERAL & TECHNICAL INFORMATION

▶ Substrate & Geometry	2,3
▶ Tolerance & Coatings	4
▶ SFM: Surface Feet per Minute	7
▶ End Mill Nomenclature, Custom Pricing & Understanding Products	8,9
▶ Special Step Drills Order Form	82
▶ Tool Reconditioning	83
▶ Tool Quote Form	84
▶ Reports: Inquiry & Tool Performance	85-86
▶ Terms, Conditions & Policies	87,89
▶ Request for Return Goods Authorization (RGA)	88
▶ Distributor Policies & Terms	90-92
▶ Part Number Index	93-105



END MILLS

“We’d like to say your End Mills are far superior to the competition. We use your Raptors daily for our steel cutting jobs, and your Vipers for all of our aluminum jobs!”

— END USER, SANTA CLARA, CA



Torque Efficiency

Many times when machinists look at cutting tool speeds and feeds, they are often misled into believing that they should be concerned with horsepower. The real driving force is not horsepower, it’s TORQUE.

Torque is the measure of how much immediate rotational force a spindle drive motor can generate.

Old School End Mills

Traditionally, a larger diameter 1” end mill would require high torque and low speed (SFM /RPM), while a 1/4” diameter end mill would require low torque and high speed (SFM / RPM). So generally, different end mill diameters & geometries have different requirements for both horsepower and torque.

Destiny End Mills

As a general rule, our end mills are designed to be run at high RPM regardless of diameter. We prefer high speed AND high torque. Our tool geometry is optimized for high speed machining.

Our end mills can have up to 3 rake faces in the cutting edge of the tool. As the tool enters the cut and takes the first 3 to 5 revolutions (and remember you can be running up to 18,000 Revolutions Per Minute) there is a tremendous amount of cutting force placed upon the tool. You can notice your HP meter jump as the tool enters the cut multiple times. This entry is when the torque curve on your CNC machine is the most important. Older CNC machines were designed to quickly reach peak torque between 1200 – 3000 RPM and then drop off. Newer, high speed machining centers hold constant torque.

We like Constant Torque

Because of the unique geometry, our tools perform best under constant torque. Take a look at the torque curve for your CNC machine. If you have a 10,000 RPM spindle motor and the torque drops from it’s constant peak at 8200 RPM, then 8200 RPM would be the maximum RPM. Take this into consideration FIRST when calculating the specific speeds and feeds listed in this catalog.

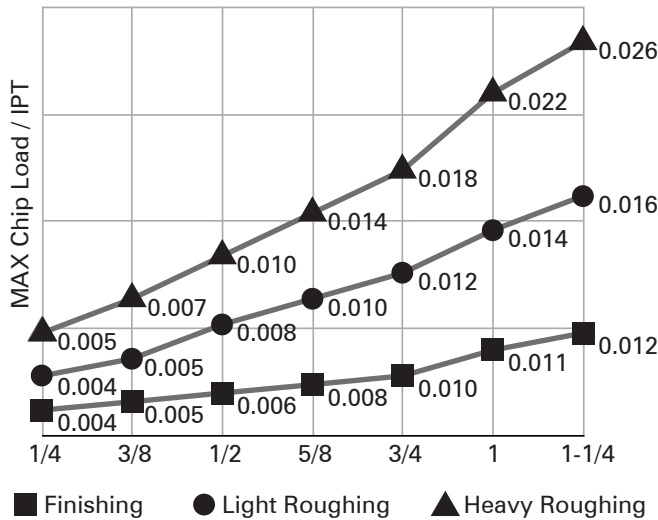
Torque Efficiency

Type of Drive	Efficiency Factor %
Direct Drive (integral motor spindle)	95%
Direct Belt Drive	90%
Back Gear Drive	75%
Geared Head Drive	75%
Oil-Hydraulic Drive	70%



Viper General Rule of Thumb: Chatter

Viper Chip Load For Finishing, Heavy Roughing & Light Roughing



Viper: Understanding Roughing, Light Roughing and Finishing

One of the most common causes of chatter with our tools is running tools with TOO LIGHT of a chip load. Most chatter problems can be fixed by INCREASING the chip load per tooth (IPT)

Heavy Roughing (Side Milling) Defined:

ADC (Axial Depth of Cut) = up to 1X diameter
 RDC (Radial Depth of Cut) = 30% – 50% of diameter

Light Roughing (Side Milling) Defined:

ADC (Axial Depth of Cut) = up to 1X diameter
 RDC (Radial Depth of Cut) = 15% – 30% of diameter

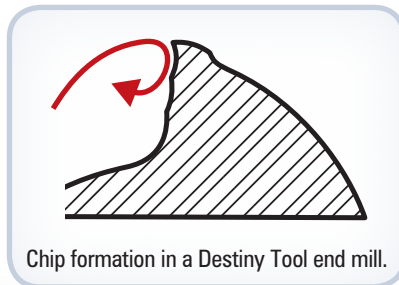
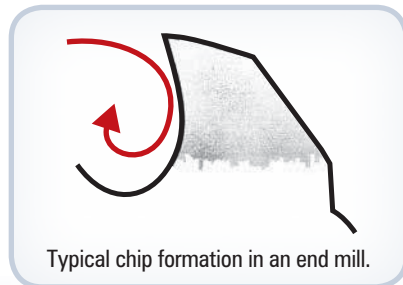
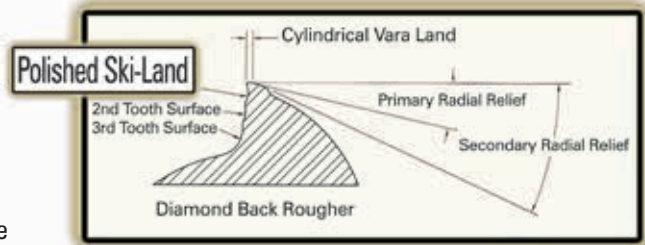
Finishing (Side Milling) Defined:

ADC (Axial Depth of Cut) = up to 1X diameter
 RDC (Radial Depth of Cut) = 4% – 15% of diameter

Viper & Diamond Back Chip Formation

One of the first things many people notice is the multiple rake faces on our tools. Think of these as first, second and third gear in your car. When you read our speed/feed charts, you will see that we have several recommendations for our tools. That's because, unlike most end mills on the market, our tools are designed for elevated chip loads, particularly in non-ferrous applications.

Most end mills form 6's & 9's by moving down into the rake face into the gullet (center line) of the tool. Our tools are designed a bit differently so that the chip actually forms in the outer rake face of the tool and ejects prior to traveling into the core diameter/gullet of the flute. This is part of the reason why increasing the chip load per tooth on our end mills will often reduce the horse power load of the machine. Less energy is required to form the chip and it reduces the heat put into the cutting tool. Heat is a major cause of cutting tool failure over time, so we developed our tools to remove as much heat in the chip as quickly as possible.



Unlike other end mills we have found that chatter is caused by too LIGHT of a chip load per tooth. INCREASING the chip load per tooth will eliminate most chatter problems!



END MILLS FOR NON-FERROUS MATERIALS



V23216

V23216S



Square End, 2 Flute, 45 Degree Helix

For high-efficiency machining of aluminum, plastics and other non-ferrous materials.

Part No. Uncoated	Part No. Stealth	Dia. of Cut	Shank Dia.	LOC	OAL
V20401	V20401S	1/16	1/8	3/32	1-1/2
V20402	V20402S	1/16	1/8	3/16	1-1/2
V20501	V20501S	5/64	1/8	7/64	1-1/2
V20502	V20502S	5/64	1/8	15/64	1-1/2
V20601	V20601S	3/32	1/8	7/64	1-1/2
V20602	V20602S	3/32	1/8	9/32	1-1/2
V20701	V20701S	7/64	1/8	5/32	1-1/2
V20702	V20702S	7/64	1/8	21/64	1-1/2
V20804	V20804S	1/8	1/8	1/4	1-1/2
V20805	V20805S	1/8	1/8	5/16	1-1/2
V20806	V20806S	1/8	1/8	3/8	1-1/2
V20808	V20808S	1/8	1/8	1/2	1-1/2
V20810	V20810S	1/8	1/8	5/8	2
V20812	V20812S	1/8	1/8	3/4	2
V20816	V20816S	1/8	1/8	1	2-1/2
V21005	V21005S	5/32	3/16	5/16	2
V21009	V21009S	5/32	3/16	9/16	2
V21205	V21205S	3/16	3/16	5/16	2
V21206	V21206S	3/16	3/16	3/8	2
V21210	V21210S	3/16	3/16	5/8	2
V21212	V21212S	3/16	3/16	3/4	2-1/2
V21216	V21216S	3/16	3/16	1	2-1/2
V21406	V21406S	7/32	1/4	3/8	2
V21412	V21412S	7/32	1/4	3/4	2-1/2
V21606	V21606S	1/4	1/4	3/8	2
V21608	V21608S	1/4	1/4	1/2	2
V21610	V21610S	1/4	1/4	5/8	2-1/2
V21612	V21612S	1/4	1/4	3/4	2-1/2
V21616	V21616S	1/4	1/4	1	2-1/2
V21618	V21618S	1/4	1/4	1-1/8	2-1/2
V21620	V21620S	1/4	1/4	1-1/4	3
V21624	V21624S	1/4	1/4	1-1/2	3
V21632	V21632S	1/4	1/4	2	4
V22007	V22007S	5/16	5/16	7/16	2
V22008	V22008S	5/16	5/16	1/2	2
V22013	V22013S	5/16	5/16	13/16	2-1/2
V22018	V22018S	5/16	5/16	1-1/8	2-1/2
V22020	V22020S	5/16	5/16	1-1/4	3
V22024	V22024S	5/16	5/16	1-1/2	3
V22032	V22032S	5/16	5/16	2	4
V22408	V22408S	3/8	3/8	1/2	2
V22410	V22410S	3/8	3/8	5/8	2
V22412	V22412S	3/8	3/8	3/4	2-1/2
V22416	V22416S	3/8	3/8	1	2-1/2

S: Stealth Coating (at end of number)

For guidance to calculate surface footage & chip load for Viper® End Mills refer to the Technical Section on pages 28 & 29.

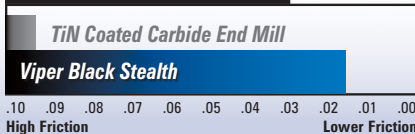
— Black Stealth is an invisible, lubricious coating that is covered in a black material to support identification between uncoated and coated tools.

Continued on next page

NOTE: Additional miniature sizes with 3/16 shank diameter can also be found on page 64

NOTE: For Diamond Like Coating add DLC after the part number (limited stock)

Friction Coefficients



Tool Life





Continued from previous page

Square End, 2 Flute, 45 Degree Helix

For high-efficiency machining of aluminum, plastics and other non-ferrous materials.

Part No. Uncoated	Part No. Stealth	Dia. of Cut	Shank Dia.	LOC	OAL
V22420	V22420S	3/8	3/8	1-1/4	3
V22424	V22424S	3/8	3/8	1-1/2	4
V22432	V22432S	3/8	3/8	2	4
V22440	V22440S	3/8	3/8	2-1/2	5
V22809	V22809S	7/16	7/16	9/16	2-3/4
V22816	V22816S	7/16	7/16	1	2-3/4
V23210	V23210S	1/2	1/2	5/8	3
V23212	V23212S	1/2	1/2	3/4	3
V23216	V23216S	1/2	1/2	1	3
V23220	V23220S	1/2	1/2	1-1/4	3
V23224	V23224S	1/2	1/2	1-1/2	4
V23232	V23232S	1/2	1/2	2	4
V23236	V23236S	1/2	1/2	2-1/4	5
V23240	V23240S	1/2	1/2	2-1/2	5
V23248	V23248S	1/2	1/2	3	6
V23264	V23264S	1/2	1/2	4	8
V24012	V24012S	5/8	5/8	3/4	3-1/2
V24020	V24020S	5/8	5/8	1-1/4	3-1/2
V24026	V24026S	5/8	5/8	1-5/8	4
V24032	V24032S	5/8	5/8	2	5
V24040	V24040S	5/8	5/8	2-1/2	5
V24044	V24044S	5/8	5/8	2-3/4	5
V24052	V24052S	5/8	5/8	3-1/4	6
V24064	V24064S	5/8	5/8	4	8
V24816	V24816S	3/4	3/4	1	4
V24826	V24826S	3/4	3/4	1-5/8	4
V24832	V24832S	3/4	3/4	2	5
V24836	V24836S	3/4	3/4	2-1/4	5
V24840	V24840S	3/4	3/4	2-1/2	5
V24848	V24848S	3/4	3/4	3	6
V24852	V24852S	3/4	3/4	3-1/4	6
V24856	V24856S	3/4	3/4	3-1/2	6
V24864	V24864S	3/4	3/4	4	7
V24880	V24880S	3/4	3/4	5	8
V25620	V25620S	7/8	7/8	1-1/4	4
V25636	V25636S	7/8	7/8	2-1/4	5
V26420	V26420S	1	1	1-1/4	4
V26424	V26424S	1	1	1-1/2	4
V26432	V26432S	1	1	2	5
V26436	V26436S	1	1	2-1/4	5
V26440	V26440S	1	1	2-1/2	5
V26448	V26448S	1	1	3	6
V26456	V26456S	1	1	3-1/2	6
V26464	V26464S	1	1	4	7
V26488	V26488S	1	1	5-1/2	8

S: Stealth Coating (at end of number)

For guidance to calculate surface footage & chip load for Viper® End Mills refer to the Technical Section on pages 28 & 29.

— Black Stealth is an invisible, lubricistic coating that is covered in a black material to support identification between uncoated and coated tools.

NOTE: For Diamond Like Coating add DLC after the part number (limited stock)



V23216

V23216S



Tolerances: Viper

End Mill Diameter: $-.0001''$ to $-.0003''$

Shank Diameter: $+.000''$ to $-.0003''$

Ball Nose: $+.001''$ to $-.001''$

SEE IT IN ACTION!





END MILLS FOR NON-FERROUS MATERIALS



V2321017 V2321017S

P

Steel

N

Aluminum



V2321227 V2321227S



Square End, 2 Flute, 45 Degree Helix

Long Shank Series with Reduced Neck, LBS*

Part No. Uncoated	Part No. Stealth	Dia. of Cut	Shank Dia.	LOC	Lbs.*	Neck Dia.	OAL
V2080304	V2080304S	1/8	1/8	3/16	1/2	0.110	1-1/2
V2120404	V2120404S	3/16	3/16	1/4	1/2	0.170	2
V2160605	V2160605S	1/4	1/4	3/8	5/8	0.235	2
V2160609	V2160609S	1/4	1/4	3/8	1-1/8	0.235	2-1/2
V2160617	V2160617S	1/4	1/4	3/8	2-1/8	0.235	4
V2161217	V2161217S	1/4	1/4	3/4	2-1/8	0.235	4
V2200605	V2200605S	5/16	5/16	3/8	5/8	0.291	2
V2200708	V2200708S	5/16	5/16	7/16	1	0.291	2-1/2
V2200717	V2200717S	5/16	5/16	7/16	2-1/8	0.291	4
V2240809	V2240809S	3/8	3/8	1/2	1-1/8	0.355	2-1/2
V2240817	V2240817S	3/8	3/8	1/2	2-1/8	0.355	4
V2241617	V2241617S	3/8	3/8	1	2-1/8	0.355	4
V2321011	V2321011S	1/2	1/2	5/8	1-3/8	0.475	3
V2321017	V2321017S	1/2	1/2	5/8	2-1/8	0.475	4
V2321048	V2321048S	1/2	1/2	5/8	6	0.475	8
V2321227	V2321227S	1/2	1/2	3/4	3-3/8	0.475	6
V2321232	V2321232S	1/2	1/2	3/4	4	0.475	6
V2401212	V2401212S	5/8	5/8	3/4	1-1/2	0.590	3-1/2
V2401219	V2401219S	5/8	5/8	3/4	2-3/8	0.590	5
V2401227	V2401227S	5/8	5/8	3/4	3-3/8	0.590	6
V2401232	V2401232S	5/8	5/8	3/4	4	0.590	6
V2401248	V2401248S	5/8	5/8	3/4	6	0.590	8
V2481612	V2481612S	3/4	3/4	1	1-1/2	0.715	4
V2481620	V2481620S	3/4	3/4	1	2-1/2	0.715	5
V2481627	V2481627S	3/4	3/4	1	3-3/8	0.715	6
V2481632	V2481632S	3/4	3/4	1	4	0.715	6
V2481648	V2481648S	3/4	3/4	1	6	0.715	8
V2482627	V2482627S	3/4	3/4	1-5/8	3-3/8	0.715	6
V2641612	V2641612S	1	1	1	1-1/2	0.960	4
V2641617	V2641617S	1	1	1	2-1/8	0.960	5
V2642027	V2642027S	1	1	1-1/4	3-3/8	0.960	6
V2642032	V2642032S	1	1	1-1/4	4	0.960	6
V2642035	V2642035S	1	1	1-1/4	4-3/8	0.960	7
V2642048	V2642048S	1	1	1-1/4	6	0.960	8
V2642432	V2642432S	1	1	1-1/2	4	0.960	6

*LBS: Length Below Shank

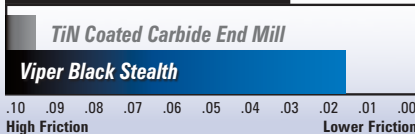
For guidance to calculate surface footage & chip load for Viper End Mills refer to the Technical Section on pages 28 & 29.

S: Stealth Coating

— Black Stealth is an invisible, lubricic coating that is covered in a black material to support identification between uncoated and coated tools.

NOTE: For Diamond Like Coating add DLC after the part number (limited stock)

Friction Coefficients



Tool Life





Square End, 2 Flute, 45 Degree Helix

Long Shank Series, NNK*

Part No. Uncoated	Part No. Stealth	Dia. of Cut	Shank Dia.	LOC	NNK*	OAL
V208040	V208040S	1/8	1/8	1/4	NNK	3
V212040	V212040S	3/16	3/16	1/4	NNK	3
V216080	V216080S	1/4	1/4	1/2	NNK	4
V220070	V220070S	5/16	5/16	7/16	NNK	4
V224080	V224080S	3/8	3/8	1/2	NNK	4
V224160	V224160S	3/8	3/8	1	NNK	4
V2321000	V2321000S	1/2	1/2	5/8	NNK	8
V232120	V232120S	1/2	1/2	3/4	NNK	6
V232200	V232200S	1/2	1/2	1-1/4	NNK	6
V240120	V240120S	5/8	5/8	3/4	NNK	6
V2401200	V2401200S	5/8	5/8	3/4	NNK	8
V248160	V248160S	3/4	3/4	1	NNK	6
V2481600	V2481600S	3/4	3/4	1	NNK	8
V264160	V264160S	1	1	1	NNK	5
V264200	V264200S	1	1	1-1/4	NNK	6
V2642000	V2642000S	1	1	1-1/4	NNK	8

For guidance to calculate surface footage & chip load for Viper® End Mills refer to the Technical Section on pages 28 & 29.



Radius, 2 Flute, 45 Degree

Part No. Uncoated	Part No. Stealth	Dia. of Cut	Shank Dia.	LOC	OAL	Radius
V21612R015	V21612R015S	1/4	1/4	3/4	2-1/2	0.015
V21612R030	V21612R030S	1/4	1/4	3/4	2-1/2	0.030
V21612R060	V21612R060S	1/4	1/4	3/4	2-1/2	0.060
V22416R010	V22416R010S	3/8	3/8	1	2-1/2	0.010
V22416R030	V22416R030S	3/8	3/8	1	2-1/2	0.030
V22416R060	V22416R060S	3/8	3/8	1	2-1/2	0.060
V22416R093	V22416R093S	3/8	3/8	1	2-1/2	0.093
V23220R010	V23220R010S	1/2	1/2	1-1/4	3	0.010
V23220R030	V23220R030S	1/2	1/2	1-1/4	3	0.030
V23220R060	V23220R060S	1/2	1/2	1-1/4	3	0.060
V23220R093	V23220R093S	1/2	1/2	1-1/4	3	0.093
V23220R125	V23220R125S	1/2	1/2	1-1/4	3	0.125
V24020R010	V24020R010S	5/8	5/8	1-1/4	3	0.010
V24020R030	V24020R030S	5/8	5/8	1-1/4	3	0.030
V24020R060	V24020R060S	5/8	5/8	1-1/4	3	0.060
V24020R093	V24020R093S	5/8	5/8	1-1/4	3	0.093
V24020R125	V24020R125S	5/8	5/8	1-1/4	3	0.125
V24826R010	V24826R010S	3/4	3/4	1-5/8	4	0.010
V24826R030	V24826R030S	3/4	3/4	1-5/8	4	0.030
V24826R060	V24826R060S	3/4	3/4	1-5/8	4	0.060
V24826R093	V24826R093S	3/4	3/4	1-5/8	4	0.093
V24826R125	V24826R125S	3/4	3/4	1-5/8	4	0.125
V24826R190	V24826R190S	3/4	3/4	1-5/8	4	0.190

For guidance to calculate surface footage & chip load for Viper® End Mills refer to the Technical Section on pages 28 & 29.

*NNK: No Neck

S: Stealth Coating

— Black Stealth is an invisible, lubricating coating that is covered in a black material to support identification between uncoated and coated tools.

NOTE: For Diamond Like Coating add DLC after the part number (limited stock)

Tolerances: Viper

End Mill Diameter: $-.0001''$ to $-.0003''$

Shank Diameter: $+.000''$ to $-.0003''$

Ball Nose: $+.001''$ to $-.001''$



V232120

V232120S



V23220R060

V23220R060S



SEE IT IN ACTION!





END MILLS FOR NON-FERROUS MATERIALS



BV23216 BV23216S



Ball, 2 Flute, 45 Degree Helix

Part No. Uncoated	Part No. Stealth	Dia. of Cut	Shank Dia.	LOC	OAL
BV20201	BV20201S	1/32	1/8	3/64	1-1/2
BV20301	BV 20301S	3/64	1/8	5/64	1-1/2
BV20401	BV20401S	1/16	1/8	3/32	1-1/2
BV20601	BV20601S	3/32	1/8	9/64	1-1/2
BV20805	BV20805S	1/8	1/8	5/16	1-1/2
BV20806	BV20806S	1/8	1/8	3/8	1-1/2
BV20808	BV20808S	1/8	1/8	1/2	1-1/2
BV21206	BV21206S	3/16	3/16	3/8	2
BV21210	BV21210S	3/16	3/16	5/8	2
BV21608	BV21608S	1/4	1/4	1/2	2
BV21612	BV21612S	1/4	1/4	3/4	2-1/2
BV22008	BV22008S	5/16	5/16	1/2	2
BV22013	BV22013S	5/16	5/16	13/16	2-1/2
BV22410	BV22410S	3/8	3/8	5/8	2
BV22416	BV22416S	3/8	3/8	1	2-1/2
BV23212	BV23212S	1/2	1/2	3/4	3
BV23216	BV23216S	1/2	1/2	1	3
BV23220	BV23220S	1/2	1/2	1-1/4	3
BV24012	BV24012S	5/8	5/8	3/4	3-1/2
BV24020	BV24020S	5/8	5/8	1-1/4	3-1/2
BV24026	BV24026S	5/8	5/8	1-5/8	4
BV24816	BV24816S	3/4	3/4	1	4
BV24826	BV24826S	3/4	3/4	1-5/8	4
BV26420	BV26420S	1	1	1-1/4	4
BV26432	BV26432S	1	1	2	5

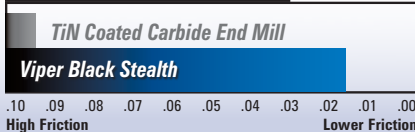
S: Stealth Coating

For guidance to calculate surface footage & chip load for Viper™ End Mills refer to the Technical Section on pages 28 & 29.

— Black Stealth is an invisible, lubricious coating that is covered in a black material to support identification between uncoated and coated tools.



Friction Coefficients



Tool Life





Ball, 2 Flute, 45 Degree Helix

Long Shank Series with Reduced Neck, LBS*

Part No. Uncoated	Part No. Stealth	Dia. of Cut	Shank Dia.	LOC	Lbs.*	Neck Dia.	OAL
BV2160617	BV2160617S	1/4	1/4	3/8	2-1/8	0.235	4
BV2161217	BV2161217S	1/4	1/4	3/4	2-1/8	0.235	4
BV2200717	BV2200717S	5/16	5/16	7/16	2-1/8	0.291	4
BV2240817	BV2240817S	3/8	3/8	1/2	2-1/8	0.355	4
BV2241617	BV2241617S	3/8	3/8	1	2-1/8	0.355	4
BV2321017	BV2321017S	1/2	1/2	5/8	2-1/8	0.475	4
BV2321227	BV2321227S	1/2	1/2	3/4	3-3/8	0.475	6
BV2401227	BV2401227S	5/8	5/8	3/4	3-3/8	0.590	6
BV2481627	BV2481627S	3/4	3/4	1	3-3/8	0.715	6

For guidance to calculate surface footage & chip load for Viper® End Mills refer to the Technical Section on pages 28 & 29.



Ball, 2 Flute

Long Shank Series NNK*

Part No. Uncoated	Part No. Stealth	Dia. of Cut	Shank Dia.	LOC	NNK*	OAL
BV216060	BV216060S	1/4	1/4	3/8	NNK*	4
BV224080	BV224080S	3/8	3/8	1/2	NNK*	4
BV232200	BV232200S	1/2	1/2	1-1/4	NNK*	6
BV248160	BV248160S	3/4	3/4	1	NNK*	6
BV264200	BV264200S	1	1	1-1/4	NNK*	6

*LBS: Length Below Shank

*NNK: No Neck

S: Stealth Coating

—Black Stealth is an invisible, lubricating coating that is covered in a black material to support identification between uncoated and coated tools.

For guidance to calculate surface footage & chip load for Viper® End Mills refer to the Technical Section on pages 28 & 29.



BV2321017 BV2321017S



BV232200 BV232200S

Tolerances: Viper

End Mill Diameter: $-.0001''$ to $-.0003''$

Shank Diameter: $+.000''$ to $-.0003''$

Ball Nose: $+.001''$ to $-.001''$



SEE IT IN ACTION!





END MILLS FOR NON-FERROUS MATERIALS



V33216

V33216S



Square End, 3 Flute, 45 Degree Helix

Part No. Uncoated	Part No. Stealth	Dia. of Cut	Shank Dia.	LOC	OAL
V30401	V30401S	1/16	1/8	3/32	1-1/2
V30402	V30402S	1/16	1/8	3/16	1-1/2
V30501	V30501S	5/64	1/8	7/64	1-1/2
V30502	V30502S	5/64	1/8	15/64	1-1/2
V30601	V30601S	3/32	1/8	7/64	1-1/2
V30602	V30602S	3/32	1/8	9/32	1-1/2
V30701	V30701S	7/64	1/8	5/32	1-1/2
V30702	V30702S	7/64	1/8	21/64	1-1/2
V30804	V30804S	1/8	1/8	1/4	1-1/2
V30805	V30805S	1/8	1/8	5/16	1-1/2
V30806	V30806S	1/8	1/8	3/8	1-1/2
V30808	V30808S	1/8	1/8	1/2	1-1/2
V30810	V30810S	1/8	1/8	5/8	2
V30812	V30812S	1/8	1/8	3/4	2
V30816	V30816S	1/8	1/8	1	2-1/2
V31005	V31005S	5/32	3/16	5/16	2
V31009	V31009S	5/32	3/16	9/16	2
V31205	V31205S	3/16	3/16	5/16	2
V31206	V31206S	3/16	3/16	3/8	2
V31209	V31209S	3/16	3/16	9/16	2
V31210	V31210S	3/16	3/16	5/8	2
V31212	V31212S	3/16	3/16	3/4	2-1/2
V31216	V31216S	3/16	3/16	1	2-1/2
V31406	V31406S	7/32	1/4	3/8	2
V31412	V31412S	7/32	1/4	3/4	2-1/2
V31606	V31606S	1/4	1/4	3/8	2
V31608	V31608S	1/4	1/4	1/2	2
V31610	V31610S	1/4	1/4	5/8	2-1/2
V31612	V31612S	1/4	1/4	3/4	2-1/2
V31616	V31616S	1/4	1/4	1	2-1/2
V31618	V31618S	1/4	1/4	1-1/8	2-1/2
V31620	V31620S	1/4	1/4	1-1/4	3
V31624	V31624S	1/4	1/4	1-1/2	3
V31628	V31628S	1/4	1/4	1-3/4	4
V31632	V31632S	1/4	1/4	2	4
V31808	V31808S	9/32	5/16	1/2	2
V31812	V31812S	9/32	5/16	3/4	2-1/2
V32007	V32007S	5/16	5/16	7/16	2
V32008	V32008S	5/16	5/16	1/2	2
V32013	V32013S	5/16	5/16	13/16	2-1/2
V32018	V32018S	5/16	5/16	1-1/8	2-1/2
V32020	V32020S	5/16	5/16	1-1/4	3
V32024	V32024S	5/16	5/16	1-1/2	3
V32032	V32032S	5/16	5/16	2	4
V32210	V32210S	11/32	3/8	5/8	2
V32216	V32216S	11/32	3/8	1	2-1/2
V32408	V32408S	3/8	3/8	1/2	2
V32410	V32410S	3/8	3/8	5/8	2
V32412	V32412S	3/8	3/8	3/4	2-1/2
V32416	V32416S	3/8	3/8	1	2-1/2
V32420	V32420S	3/8	3/8	1-1/4	3
V32424	V32424S	3/8	3/8	1-1/2	4
V32432	V32432S	3/8	3/8	2	4
V32440	V32440S	3/8	3/8	2-1/2	5
V32809	V32809S	7/16	7/16	9/16	2-3/4

S: Stealth Coating

For guidance to calculate surface footage & chip load for Viper™ End Mills refer to the Technical Section on pages 28 & 29.

— Black Stealth is an invisible, lubricating coating that is covered in a black material to support identification between uncoated and coated tools.

Continued on next page

NOTE: Additional miniature sizes with 3/16 shank diameter can also be found on page 67.

NOTE: For Diamond Like Coating add DLC after the part number (limited stock)

Friction Coefficients



Tool Life





Continued from previous page

Square End, 3 Flute, 45 Degree Helix

Part No. Uncoated	Part No. Stealth	Dia. of Cut	Shank Dia.	LOC	OAL
V32816	V32816S	7/16	7/16	1	2-3/4
V33210	V33210S	1/2	1/2	5/8	3
V33212	V33212S	1/2	1/2	3/4	3
V33216	V33216S	1/2	1/2	1	3
V33220	V33220S	1/2	1/2	1-1/4	3
V33224	V33224S	1/2	1/2	1-1/2	4
V33228	V33228S	1/2	1/2	1-3/4	4
V33232	V33232S	1/2	1/2	2	4
V33236	V33236S	1/2	1/2	2-1/4	5
V33240	V33240S	1/2	1/2	2-1/2	5
V33248	V33248S	1/2	1/2	3	6
V33252	V33252S	1/2	1/2	3-1/4	6
V33264	V33264S	1/2	1/2	4	7
V33280	V33280S	1/2	1/2	5	8
V34012	V34012S	5/8	5/8	3/4	3-1/2
V34016	V34016S	5/8	5/8	1	3-1/2
V34020	V34020S	5/8	5/8	1-1/4	3-1/2
V34026	V34026S	5/8	5/8	1-5/8	4
V34032	V34032S	5/8	5/8	2	5
V34036	V34036S	5/8	5/8	2-1/4	5
V34040	V34040S	5/8	5/8	2-1/2	5
V34044	V34044S	5/8	5/8	2-3/4	5
V34052	V34052S	5/8	5/8	3-1/4	6
V34064	V34064S	5/8	5/8	4	8
V34816	V34816S	3/4	3/4	1	4
V34826	V34826S	3/4	3/4	1-5/8	4
V34832	V34832S	3/4	3/4	2	5
V34836	V34836S	3/4	3/4	2-1/4	5
V34840	V34840S	3/4	3/4	2-1/2	5
V34848	V34848S	3/4	3/4	3	6
V34852	V34852S	3/4	3/4	3-1/4	6
V34856	V34856S	3/4	3/4	3-1/2	6
V34864	V34864S	3/4	3/4	4	7
V34868	V34868S	3/4	3/4	4-1/4	7
V34880	V34880S	3/4	3/4	5	8
V34896	V34896S	3/4	3/4	6	9
V35620	V35620S	7/8	7/8	1-1/4	4
V35636	V35636S	7/8	7/8	2-1/4	5
V36420	V36420S	1	1	1-1/4	4
V36424	V36424S	1	1	1-1/2	4
V36432	V36432S	1	1	2	5
V36436	V36436S	1	1	2-1/4	5
V36440	V36440S	1	1	2-1/2	5
V36448	V36448S	1	1	3	6
V36452	V36452S	1	1	3-1/4	6
V36456	V36456S	1	1	3-1/2	6
V36464	V36464S	1	1	4	7
V36468	V36468S	1	1	4-1/4	7
V36488	V36488S	1	1	5-1/2	8
V36496	V36496S	1	1	6	9
V38036	V38036S	1-1/4	1-1/4	2-1/4	5-1/2

S: Stealth Coating

For guidance to calculate surface footage & chip load for Viper® End Mills refer to the Technical Section on pages 28 & 29.

—Black Stealth is an invisible, lubricic coating that is covered in a black material to support identification between uncoated and coated tools.

NOTE: For Diamond Like Coating add DLC after the part number (limited stock)



V33216 V33216S



Tolerances: Viper

End Mill Diameter: $-.0001''$ to $-.0003''$

Shank Diameter: $+.000''$ to $-.0003''$

Ball Nose: $+.001''$ to $-.001''$

SEE IT IN ACTION!

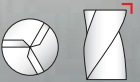




END MILLS FOR NON-FERROUS MATERIALS



V3321020 V3321020S



Square End, 3 Flute, 45 Degree Helix

Long Shank Series with Reduced Neck, LBS*

Part No. Uncoated	Part No. Stealth	Dia. of Cut	Shank Dia.	LOC	Lbs.*	Neck Dia.	OAL
V3080304	V3080304S	1/8	1/8	3/16	1/2	0.110	1-1/2
V3120404	V3120404S	3/16	3/16	1/4	1/2	0.170	2
V3160605	V3160605S	1/4	1/4	3/8	5/8	0.235	2
V3160609	V3160609S	1/4	1/4	3/8	1-1/8	0.235	2-1/2
V3160617	V3160617S	1/4	1/4	3/8	2-1/8	0.235	4
V3160809	V3160809S	1/4	1/4	1/2	1-1/8	0.235	4
V3161217	V3161217S	1/4	1/4	3/4	2-1/8	0.235	4
V3200605	V3200605S	5/16	5/16	3/8	5/8	0.291	2
V3200708	V3200708S	5/16	5/16	7/16	1	0.291	2-1/2
V3200717	V3200717S	5/16	5/16	7/16	2-1/8	0.291	4
V3240809	V3240809S	3/8	3/8	1/2	1-1/8	0.355	2-1/2
V3240817	V3240817S	3/8	3/8	1/2	2-1/8	0.355	4
V3241017	V3241017S	3/8	3/8	5/8	2-1/8	0.355	4
V3241617	V3241617S	3/8	3/8	1	2-1/8	0.355	4
V3321011	V3321011S	1/2	1/2	5/8	1-3/8	0.475	3
V3321017	V3321017S	1/2	1/2	5/8	2-1/8	0.475	4
V3321020	V3321020S	1/2	1/2	5/8	2-1/2	0.475	5
V3321048	V3321048S	1/2	1/2	5/8	6	0.475	8
V3321227	V3321227S	1/2	1/2	3/4	3-3/8	0.475	6
V3321232	V3321232S	1/2	1/2	3/4	4	0.475	6
V3401212	V3401212S	5/8	5/8	3/4	1-1/2	0.590	3-1/2
V3401219	V3401219S	5/8	5/8	3/4	2-3/8	0.590	5
V3401227	V3401227S	5/8	5/8	3/4	3-3/8	0.590	6
V3401232	V3401232S	5/8	5/8	3/4	4	0.590	6
V3401248	V3401248S	5/8	5/8	3/4	6	0.590	8
V3481612	V3481612S	3/4	3/4	1	1-1/2	0.715	4
V3481616	V3481616S	3/4	3/4	1	2	0.715	5
V3481620	V3481620S	3/4	3/4	1	2-1/2	0.715	5
V3481627	V3481627S	3/4	3/4	1	3-3/8	0.715	6
V3481632	V3481632S	3/4	3/4	1	4	0.715	6
V3481648	V3481648S	3/4	3/4	1	6	0.715	8
V3482627	V3482627S	3/4	3/4	1-5/8	3-3/8	0.715	6
V3641612	V3641612S	1	1	1	1-1/2	0.960	4
V3641617	V3641617S	1	1	1	2-1/8	0.960	5
V3642027	V3642027S	1	1	1-1/4	3-3/8	0.960	6
V3642032	V3642032S	1	1	1-1/4	4	0.960	6
V3642035	V3642035S	1	1	1-1/4	4-3/8	0.960	7
V3642048	V3642048S	1	1	1-1/4	6	0.960	8
V3642432	V3642432S	1	1	1-1/2	4	0.960	6
V3643272	V3643272S	1	1	2	9	0.960	13
V3643280	V3643280S	1	1	2	10	0.960	16

*LBS: Length Below Shank

For guidance to calculate surface footage & chip load for Viper® End Mills refer to the Technical Section on pages 28 & 29.

S: Stealth Coating

— Black Stealth is an invisible, lubricating coating that is covered in a black material to support identification between uncoated and coated tools.

NOTE: For Diamond Like Coating add DLC after the part number (limited stock)

Friction Coefficients



Tool Life





Square End, 3 Flute, Regular, 45 Degree Helix

Long Shank Series, NNK*

Part No. Uncoated	Part No. Stealth	Dia. of Cut	Shank Dia.	LOC	NNK*	OAL
V308040	V308040S	1/8	1/8	1/4	NNK	3
V312040	V312040S	3/16	3/16	1/4	NNK	3
V316080	V316080S	1/4	1/4	1/2	NNK	4
V3161200	V3161200S	1/4	1/4	3/4	NNK	6
V320070	V320070S	5/16	5/16	7/16	NNK	4
V324080	V324080S	3/8	3/8	1/2	NNK	4
V324160	V324160S	3/8	3/8	1	NNK	4
V3241600	V3241600S	3/8	3/8	1	NNK	6
V3321000	V3321000S	1/2	1/2	5/8	NNK	8
V332120	V332120S	1/2	1/2	3/4	NNK	6
V332200	V332200S	1/2	1/2	1-1/4	NNK	6
V340120	V340120S	5/8	5/8	3/4	NNK	6
V3401200	V3401200S	5/8	5/8	3/4	NNK	8
V348160	V348160S	3/4	3/4	1	NNK	6
V3481600	V3481600S	3/4	3/4	1	NNK	8
V3482000	V3482000S	3/4	3/4	1-1/4	NNK	8
V34820000	V34820000S	3/4	3/4	1-1/4	NNK	12
V364160	V364160S	1	1	1	NNK	5
V364200	V364200S	1	1	1-1/4	NNK	6
V3642000	V3642000S	1	1	1-1/4	NNK	8
V36420000	V36420000S	1	1	1-1/4	NNK	12
V36432000	V36432000S	1	1	2	NNK	13
V380320	V380320S	1-1/4	1-1/4	2	NNK	7-1/2
V3803200	V3803200S	1-1/4	1-1/4	2	NNK	13

*NNK: No Neck

S: Stealth Coating

— Black Stealth is an invisible, lubricating coating that is covered in a black material to support identification between uncoated and coated tools.

NOTE: For Diamond Like Coating add DLC after the part number (limited stock)

For guidance to calculate surface footage & chip load for Viper® End Mills refer to the Technical Section on pages 28 & 29.



V3321000

V3321000S



Tolerances: Viper

End Mill Diameter: $-.0001"$ to $-.0003"$

Shank Diameter: $+.000"$ to $-.0003"$

Ball Nose: $+.001"$ to $-.001"$



SEE IT IN ACTION!

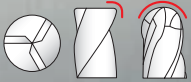




END MILLS FOR NON-FERROUS MATERIALS



V33220R093 V33220R093S



Radius, 3 Flute, 45 Degree

Part No. Uncoated	Part No. Stealth	Dia. of Cut	Shank Dia.	LOC	OAL	Radius
V31606R010	V31606R010S	1/4	1/4	3/8	2	0.010
V31606R015	V31606R015S	1/4	1/4	3/8	2	0.015
V31606R030	V31606R030S	1/4	1/4	3/8	2	0.030
V31606R060	V31606R060S	1/4	1/4	3/8	2	0.060
V31608R010	V31608R010S	1/4	1/4	1/2	2	0.010
V31608R015	V31608R015S	1/4	1/4	1/2	2	0.015
V31608R030	V31608R030S	1/4	1/4	1/2	2	0.030
V31608R060	V31608R060S	1/4	1/4	1/2	2	0.060
V31612R010	V31612R010S	1/4	1/4	3/4	2-1/2	0.010
V31612R015	V31612R015S	1/4	1/4	3/4	2-1/2	0.015
V31612R030	V31612R030S	1/4	1/4	3/4	2-1/2	0.030
V31612R060	V31612R060S	1/4	1/4	3/4	2-1/2	0.060
V32408R010	V32408R010S	3/8	3/8	1/2	2	0.010
V32408R030	V32408R030S	3/8	3/8	1/2	2	0.030
V32408R060	V32408R060S	3/8	3/8	1/2	2	0.060
V32408R093	V32408R093S	3/8	3/8	1/2	2	0.093
V32412R010	V32412R010S	3/8	3/8	3/4	2-1/2	0.010
V32412R030	V32412R030S	3/8	3/8	3/4	2-1/2	0.030
V32412R060	V32412R060S	3/8	3/8	3/4	2-1/2	0.060
V32412R093	V32412R093S	3/8	3/8	3/4	2-1/2	0.093
V32416R010	V32416R010S	3/8	3/8	1	2-1/2	0.010
V32416R030	V32416R030S	3/8	3/8	1	2-1/2	0.030
V32416R060	V32416R060S	3/8	3/8	1	2-1/2	0.060
V32416R093	V32416R093S	3/8	3/8	1	2-1/2	0.093
V33210R010	V33210R010S	1/2	1/2	5/8	3	0.010
V33210R030	V33210R030S	1/2	1/2	5/8	3	0.030
V33210R045	V33210R045S	1/2	1/2	5/8	3	0.045
V33210R060	V33210R060S	1/2	1/2	5/8	3	0.060
V33210R090	V33210R090S	1/2	1/2	5/8	3	0.090
V33210R093	V33210R093S	1/2	1/2	5/8	3	0.093
V33210R125	V33210R125S	1/2	1/2	5/8	3	0.125
V33216R010	V33216R010S	1/2	1/2	1	3	0.010
V33216R030	V33216R030S	1/2	1/2	1	3	0.030
V33216R045	V33216R045S	1/2	1/2	1	3	0.045
V33216R060	V33216R060S	1/2	1/2	1	3	0.060
V33216R090	V33216R090S	1/2	1/2	1	3	0.090
V33216R093	V33216R093S	1/2	1/2	1	3	0.093
V33216R125	V33216R125S	1/2	1/2	1	3	0.125
V33220R010	V33220R010S	1/2	1/2	1-1/4	3	0.010
V33220R030	V33220R030S	1/2	1/2	1-1/4	3	0.030
V33220R045	V33220R045S	1/2	1/2	1-1/4	3	0.045
V33220R060	V33220R060S	1/2	1/2	1-1/4	3	0.060
V33220R090	V33220R090S	1/2	1/2	1-1/4	3	0.090
V33220R093	V33220R093S	1/2	1/2	1-1/4	3	0.093
V33220R125	V33220R125S	1/2	1/2	1-1/4	3	0.125
V34012R010	V34012R010S	5/8	5/8	3/4	3-1/2	0.010
V34012R030	V34012R030S	5/8	5/8	3/4	3-1/2	0.030
V34012R060	V34012R060S	5/8	5/8	3/4	3-1/2	0.060
V34012R093	V34012R093S	5/8	5/8	3/4	3-1/2	0.093
V34012R125	V34012R125S	5/8	5/8	3/4	3-1/2	0.125
V34020R010	V34020R010S	5/8	5/8	1-1/4	3-1/2	0.010
V34020R030	V34020R030S	5/8	5/8	1-1/4	3-1/2	0.030
V34020R060	V34020R060S	5/8	5/8	1-1/4	3-1/2	0.060
V34020R093	V34020R093S	5/8	5/8	1-1/4	3-1/2	0.093
V34020R125	V34020R125S	5/8	5/8	1-1/4	3-1/2	0.125
V34026R010	V34026R010S	5/8	5/8	1-5/8	4	0.010
V34026R030	V34026R030S	5/8	5/8	1-5/8	4	0.030
V34026R060	V34026R060S	5/8	5/8	1-5/8	4	0.060
V34026R093	V34026R093S	5/8	5/8	1-5/8	4	0.093
V34026R125	V34026R125S	5/8	5/8	1-5/8	4	0.125
V34816R010	V34816R010S	3/4	3/4	1	4	0.010
V34816R030	V34816R030S	3/4	3/4	1	4	0.030
V34816R045	V34816R045S	3/4	3/4	1	4	0.045
V34816R060	V34816R060S	3/4	3/4	1	4	0.060
V34816R093	V34816R093S	3/4	3/4	1	4	0.093
V34816R125	V34816R125S	3/4	3/4	1	4	0.125
V34816R190	V34816R190S	3/4	3/4	1	4	0.190
V34826R010	V34826R010S	3/4	3/4	1-5/8	4	0.010
V34826R030	V34826R030S	3/4	3/4	1-5/8	4	0.030
V34826R045	V34826R045S	3/4	3/4	1-5/8	4	0.045
V34826R060	V34826R060S	3/4	3/4	1-5/8	4	0.060

Continued on next page

For guidance to calculate surface footage & chip load for Viper End Mills refer to the Technical Section on pages 28 & 29.

NOTE: For Diamond Like Coating add DLC after the part number (limited stock)





Radius, 3 Flute, 45 Degree

Continued from previous page

Part No. Uncoated	Part No. Stealth	Dia. of Cut	Shank Dia.	LOC	OAL	Radius
V34826R090	V34826R090S	3/4	3/4	1-5/8	4	0.090
V34826R093	V34826R093S	3/4	3/4	1-5/8	4	0.093
V34826R125	V34826R125S	3/4	3/4	1-5/8	4	0.125
V34826R190	V34826R190S	3/4	3/4	1-5/8	4	0.190
V34832R010	V34832R010S	3/4	3/4	2	5	0.010
V34832R030	V34832R030S	3/4	3/4	2	5	0.030
V34832R045	V34832R045S	3/4	3/4	2	5	0.045
V34832R060	V34832R060S	3/4	3/4	2	5	0.060
V34832R093	V34832R093S	3/4	3/4	2	5	0.060
V34832R125	V34832R125S	3/4	3/4	2	5	0.125
V34832R190	V34832R190S	3/4	3/4	2	5	0.190
V36424R030	V36424R030S	1	1	1-1/2	4	0.030
V36424R060	V36424R060S	1	1	1-1/2	4	0.060
V36424R093	V36424R093S	1	1	1-1/2	4	0.093
V36424R125	V36424R125S	1	1	1-1/2	4	0.125
V36424R190	V36424R190S	1	1	1-1/2	4	0.190
V36426R190	V36426R190S	1	1	2-1/4	5	0.190
V36436R030	V36436R030S	1	1	2-1/4	5	0.030
V36436R060	V36436R060S	1	1	2-1/4	5	0.060
V36436R093	V36436R093S	1	1	2-1/4	5	0.093
V36436R125	V36436R125S	1	1	2-1/4	5	0.125

For guidance to calculate surface footage & chip load for Viper® End Mills refer to the Technical Section on pages 28 & 29.



NOTE: For Diamond Like Coating add DLC after the part number (limited stock)

Ball, 3 Flute, 45 Degree Helix

Part No. Uncoated	Part No. Stealth	Dia. of Cut	Shank Dia.	LOC	OAL
BV30805	BV30805S	1/8	1/8	5/16	1-1/2
BV30806	BV30806S	1/8	1/8	3/8	1-1/2
BV30808	BV30808S	1/8	1/8	1/2	1-1/2
BV31206	BV31206S	3/16	3/16	3/8	2
BV31210	BV31210S	3/16	3/16	5/8	2-1/2
BV31608	BV31608S	1/4	1/4	1/2	2
BV31612	BV31612S	1/4	1/4	3/4	2-1/2
BV32008	BV32008S	5/16	5/16	1/2	2
BV32013	BV32013S	5/16	5/16	13/16	2-1/2
BV32410	BV32410S	3/8	3/8	5/8	2
BV32416	BV32416S	3/8	3/8	1	2-1/2
BV33212	BV33212S	1/2	1/2	3/4	3
BV33216	BV33216S	1/2	1/2	1	3
BV33220	BV33220S	1/2	1/2	1-1/4	3
BV34012	BV34012S	5/8	5/8	3/4	3-1/2
BV34020	BV34020S	5/8	5/8	1-1/4	3-1/2
BV34026	BV34026S	5/8	5/8	1-5/8	4
BV34816	BV34816S	3/4	3/4	1	4
BV34826	BV34826S	3/4	3/4	1-5/8	4
BV36420	BV36420S	1	1	1-1/4	4
BV36432	BV36432S	1	1	2	5

For guidance to calculate surface footage & chip load for Viper® End Mills refer to the Technical Section on pages 28 & 29.

S: Stealth Coating

—Black Stealth is an invisible, lubricious coating that is covered in a black material to support identification between uncoated and coated tools.

Tolerances: Viper

End Mill Diameter: $-.0001"$ to $-.0003"$
Shank Diameter: $+.000"$ to $-.0003"$
Ball Nose: $+.001"$ to $-.001"$



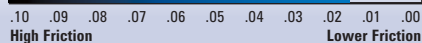
SEE IT IN ACTION!



Friction Coefficients

TiN Coated Carbide End Mill

Viper Black Stealth



Tool Life

4 Hours: Carbide

40 hours: Viper Black Stealth



BV33216

BV33216S





END MILLS FOR NON-FERROUS MATERIALS



BV3321017



BV3321017S



BV332200



BV332200S



Ball, 3 Flute, 45 Degree Helix

Long Shank Series with Reduced Neck, LBS*

Part No. Uncoated	Part No. Stealth	Dia. of Cut	Shank Dia.	LOC	Lbs.*	Neck Dia.	OAL
BV3160617	BV3160617S	1/4	1/4	3/8	2-1/8	0.235	4
BV3161217	BV3161217S	1/4	1/4	3/4	2-1/8	0.235	4
BV3200717	BV3200717S	5/16	5/16	7/16	2-1/8	0.291	4
BV3240817	BV3240817S	3/8	3/8	1/2	2-1/8	0.355	4
BV3241617	BV3241617S	3/8	3/8	1	2-1/8	0.355	4
BV3321017	BV3321017S	1/2	1/2	5/8	2-1/8	0.475	4
BV3321227	BV3321227S	1/2	1/2	5/8	3-3/8	0.475	6
BV3401227	BV3401227S	5/8	5/8	3/4	3-3/8	0.590	6
BV3481627	BV3481627S	3/4	3/4	1	3-3/8	0.715	6

For guidance to calculate surface footage & chip load for Viper® End Mills refer to the Technical Section on pages 28 & 29.



Ball, 3 Flute

Long Shank Series NNK*

Part No. Uncoated	Part No. Stealth	Dia. of Cut	Shank Dia.	LOC	NNK*	OAL
BV316060	BV316060S	1/4	1/4	3/8	NNK*	4
BV324080	BV324080S	3/8	3/8	1/2	NNK*	4
BV332200	BV332200S	1/2	1/2	1-1/4	NNK*	6
BV348160	BV348160S	3/4	3/4	1	NNK*	6
BV364200	BV364200S	1	1	1-1/4	NNK*	6

For guidance to calculate surface footage & chip load for Viper® End Mills refer to the Technical Section on pages 28 & 29.

*LBS: Length Below Shank

*NNK: No Neck

S: Stealth Coating

— Black Stealth is an invisible, lubricious coating that is covered in a black material to support identification between uncoated and coated tools.

Tolerances: Viper

End Mill Diameter: $-0.001"$ to $-0.003"$

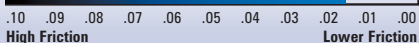
Shank Diameter: $+0.000"$ to $-0.003"$

Ball Nose: $+0.001"$ to $-0.001"$

Friction Coefficients

TiN Coated Carbide End Mill

Viper Black Stealth



Tool Life

4 Hours: Carbide

40 hours: Viper Black Stealth



SEE IT IN ACTION!





Radius, 4 Flute Viper, 45 Degree

Part No. Coated	Part No. Stealth	Dia. of Cut	Shank Dia.	LOC	OAL	Radius
V43210R030	V43210R030S	1/2	1/2	5/8	3	0.030
V43216R030	V43216R030S	1/2	1/2	1	3	0.030
V43220R030	V43220R030S	1/2	1/2	1-1/4	3	0.030
V44020R030	V44020R030S	5/8	5/8	1-1/4	3-1/2	0.030
V44026R030	V44026R030S	5/8	5/8	1-5/8	4	0.030
V44816R040	V44816R040S	3/4	3/4	1	4	0.040
V44826R040	V44826R040S	3/4	3/4	1-5/8	4	0.040
V44836R040	V44836R040S	3/4	3/4	2-1/4	5	0.040
V46424R040	V46424R040S	1	1	1-1/2	4	0.040
V46436R040	V46436R040S	1	1	2-1/4	5	0.040

For guidance to calculate surface footage & chip load for Viper® End Mills refer to the Technical Section on pages 28 & 29.



Square End, 4 flute, 45 Degree Helix

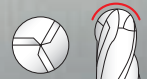
Part No. Coated	Part No. Stealth	Dia. of Cut	Shank Dia.	LOC	OAL
V43210	V43210S	1/2	1/2	5/8	3
V43216	V43216S	1/2	1/2	1	3
V43220	V43220S	1/2	1/2	1-1/4	3
V44020	V44020S	5/8	5/8	1-1/4	3-1/2
V44026	V44026S	5/8	5/8	1-5/8	4
V44816	V44816S	3/4	3/4	1	4
V44826	V44826S	3/4	3/4	1-5/8	4
V44836	V44836S	3/4	3/4	2-1/4	5
V46424	V46424S	1	1	1-1/2	4
V46436	V46436S	1	1	2-1/4	5

For guidance to calculate surface footage & chip load for Viper® End Mills refer to the Technical Section on pages 28 & 29.

NOTE: For Diamond Like Coating add DLC after the part number (limited stock)



V43210

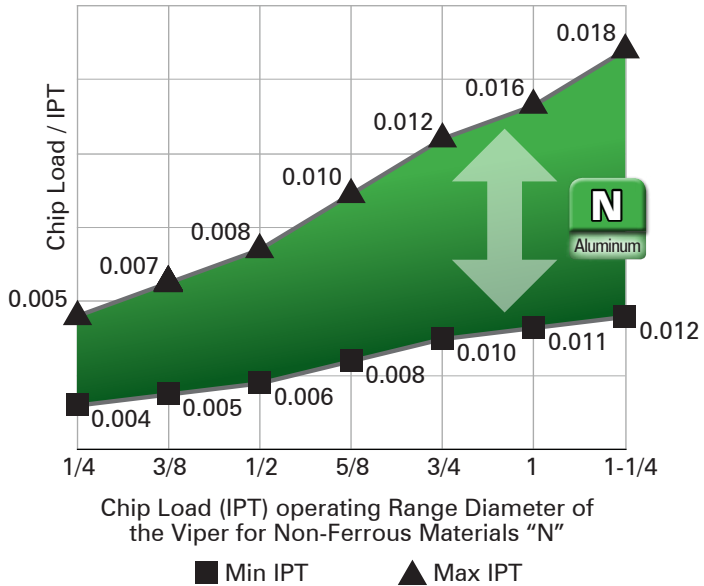


Viper DVH End Mills

While our Diamond Back series end mills are primarily for roughing, our Viper DVH series end mills are for both roughing and finishing.

The "General Operating Range" is based upon **1X diameter (ADC / DOC)** in full diameter (RDC / WOC) **SLOTTING**. The minimum chip loads remain constant for all applications, however, the maximum chip loads can be increased for side milling applications in finishing, heavy roughing & light roughing.

Viper – Chip Load Operating Range



Aluminum		Viper DVH – "N" Non-Ferrous Alloys – SFM Starting Parameters					
ADC	RDC	Slotting			Peripheral		
		Conservative	Moderate	Aggressive	Conservative	Moderate	Aggressive
1/2 X D	1/4 X D	1600	2400	MAX	1800	2400	MAX
1 X D	1/2 X D	1400	2000	MAX	1600	2400	MAX
1.5 X D	1 X D	1200	1600	MAX	1400	1800	MAX
2 X D	1 X D	1000	1400	MAX	1200	1600	MAX

Use 70% of your RPM when slotting over 1 X D

Material	Min SFM	Median SFM	Max SFM
Aluminum	1200	65% Max RPM	Max RPM
Aluminum Cast	1000	65% Max RPM	Max RPM
Brass Yellow, Red	400	950	1500
Bronze – Alum Bronze	250	625	1000
Composites: CFRP; Aramid	200	300	400
Composites: Honeycomb	200	300	400
Composites: Phenolic	600	800	1000
Copper	800	900	1000
Delrin	800	1,050	1300
Graphite	600	800	1000
Plastics: Hard	500	800	1000
Plastics: Soft	600	800	1000

Speed & Feed Formulas

SFM = RPM X .262 X Tool Diameter

RPM = SFM X 3.82 ÷ Tool Diameter

IPM = RPM X IPT (CLPT) X Number of Flutes

IPT = IPM ÷ (RPM X Number of Flutes)

NOTE: Reduce SFM when using long reach tools.

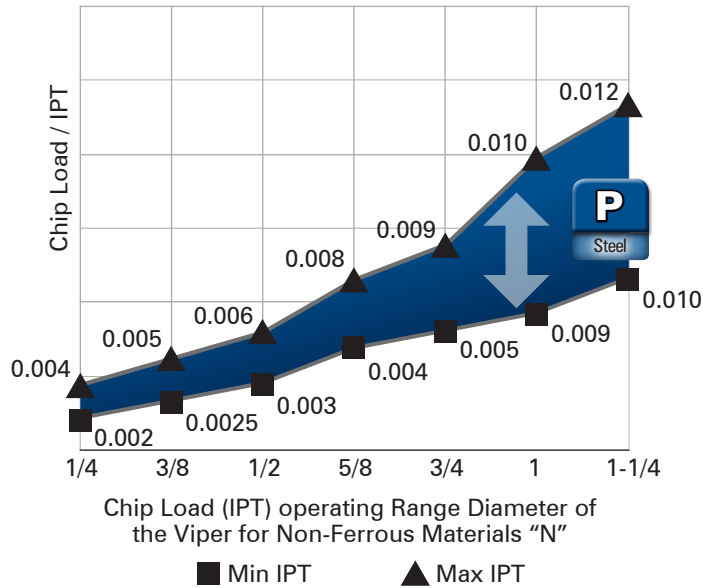
MRR = RDC X ADC X IPM (a.k.a. CIM)

HP = KW X 1.342

Torque (Full Load) = 5252 X HP ÷ RPM



Viper – Chip Load Operating Range



Steel		Viper DVH – "P" Mild Steel – SFM Starting Parameters					
ADC	RDC	Slotting			Peripheral		
		Conservative	Moderate	Aggressive	Conservative	Moderate	Aggressive
1/2 X D	1/4 X D	500	600	800	550	700	900
1 X D	1/2 X D	400	500	600	450	600	800
1.5 X D	1 X D	350	450	500	400	500	700
2 X D	1 X D	300	400	450	350	400	600

These parameters for materials in this material group that are Only under <18 – 20 HRc (Brinell Hardness <223 – 217). Our Raptor DVH, Raptor 3/6 and Python series end mills are better suited for this material group.

Material	Min SFM	Median SFM	Max SFM
Alloy Steel 4140, 4150, 4320, 5120, 6118, 6150, 8620	250	350	450
Free Machining Steel 1111, 1115, 1140	300	450	600
Low Carbon Steel 1010, 1018, 1020 12L14, A36	300	450	600
Med Carbon Steel 1035, 1040, 1095, 1525, 1572	200	320	470
Tool Steel A2, <35 R/c	150	300	450
Tool Steel D2 <35 R/c	150	300	450
Tool Steel P20, H13 <35 R/c	160	305	450

Speed & Feed Formulas

$$\text{SFM} = \text{RPM} \times .262 \times \text{Tool Diameter}$$

$$\text{RPM} = \text{SFM} \times 3.82 \div \text{Tool Diameter}$$

$$\text{IPM} = \text{RPM} \times \text{IPT (CLPT)} \times \text{Number of Flutes}$$

$$\text{IPT} = \text{IPM} \div (\text{RPM} \times \text{Number of Flutes})$$

NOTE: Reduce SFM when using long reach tools.

$$\text{MRR} = \text{RDC} \times \text{ADC} \times \text{IPM (a.k.a. CIM)}$$

$$\text{HP} = \text{KW} \times 1.342$$

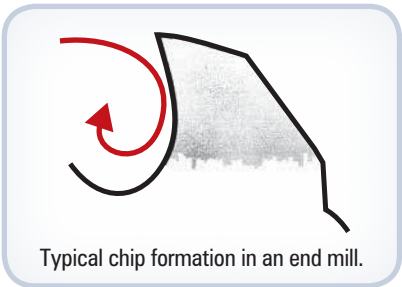
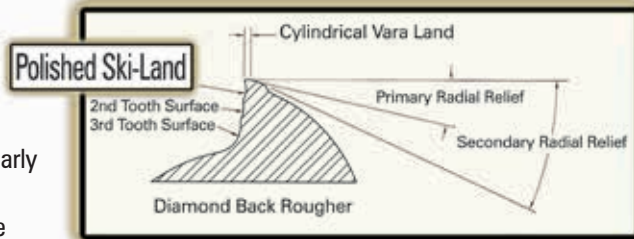
$$\text{Torque (Full Load)} = 5252 \times \text{HP} \div \text{RPM}$$



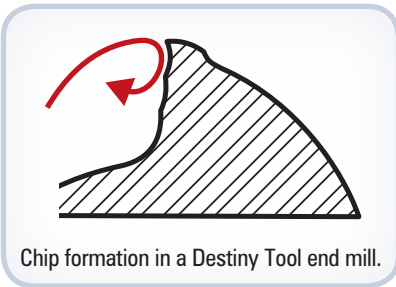
Diamond Back Chip Formation

One of the first things many people first notice is the multiple rake faces on our tools. Think of these as first, second and third gear in your car. When you read our speed/feed charts you will see that we have several recommendations for our tools. That's because, unlike most end mills on the market our tools are designed for elevated chip loads particularly in non-ferrous applications.

Most end mills form 6's & 9's by moving down into the rake face into the gullet (center line) of the tool. Our tools are designed a bit differently so that the chip actually forms in the outer rake face of the tool and ejects prior to traveling into the core diameter/gullet of the flute. This is part of the reason why increasing the chip load per tooth on our end mills will often reduce the horse power load of the machine. Less energy is required to form the chip and it reduces the heat put into the cutting tool. Heat is a major cause of cutting tool failure over time, so we developed our tools to remove as much heat in the chip as quickly as possible.



Typical chip formation in an end mill.



Chip formation in a Destiny Tool end mill.

Unlike other end mills we have found that chatter is caused by too LIGHT of a chip load per tooth. INCREASING the chip load per tooth will eliminate most chatter problems!

Diamond Back General Rule of Thumb: Chatter

Diamond Back: Understanding Roughing, Light Roughing and Finishing

One of the most common causes of chatter with our tools is running tools with TOO LIGHT of a chip load. Most chatter problems can be fixed by INCREASING the chip load per tooth (IPT)

Heavy Roughing (Side Milling) Defined:

- ADC (Axial Depth of Cut) = up to 1X diameter
- RDC (Radial Depth of Cut) = 30% – 50% of diameter

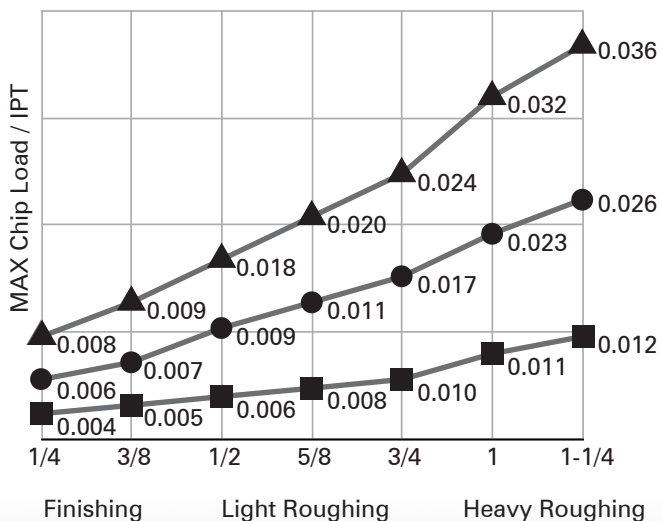
Light Roughing (Side Milling) Defined:

- ADC (Axial Depth of Cut) = up to 1X diameter
- RDC (Radial Depth of Cut) = 15% – 30% of diameter

Finishing (Side Milling) Defined:

- ADC (Axial Depth of Cut) = up to 1X diameter
- RDC (Radial Depth of Cut) = 4% – 15% of diameter

Diamond Back Chip Load For Finishing, Heavy Roughing & Light Roughing





2 Flute, Roughers, 45 Degree Helix

For high-speed machining of aluminum

Part No. Uncoated	Part No. Stealth	ZrN Coating	Dia. of Cut	Shank Dia.	LOC	OAL	Radius
DR21612R020	DR21612R020S	DR21612R020Z	1/4	1/4	3/4	2-1/2	0.020
DR22416R020	DR22416R020S	DR22416R020Z	3/8	3/8	1	2-1/2	0.020
DR23220R030	DR23220R030S	DR23220R030Z	1/2	1/2	1-1/4	3	0.030
DR24026R030	DR24026R030S	DR24026R030Z	5/8	5/8	1-5/8	4	0.030
DR24826R030	DR24826R030S	DR24826R030Z	3/4	3/4	1-5/8	4	0.030
DR24836R030	DR24836R030S	DR24836R030Z	3/4	3/4	2-1/4	5	0.030

For guidance to calculate surface footage & chip load for Diamond Back™ End Mills refer to the Technical Section on page 35.



2 Flute, Roughers

Long Shank Series with Reduced Neck, LBS*, Radius

Part No. Uncoated	Part No. Stealth	ZrN Coating	Dia. of Cut	Shank Dia.	LOC	LBS*	Neck Dia.	OAL	Radius
DR2160817R020	DR2160817R020S	DR2160817R020Z	1/4	1/4	1/2	2-1/8	0.235	4	0.020
DR2240817R020	DR2240817R020S	DR2240817R020Z	3/8	3/8	1/2	2-1/8	0.355	4	0.020
DR2321227R030	DR2321227R030S	DR2321227R030Z	1/2	1/2	3/4	3-3/8	0.475	6	0.030
DR2401227R030	DR2401227R030S	DR2401227R030Z	5/8	5/8	3/4	3-3/8	0.590	6	0.030
DR2481627R030	DR2481627R030S	DR2481627R030Z	3/4	3/4	1	3-3/8	0.715	6	0.030

*LBS: Length Below Shank

S: Stealth Coating (at end of number)

Z: Zirconium Coating, Limited Stock

For guidance to calculate surface footage & chip load for Diamond Back™ End Mills refer to the Technical Section on page 35.



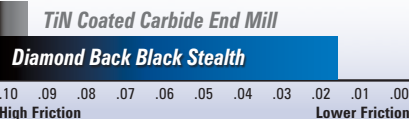
DR23220R030 DR23220R030S DR23220R030Z



Tolerances: Diamond Back

End Mill Diameter: $-.0001''$ to $-.0003''$
 Shank Diameter: $+.000''$ to $-.0003''$
 Ball Nose: $+.001''$ to $-.001''$

Friction Coefficients



Tool Life



SEE IT IN ACTION!





END MILLS FOR NON-FERROUS MATERIALS



BDR23220 BDR23220S BDR23220Z



Ball, 2 Flute, Roughers

Part No. Uncoated	Part No. Stealth	ZrN Coating	Dia. of Cut	Shank Dia.	LOC	OAL
BDR21612	BDR21612S	BDR21612Z	1/4	1/4	3/4	2-1/2
BDR22416	BDR22416S	BDR22416Z	3/8	3/8	1	2-1/2
BDR23220	BDR23220S	BDR23220Z	1/2	1/2	1-1/4	3
BDR24026	BDR24026S	BDR24026Z	5/8	5/8	1-5/8	4
BDR24826	BDR24826S	BDR24826Z	3/4	3/4	1-5/8	4
BDR24836	BDR24836S	BDR24836Z	3/4	3/4	2-1/4	5

For guidance to calculate surface footage & chip load for Diamond Back™ End Mills refer to the Technical Section on page 35.



Ball, 2 Flute, Roughers

Long Shank Series with Reduced Neck, LBS*

Part No. Uncoated	Part No. Stealth	ZrN Coating	Dia. of Cut	Shank Dia.	LOC	LBS*	Neck Dia.	OAL
BDR2160817	BDR2160817S	BDR2160817Z	1/4	1/4	1/2	2-1/8	0.235	4
BDR2240817	BDR2240817S	BDR2240817Z	3/8	3/8	1/2	2-1/8	0.355	4
BDR2321227	BDR2321227S	BDR2321227Z	1/2	1/2	3/4	3-3/8	0.475	6
BDR2401227	BDR2401227S	BDR2401227Z	5/8	5/8	3/4	3-3/8	0.590	6
BDR2481627	BDR2481627S	BDR2481627Z	3/4	3/4	1	3-3/8	0.715	6

*LBS: Length Below Shank

S: Stealth Coating (at end of number)
Z: Zirconium Coating, Limited Stock

For guidance to calculate surface footage & chip load for Diamond Back™ End Mills refer to the Technical Section on page 35.



Friction Coefficients

TiN Coated Carbide End Mill
Diamond Back Black Stealth

.10 .09 .08 .07 .06 .05 .04 .03 .02 .01 .00
High Friction Lower Friction

Tool Life

4 Hours: Carbide
40 hours: Diamond Back Black Stealth





3 Flute, Roughers

Part No. Uncoated	Part No. Stealth	ZrN Coating	Dia. of Cut	Shank Dia.	LOC	OAL	Radius
DR31606R020	DR31606R020S	DR31606R020Z	1/4	1/4	3/8	2	0.020
DR31608R020	DR31608R020S	DR31608R020Z	1/4	1/4	1/2	2	0.020
DR31612R020	DR31612R020S	DR31612R020Z	1/4	1/4	3/4	2-1/2	0.020
DR32410R020	DR32410R020S	DR32410R020Z	3/8	3/8	5/8	2	0.020
DR32416R020	DR32416R020S	DR32416R020Z	3/8	3/8	1	2-1/2	0.020
DR33210R030	DR33210R030S	DR33210R030Z	1/2	1/2	5/8	3	0.030
DR33216R030	DR33216R030S	DR33216R030Z	1/2	1/2	1	3	0.030
DR33220R030	DR33220R030S	DR33220R030Z	1/2	1/2	1-1/4	3	0.030
DR33220R045	DR33220R045S	DR33220R045Z	1/2	1/2	1-1/4	3	0.045
DR33220R060	DR33220R060S	DR33220R060Z	1/2	1/2	1-1/4	3	0.060
DR33220R090	DR33220R090S	DR33220R090Z	1/2	1/2	1-1/4	3	0.090
DR33220R125	DR33220R125S	DR33220R125Z	1/2	1/2	1-1/4	3	0.125
DR33224R030	DR33224R030S	DR33224R030Z	1/2	1/2	1-1/2	4	0.030
DR33232R030	DR33232R030S	DR33232R030Z	1/2	1/2	2	4	0.030
DR34012R030	DR34012R030S	DR34012R030Z	5/8	5/8	3/4	3-1/2	0.030
DR34020R030	DR34020R030S	DR34020R030Z	5/8	5/8	1-1/4	3-1/2	0.030
DR34020R060	DR34020R060S	DR34020R060Z	5/8	5/8	1-1/4	3-1/2	0.060
DR34020R093	DR34020R093S	DR34020R093Z	5/8	5/8	1-1/4	3-1/2	0.093
DR34020R125	DR34020R125S	DR34020R125Z	5/8	5/8	1-1/4	3-1/2	0.125
DR34026R030	DR34026R030S	DR34026R030Z	5/8	5/8	1-5/8	4	0.030
DR34026R060	DR34026R060S	DR34026R060Z	5/8	5/8	1-5/8	4	0.060
DR34026R093	DR34026R093S	DR34026R093Z	5/8	5/8	1-5/8	4	0.093
DR34026R125	DR34026R125S	DR34026R125Z	5/8	5/8	1-5/8	4	0.125
DR34032R030	DR34032R030S	DR34032R030Z	5/8	5/8	2	5	0.030
DR34816R030	DR34816R030S	DR34816R030Z	3/4	3/4	1	4	0.030
DR34826R030	DR34826R030S	DR34826R030Z	3/4	3/4	1-5/8	4	0.030
DR34826R045	DR34826R045S	DR34826R045Z	3/4	3/4	1-5/8	4	0.045
DR34826R060	DR34826R060S	DR34826R060Z	3/4	3/4	1-5/8	4	0.060
DR34826R090	DR34826R090S	DR34826R090Z	3/4	3/4	1-5/8	4	0.090
DR34826R125	DR34826R125S	DR34826R125Z	3/4	3/4	1-5/8	4	0.125
DR34826R190	DR34826R190S	DR34826R190Z	3/4	3/4	1-5/8	4	0.190
DR34836R030	DR34836R030S	DR34836R030Z	3/4	3/4	2-1/4	5	0.030
DR34852R030	DR34852R030S	DR34852R030Z	3/4	3/4	3-1/4	6	0.030
DR36424R030	DR36424R030S	DR36424R030Z	1	1	1-1/2	4	0.030
DR36424R060	DR36424R060S	DR36424R060Z	1	1	1-1/2	4	0.060
DR36424R093	DR36424R093S	DR36424R093Z	1	1	1-1/2	4	0.093
DR36424R125	DR36424R125S	DR36424R125Z	1	1	1-1/2	4	0.125
DR36436R030	DR36436R030S	DR36436R030Z	1	1	2-1/4	5	0.030
DR36452R030	DR36452R030S	DR36452R030Z	1	1	3-1/4	6	0.030

S: Stealth Coating (at end of number)

Z: Zirconium Coating, Limited Stock

— Additional radius sizes in stock. Call for availability.

For guidance to calculate surface footage & chip load for Diamond Back™ End Mills refer to the Technical Section on page 35.



DR33216R030 DR33216R030S DR33210R030Z



Tolerances: Diamond Back

End Mill Diameter: $-0.001''$ to $-0.003''$
Shank Diameter: $+0.000''$ to $-0.003''$
Ball Nose: $+0.01''$ to $-0.01''$

SEE IT IN ACTION!





END MILLS FOR NON-FERROUS MATERIALS



DR3321017R030 DR3321017R030S DR3321017R030Z



N
Aluminum



DR43216R030



3 Flute, Roughers

Long Shank Series with Reduced Neck, LBS* Radius

Part No. Uncoated	Part No. Stealth	ZrN Coating	Dia. of Cut	Shank Dia.	LOC	LBS*	Neck Dia.	OAL	Radius
DR3160617R020	DR3160617R020S	DR3160617R020Z	1/4	1/4	3/8	2-1/8	0.235	4	0.020
DR3240809R020	DR3240809R020S	DR3240809R020Z	3/8	3/8	1/2	1-1/8	0.355	2-1/2	0.020
DR3240817R020	DR3240817R020S	DR3240817R020Z	3/8	3/8	1/2	2-1/8	0.355	4	0.020
DR3321011R030	DR3321011R030S	DR3321011R030Z	1/2	1/2	5/8	1-3/8	0.475	3	0.030
DR3321017R030	DR3321017R030S	DR3321017R030Z	1/2	1/2	5/8	2-1/8	0.475	4	0.030
DR3321020R030	DR3321020R030S	DR3321020R030Z	1/2	1/2	5/8	2-1/2	0.475	5	0.030
DR3321227R030	DR3321227R030S	DR3321227R030Z	1/2	1/2	3/4	3-3/8	0.475	6	0.030
DR3401227R030	DR3401227R030S	DR3401227R030Z	5/8	5/8	3/4	3-3/8	0.590	6	0.030
DR3481616R030	DR3481616R030S	DR3481616R030Z	3/4	3/4	1	2	0.715	5	0.030
DR3481627R030	DR3481627R030S	DR3481627R030Z	3/4	3/4	1	3-3/8	0.715	6	0.030
DR3481640R030	DR3481640R030S	DR3481640R030Z	3/4	3/4	1	5	0.715	8	0.030
DR3642027R030	DR3642027R030S	DR3642027R030Z	1	1	1-1/4	3-3/8	0.960	6	0.030
DR3642040R030	DR3642040R030S	DR3642040R030Z	1	1	1-1/4	5	0.960	8	0.030
DR3643280R030	DR3643280R030S	DR3643280R030Z	1	1	2	10	0.960	13	0.030

*LBS: Length Below Shank

S: Stealth Coating (at end of number)

Z: Zirconium Coating, Limited Stock

For guidance to calculate surface footage & chip load for Diamond Back™ End Mills refer to the Technical Section on page 35.



Radius, 4 Flute Diamondback Rougher, 45 Degree

Part No. Coated	Part No. Stealth	Dia. of Cut	Shank Dia.	LOC	OAL	Radius
DR43210R030	DR43210R030S	1/2	1/2	5/8	3	0.030
DR43216R030	DR43216R030S	1/2	1/2	1	3	0.030
DR43220R030	DR43220R030S	1/2	1/2	1-1/4	3	0.030
DR44020R030	DR44020R030S	5/8	5/8	1-1/4	3-1/2	0.030
DR44026R030	DR44026R030S	5/8	5/8	1-5/8	4	0.030
DR44816R040	DR44816R040S	3/4	3/4	1	4	0.040
DR44826R040	DR44826R040S	3/4	3/4	1-5/8	4	0.040
DR44836R040	DR44836R040S	3/4	3/4	2-1/4	5	0.040
DR46424R040	DR46424R040S	1	1	1-1/2	4	0.040
DR46436R040	DR46436R040S	1	1	2-1/4	5	0.040

For guidance to calculate surface footage & chip load for Diamond Back™ End Mills refer to the Technical Section on page 35.



Tolerances: Diamond Back

End Mill Diameter: $-0.001"$ to $-0.0003"$

Shank Diameter: $+0.000"$ to $-0.0003"$

Friction Coefficients

TiN Coated Carbide End Mill



Tool Life

4 Hours: Carbide

40 hours: Diamond Back Black Stealth

SEE IT IN ACTION!



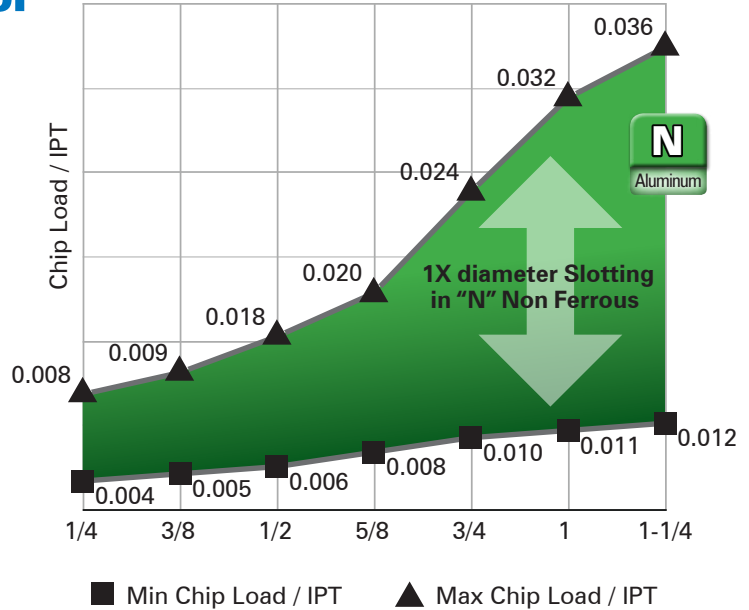


Diamond Back Rougher

The Diamond Back Rougher is designed for maximum Metal Removal Rates (MRR) in Non Ferrous Applications. Although the charts depict a maximum chip load per tooth (IPT) value your maximum may be lower due to machine horsepower, **machine torque**, toolholder and/or workholding.

The "General Operating Range" is based upon **1X diameter** (ADC / DOC) in full diameter (RDC / WOC) **SLOTTING**. The minimum chip loads remain constant for all applications, however, the maximum chip loads can be increased for side milling applications in finishing, heavy roughing & light roughing.

Diamond Back Rougher – Chip Load General Operating Range



ADC		Diamond Back – "N" Non-Ferrous Alloys – SFM Starting Parameters					
ADC	RDC	Slotting			Peripheral		
		Conservative	Moderate	Aggressive	Conservative	Moderate	Aggressive
1/2 X D	1/4 X D	1600	2400	MAX	1800	2400	MAX
1 X D	1/2 X D	1400	2400	MAX	1600	2400	MAX
1.5 X D	1 X D	1200	2400	MAX	1400	1800	MAX
2 X D	1 X D	1000	2000	MAX	1200	1600	MAX

Material	Min SFM	Median SFM	Max SFM
Aluminum	1200	65% Max RPM	Max RPM
Aluminum Cast	1000	65% Max RPM	Max RPM
Brass Yellow, Red	400	950	1500
Bronze – Alum Bronze	250	625	1000
Composites: CFRP; Aramid	200	300	400
Composites: Honeycomb	200	300	400
Composites: Phenolic	600	800	1000
Copper	800	900	1000
Delrin	800	1,050	1300
Graphite	600	800	1000
Plastics: Hard	500	800	1000
Plastics: Soft	600	800	1000

Speed & Feed Formulas

SFM = RPM X .262 X Tool Diameter

RPM = SFM X 3.82 ÷ Tool Diameter

IPM = RPM X IPT (CLPT) X Number of Flutes

IPT = IPM ÷ (RPM X Number of Flutes)

NOTE: Reduce SFM when using long reach tools.

MRR = RDC X ADC X IPM (a.k.a. CIM)

HP = KW X 1.342

Torque (Full Load) = 5252 X HP ÷ RPM



END MILLS FOR FERROUS AND NON-FERROUS MATERIALS

Python
45° HELIX END MILLS



P31210X P31205D P31210R



3 Flute, 45 Degree Rapid Helix

For high-speed machining of stainless steel and aluminum

Part No. S/E	X-Treme Coating	Dia. of Cut	Shank Dia.	LOC	OAL
P30706	P30706X	7/64	1/8	3/8	1-1/2
P30805	P30805X	1/8	1/8	5/16	1-1/2
P30808	P30808X	1/8	1/8	1/2	1-1/2
P30812	P30812X	1/8	1/8	3/4	2
P30906	P30906X	9/64	3/16	3/8	2
P31206	P31206X	3/16	3/16	3/8	2
P31210	P31210X	3/16	3/16	5/8	2-1/2
P31212	P31212X	3/16	3/16	3/4	2-1/2

For guidance to calculate surface footage & chip load for Python™ End Mills refer to the Technical Section on pages 39 to 41.



3 Flute, Double End, 45 Degree Rapid Helix

Part No. S/E	X-Treme Coating	Dia. of Cut	Shank Dia.	LOC	OAL
P30804D	N/A	1/8	1/8	1/4	1-1/2
P31005D	P31005DX	5/32	3/16	5/16	2
P31205D	P31205DX	3/16	3/16	5/16	2
P31408D	P31408DX	7/32	1/4	1/2	2-1/2

For guidance to calculate surface footage & chip load for Python™ End Mills refer to the Technical Section on pages 39 to 41.



3 Flute, 45 Degree Rapid Helix, With Radius

Part No. S/E	X-Treme Coating	Dia. of Cut	Shank Dia.	LOC	OAL	Radius
P30706R	P30706RX	7/64	1/8	3/8	1-1/2	.015-.020
P30805R	P30805RX	1/8	1/8	5/16	1-1/2	.008-.012
P30808R	P30808RX	1/8	1/8	1/2	1-1/2	.008-.012
P30906R	P30906RX	9/64	3/16	3/8	2	.015-.020
P31206R	P31206RX	3/16	3/16	3/8	2	.008-.012
P31210R	P31210RX	3/16	3/16	5/8	2-1/2	.008-.012

X: X-Treme Coating

For guidance to calculate surface footage & chip load for Python™ End Mills refer to the Technical Section on pages 39 to 41.



5 Flute, 45 Degree Rapid Helix

Part No. S/E	X-Treme Coating	Dia. of Cut	Shank Dia.	LOC	OAL
P50805	P50805X	1/8	1/8	5/16	1-1/2
P50808	P50808X	1/8	1/8	1/2	1-1/2
P50812	P50812X	1/8	1/8	3/4	2
P51206	P51206X	3/16	3/16	3/8	2
P51210	P51210X	3/16	3/16	5/8	2-1/2
P51212	P51212X	3/16	3/16	3/4	2-1/2
P51608	P51608X	1/4	1/4	1/2	2
P51612	P51612X	1/4	1/4	3/4	2-1/2
P51618	P51618X	1/4	1/4	1-1/8	2-1/2
P52008	P52008X	5/16	5/16	1/2	2
P52013	P52013X	5/16	5/16	13/16	2-1/2
P52018	P52018X	5/16	5/16	1-1/8	2-1/2
P52410	P52410X	3/8	3/8	5/8	2
P52416	P52416X	3/8	3/8	1	2-1/2
P52420	P52420X	3/8	3/8	1-1/4	3
P52809	P52809X	7/16	7/16	9/16	2-3/4
P52816	P52816X	7/16	7/16	1	2-3/4
P53212	P53212X	1/2	1/2	3/4	3
P53216	P53216X	1/2	1/2	1	3
P53220	P53220X	1/2	1/2	1-1/4	3
P53224	P53224X	1/2	1/2	1-1/2	4
P53232	P53232X	1/2	1/2	2	4
P54012	P54012X	5/8	5/8	3/4	3-1/2
P54020	P54020X	5/8	5/8	1-1/4	3-1/2
P54026	P54026X	5/8	5/8	1-5/8	4
P54032	P54032X	5/8	5/8	2	5
P54036	P54036X	5/8	5/8	2-1/4	5
P54052	P54052X	5/8	5/8	3-1/4	6
P54816	P54816X	3/4	3/4	1	4
P54826	P54826X	3/4	3/4	1-5/8	4
P54832	P54832X	3/4	3/4	2	5
P54836	P54836X	3/4	3/4	2-1/4	5
P54840	P54840X	3/4	3/4	2-1/2	5
P54852	P54852X	3/4	3/4	3-1/4	6
P56424	P56424X	1	1	1-1/2	4
P56432	P56432X	1	1	2	5
P56440	P56440X	1	1	2-1/2	5
P56452	P56452X	1	1	3-1/4	6
P56464	P56464X	1	1	4	7

X: X-Treme Coating

For guidance to calculate surface footage & chip load for Python™ End Mills refer to the Technical Section on pages 39 to 41.



P53216

P53216X

P

Steel

N

Aluminum

Tolerances: Python

End Mill Diameter: $-.000''$ to $-.002''$
Shank Diameter: $+.000''$ to $-.0003''$

SEE IT IN ACTION!





END MILLS FOR FERROUS AND NON-FERROUS MATERIALS

Python
45° HELIX END MILLS



P53210D P78032 P78032X

P

Steel

N

Aluminum



5 Flute, Double End, 45 Degree Rapid Helix

Part No. S/E	X-Treme Coating	Dia. of Cut	Shank Dia.	LOC	OAL
P50804D	P50804DX	1/8	1/8	1/4	1-1/2
P51005D	P51005DX	5/32	3/16	5/16	2
P51205D	P51205DX	3/16	3/16	5/16	2
P51408D	P51408DX	7/32	1/4	1/2	2-1/2
P51608D	P51608DX	1/4	1/4	1/2	2-1/2
P52008D	P52008DX	5/16	5/16	1/2	2-1/2
P52409D	P52409DX	3/8	3/8	9/16	2-1/2
P52809D	P52809DX	7/16	7/16	9/16	2-3/4
P53210D	P53210DX	1/2	1/2	5/8	3

For guidance to calculate surface footage & chip load for Python™ End Mills refer to the Technical Section on pages 39 to 41.



7 Flute, 45 Degree Rapid Helix

Part No. S/E	X-Treme Coating	Dia. of Cut	Shank Dia.	LOC	OAL
P78020	P78020X	1-1/4	1-1/4	1-1/4	4-1/2
P78032	P78032X	1-1/4	1-1/4	2	4-1/2
P78050	P78050X	1-1/4	1-1/4	3-1/4	6
P78080	P78080X	1-1/4	1-1/4	5	7-1/2

X: X-Treme Coating

For guidance to calculate surface footage & chip load for Python™ End Mills refer to the Technical Section on pages 39 to 41.



Tolerances: Python

End Mill Diameter: -.0001" to -.0002"
Shank Diameter: +.000" to -.0003"

SEE IT IN ACTION!



D DESTINY TOOL
THE MARK OF PERFORMANCE



SFM: Surface Feet per Minute

This chart provides some general operating parameters for calculating surface footage for Destiny End Mills. These are starting condition guidelines only. The machine tool, workholding/xturing, toolholding, partcon guration, and coolant capability may significantly influence your specific applications.

Material	Min SFM	Median SFM	Max SFM	Destiny Tool			
				1st Choice	Page #	2nd Choice	Page #
Aluminum	1200	65% Max RPM	Max RPM	Diamond Back	29-32	Viper	14-25
Aluminum Cast	1000	65% Max RPM	Max RPM	Diamond Back	29-32	Viper	14-25
Brass Yellow, Red	400	950	1500	Diamond Back	29-32	Viper	14-25
Bronze – Alum Bronze	250	625	1000	Diamond Back	29-32	Viper	14-25
Composites: CFRP; Aramid	200	300	400	Viper	14-25	Python	34-36
Composites: Honeycomb	200	300	400	Viper	14-25	Python	34-36
Composites: Phenolic	600	800	1000	Viper	14-25		
Copper	800	900	1000	Viper	14-25	Python	34-36
Delrin	800	1,050	1300	Viper	14-25		
Graphite	600	800	1000	Viper	14-25		
Plastics: Hard	500	800	1000	Viper	14-25		
Plastics: Soft	600	800	1000	Viper	14-25		
Cobalt Alloys Haynes 25, 188, Stellite	60	90	110	Raptor DVH	41-47	Raptor 3/6	50-53
Hastelloy	100	180	220	Raptor DVH	41-47	Raptor 3/6	50-53
Inconel 525, 700, 718, Rene 41, Nomonic, Waspaloy, Monel, Hastelloy, Astroloy, Udimet	65	158	250	Raptor DVH	41-47	Raptor 3/6	50-53
Invar	150	200	400	Raptor DVH	41-47	Raptor 3/6	50-53
Iron Alloys A-286, 16-25-6	150	200	400	Raptor DVH	41-47	Raptor 3/6	50-53
Kovar	250	375	500	Raptor DVH	41-47	Raptor 3/6	50-53
Nickel Alloys	75	150	180	Raptor DVH	41-47	Raptor 3/6	50-53
Notronic	100	180	220	Raptor DVH	41-47	Raptor 3/6	50-53
Titanium 4AL4V	100	180	220	Raptor DVH	41-47	Raptor 3/6	50-53
Titanium 6AL4V	160	280	400	Raptor DVH	41-47	Raptor 3/6	50-53
Titanium 6AL6V	160	280	400	Raptor DVH	41-47	Raptor 3/6	50-53
Titanium Comm Pure	80	290	500	Raptor DVH	41-47	Raptor 3/6	50-53
Stainless Austenitic 304L, 316L, 13-8	250	325	400	Raptor DVH	41-47	Raptor 3/6	50-53
Stainless Austenitic 303, 304	260	350	500	Raptor DVH	41-47	Raptor 3/6	50-53
Stainless Ferritic 430, 434	250	300	400	Raptor DVH	41-47	Raptor 3/6	50-53
Stainless Martensitic 17-4	250	425	600	Raptor DVH	41-47	Raptor 3/6	50-53
Stainless Martensitic 420, 440	200	300	400	Raptor DVH	41-47	Raptor 3/6	50-53
Stainless Martensitic 15-5	250	300	400	Raptor DVH	41-47	Raptor 3/6	50-53
Stainless Martensitic 410, 416	250	325	400	Raptor DVH	41-47	Raptor 3/6	50-53
Alloy Steel 4140, 4150, 4320, 5120, 6118, 6150, 8620	250	350	450	Raptor DVH	41-47	Raptor 3/6	50-53
Free Machining Steel 1111, 1115, 1140	300	450	600	Raptor DVH	41-47	Raptor 3/6	50-53
Low Carbon Steel 1010, 1018, 1020 12L14, A36	300	450	600	Raptor DVH	41-47	Raptor 3/6	50-53
Med Carbon Steel 1035, 1040, 1095, 1525, 1572	200	320	470	Raptor DVH	41-47	Raptor 3/6	50-53
Tool Steel A2, <35 R/c	150	300	450	Raptor DVH	41-47	Raptor 3/6	50-53
Tool Steel D2 <35 R/c	150	300	450	Raptor DVH	41-47	Raptor 3/6	50-53
Tool Steel P20, H13 <35 R/c	160	305	450	Raptor DVH	41-47	Raptor 3/6	50-53
Cast Iron Ductile A536	200	350	500	Raptor DVH	41-47	Raptor 3/6	50-53
Cast Iron Gray A48, Class 20 – 60	250	400	500	Raptor DVH	41-47	Raptor 3/6	50-53

NOTE: Reduce SFM when using long reach tools.

Python The Python is our general purpose end mill used for many common machine shop operations.

High Temp

S

Python – “S” High Temp Alloys – SFM Starting Parameters

ADC	RDC	Slotting			Peripheral		
		Conservative	Moderate	Aggressive	Conservative	Moderate	Aggressive
1/2 X D	1/4 X D	125	150	175	150	175	200
1 X D	1/2 X D	100	125	150	125	150	175
1.5 X D	1 X D	75	100	125	100	125	150
2 X D	1 X D	60	80	100	80	105	125

Stainless

M

Python – “M” Stainless – SFM Starting Parameters

ADC	RDC	Slotting			Peripheral		
		Conservative	Moderate	Aggressive	Conservative	Moderate	Aggressive
1/2 X D	1/4 X D	300	350	400	350	400	450
1 X D	1/2 X D	275	325	350	300	350	400
1.5 X D	1 X D	250	300	330	275	325	375
2 X D	1 X D	225	275	250	250	300	250

Steel

P

Python – “P” Mild Steel – SFM Starting Parameters

ADC	RDC	Slotting			Peripheral		
		Conservative	Moderate	Aggressive	Conservative	Moderate	Aggressive
1/2 X D	1/4 X D	400	450	500	450	500	550
1 X D	1/2 X D	350	400	450	400	450	500
1.5 X D	1 X D	300	350	400	350	400	450
2 X D	1 X D	250	300	350	300	350	400

Cast Iron

K

Python – “K” Cast Iron – SFM Starting Parameters

ADC	RDC	Slotting			Peripheral		
		Conservative	Moderate	Aggressive	Conservative	Moderate	Aggressive
1/2 X D	1/4 X D	250	300	350	300	350	400
1 X D	1/2 X D	225	275	325	275	325	375
1.5 X D	1 X D	250	300	350	250	300	350
2 X D	1 X D	200	225	250	200	250	350

Speed & Feed Formulas

$$\text{SFM} = \text{RPM} \times .262 \times \text{Tool Diameter}$$

$$\text{RPM} = \text{SFM} \times 3.82 \div \text{Tool Diameter}$$

$$\text{IPM} = \text{RPM} \times \text{IPT (CLPT)} \times \text{Number of Flutes}$$

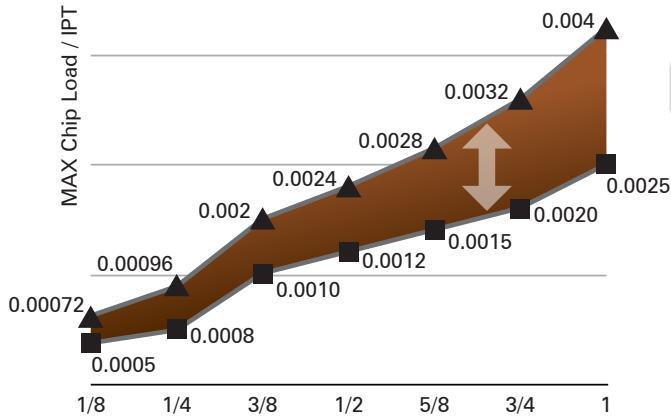
$$\text{IPT} = \text{IPM} \div (\text{RPM} \times \text{Number of Flutes})$$

NOTE: Reduce SFM when using long reach tools.

$$\text{MRR} = \text{RDC} \times \text{ADC} \times \text{IPM (a.k.a. CIM)}$$

$$\text{HP} = \text{KW} \times 1.342$$

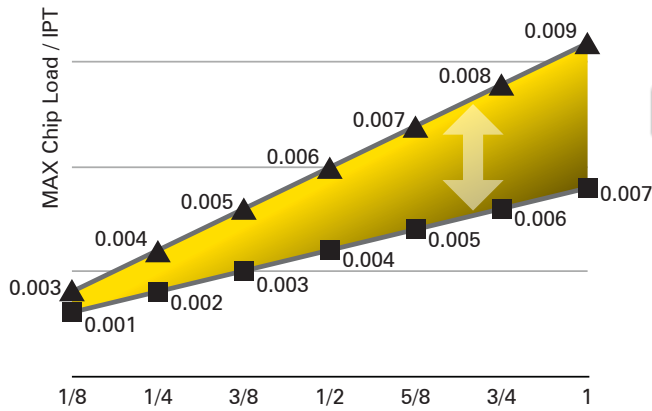
$$\text{Torque (Full Load)} = 5252 \times \text{HP} \div \text{RPM}$$



S
HighTemp

Python – Chip Load Operating Range "S" High Temp Alloys

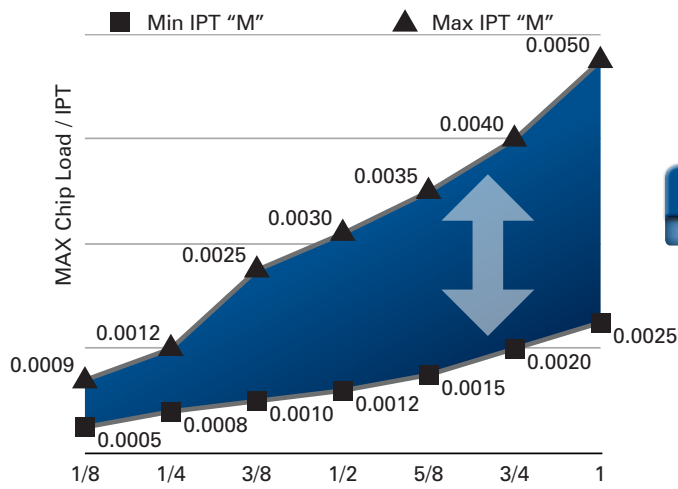
■ Min IPT "N" ▲ Max IPT "N"



M
Stainless

Python – Chip Load Operating Range "M" Stainless

■ Min IPT "N" ▲ Max IPT "N"



P
Steel

Python – Chip Load Operating Range "P" Steel

■ Min IPT "N" ▲ Max IPT "N"



K
Cast Iron

Python – Chip Load Operating Range "K" Cast Iron

■ Min IPT "N" ▲ Max IPT "N"



END MILLS FOR HIGH-TEMPERATURE & EXOTIC MATERIALS

"We are amazed at the Destiny Tool Raptor 3/6 tool – previous tool cut 20 pieces, your tool is on our 200th part and still running!"

— END USER, PIERCETON, IN

Some of the most common problems associated with machining Exotic materials is the abrasiveness of the materials combined with their, often times, gummy properties and their ability to quickly work harden.

Our Raptor DVH end mills are designed to address each one of those common problems with some very unique design components.

By utilizing a very up-sharp primary grind we reduce chatter and harmonics which often lead to workhardening. Our geometry also evacuates the chips from the flute quickly, so we reduce the amount of heat buildup inside the flute which results in increased material removal rates.

Our coatings are optimized for Titanium Alloys, Inconel, Nickel Alloys and other high temperature materials which a low coefficient of friction value but some great wear resistance against abrasive wear.

Our unique geometry, combined with our substrate and coatings, combined permits higher feed rates for slotting, profiling and semi-finishing.



DVH
Raptor
38° HELIX SOLID CARBIDE END MILLS

Raptor
38° HELIX SOLID CARBIDE END MILLS



SEE OUR TOOLS IN ACTION!
www.youtube.com/user/destinytool



Square End, 4 Flute, Variable Helix

Stub, Regular, Medium Length (AlTiN Coating)

Part No. Coated	Dia. of Cut	Shank Dia.	LOC	OAL
DVH40401C	1/16	1/8	3/32	1-1/2
DVH40402C	1/16	1/8	3/16	1-1/2
DVH40501C	5/64	1/8	7/64	1-1/2
DVH40502C	5/64	1/8	15/64	1-1/2
DVH40601C	3/32	1/8	7/64	1-1/2
DVH40602C	3/32	1/8	9/32	1-1/2
DVH40701C	7/64	1/8	5/32	1-1/2
DVH40702C	7/64	1/8	21/64	1-1/2
DVH40804C	1/8	1/8	1/4	1-1/2
DVH40806C	1/8	1/8	3/8	1-1/2
DVH40808C	1/8	1/8	1/2	2
DVH41205C	3/16	3/16	5/16	2
DVH41207C	3/16	3/16	7/16	2
DVH41210C	3/16	3/16	5/8	2
DVH41214C	3/16	3/16	7/8	2-1/2
DVH41406C	7/32	1/4	3/8	2
DVH41412C	1/4	1/4	1	2-1/2
DVH41606C	1/4	1/4	3/8	2
DVH41608C	1/4	1/4	1/2	2-1/2
DVH41612C	1/4	1/4	3/4	2-1/2
DVH41616C	1/4	1/4	1	2-1/2
DVH41620C	1/4	1/4	1-1/4	3
DVH42008C	5/16	5/16	1/2	2
DVH42013C	5/16	5/16	13/16	2-1/2
DVH42408C	3/8	3/8	1/2	2
DVH42412C	3/8	3/8	3/4	2-1/2
DVH42414C	3/8	3/8	7/8	2-1/2
DVH42416C	3/8	3/8	1	2-1/2
DVH42420C	3/8	3/8	1-1/4	3
DVH42424C	3/8	3/8	1-1/2	4
DVH43210C	1/2	1/2	5/8	3
DVH43216C	1/2	1/2	1	3
DVH43220C	1/2	1/2	1-1/4	3
DVH43224C	1/2	1/2	1-1/2	4
DVH43232C	1/2	1/2	2	4
DVH43240C	1/2	1/2	2-1/2	5
DVH43248C	1/2	1/2	3	6
DVH44012C	5/8	5/8	3/4	3
DVH44020C	5/8	5/8	1-1/4	3-1/2
DVH44024C	5/8	5/8	1-1/2	4
DVH44032C	5/8	5/8	2	5
DVH44036C	5/8	5/8	2-1/4	5
DVH44816C	3/4	3/4	1	3
DVH44824C	3/4	3/4	1-1/2	4
DVH44832C	3/4	3/4	2	5
DVH44836C	3/4	3/4	2-1/4	5
DVH44840C	3/4	3/4	2-1/2	5
DVH44852C	3/4	3/4	3-1/4	6
DVH46416C	1	1	1	3
DVH46424C	1	1	1-1/2	4
DVH46436C	1	1	2-1/4	5
DVH46452C	1	1	3-1/4	6

C: AlTiN Coating

For guidance to calculate surface footage & chip load for Raptor™ DVH End Mills refer to the Technical Section on pages 54 to 55.



DVH43216C

P	M	S
Steel	Stainless	High Temp

A: Autonomous Coating - For high heat as well as low heat applications (limited stock)

Tolerances: Raptor

End Mill Diameter: $-.000''$ to $-.002''$
Shank Diameter: $+.000''$ to $-.0003''$



SEE IT IN ACTION!





END MILLS FOR HIGH-TEMPERATURE & EXOTIC MATERIALS



DVH432160C



BDVH43210C

P Steel	M Stainless	S HighTemp
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Square End, 4 Flute, Long Shank Series

(AlTiN Coating)

Part No. Coated	Dia. of Cut	Shank Dia.	LOC	OAL
DVH4060817C	1/4	1/4	1/2	4
DVH4081208C	1/8	1/8	3/16	3
DVH4120804C	3/16	3/16	.281	3
DVH416080C	1/4	1/4	1/2	4
DVH420130C	5/16	5/16	13/16	4
DVH424140C	3/8	3/8	7/8	5
DVH432160C	1/2	1/2	1	6
DVH4321600C	1/2	1/2	1	7
DVH4401600C	5/8	5/8	1	7
DVH440200C	5/8	5/8	1-1/4	6
DVH4481600C	3/4	3/4	1	7
DVH448240C	3/4	3/4	1-1/2	6
DVH4483200C	3/4	3/4	2	8
DVH44832000C	3/4	3/4	2	12
DVH464240C	1	1	1-1/2	6
DVH4642400C	1	1	1-1/2	7
DVH4643200C	1	1	2	8
DVH46432000C	1	1	2	12

For guidance to calculate surface footage & chip load for Raptor™ DVH End Mills refer to the Technical Section on pages 54 to 55.



Ball, 4 Flute

(AlTiN Coating)

Part No. Coated	Dia. of Cut	Shank Dia.	LOC	OAL
BDVH40804C	1/8	1/8	1/4	1-1/2
BDVH40806C	1/8	1/8	3/8	1-1/2
BDVH40808C	1/8	1/8	1/2	2
BDVH41205C	3/16	3/16	5/16	2
BDVH41210C	3/16	3/16	5/8	2
BDVH41606C	1/4	1/4	3/8	2
BDVH41608C	1/4	1/4	1/2	2-1/2
BDVH41612C	1/4	1/4	3/4	2-1/2
BDVH42008C	5/16	5/16	1/2	2
BDVH42013C	5/16	5/16	13/16	2-1/2
BDVH42408C	3/8	3/8	1/2	2
BDVH42414C	3/8	3/8	7/8	2-1/2
BDVH43210C	1/2	1/2	5/8	3
BDVH43216C	1/2	1/2	1	3
BDVH43220C	1/2	1/2	1-1/4	3
BDVH44012C	5/8	5/8	3/4	3
BDVH44020C	5/8	5/8	1-1/4	3-1/2
BDVH44816C	3/4	3/4	1	4
BDVH44824C	3/4	3/4	1-1/2	4
BDVH46424C	1	1	1-1/2	4

C: AlTiN Coating

For guidance to calculate surface footage & chip load for Raptor™ DVH End Mills refer to the Technical Section on pages 54 to 55.



Radius, 4 Flute

Stub, Regular, Medium Length (AlTiN Coating)

Part No. Coated	Dia. of Cut	Shank Dia.	LOC	OAL	Radius
DVH40401RC	1/16	1/8	3/32	1-1/2	0.005
DVH40402RC	1/16	1/8	3/16	1-1/2	0.005
DVH40501RC	5/64	1/8	7/64	1-1/2	0.005
DVH40502RC	5/64	1/8	15/64	1-1/2	0.005
DVH40601RC	3/32	1/8	7/64	1-1/2	0.005
DVH40602RC	3/32	1/8	9/32	1-1/2	0.005
DVH40701RC	7/64	1/8	5/32	1-1/2	0.005
DVH40702RC	7/64	1/8	21/64	1-1/2	0.005
DVH40804RC	1/8	1/8	1/4	1-1/2	.008-.012
DVH40806RC	1/8	1/8	3/8	1-1/2	.008-.012
DVH40808RC	1/8	1/8	1/2	2	.008-.012
DVH41205RC	3/16	3/16	5/16	2	.008-.012
DVH41207RC	3/16	3/16	7/16	2	.008-.012
DVH41210RC	3/16	3/16	5/8	2	.008-.012
DVH41214RC	3/16	3/16	7/8	2-1/2	.008-.012
DVH41406RC	7/32	1/4	3/8	2	.015-.020
DVH41412RC	7/32	1/4	3/4	2-1/2	.015-.020
DVH41604RC	1/4	1/4	1/4	2	.015-.020
DVH41606RC	1/4	1/4	3/8	2	.015-.020
DVH41608RC	1/4	1/4	1/2	2-1/2	.015-.020
DVH41612RC	1/4	1/4	3/4	2-1/2	.015-.020
DVH41616RC	1/4	1/4	1	2-1/2	.015-.020
DVH41620RC	1/4	1/4	1-1/4	3	.015-.020
DVH42005RC	5/16	5/16	5/16	2	.015-.020
DVH42008RC	5/16	5/16	1/2	2	.015-.020
DVH42013RC	5/16	5/16	13/16	2-1/2	.015-.020
DVH42406RC	3/8	3/8	3/8	2	.015-.020
DVH42408RC	3/8	3/8	1/2	2	.015-.020
DVH42414RC	3/8	3/8	7/8	2-1/2	.015-.020
DVH42416RC	3/8	3/8	1	2-1/2	.015-.020
DVH42420RC	3/8	3/8	1-1/4	3	.015-.020
DVH42424RC	3/8	3/8	1-1/2	4	.015-.020
DVH42816RC	7/16	7/16	1	2-3/4	.025-.030
DVH43208RC	1/2	1/2	1/2	3	.025-.030
DVH43210RC	1/2	1/2	5/8	3	.025-.030
DVH43216RC	1/2	1/2	1	3	.025-.030
DVH43220RC	1/2	1/2	1-1/4	3	.025-.030
DVH43224RC	1/2	1/2	1-1/2	4	.025-.030
DVH43228RC	1/2	1/2	1-3/4	4	.025-.030
DVH43232RC	1/2	1/2	2	4	.025-.030
DVH43236RC	1/2	1/2	2-1/4	5	.025-.030
DVH43240RC	1/2	1/2	2-1/2	5	.025-.030
DVH43248RC	1/2	1/2	3	6	.025-.030
DVH44010RC	5/8	5/8	5/8	3	.035-.040
DVH44012RC	5/8	5/8	3/4	3	.035-.040
DVH44020RC	5/8	5/8	1-1/4	3-1/2	.035-.040
DVH44024RC	5/8	5/8	1-1/2	4	.035-.040
DVH44032RC	5/8	5/8	2	5	.035-.040
DVH44036RC	5/8	5/8	2-1/4	5	.035-.040
DVH44812RC	3/4	3/4	3/4	3	.035-.040
DVH44816RC	3/4	3/4	1	3	.035-.040
DVH44824RC	3/4	3/4	1-1/2	4	.035-.040
DVH44832RC	3/4	3/4	2	5	.035-.040
DVH44836RC	3/4	3/4	2-1/4	5	.035-.040
DVH44840RC	3/4	3/4	2-1/2	5	.035-.040
DVH44852RC	3/4	3/4	3-1/4	6	.035-.040
DVH46416RC	1	1	1	3	.035-.040
DVH46424RC	1	1	1-1/2	4	.035-.040
DVH46436RC	1	1	2-1/4	5	.035-.040
DVH46452RC	1	1	3-1/4	6	.035-.040



DVH43210RC

P	M	S
Steel	Stainless	High Temp

C: AlTiN Coating

For guidance to calculate surface footage & chip load for Raptor™ DVH End Mills refer to the Technical Section on pages 54 to 55.

A: Autonomous Coating - For high heat as well as low heat applications (limited stock)

NOTE: Additional miniature sizes with 3/16 shank diameter can be found on page 65.

Additional radius sizes on page 46.

SEE IT IN ACTION!



YouTube

Tolerances: Raptor

End Mill Diameter: -.000" to -.002"
Shank Diameter: +.000" to -.0003"





END MILLS FOR HIGH-TEMPERATURE & EXOTIC MATERIALS



DVH4321600RC DVH42408R030C

P Steel	M Stainless	S High Temp
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Additional Radius Sizes, 4 Flute

(AlTiN Coating)

Part No. Coated	Dia. of Cut	Shank Dia.	LOC	OAL	Radius
DVH40804R030C	1/8	1/8	1/4	1-1/2	0.030
DVH40806R030C	1/8	1/8	3/8	1-1/2	0.030
DVH41205R030C	3/16	3/16	5/16	2	0.030
DVH41207R030C	3/16	3/16	7/16	2	0.030
DVH41608R030C	1/4	1/4	1/2	2-1/2	0.030
DVH41612R030C	1/4	1/4	3/4	2-1/2	0.030
DVH42008R030C	5/16	5/16	1/2	2	0.030
DVH42013R030C	5/16	5/16	13/16	2-1/2	0.030
DVH42408R030C	3/8	3/8	1/2	2	0.030
DVH42416R030C	3/8	3/8	1	2-1/2	0.030
DVH42408R060C	3/8	3/8	1/2	2	0.060
DVH42416R060C	3/8	3/8	1	2-1/2	0.060
DVH43216R010C	1/2	1/2	1	3	0.010
DVH43216R060C	1/2	1/2	1	3	0.060
DVH43216R090C	1/2	1/2	1	3	0.090
DVH43216R125C	1/2	1/2	1	3	0.125
DVH43220R060C	1/2	1/2	1-1/4	3	0.060
DVH43220R125C	1/2	1/2	1-1/4	3	0.125
DVH44020R060C	5/8	5/8	1-1/4	3-1/2	0.060
DVH44020R090C	5/8	5/8	1-1/4	3-1/2	0.090
DVH44020R125C	5/8	5/8	1-1/4	3-1/2	0.125
DVH44824R060C	3/4	3/4	1-1/2	4	0.060
DVH44824R090C	3/4	3/4	1-1/2	4	0.090
DVH44824R125C	3/4	3/4	1-1/2	4	0.125
DVH44824R190C	3/4	3/4	1-1/2	4	0.190
DVH46424R060C	1	1	1-1/2	4	0.060
DVH46424R090C	1	1	1-1/2	4	0.090
DVH46424R125C	1	1	1-1/2	4	0.125
DVH46424R190C	1	1	1-1/2	4	0.190

— Additional radius sizes (in stock), see page 45.

For guidance to calculate surface footage & chip load for Raptor™ DVH End Mills refer to the Technical Section on pages 54 to 55.



Radius, 4 Flute, Long Shank Series

(AlTiN Coating)

Part No. Coated	Dia. of Cut	Shank Dia.	LOC	OAL	Radius
DVH416080RC	1/4	1/4	1/2	4	.015-.020
DVH420130RC	5/16	5/16	13/16	4	.015-.020
DVH424140RC	3/8	3/8	7/8	5	.015-.020
DVH432160RC	1/2	1/2	1	6	.025-.030
DVH4321600RC	1/2	1/2	1	7	.025-.030
DVH4401600RC	5/8	5/8	1	7	.035-.040
DVH440200RC	5/8	5/8	1-1/4	6	.035-.040
DVH4481600RC	3/4	3/4	1	7	.035-.040
DVH448240RC	3/4	3/4	1-1/2	6	.035-.040
DVH4483200RC	3/4	3/4	2	8	.035-.040
DVH44832000RC	3/4	3/4	2	12	.035-.040
DVH464240RC	1	1	1-1/2	6	.035-.040
DVH4642400RC	1	1	1-1/2	7	.035-.040
DVH4643200RC	1	1	2	8	.035-.040
DVH46432000RC	1	1	2	12	.035-.040

C: AlTiN Coating

For guidance to calculate surface footage & chip load for Raptor™ DVH End Mills refer to the Technical Section on pages 54 to 55.

A: Autonomous Coating - For high heat as well as low heat applications (limited stock)





4 Flute, Long Shank Series with Reduced Neck, Radius, LBS* (AlTiN Coating)

Part No. Coated	Dia. of Cut	Shank Dia.	LOC	LBS*	Neck Dia.	OAL	Radius
DVH4240815RC	3/8	3/8	1/2	1-7/8	0.360	4	.015-.020
DVH4321011RC	1/2	1/2	5/8	1-3/8	0.480	3	.025-.030
DVH4321017RC	1/2	1/2	5/8	2-1/8	0.480	4	.025-.030
DVH4401218RC	5/8	5/8	3/4	2-1/4	0.605	5	.035-.040
DVH4481618RC	3/4	3/4	1	2-1/4	0.730	5	.035-.040
DVH4481626RC	3/4	3/4	1	3-1/4	0.730	6	.035-.040

*LBS: Length below shank

For guidance to calculate surface footage & chip load for Raptor™ DVH End Mills refer to the Technical Section on pages 54 to 55.



Rougher, 4 Flute Stub, Regular, Medium Length with Radius (AlTiN Coating)

Part No. Coated	Dia. of Cut	Shank Dia.	LOC	OAL	Radius
DVHR41606RC	1/4	1/4	3/8	2	.015-.020
DVHR41608RC	1/4	1/4	1/2	2-1/2	.015-.020
DVHR41612RC	1/4	1/4	3/4	2-1/2	.015-.020
DVHR42008RC	5/16	5/16	1/2	2	.015-.020
DVHR42013RC	5/16	5/16	13/16	2-1/2	.015-.020
DVHR42408RC	3/8	3/8	1/2	2	.015-.020
DVHR42414RC	3/8	3/8	7/8	2-1/2	.015-.020
DVHR42416RC	3/8	3/8	1	2-1/2	.015-.020
DVHR42420RC	3/8	3/8	1-1/4	3	.015-.020
DVHR43210RC	1/2	1/2	5/8	3	.025-.030
DVHR43216RC	1/2	1/2	1	3	.025-.030
DVHR43220RC	1/2	1/2	1-1/4	3	.025-.030
DVHR43232RC	1/2	1/2	2	4	.025-.030
DVHR44012RC	5/8	5/8	3/4	3	.035-.040
DVHR44020RC	5/8	5/8	1-1/4	3-1/2	.035-.040
DVHR44024RC	5/8	5/8	1-1/2	4	.035-.040
DVHR44036RC	5/8	5/8	2-1/4	5	.035-.040
DVHR44816RC	3/4	3/4	1	3	.035-.040
DVHR44824RC	3/4	3/4	1-1/2	4	.035-.040
DVHR44836RC	3/4	3/4	2-1/4	5	.035-.040
DVHR44852RC	3/4	3/4	3-1/4	6	.035-.040
DVHR46416RC	1	1	1	3	.035-.040
DVHR46424RC	1	1	1-1/2	4	.035-.040
DVHR46436RC	1	1	2-1/4	5	.035-.040
DVHR46452RC	1	1	3-1/4	6	.035-.040

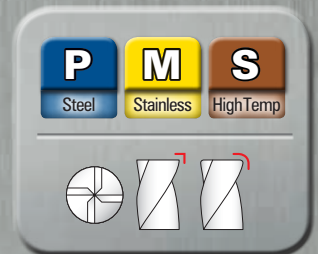
C: AlTiN Coating

For guidance to calculate surface footage & chip load for Raptor™ DVH End Mills refer to the Technical Section on pages 54 to 55.



DVHR43210RC

DVH4321017RC



A: Autonomous Coating - For high heat as well as low heat applications (limited stock)

Tolerances: Raptor

End Mill Diameter: $-.000''$ to $-.002''$
Shank Diameter: $+.000''$ to $-.0003''$



SEE IT IN ACTION!





END MILLS FOR HIGH-TEMPERATURE & EXOTIC MATERIALS



DVHR432160RC

DVHR4321017RC



Rougher, 4 Flute, Long Shank Series with Radius, NNK (AlTiN Coating)

Part No. Coated	Dia. of Cut	Shank Dia.	LOC	OAL	Radius
DVHR416080RC	1/4	1/4	1/2	4	.015-.020
DVHR420130RC	5/16	5/16	13/16	4	.015-.020
DVHR424140RC	3/8	3/8	7/8	5	.015-.020
DVHR432160RC	1/2	1/2	1	6	.025-.030
DVHR4321600RC	1/2	1/2	1	7	.025-.030
DVHR4401600RC	5/8	5/8	1	7	.035-.040
DVHR440200RC	5/8	5/8	1-1/4	6	.035-.040
DVHR4481600RC	3/4	3/4	1	7	.035-.040
DVHR448240RC	3/4	3/4	1-1/2	6	.035-.040
DVHR464240RC	1	1	1-1/2	6	.035-.040
DVHR4642400RC	1	1	1-1/2	7	.035-.040

For guidance to calculate surface footage & chip load for Raptor™ DVH End Mills refer to the Technical Section on pages 54 to 55.



Rougher, 4 Flute, Long Shank Series with Reduced Neck, LBS* (AlTiN Coating)

Part No. Coated	Dia. of Cut	Shank Dia.	LOC	LBS*	Neck Dia.	OAL	Radius
DVHR4240815RC	3/8	3/8	1/2	1-7/8	0.360	4	.015-.020
DVHR4321011RC	1/2	1/2	5/8	1-3/8	0.480	3	.025-.030
DVHR4321017RC	1/2	1/2	5/8	2-1/8	0.480	4	.025-.030
DVHR4401218RC	5/8	5/8	3/4	2-1/4	0.605	5	.035-.040
DVHR4481618RC	3/4	3/4	1	2-1/4	0.730	5	.035-.040
DVHR4481626RC	3/4	3/4	1	3-1/4	0.730	6	.035-.040

*LBS: Length below shank
C: AlTiN Coating

P

Steel

M

Stainless

S

HighTemp

DVH43216RC RAPTOR
1/2 inch diameter
1 pass .500 deep
24 IPM
27 seconds

COMPETITOR
1/2 inch diameter
2 passes .250 deep
8 IPM
2 minutes 50 seconds

30% Increased Tool Life

100% Increased Depth of Cut

300% Increased Feed Rate

A: Autonomous Coating - For high heat as well as low heat applications (limited stock)

Tolerances: Raptor

End Mill Diameter: -.000" to -.002"

Shank Diameter: +.000" to -.0003"



SEE IT IN ACTION!





Radius, 5 Flute, Variable Helix

Stub, Regular, Medium Length with Radius (AlTiN Coating)

Part No. Coated	Dia. of Cut	Shank Dia.	LOC	OAL	Radius
DVH51606RC	1/4	1/4	3/8	2	0.020
DVH51608RC	1/4	1/4	1/2	2-1/2	0.020
DVH51612RC	1/4	1/4	3/4	2-1/2	0.020
DVH51616RC	1/4	1/4	1	3	0.020
DVH52007RC	5/16	5/16	7/16	2	0.020
DVH52013RC	5/16	5/16	13/16	2-1/2	0.020
DVH52016RC	5/16	5/16	1	3	0.020
DVH52408RC	3/8	3/8	1/2	2	0.020
DVH52412RC	3/8	3/8	3/4	2-1/2	0.020
DVH52416RC	3/8	3/8	1	3	0.020
DVH52420RC	3/8	3/8	1-1/4	3	0.020
DVH53210RC	1/2	1/2	5/8	3	0.030
DVH53216RC	1/2	1/2	1	3	0.030
DVH53220RC	1/2	1/2	1-1/4	3	0.030
DVH53226RC	1/2	1/2	1-5/8	4	0.030
DVH53234RC	1/2	1/2	2-1/8	4	0.030
DVH53240RC	1/2	1/2	2-1/2	5	0.030
DVH54012RC	5/8	5/8	3/4	3	0.030
DVH54026RC	5/8	5/8	1-5/8	4	0.030
DVH54034RC	5/8	5/8	2-1/8	5	0.030
DVH54048RC	5/8	5/8	3	5	.035-.040
DVH54816RC	3/4	3/4	1	3	.035-.040
DVH54826RC	3/4	3/4	1-5/8	4	.035-.040
DVH54836RC	3/4	3/4	2-1/4	5	.035-.040
DVH54844RC	3/4	3/4	2-3/4	5	.035-.040
DVH54848RC	3/4	3/4	3	5	.035-.040
DVH56420RC	1	1	1-1/4	4	.035-.040
DVH56432RC	1	1	2	5	.035-.040
DVH56442RC	1	1	2-5/8	5	.035-.040
DVH56452RC	1	1	3-1/4	6	.035-.040

C: AlTiN Coating

For guidance to calculate surface footage & chip load for Raptor® DVH End Mills refer to the Technical Section on pages 54 to 55.



DVH53216C

P Steel	M Stainless	S High Temp
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5 Flute, Variable Helix

Stub, Regular, Medium Length (AlTiN Coating)

Part No. Coated	Dia. of Cut	Shank Dia.	LOC	OAL
DVH51606C	1/4	1/4	3/8	2
DVH51608C	1/4	1/4	1/2	2-1/2
DVH51612C	1/4	1/4	3/4	2-1/2
DVH51616C	1/4	1/4	1	3
DVH52007C	5/16	5/16	7/16	2
DVH52013C	5/16	5/16	13/16	2-1/2
DVH52016C	5/16	5/16	1	3
DVH52408C	3/8	3/8	1/2	2
DVH52416C	3/8	3/8	1	3
DVH52420C	3/8	3/8	1-1/4	3
DVH53210C	1/2	1/2	5/8	3
DVH53216C	1/2	1/2	1	3
DVH53220C	1/2	1/2	1-1/4	3
DVH53226C	1/2	1/2	1-5/8	4
DVH53234C	1/2	1/2	2-1/8	4
DVH53240C	1/2	1/2	2-1/2	5
DVH54012C	5/8	5/8	3/4	3
DVH54026C	5/8	5/8	1-5/8	4
DVH54034C	5/8	5/8	2-1/8	5
DVH54048C	5/8	5/8	3	5
DVH54816C	3/4	3/4	1	3
DVH54826C	3/4	3/4	1-5/8	4
DVH54836C	3/4	3/4	2-1/4	5
DVH54844C	3/4	3/4	2-3/4	5
DVH54848C	3/4	3/4	3	5
DVH56420C	1	1	1-1/4	4
DVH56432C	1	1	2	5
DVH56442C	1	1	2-5/8	5
DVH56452C	1	1	3-1/4	6

C: AlTiN Coating

For guidance to calculate surface footage & chip load for Raptor® DVH End Mills refer to the Technical Section on pages 54 to 55.

A: Autonomous Coating - For high heat as well as low heat applications (limited stock)





END MILLS FOR HIGH-TEMPERATURE & EXOTIC MATERIALS



DVH53234CC

P

Steel

M

Stainless

S

High Temp



DVH73234CC

5 Flute, Variable Helix with Chip Control

Stub, Regular, Medium Length (AlTiN Coating)

Part No. Coated	Dia. of Cut	Shank Dia.	LOC	OAL
DVH51612CC	1/4	1/4	3/4	2-1/2
DVH51616CC	1/4	1/4	1	3
DVH52013CC	5/16	5/16	13/16	2-1/2
DVH52016CC	5/16	5/16	1	3
DVH52416CC	3/8	3/8	1	3
DVH52420CC	3/8	3/8	1-1/4	3
DVH53216CC	1/2	1/2	1	3
DVH53220CC	1/2	1/2	1-1/4	3
DVH53226CC	1/2	1/2	1-5/8	4
DVH53234CC	1/2	1/2	2-1/8	4
DVH53240CC	1/2	1/2	2-1/2	5
DVH54026CC	5/8	5/8	1-5/8	4
DVH54034CC	5/8	5/8	2-1/8	5
DVH54048CC	5/8	5/8	3	5
DVH54826CC	3/4	3/4	1-5/8	4
DVH54836CC	3/4	3/4	2-1/4	5
DVH54844CC	3/4	3/4	2-3/4	5
DVH54848CC	3/4	3/4	3	5
DVH56432CC	1	1	2	5
DVH56442CC	1	1	2-5/8	5
DVH56452CC	1	1	3-1/4	6

C: AlTiN Coating

For guidance to calculate surface footage & chip load for Raptor™ DVH End Mills refer to the Technical Section on pages 54 to 55.

Radius, 5 Flute, Variable Helix with Chip Control

Stub, Regular, Medium Length (AlTiN Coating)

Part No. Coated	Dia. of Cut	Shank Dia.	LOC	OAL	Radius
DVH51612RCC	1/4	1/4	3/4	2 - 1/2	.020
DVH51616RCC	1/4	1/4	1	3	.020
DVH52013RCC	5/16	5/16	13/16	2 - 1/2	.020
DVH52016RCC	5/16	5/16	1	3	.020
DVH52416RCC	3/8	3/8	1	3	.020
DVH52420RCC	3/8	3/8	1 - 1/4	3	.020
DVH53216RCC	1/2	1/2	1	3	.030
DVH53220RCC	1/2	1/2	1 - 1/4	3	.030
DVH53226RCC	1/2	1/2	1 - 5/8	4	.030
DVH53234RCC	1/2	1/2	2 - 1/8	4	.030
DVH54026RCC	5/8	5/8	1 - 5/8	4	.030
DVH54034RCC	5/8	5/8	2 - 1/8	5	.030
DVH54826RCC	3/4	3/4	1 - 5/8	4	.035-.040
DVH54836RCC	3/4	3/4	2 - 1/4	5	.035-.040
DVH54844RCC	3/4	3/4	2 - 3/4	5	.035-.040
DVH56432RCC	1	1	2	5	.035-.040
DVH56442RCC	1	1	2 - 5/8	5	.035-.040
DVH56452RCC	1	1	3 - 1/4	6	.035-.040

C: AlTiN Coating

For guidance to calculate surface footage & chip load for Raptor™ DVH End Mills refer to the Technical Section on pages 54 to 55.

7 Flute, Variable Helix with Chip Control

Stub, Regular, Medium Length (AlTiN Coating)

Part No. Coated	Dia. of Cut	Shank Dia.	LOC	OAL
DVH73226CC	1/2	1/2	1-5/8	4
DVH73234CC	1/2	1/2	2-1/8	4
DVH73240CC	1/2	1/2	2-1/2	5
DVH74026CC	5/8	5/8	1-5/8	4
DVH74034CC	5/8	5/8	2-1/8	5
DVH74048CC	5/8	5/8	3	5
DVH74826CC	3/4	3/4	1-5/8	4
DVH74836CC	3/4	3/4	2-1/4	5
DVH74844CC	3/4	3/4	2-3/4	5
DVH74848CC	3/4	3/4	3	5
DVH76432CC	1	1	2	5
DVH76442CC	1	1	2-5/8	5
DVH76452CC	1	1	3-1/4	6

C: AlTiN Coating

For guidance to calculate surface footage & chip load for Raptor™ DVH End Mills refer to the Technical Section on pages 54 to 55.

A: Autonomous Coating - For high heat as well as low heat applications (limited stock)

The Chip Control (CC) option helps chip flow by breaking the cut material into optimal lengths, eliminating chip packing allowing a greater metal removal rate (MMR).



Radius, 7 Flute, Variable Helix with Chip Control

Stub, Regular, Medium Length (AlTiN Coating)

Part No. Coated	Dia. of Cut	Shank Dia.	LOC	OAL	Radius
DVH73226RCC	1/2	1/2	1 - 5/8	4	.030
DVH73234RCC	1/2	1/2	2 - 1/8	4	.030
DVH74026RCC	5/8	5/8	1 - 5/8	4	.030
DVH74034RCC	5/8	5/8	2 - 1/8	5	.030
DVH74826RCC	3/4	3/4	1 - 5/8	4	.035-.040
DVH74836RCC	3/4	3/4	2 - 1/4	5	.035-.040
DVH74844RCC	3/4	3/4	2 - 3/4	5	.035-.040
DVH76432RCC	1	1	2	5	.035-.040
DVH76442RCC	1	1	2 - 5/8	5	.035-.040
DVH76452RCC	1	1	3 - 1/4	6	.035-.040

C: AlTiN Coating

For guidance to calculate surface footage & chip load for Raptor™ DVH End Mills refer to the Technical Section on pages 54 to 55.



7 Flute, Variable Helix

Stub, Regular, Medium Length (AlTiN Coating)

Part No. Coated	Dia. of Cut	Shank Dia.	LOC	OAL
DVH71606C	1/4	1/4	3/8	2
DVH71608C	1/4	1/4	1/2	2-1/2
DVH71612C	1/4	1/4	3/4	2-1/2
DVH71616C	1/4	1/4	1	3
DVH72007C	5/16	5/16	7/16	2
DVH72013C	5/16	5/16	13/16	2-1/2
DVH72016C	5/16	5/16	1	3
DVH72408C	3/8	3/8	1/2	2
DVH72412C	3/8	3/8	3/4	2-1/2
DVH72416C	3/8	3/8	1	3
DVH72420C	3/8	3/8	1-1/4	3
DVH73210C	1/2	1/2	5/8	3
DVH73216C	1/2	1/2	1	3
DVH73220C	1/2	1/2	1-1/4	3
DVH73226C	1/2	1/2	1-5/8	4
DVH73234C	1/2	1/2	2-1/8	4
DVH73240C	1/2	1/2	2-1/2	5
DVH74012C	5/8	5/8	3/4	3
DVH74020C	5/8	5/8	1-1/4	3-1/2
DVH74026C	5/8	5/8	1-5/8	4
DVH74034C	5/8	5/8	2-1/8	5
DVH74048C	5/8	5/8	3	5
DVH74816C	3/4	3/4	1	3
DVH74820C	3/4	3/4	1-1/4	4
DVH74826C	3/4	3/4	1-5/8	4
DVH74836C	3/4	3/4	2-1/4	5
DVH74844C	3/4	3/4	2-3/4	5
DVH74848C	3/4	3/4	3	5
DVH76420C	1	1	1-1/4	4
DVH76432C	1	1	2	5
DVH76442C	1	1	2-5/8	5
DVH76452C	1	1	3-1/4	6

C: AlTiN Coating

For guidance to calculate surface footage & chip load for Raptor™ DVH End Mills refer to the Technical Section on pages 54 to 55.



DVH73234RCC

P Steel	M Stainless	S High Temp



DVH73226C

A: Autonomous Coating - For high heat as well as low heat applications (limited stock)

The Chip Control (CC) option helps chip flow by breaking the cut material into optimal lengths, eliminating chip packing allowing a greater metal removal rate (MMR).



END MILLS FOR NON-FERROUS MATERIALS



DVH74026RC



DVH94034RCC



Radius, 7 Flute, Variable Helix

Stub, Regular, Medium Length (AlTiN Coating)

Part No. Coated	Dia. of Cut	Shank Dia.	LOC	OAL	Radius
DVH71606RC	1/4	1/4	3/8	2	.020
DVH71608RC	1/4	1/4	1/2	2-1/2	.020
DVH71612RC	1/4	1/4	3/4	2-1/2	.020
DVH71616RC	1/4	1/4	1	3	.020
DVH72007RC	5/16	5/16	7/16	2	.020
DVH72013RC	5/16	5/16	13/16	2-1/2	.020
DVH72016RC	5/16	5/16	1	3	.020
DVH72408RC	3/8	3/8	1/2	2	.020
DVH72412RC	3/8	3/8	3/4	2-1/2	.020
DVH72416RC	3/8	3/8	1	3	.020
DVH72420RC	3/8	3/8	1-1/4	3	.020
DVH73210RC	1/2	1/2	5/8	3	.030
DVH73216RC	1/2	1/2	1	3	.030
DVH73220RC	1/2	1/2	1-1/4	3	.030
DVH73226RC	1/2	1/2	1-5/8	4	.030
DVH73234RC	1/2	1/2	2-1/8	4	.030
DVH73240RC	1/2	1/2	2-1/2	5	.030
DVH74012RC	5/8	5/8	3/4	3	.030
DVH74020RC	5/8	5/8	1-1/4	3-1/2	.030
DVH74026RC	5/8	5/8	1-5/8	4	.030
DVH74034RC	5/8	5/8	2-1/8	5	.030
DVH74048RC	5/8	5/8	3	5	.030
DVH74816RC	3/4	3/4	1	3	.035-.040
DVH74820RC	3/4	3/4	1-1/4	4	.035-.040
DVH74826RC	3/4	3/4	1-5/8	4	.035-.040
DVH74836RC	3/4	3/4	2-1/4	5	.035-.040
DVH74844RC	3/4	3/4	2-3/4	5	.035-.040
DVH74848RC	3/4	3/4	3	5	.035-.040
DVH76420RC	1	1	1-1/4	4	.035-.040
DVH76432RC	1	1	2	5	.035-.040
DVH76442RC	1	1	2-5/8	5	.035-.040
DVH76452RC	1	1	3-1/4	6	.035-.040

C: AlTiN Coating

For guidance to calculate surface footage & chip load for Raptor™ DVH End Mills refer to the Technical Section on pages 54 to 55.

9 Flute, Variable Helix with Chip Control

Stub, Regular, Medium Length (AlTiN Coating)

Part No. Coated	Dia. of Cut	Shank Dia.	LOC	OAL
DVH93226CC	1/2	1/2	1-5/8	4
DVH93234CC	1/2	1/2	2-1/8	4
DVH94034CC	5/8	5/8	2-1/8	5

C: AlTiN Coating

For guidance to calculate surface footage & chip load for Raptor™ DVH End Mills refer to the Technical Section on pages 54 to 55.

Radius, 9 Flute, Variable Helix with Chip Control

Stub, Regular, Medium Length (AlTiN Coating)

Part No. Coated	Dia. of Cut	Shank Dia.	LOC	OAL	Radius
DVH93226RCC	1/2	1/2	1 - 5/8	4	.030
DVH93234RCC	1/2	1/2	2 - 1/8	4	.030
DVH94034RCC	5/8	5/8	2 - 1/8	5	.030

C: AlTiN Coating

For guidance to calculate surface footage & chip load for Raptor™ DVH End Mills refer to the Technical Section on pages 54 to 55.

9 Flute, Variable Helix

Stub, Regular, Medium Length (AlTiN Coating)

Part No. Coated	Dia. of Cut	Shank Dia.	LOC	OAL
DVH93220C	1/2	1/2	1-1/4	3
DVH93226C	1/2	1/2	1-5/8	4
DVH93234C	1/2	1/2	2-1/8	4
DVH94026C	5/8	5/8	1-5/8	4
DVH94034C	5/8	5/8	2-1/8	5

C: AlTiN Coating

For guidance to calculate surface footage & chip load for Raptor™ DVH End Mills refer to the Technical Section on pages 54 to 55.

A: Autonomous Coating - For high heat as well as low heat applications (limited stock)

The Chip Control (CC) option helps chip flow by breaking the cut material into optimal lengths, eliminating chip packing allowing a greater metal removal rate (MMR).



11 Flute, Variable Helix with Chip Control

Stub, Regular, Medium Length (AlTiN Coating)

Part No. Coated	Dia. of Cut	Shank Dia.	LOC	OAL
DVH114826CC	3/4	3/4	1-5/8	4
DVH114836CC	3/4	3/4	2-1/4	5
DVH114844CC	3/4	3/4	2-3/4	5

C: AlTiN Coating

For guidance to calculate surface footage & chip load for Raptor™ DVH End Mills refer to the Technical Section on pages 54 to 55.



Radius, 11 Flute, Variable Helix with Chip Control

Stub, Regular, Medium Length (AlTiN Coating)

Part No. Coated	Dia. of Cut	Shank Dia.	LOC	OAL	Radius
DVH114826RCC	3/4	3/4	1-5/8	4	.035-.040
DVH114836RCC	3/4	3/4	2-1/4	5	.035-.040
DVH114844RCC	3/4	3/4	2-3/4	5	.035-.040

C: AlTiN Coating

For guidance to calculate surface footage & chip load for Raptor™ DVH End Mills refer to the Technical Section on pages 54 to 55.

11 Flute, Variable Helix

Stub, Regular, Medium Length (AlTiN Coating)

Part No. Coated	Dia. of Cut	Shank Dia.	LOC	OAL
DVH114826C	3/4	3/4	1-5/8	4
DVH114836C	3/4	3/4	2-1/4	5
DVH114844C	3/4	3/4	2-3/4	5

C: AlTiN Coating

For guidance to calculate surface footage & chip load for Raptor™ DVH End Mills refer to the Technical Section on pages 54 to 55.

13 Flute, Variable Helix with Chip Control

Stub, Regular, Medium Length (AlTiN Coating)

Part No. Coated	Dia. of Cut	Shank Dia.	LOC	OAL
DVH136432CC	1	1	2	5
DVH136442CC	1	1	2-5/8	5
DVH136452CC	1	1	3-1/4	6

C: AlTiN Coating

For guidance to calculate surface footage & chip load for Raptor™ DVH End Mills refer to the Technical Section on pages 54 to 55.



Radius, 13 Flute, Variable Helix with Chip Control

Stub, Regular, Medium Length (AlTiN Coating)

Part No. Coated	Dia. of Cut	Shank Dia.	LOC	OAL	Radius
DVH136432RCC	1	1	2	5	.035-.040
DVH136442RCC	1	1	2-5/8	5	.035-.040
DVH136452RCC	1	1	3-1/4	6	.035-.040

C: AlTiN Coating

For guidance to calculate surface footage & chip load for Raptor™ DVH End Mills refer to the Technical Section on pages 54 to 55.

13 Flute, Variable Helix

Stub, Regular, Medium Length (AlTiN Coating)

Part No. Coated	Dia. of Cut	Shank Dia.	LOC	OAL
DVH136432C	1	1	2	5
DVH136442C	1	1	2-5/8	5
DVH136452C	1	1	3-1/4	6

C: AlTiN Coating

For guidance to calculate surface footage & chip load for Raptor™ DVH End Mills refer to the Technical Section on pages 54 to 55.

A: Autonomous Coating - For high heat as well as low heat applications (limited stock)

The Chip Control (CC) option helps chip flow by breaking the cut material into optimal lengths, eliminating chip packing allowing a greater metal removal rate (MMR).



DVH114826CC

DVH114826C



DVH136432RCC

DVH136432C

Raptor DVH 4 Flute, 5 Flute, 7 Flute, 9 Flute, 11 Flute & 13 Flute

The Raptor DVH 4 flute and 5 flute end mills are ideally suited for SLOTTING applications as well as periphery machining operations in Stainless Steel and High Temperature alloys.

High Temp

S

Raptor DVH 4F & 5F – “S” High Temp Alloys – SFM Starting Parameters

ADC	RDC	Slotting			Peripheral		
		Conservative	Moderate	Aggressive	Conservative	Moderate	Aggressive
1/2 X D	1/4 X D	150	200	250	200	250	300
1 X D	1/2 X D	125	175	225	150	200	150
1.5 X D	1 X D	100	160	200	125	175	225
2 X D	1 X D	75	125	175	90	140	190

Stainless

M

Raptor DVH 4F & 5F – “M” Stainless – SFM Starting Parameters

ADC	RDC	Slotting			Peripheral		
		Conservative	Moderate	Aggressive	Conservative	Moderate	Aggressive
1/2 X D	1/4 X D	350	425	500	250	450	550
1 X D	1/2 X D	250	350	450	350	425	500
1.5 X D	1 X D	250	325	375	250	350	450
2 X D	1 X D	200	275	325	225	300	400

Steel

P

Raptor DVH 4F & 5F – “P” Mild Steel – SFM Starting Parameters

ADC	RDC	Slotting			Peripheral		
		Conservative	Moderate	Aggressive	Conservative	Moderate	Aggressive
1/2 X D	1/4 X D	500	550	700	550	600	750
1 X D	1/2 X D	400	500	550	500	550	700
1.5 X D	1 X D	350	450	500	400	500	550
2 X D	1 X D	325	425	450	350	450	475

Speed & Feed Formulas

$$\text{SFM} = \text{RPM} \times .262 \times \text{Tool Diameter}$$

$$\text{RPM} = \text{SFM} \times 3.82 \div \text{Tool Diameter}$$

$$\text{IPM} = \text{RPM} \times \text{IPT (CLPT)} \times \text{Number of Flutes}$$

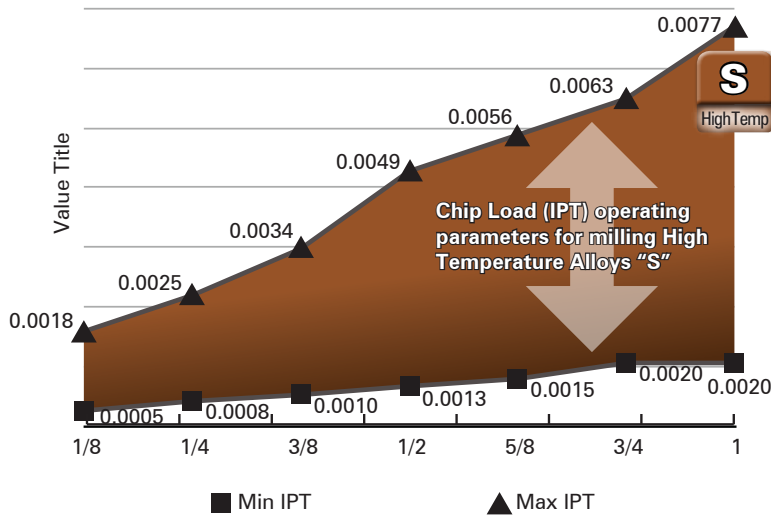
$$\text{IPT} = \text{IPM} \div (\text{RPM} \times \text{Number of Flutes})$$

$$\text{MRR} = \text{RDC} \times \text{ADC} \times \text{IPM (a.k.a. CIM)}$$

$$\text{HP} = \text{KW} \times 1.342$$

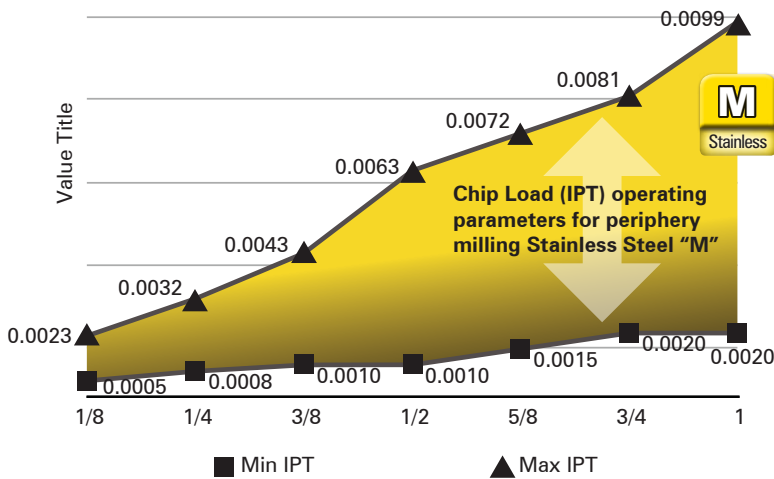
$$\text{Torque (Full Load)} = 5252 \times \text{HP} \div \text{RPM}$$

NOTE: Reduce SFM when using long reach tools.



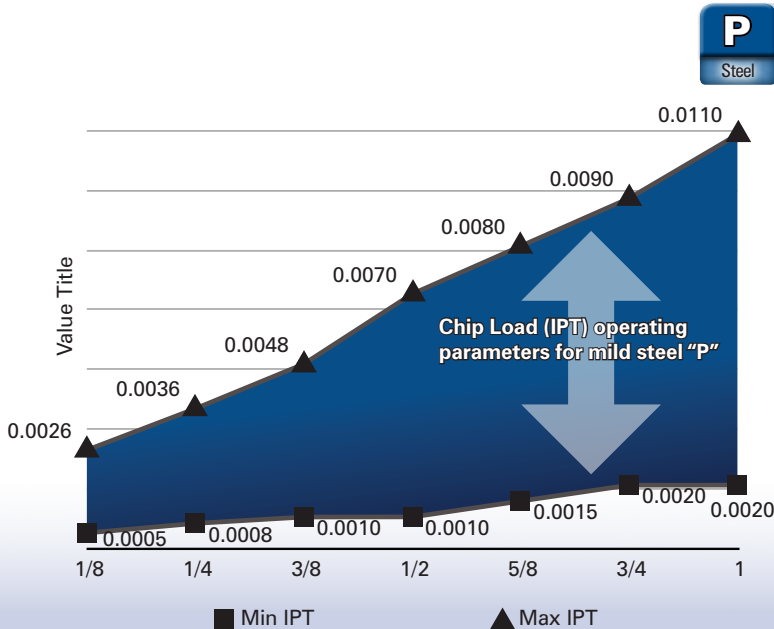
Raptor 4 & 5 Flute Chip Load Operating Range "S" High Temp Alloys

Material	Min SFM	Median SFM	Max SFM
Cobalt Alloys Haynes 25, 188, Stellite	60	90	110
Hastelloy	100	180	220
Inconel 525, 700, 718, Rene 41, Nimonick, Waspaloy, Monel, Hastelloy, Astroloy, Udimet	65	158	250
Invar	150	200	400
Iron Alloys A-286, 16-25-6	150	200	400
Kovar	250	375	500
Nickel Alloys	75	150	180
Notronic	100	180	220
Titanium 4AL4V	100	180	220
Titanium 6AL4V	160	280	400
Titanium 6AL6V	160	280	400
Titanium Comm Pure	80	290	500



Raptor 4 & 5 Flute Chip Load Operating Range "M" Stainless

Material	Min SFM	Median SFM	Max SFM
Stainless Austenitic 304L, 316L, 13-8	250	325	400
Stainless Austenitic 303, 304	260	350	500
Stainless Ferritic 430, 434	250	300	400
Stainless Martensitic 17-4	250	425	600
Stainless Martensitic 420, 440	200	300	400
Stainless Martensitic 15-5	250	300	400
Stainless Martensitic 410, 416	250	325	400



Raptor 4 & 5 Flute Chip Load Operating Range "P" Steel

Material	Min SFM	Median SFM	Max SFM
Alloy Steel 4140, 4150, 4320, 5120, 6118, 6150, 8620	250	350	450
Free Machining Steel 1111, 1115, 1140	300	450	600
Low Carbon Steel 1010, 1018, 1020 12L14, A36	300	450	600
Med Carbon Steel 1035, 1040, 1095, 1525, 1572	200	320	470
Tool Steel A2, <35 R/c	150	300	450
Tool Steel D2 <35 R/c	150	300	450
Tool Steel P20, H13 <35 R/c	160	305	450



END MILLS FOR HIGH-TEMPERATURE & EXOTIC MATERIALS

Raptor
38° HELIX SOLID CARBIDE END MILLS



R63216C

P Steel	M Stainless	S High Temp
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Raptor 3/6 Variable Helix

Raptor 3/6 Flute, Square End, Stub, Regular, Medium Length, 6-Teeth Profiling (AlTiN Coating)

Part No. Coated	Dia. of Cut	Shank Dia.	LOC	OAL
R60804C	1/8	1/8	1/4	1-1/2
R60806C	1/8	1/8	3/8	1-1/2
R61205C	3/16	3/16	5/16	2
R61207C	3/16	3/16	7/16	2
R61210C	3/16	3/16	5/8	2
R61214C	3/16	3/16	7/8	2-1/2
R61606C	1/4	1/4	3/8	2
R61608C	1/4	1/4	1/2	2-1/2
R61612C	1/4	1/4	3/4	2-1/2
R61620C	1/4	1/4	1-1/4	3
R62008C	5/16	5/16	1/2	2
R62013C	5/16	5/16	13/16	2-1/2
R62408C	3/8	3/8	1/2	2
R62414C	3/8	3/8	7/8	2-1/2
R62416C	3/8	3/8	1	2-1/2
R62420C	3/8	3/8	1-1/4	3
R63210C	1/2	1/2	5/8	3
R63216C	1/2	1/2	1	3
R63220C	1/2	1/2	1-1/4	3
R63232C	1/2	1/2	2	4
R64012C	5/8	5/8	3/4	3
R64020C	5/8	5/8	1-1/4	3-1/2
R64024C	5/8	5/8	1-1/2	4
R64036C	5/8	5/8	2-1/4	5
R64816C	3/4	3/4	1	3
R64824C	3/4	3/4	1-1/2	4
R64836C	3/4	3/4	2-1/4	5
R64852C	3/4	3/4	3-1/4	6
R66416C	1	1	1	3
R66424C	1	1	1-1/2	4
R66436C	1	1	2-1/4	5
R66452C	1	1	3-1/4	6

For guidance to calculate surface footage & chip load for Raptor™ End Mills refer to the Technical Section on pages 60 to 61.



Tolerances: Raptor 3/6

End Mill Diameter: $-.000''$ to $-.002''$
Shank Diameter: $+.000''$ to $-.0003''$



Raptor
38° HELIX SOLID CARBIDE END MILLS

SEE IT IN ACTION!



D DESTINY TOOL
THE MARK OF PERFORMANCE



Raptor 3/6 Flute, Square End LBS*

Long Shank Series with Reduced Neck (AlTiN Coating)

Part No. Coated	Dia. of Cut	Shank Dia.	LOC	LBS*	Neck Dia.	OAL
R6240815C	3/8	3/8	1/2	1-7/8	0.360	4
R6321011C	1/2	1/2	5/8	1-3/8	0.480	3
R6321017C	1/2	1/2	5/8	2-1/8	0.480	4
R6401218C	5/8	5/8	3/4	2-1/4	0.605	5
R6481618C	3/4	3/4	1	2-1/4	0.730	5
R6481626C	3/4	3/4	1	3-1/4	0.730	6

*LBS: Length below shank
C: AlTiN Coating

For guidance to calculate surface footage & chip load for Raptor™ End Mills refer to the Technical Section on pages 60 to 61.



Raptor 3/6 Flute, Square End, Long Shank Series, NNK*

(AlTiN Coating).

Part No. Coated	Dia. of Cut	Shank Dia.	LOC	NNK*	OAL
R624140C	3/8	3/8	7/8	NNK	5
R632160C	1/2	1/2	1	NNK	6
R6321600C	1/2	1/2	1	NNK	7
R6481600C	3/4	3/4	1	NNK	7
R648240C	3/4	3/4	1-1/2	NNK	6
R664240C	1	1	1-1/2	NNK	6
R6642400C	1	1	1-1/2	NNK	7

*NNK: No Neck

For guidance to calculate surface footage & chip load for Raptor™ End Mills refer to the Technical Section on pages 60 to 61.



Raptor 3/6 Flute

Stub, Regular, Medium Length with Radius, 6-Teeth Profiling (AlTiN Coating)

Part No. Coated	Dia. of Cut	Shank Dia.	LOC	OAL	Radius
R61606RC	1/4	1/4	3/8	2	.015-.020
R61608RC	1/4	1/4	1/2	2-1/2	.015-.020
R61612RC	1/4	1/4	3/4	2-1/2	.015-.020
R61616RC	1/4	1/4	1	2-1/2	.015-.020
R61620RC	1/4	1/4	1-1/4	3	.015-.020
R62008RC	5/16	5/16	1/2	2	.015-.020
R62013RC	5/16	5/16	13/16	2-1/2	.015-.020
R62408RC	3/8	3/8	1/2	2	.015-.020
R62414RC	3/8	3/8	7/8	2-1/2	.015-.020

C: AlTiN Coating

For guidance to calculate surface footage & chip load for Raptor™ End Mills refer to the Technical Section on pages 60 to 61.

Raptor
38° HELIX SOLID CARBIDE END MILLS



R6321017C R632160C R62408RC

P Steel	M Stainless	S High Temp
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END MILLS FOR HIGH-TEMPERATURE & EXOTIC MATERIALS

Raptor
38° HELIX SOLID CARBIDE END MILLS



R63216RC

P Steel	M Stainless	S High Temp
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Raptor 3/6 Flute

Stub, Regular, Medium Length with Radius, 6-Teeth Profiling (AlTiN Coating)

Part No. Coated	Dia. of Cut	Shank Dia.	LOC	OAL	Radius
R62416RC	3/8	3/8	1	2-1/2	.015-.020
R62420RC	3/8	3/8	1-1/4	3	.015-.020
R63210RC	1/2	1/2	5/8	3	.025-.030
R63216RC	1/2	1/2	1	3	.025-.030
R63220RC	1/2	1/2	1-1/4	3	.025-.030
R63228RC	1/2	1/2	1-3/4	4	.025-.030
R63232RC	1/2	1/2	2	4	.025-.030
R63236RC	1/2	1/2	2-1/4	5	.025-.030
R64012RC	5/8	5/8	3/4	3	.035-.040
R64020RC	5/8	5/8	1-1/4	3-1/2	.035-.040
R64024RC	5/8	5/8	1-1/2	4	.035-.040
R64036RC	5/8	5/8	2-1/4	5	.035-.040
R64040RC	5/8	5/8	2-1/2	5	.035-.040
R64816RC	3/4	3/4	1	3	.035-.040
R64824RC	3/4	3/4	1-1/2	4	.035-.040
R64836RC	3/4	3/4	2-1/4	5	.035-.040
R66416RC	1	1	1	3	.035-.040
R66424RC	1	1	1-1/2	4	.035-.040
R66436RC	1	1	2-1/4	5	.035-.040
R66452RC	1	1	3-1/4	6	.035-.040

C: AlTiN Coating

For guidance to calculate surface footage & chip load for Raptor® End Mills refer to the Technical Section on pages 60 to 61.



D DESTINY TOOL
THE MARK OF PERFORMANCE



Raptor 3/6 Flute, Long Shank Series with Radius

(AlTiN Coating).

Part No. Coated	Dia. of Cut	Shank Dia.	LOC	OAL	Radius
R616080RC	1/4	1/4	1/2	4	.015-.020
R620130RC	5/16	5/16	13/16	4	.015-.020
R624140RC	3/8	3/8	7/8	5	.015-.020
R632160RC	1/2	1/2	1	6	.025-.030
R6321600RC	1/2	1/2	1	7	.025-.030
R6401600RC	5/8	5/8	1	7	.035-.040
R640200RC	5/8	5/8	1-1/4	6	.035-.040
R6481600RC	3/4	3/4	1	7	.035-.040
R648240RC	3/4	3/4	1-1/2	6	.035-.040
R664240RC	1	1	1-1/2	6	.035-.040
R6642400RC	1	1	1-1/2	7	.035-.040

For guidance to calculate surface footage & chip load for Raptor™ End Mills refer to the Technical Section on pages 60 to 61.



Raptor 3/6 Flute

Long Shank Series with Reduced Neck, Radius, LBS* (AlTiN Coating)

Part No. Coated	Dia. of Cut	Shank Dia.	LOC	LBS*	Neck Dia.	OAL	Radius
R6240815RC	3/8	3/8	1/2	1-7/8	0.360	4	.015-.020
R6321011RC	1/2	1/2	5/8	1-3/8	0.480	3	.025-.030
R6321017RC	1/2	1/2	5/8	2-1/8	0.480	4	.025-.030
R6401218RC	5/8	5/8	3/4	2-1/4	0.605	5	.035-.040
R6481618RC	3/4	3/4	1	2-1/4	0.730	5	.035-.040
R6481626RC	3/4	3/4	1	3-1/4	0.730	6	.035-.040

*LBS: Length below shank
C: AlTiN Coating

For guidance to calculate surface footage & chip load for Raptor™ End Mills refer to the Technical Section on pages 60 to 61.



P Steel	M Stainless	S High Temp
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Tolerances: Raptor 3/6

End Mill Diameter: $-.000''$ to $-.002''$
Shank Diameter: $+.000''$ to $-.0003''$



SEE IT IN ACTION!





Raptor 3/6

The Raptor 3/6 is designed for Periphery Milling NOT slotting applications. Program the Raptor 3/6 as if it were a 6 fluted tool. The Chip Load per Tooth (IPT) values shown here are based upon 6 flute NOT 3 flute values.

Because the Raptor 3/6 has a "trailing edge" the Chip Load is spread between the leading edge which actually takes more of the chip load than the trailing edge in the cut. Additionally, because of the double variable helix design, the actual chip load per tooth will vary along the Axial Length of Cut.

Without complicating your calculations this Operating Range chart is a simple and easy-to-use reference to begin maximization of your metal removal rate.

S		High Temp					
Raptor 3/6 – "S" High Temp Alloys – SFM Starting Parameters							
ADC	RDC	Slotting			Peripheral		
		Conservative	Moderate	Aggressive	Conservative	Moderate	Aggressive
1/2 X D	1/4 X D	NA	NA	NA	200	250	300
1 X D	1/2 X D	NA	NA	NA	150	200	250
1.5 X D	1 X D	NA	NA	NA	125	175	225
2 X D	1 X D	NA	NA	NA	100	150	175

M		Stainless					
Raptor 3/6 – "M" Stainless – SFM Starting Parameters							
ADC	RDC	Slotting			Peripheral		
		Conservative	Moderate	Aggressive	Conservative	Moderate	Aggressive
1/2 X D	1/4 X D	NA	NA	NA	250	450	550
1 X D	1/2 X D	NA	NA	NA	350	425	500
1.5 X D	1 X D	NA	NA	NA	250	350	450
2 X D	1 X D	NA	NA	NA	200	300	400

P		Steel					
Raptor 3/6 – "P" Mild Steel – SFM Starting Parameters							
ADC	RDC	Slotting			Peripheral		
		Conservative	Moderate	Aggressive	Conservative	Moderate	Aggressive
1/2 X D	1/4 X D	NA	NA	NA	550	600	750
1 X D	1/2 X D	NA	NA	NA	500	550	700
1.5 X D	1 X D	NA	NA	NA	400	500	550
2 X D	1 X D	NA	NA	NA	300	350	450

Speed & Feed Formulas

$$\text{SFM} = \text{RPM} \times .262 \times \text{Tool Diameter}$$

$$\text{RPM} = \text{SFM} \times 3.82 \div \text{Tool Diameter}$$

$$\text{IPM} = \text{RPM} \times \text{IPT (CLPT)} \times \text{Number of Flutes}$$

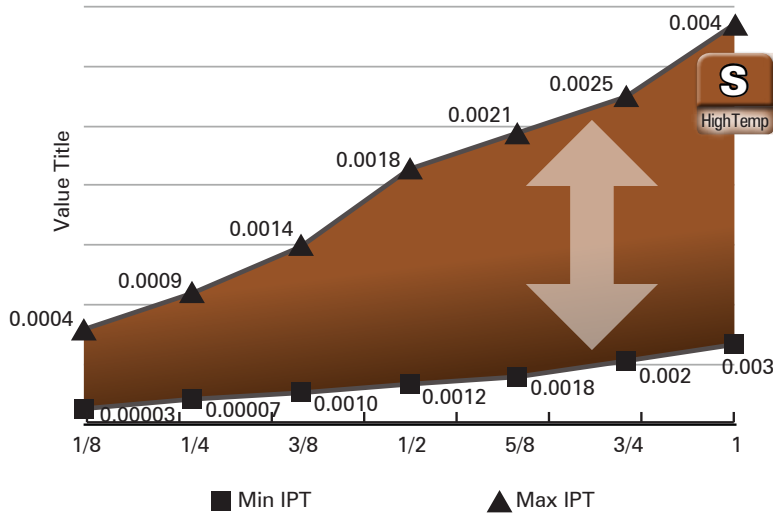
$$\text{IPT} = \text{IPM} \div (\text{RPM} \times \text{Number of Flutes})$$

NOTE: Reduce SFM when using long reach tools.

$$\text{MRR} = \text{RDC} \times \text{ADC} \times \text{IPM (a.k.a. CIM)}$$

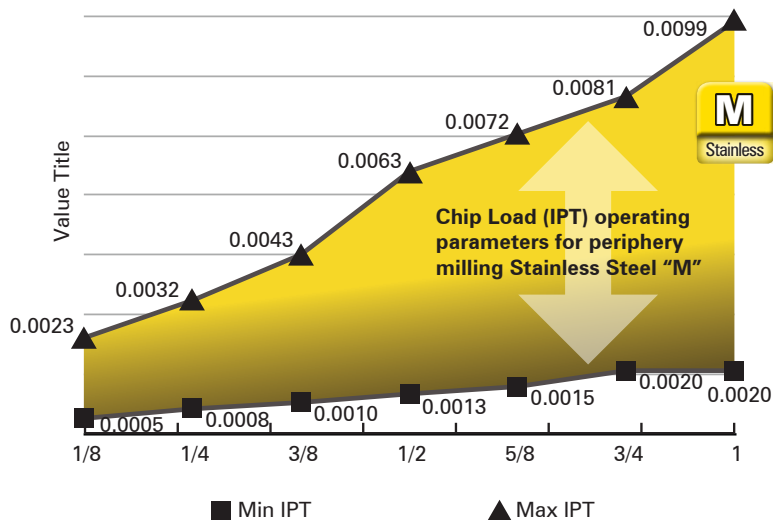
$$\text{HP} = \text{KW} \times 1.342$$

$$\text{Torque (Full Load)} = 5252 \times \text{HP} \div \text{RPM}$$



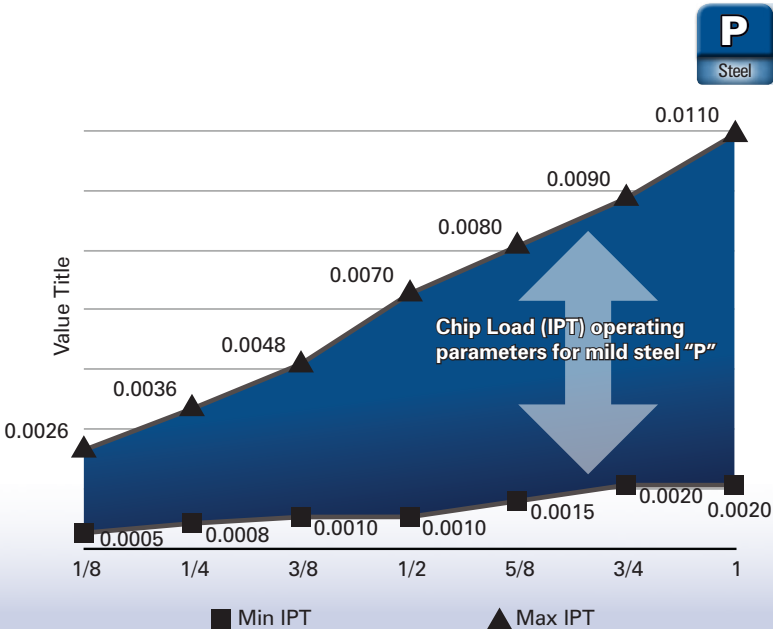
Raptor 3/6 Chip Load General Operating Range "S" High Temp Alloys

Material	Min SFM	Median SFM	Max SFM
Cobalt Alloys Haynes 25, 188, Stellite	60	90	110
Hastelloy	100	180	220
Inconel 525, 700, 718, Rene 41, Nimonick, Waspaloy, Monel, Hastelloy, Astroloy, Udimet	65	158	250
Invar	150	200	400
Iron Alloys A-286, 16-25-6	150	200	400
Kovar	250	375	500
Nickel Alloys	75	150	180
Notronic	100	180	220
Titanium 4AL4V	100	180	220
Titanium 6AL4V	160	280	400
Titanium 6AL6V	160	280	400
Titanium Comm Pure	80	290	500



Raptor 3/6 Chip Load General Operating Range "M" Stainless

Material	Min SFM	Median SFM	Max SFM
Stainless Austenitic 304L, 316L, 13-8	250	325	400
Stainless Austenitic 303, 304	260	350	500
Stainless Ferritic 430, 434	250	300	400
Stainless Martensitic 17-4	250	425	600
Stainless Martensitic 420, 440	200	300	400
Stainless Martensitic 15-5	250	300	400
Stainless Martensitic 410, 416	250	325	400



Raptor 3/6 Chip Load General Operating Range "P" Steel

Material	Min SFM	Median SFM	Max SFM
Alloy Steel 4140, 4150, 4320, 5120, 6118, 6150, 8620	250	350	450
Free Machining Steel 1111, 1115, 1140	300	450	600
Low Carbon Steel 1010, 1018, 1020 12L14, A36	300	450	600
Med Carbon Steel 1035, 1040, 1095, 1525, 1572	200	320	470
Tool Steel A2, <35 R/c	150	300	450
Tool Steel D2 <35 R/c	150	300	450
Tool Steel P20, H13 <35 R/c	160	305	450



MINIATURES, VARIABLE HELIX

MINIATURES

"Our Miniature end mills offer a broad range of intricate and precision cutting!"



Cobra
37° HELIX END MILLS

Reptor
38° HELIX SOLID CARBIDE END MILLS

Viper
45° HELIX END MILLS



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SEE OUR TOOLS IN ACTION!

www.youtube.com/user/destinytool

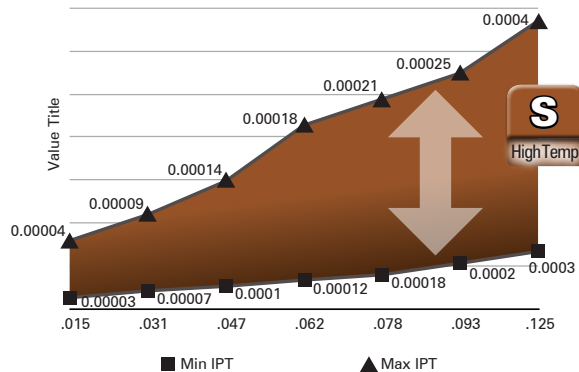
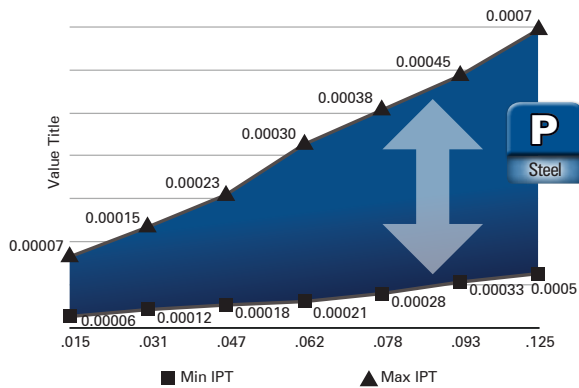
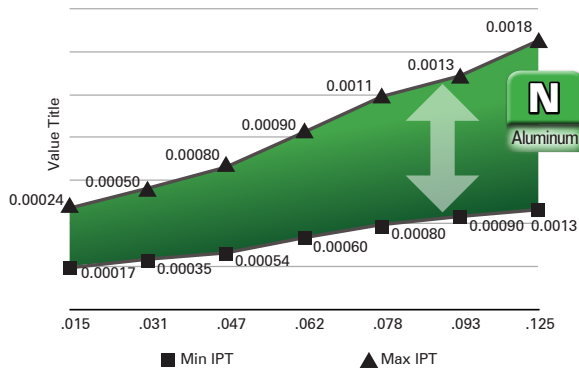
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62 WWW.DESTINYTOOL.COM



Miniatures

- Double variable helix design reduces chatter and harmonics, better finish, and increases material removal rates
- Corner radius for improved strength
- AlTiN coated for improved lubricity and heat resistance
- Better than h6 shank tolerance for shrink fit holders



Aluminum							
ADC	RDC	Slotting			Peripheral		
		Conservative	Moderate	Aggressive	Conservative	Moderate	Aggressive
1/4 X D	1/8 X D	600	800	900	800	1000	1200
1/4 X D	1/4 X D	600	800	900	800	1000	1200
1/2 X D	1/4 X D	500	700	800	600	800	1000
1 X D	1/2 X D	400	600	700	500	700	900

Medium Alloy – Low Carbon Steels							
ADC	RDC	Slotting			Peripheral		
		Conservative	Moderate	Aggressive	Conservative	Moderate	Aggressive
1/4 X D	1/8 X D	500	600	700	600	700	800
1/4 X D	1/4 X D	400	500	600	500	600	700
1/2 X D	1/4 X D	300	400	500	400	500	600
1 X D	1/2 X D	200	300	400	300	400	500

High Temp Alloys							
ADC	RDC	Slotting			Peripheral		
		Conservative	Moderate	Aggressive	Conservative	Moderate	Aggressive
1/4 X D	1/8 X D	70	90	150	80	100	180
1/4 X D	1/4 X D	60	80	120	70	90	150
1/2 X D	1/4 X D	50	70	90	60	80	120
1 X D	1/2 X D	40	60	80	50	70	100

NOTE: Reduce SFM when using long reach tools.



MINIATURES, VARIABLE HELIX

Cobra™
37° HELIX END MILLS



C208S025

P Steel	M Stainless	K Cast Iron
N Aluminum	S High Temp	H Hard



Cobra Miniatures: 2 & 4 Flute, Stub Length

2 Flt P/N	2 Flt Coated P/N	4 Flt P/N	4 Flt Coated P/N	Dia. of Cut	LOC	Shank Dia.	OAL
C208S010	C208S010C	C408S010	C408S010C	0.010	0.015	1/8	1-1/2
C208S015	C208S015C	C408S015	C408S015C	0.015	0.0225	1/8	1-1/2
C208S020	C208S020C	C408S020	C408S020C	0.020	0.03	1/8	1-1/2
C208S025	C208S025C	C408S025	C408S025C	0.025	0.0375	1/8	1-1/2
C208S030	C208S030C	C408S030	C408S030C	0.030	0.045	1/8	1-1/2
C208S031	C208S031C	C408S031	C408S031C	0.031	0.0465	1/8	1-1/2
C208S045	C208S045C	C408S045	C408S045C	0.045	0.0675	1/8	1-1/2
C208S047	C208S047C	C408S047	C408S047C	0.047	0.0705	1/8	1-1/2
C208S055	C208S055C	C408S055	C408S055C	0.055	0.0825	1/8	1-1/2
C208S062	C208S062C	C408S062	C408S062C	0.062	0.093	1/8	1-1/2
C208S078	C208S078C	C408S078	C408S078C	0.078	0.117	1/8	1-1/2
C208S093	C208S093C	C408S093	C408S093C	0.093	0.1395	1/8	1-1/2
C208S100	C208S100C	C408S100	C408S100C	0.100	0.15	1/8	1-1/2
C208S120	C208S120C	C408S120	C408S120C	0.120	0.18	1/8	1-1/2

C: AITiN Coating (at end of number)

For guidance to calculate surface footage & chip load for Destiny End Mills refer to the Technical Section on page 63.



Cobra Miniatures: 2 & 4 Flute - Square End, Regular Length

2 Flute Part No. Uncoated	2 Flute Part No. Coated	4 Flute Part No. Uncoated	4 Flute Part No. Coated	Dia. of Cut	LOC	Shank Dia.	OAL
C208N010	C208N010C	C408N010	C408N010C	0.010	0.030	1/8	1-1/2
C208N015	C208N015C	C408N015	C408N015C	0.015	0.045	1/8	1-1/2
C208N020	C208N020C	C408N020	C408N020C	0.020	0.060	1/8	1-1/2
C208N025	C208N025C	C408N025	C408N025C	0.025	0.075	1/8	1-1/2
C208N030	C208N030C	C408N030	C408N030C	0.030	0.090	1/8	1-1/2
C208N031	C208N031C	C408N031	C408N031C	0.031	0.093	1/8	1-1/2
C208N045	C208N045C	C408N045	C408N045C	0.045	0.135	1/8	1-1/2
C208N047	C208N047C	C408N047	C408N047C	0.047	0.141	1/8	1-1/2
C208N055	C208N055C	C408N055	C408N055C	0.055	0.165	1/8	1-1/2
C208N062	C208N062C	C408N062	C408N062C	0.062	0.187	1/8	1-1/2
C208N078	C208N078C	C408N078	C408N078C	0.078	0.234	1/8	1-1/2
C208N093	C208N093C	C408N093	C408N093C	0.093	0.279	1/8	1-1/2
C208N100	C208N100C	C408N100	C408N100C	0.100	0.300	1/8	1-1/2
C208N120	C208N120C	C408N120	C408N120C	0.120	0.360	1/8	1-1/2

C: AITiN Coating (at end of number)

For guidance to calculate surface footage & chip load for Destiny End Mills refer to the Technical Section on page 63.

Raptor™
38° HELIX SOLID CARBIDE END MILLS

Raptor DVH Miniatures, 4 Flute, Long Shank Series with Reduced Neck, LBS*

Part No.	Part No. Coated	Shank Dia.	Dia. of Cut	LOC	LBS*	Neck Dia.	OAL
DVH4020316	DVH4020316S	1/8	1/32	3/64	.500	.029	3
DVH4030916	DVH4030916S	1/8	3/64	.071	.500	.044	3
DVH4040616	DVH4040616S	1/8	1/16	3/32	.500	.059	3
DVH4060916	DVH4060916S	1/8	3/32	0.141	.500	.089	3

*LBS: Length below shank

For guidance to calculate surface footage & chip load for Destiny End Mills refer to the Technical Section on page 63.

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Raptor DVH Miniatures, 3 Flute, Variable Helix with Radius
(AlTiN Coating).

Part No. Coated	Dia. of Cut	Shank Dia.	LOC	OAL	Radius
DVH3S015RC	0.015	1/8	0.022	1-1/2	0.004
DVH3N015RC	0.015	1/8	0.045	1-1/2	0.004
DVH3S020RC	0.020	1/8	0.030	1-1/2	0.004
DVH3N020RC	0.020	1/8	0.060	1-1/2	0.004
DVH3S025RC	0.025	1/8	0.038	1-1/2	0.004
DVH3N025RC	0.025	1/8	0.075	1-1/2	0.004
DVH3S031RC	0.031	1/8	0.046	1-1/2	0.005
DVH3N031RC	0.031	1/8	0.093	1-1/2	0.005
DVH3S035RC	0.035	1/8	0.053	1-1/2	0.005
DVH3N035RC	0.035	1/8	0.105	1-1/2	0.005
DVH3S040RC	0.040	1/8	0.060	1-1/2	0.005
DVH3N040RC	0.040	1/8	0.120	1-1/2	0.005
DVH3S045RC	0.045	1/8	0.068	1-1/2	0.005
DVH3N045RC	0.045	1/8	0.135	1-1/2	0.005
DVH3S047RC	0.047	1/8	0.070	1-1/2	0.005
DVH3N047RC	0.047	1/8	0.141	1-1/2	0.005
DVH3S050RC	0.050	1/8	0.075	1-1/2	0.005
DVH3N050RC	0.050	1/8	0.150	1-1/2	0.005
DVH3S055RC	0.055	1/8	0.083	1-1/2	0.005
DVH3N055RC	0.055	1/8	0.165	1-1/2	0.005
DVH3S060RC	0.060	1/8	0.090	1-1/2	0.010
DVH3N060RC	0.060	1/8	0.180	1-1/2	0.010
DVH3S062RC	0.062	1/8	0.093	1-1/2	0.010
DVH3N062RC	0.062	1/8	0.186	1-1/2	0.010
DVH3S078RC	0.078	1/8	0.117	1-1/2	0.010
DVH3N078RC	0.078	1/8	0.234	1-1/2	0.010
DVH3S093RC	0.093	1/8	0.139	1-1/2	0.010
DVH3N093RC	0.093	1/8	0.279	1-1/2	0.010

For guidance to calculate surface footage & chip load for Destiny End Mills refer to the Technical Section on page 63.



Raptor DVH Miniatures, 4 Flute, Variable Helix with Radius
With 3/16 Shank (AlTiN Coating)

Part No. Coated	Dia. of Cut	Shank Dia.	LOC	OAL	Radius
DVH404010RC	1/16	3/16	3/32	2	0.005
DVH404020RC	1/16	3/16	3/16	2	0.005
DVH405010RC	5/64	3/16	7/64	2	0.005
DVH405020RC	5/64	3/16	15/64	2	0.005
DVH406010RC	3/32	3/16	9/64	2	0.005
DVH406020RC	3/32	3/16	9/32	2	0.005
DVH407010RC	7/64	3/16	5/32	2	0.005
DVH407020RC	7/64	3/16	21/64	2	0.005
DVH408030RC	1/8	3/16	3/16	2	0.010
DVH408060RC	1/8	3/16	3/8	2	0.010

C: AlTiN Coating

For guidance to calculate surface footage & chip load for Destiny End Mills refer to the Technical Section on page 63.

NOTE: Additional miniature sizes with 1/8 shank diameter can also be found on page 45.

Tolerances: Raptor

End Mill Diameter: $-.000''$ to $-.002''$
Shank Diameter: $+.000''$ to $-.0003''$

SEE IT IN ACTION!



DVH408060RC





MINIATURES, VARIABLE HELIX



V2121816



V2080600



Viper Miniatures, 2 Flute, Long Shank Series with Reduced Neck, LBS*

Part No.	Part No. Coated	Shank Dia.	Dia. of Cut	LOC	LBS*	Neck Dia.	OAL
V2020308	V2020308S	1/8	1/32	3/64	.250	.029	3
V2031008	V2031008S	1/8	3/64	.071	.250	.044	3
V2040612	V2040612S	1/8	1/16	3/32	.375	.058	3
V2051412	V2051412S	1/8	5/64	0.117	.375	.074	3
V2060916	V2060916S	1/8	3/32	9/64	.500	.088	2-1/2
V2081216	V2081216S	1/8	1/8	3/16	.500	.118	3
V2121816	V2121816S	3/16	3/16	.281	.500	.178	3

*LBS: Length below shank

For guidance to calculate surface footage & chip load for Destiny End Mills refer to the Technical Section on page 63.



Viper Miniatures, Square End, 2 Flute, 45 Degree Helix

Part No. Uncoated	Part No. Stealth	Dia. of Cut	Shank Dia.	LOC	OAL
V202010	V202010S	1/32	3/16	3/64	2
V202020	V202020S	1/32	3/16	3/32	2
V203010	V203010S	3/64	3/16	.071	2
V203020	V203020S	3/64	3/16	9/64	2
V204010	V204010S	1/16	3/16	3/32	2
V204020	V204020S	1/16	3/16	3/16	2
V205010	V205010S	5/64	3/16	7/64	2
V205020	V205020S	5/64	3/16	15/64	2
V206010	V206010S	3/32	3/16	7/64	2
V206020	V206020S	3/32	3/16	9/32	2
V207010	V207010S	7/64	3/16	5/32	2
V207020	V207020S	7/64	3/16	21/64	2
V208030	V208030S	1/8	3/16	3/16	2
V208060	V208060S	1/8	3/16	3/8	2
V208080	V208080S	1/8	3/16	1/2	2

For guidance to calculate surface footage & chip load for Destiny End Mills refer to the Technical Section on page 63.

NOTE: Additional miniature sizes with 1/8 shank diameter can be found on page 14.



Viper Miniatures, Square End, 2 Flute, 45 Degree Helix With 1/4 Shank

Part No.	Part No. Stealth	Dia. of Cut	Shank Dia.	LOC	OAL
V202010Q	V202010QS	1/32	1/4	3/64	2
V202020Q	V202020QS	1/32	1/4	3/32	2
V203010Q	V203010QS	3/64	1/4	.071	2
V203020Q	V203020QS	3/64	1/4	9/64	2
V204010Q	V204010QS	1/16	1/4	3/32	2
V204020Q	V204020QS	1/16	1/4	3/16	2
V205010Q	V205010QS	5/64	1/4	7/64	2
V205020Q	V205020QS	5/64	1/4	15/64	2
V206010Q	V206010QS	3/32	1/4	7/64	2
V206020Q	V206020QS	3/32	1/4	9/32	2
V207010Q	V207010QS	7/64	1/4	5/32	2
V207020Q	V207020QS	7/64	1/4	21/64	2
V208030Q	V208030QS	1/8	1/4	3/16	2
V208060Q	V208060QS	1/8	1/4	3/8	2
V208080Q	V208080QS	1/8	1/4	1/2	2

S: Stealth Coating
Q: Quarter Inch Shank

For guidance to calculate surface footage & chip load for Destiny End Mills refer to the Technical Section on page 63.

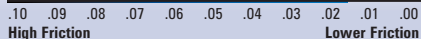
Tolerances: Viper

End Mill Diameter: $-.0001"$ to $-.0003"$ Shank Diameter: $+.000"$ to $-.0003"$

Friction Coefficients

TiN Coated Carbide End Mill

Viper Black Stealth



Tool Life

4 Hours: Carbide

40 hours: Viper Black Stealth



SEE IT IN ACTION!





Viper Miniatures, Square End, 3 Flute, 45 Degree Helix

Part No. Uncoated	Part No. Stealth	Dia. of Cut	Shank Dia.	LOC	OAL
V302010	V302010S	1/32	3/16	3/64	2
V302020	V302020S	1/32	3/16	3/32	2
V303010	V303010S	3/64	3/16	.071	2
V303020	V303020S	3/64	3/16	9/64	2
V304010	V304010S	1/16	3/16	3/32	2
V304020	V304020S	1/16	3/16	3/16	2
V305010	V305010S	5/64	3/16	7/64	2
V305020	V305020S	5/64	3/16	15/64	2
V306010	V306010S	3/32	3/16	7/64	2
V306020	V306020S	3/32	3/16	9/32	2
V307010	V307010S	7/64	3/16	5/32	2
V307020	V307020S	7/64	3/16	21/64	2
V308030	V308030S	1/8	3/16	3/16	2
V308060	V308060S	1/8	3/16	3/8	2
V308080	V308080S	1/8	3/16	1/2	2

S: Stealth Coating

For guidance to calculate surface footage & chip load for Destiny End Mills refer to the Technical Section on page 63.

— Black Stealth is an invisible, lubricative coating that is covered in a black material to support identification between uncoated and coated tools.

NOTE: Additional miniature sizes with 1/8 shank diameter can be found on page 20.



Viper Miniatures, Square End, 3 Flute, 45 Degree Helix

With 1/4 Shank

Part No. Coated	Part No. Stealth	Dia. of Cut	Shank Dia.	LOC	OAL
V302010Q	V302010QS	1/32	1/4	3/64	2
V302020Q	V302020QS	1/32	1/4	3/32	2
V303010Q	V303010QS	3/64	1/4	.071	2
V303020Q	V303020QS	3/64	1/4	9/64	2
V304010Q	V304010QS	1/16	1/4	3/32	2
V304020Q	V304020QS	1/16	1/4	3/16	2
V305010Q	V305010QS	5/64	1/4	7/64	2
V305020Q	V305020QS	5/64	1/4	15/64	2
V306010Q	V306010QS	3/32	1/4	7/64	2
V306020Q	V306020QS	3/32	1/4	9/32	2
V307010Q	V307010QS	7/64	1/4	5/32	2
V307020Q	V307020QS	7/64	1/4	21/64	2
V308030Q	V308030QS	1/8	1/4	3/16	2
V308060Q	V308060QS	1/8	1/4	3/8	2
V308080Q	V308080QS	1/8	1/4	1/2	2

S: Stealth Coating

For guidance to calculate surface footage & chip load for Destiny End Mills refer to the Technical Section on page 63.



V308060

V308080



MINIATURES, VARIABLE HELIX

DVH

Raptor
38° HELIX SOLID CARBIDE END MILLS



DVH408060QRC DVH4060916 DVH4060916RC



Raptor DVH Miniatures, 4 Flute, Variable Helix with Radius With 1/4 Shank (AlTiN Coating)

Part No. Coated	Dia. of Cut	Shank Dia.	LOC	OAL	Radius
DVH404010QRC	1/16	1/4	3/32	2	0.005
DVH404020QRC	1/16	1/4	3/16	2	0.005
DVH405010QRC	5/64	1/4	7/64	2	0.005
DVH405020QRC	5/64	1/4	15/64	2	0.005
DVH406010QRC	3/32	1/4	9/64	2	0.005
DVH406020QRC	3/32	1/4	9/32	2	0.005
DVH407010QRC	7/64	1/4	5/32	2	0.005
DVH407020QRC	7/64	1/4	21/64	2	0.005
DVH408030QRC	1/8	1/4	3/16	2	0.010
DVH408060QRC	1/8	1/4	3/8	2	0.010

S: Stealth Coating

For guidance to calculate surface footage & chip load for Destiny End Mills refer to the Technical Section on page 63.



4 Flute, DVH Miniatures

Long Shank Series with Reduced Neck, LBS*

Part No.	Part No. Coated	Shank Dia.	Dia of Cut	LOC	LBS*	Neck Dia.	OAL
DVH4020316	DVH4020316C	1/8	1/32	3/64	.500	.029	3
DVH4030916	DVH4030916C	1/8	3/64	.071	.500	.044	3
DVH4040616	DVH4040616C	1/8	1/16	3/32	.500	.059	3
DVH4060916	DVH4060916C	1/8	3/32	0.141	.500	.089	3

*LBS: Length Below Shank

For guidance to calculate surface footage & chip load for Destiny End Mills refer to the Technical Section on page 63.



4 Flute, DVH Miniatures

Long Shank Series with Reduced Neck, Radius, LBS*

Part No. Coated	Shank Dia.	Dia of Cut	LOC	LBS*	Neck Dia.	OAL	Radius
DVH4020316RC	1/8	1/32	3/64	.500	.029	3	0.005
DVH4030916RC	1/8	3/64	.071	.500	.044	3	0.005
DVH4040616RC	1/8	1/16	3/32	.500	.059	3	0.010
DVH4060916RC	1/8	3/32	0.141	.500	.089	3	0.010

C: AlTiN Coating

For guidance to calculate surface footage & chip load for Destiny End Mills refer to the Technical Section on page 63.

*LBS: Length below shank

Raptor
38° HELIX SOLID CARBIDE END MILLS

SEE IT IN ACTION!



YouTube

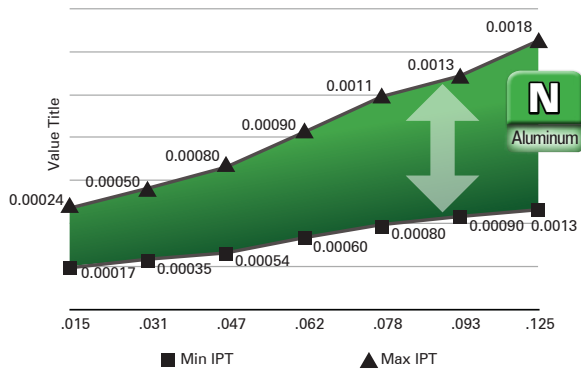


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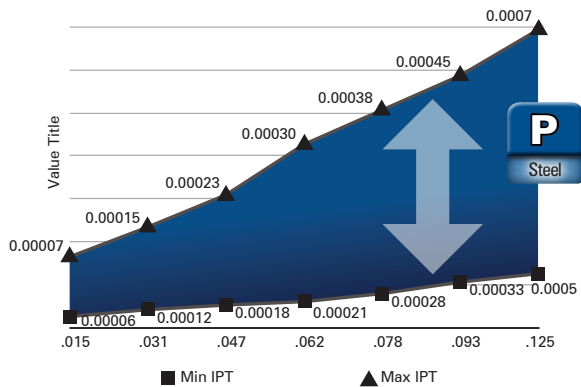


Miniatures

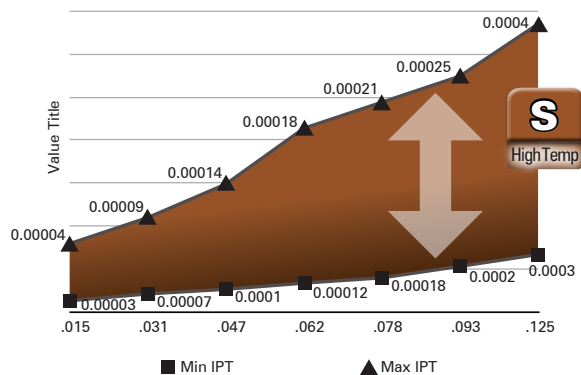
- Double variable helix design reduces chatter and harmonics, better finish, and increases material removal rates
- Corner radius for improved strength
- AlTiN coated for improved lubricity and heat resistance
- Better than h6 shank tolerance for shrink fit holders



Aluminum							
ADC	RDC	Slotting			Peripheral		
		Conservative	Moderate	Aggressive	Conservative	Moderate	Aggressive
1/4 X D	1/8 X D	600	800	900	800	1000	1200
1/4 X D	1/4 X D	600	800	900	800	1000	1200
1/2 X D	1/4 X D	500	700	800	600	800	1000
1 X D	1/2 X D	400	600	700	500	700	900



Medium Alloy – Low Carbon Steels							
ADC	RDC	Slotting			Peripheral		
		Conservative	Moderate	Aggressive	Conservative	Moderate	Aggressive
1/4 X D	1/8 X D	500	600	700	600	700	800
1/4 X D	1/4 X D	400	500	600	500	600	700
1/2 X D	1/4 X D	300	400	500	400	500	600
1 X D	1/2 X D	200	300	400	300	400	500



High Temp Alloys							
ADC	RDC	Slotting			Peripheral		
		Conservative	Moderate	Aggressive	Conservative	Moderate	Aggressive
1/4 X D	1/8 X D	70	90	150	80	100	180
1/4 X D	1/4 X D	60	80	120	70	90	150
1/2 X D	1/4 X D	50	70	90	60	80	120
1 X D	1/2 X D	40	60	80	50	70	100



CHAMFER TOOLS

“Destiny Tools are consistently very reliable, long lasting, and more importantly cost effective!”

— END USER, SAN JOSE, CA



SEE OUR TOOLS IN ACTION!

www.youtube.com/user/destinytool



2 Flute, Single End, 60 Degree

Part No. S/E	S/E TiCN Coating	S/E X-Treme Coating	Dia. of Cut	OAL
AS21660	AS21660N	AS21660X	1/4	2-1/2
AS22460	AS22460N	AS22460X	3/8	2-1/2
AS23260	AS23260N	AS23260X	1/2	3

For guidance to calculate surface footage & chip load for Destiny End Mills refer to the Technical Section on page 7.



2 Flute, Single End, 82 Degree

Part No. S/E	S/E TiCN Coating	S/E X-Treme Coating	Dia. of Cut	OAL
AS20882	AS20882N	AS20882X	1/8	1-1/2
AS21682	AS21682N	AS21682X	1/4	2-1/2
AS22482	N/A	AS22482X	3/8	2-1/2
AS23282	N/A	AS23282X	1/2	3

For guidance to calculate surface footage & chip load for Destiny End Mills refer to the Technical Section on page 7.



2 Flute, Single End, 90 Degree

Part No. S/E	S/E TiCN Coating	S/E X-Treme Coating	Dia. of Cut	OAL
AS20890	AS20890N	AS20890X	1/8	1-1/2
AS21290	AS21290N	AS21290X	3/16	2
AS21690	AS21690N	AS21690X	1/4	2-1/2
AS22490	AS22490N	AS22490X	3/8	2-1/2
AS23290	AS23290N	AS23290X	1/2	3
AS24890	AS24890N	AS24890X	3/4	4

N: TiCN Coating
X: X-Treme Coating

For guidance to calculate surface footage & chip load for Destiny End Mills refer to the Technical Section on page 7.



AS23260 AS23282 AS23290

P

Steel

N

Aluminum

Tolerances: Chamfer Tools

End Mill Diameter: $-.0001"$ to $-.002"$
Shank Diameter: $+.000"$ to $-.0003"$

SEE IT IN ACTION!





2 Flute, Single End, 90 Degree, Long Shank Series

Part No. S/E	S/E TiCN Coating	S/E X-Treme Coating	Dia. of Cut	OAL
ASL20890	ASL20890N	ASL20890X	1/8	2
ASL21690	ASL21690N	ASL21690X	1/4	4
ASL22490	ASL22490N	ASL22490X	3/8	5
ASL23290	ASL23290N	ASL23290X	1/2	6

For guidance to calculate surface footage & chip load for Destiny End Mills refer to the Technical Section on page 7.



2 Flute, Double End, 90 Degree

Part No. S/E	S/E TiCN Coating	S/E X-Treme Coating	Dia. of Cut	OAL
AD20890	AD20890N	AD20890X	1/8	1-1/2
AD21290	AD21290N	AD21290X	3/16	2
AD21690	AD21690N	AD21690X	1/4	2-1/2
AD22490	AD22490N	AD22490X	3/8	2-1/2
AD23290	AD23290N	AD23290X	1/2	3
AD24890	AD24890N	AD24890X	3/4	4

For guidance to calculate surface footage & chip load for Destiny End Mills refer to the Technical Section on page 7.



2 Flute, Single End, 120 Degree

Part No. S/E	S/E TiCN Coating	S/E X-Treme Coating	Dia. of Cut	OAL
AS232120	N/A	AS232120X	1/2	3

N: TiCN Coating
X: X-Treme Coating

For guidance to calculate surface footage & chip load for Destiny End Mills refer to the Technical Section on page 7.



3 Flute, Single End, 60, 90 and 120 Degree, with Helix (Built on helical platform)

Part No. S/E	S/E X-Treme Coating	Dia. of Cut	Tip Dia.	OAL
AS31660	AS31660X	1/4	.063	2-1/2
AS31690	AS31690X	1/4	.060	2-1/2
AS316120	AS316120X	1/4	.060	2-1/2
AS32460	AS32460X	3/8	.068	2-1/2
AS32490	AS32490X	3/8	.070	2-1/2
AS324120	AS324120X	3/8	.070	2-1/2
AS33260	AS33260X	1/2	.100	3
AS33290	AS33290X	1/2	.100	3
AS332120	AS332120X	1/2	.100	3
AS34090	AS34090X	5/8	.100	3
AS34890	AS34890X	3/4	.125	3

For guidance to calculate surface footage & chip load for Destiny End Mills refer to the Technical Section on page 7.



ASL23290 AD23290 AS232120





5 Flute, Single End, 60, 90 and 120 Degree, with Helix
(Built on helical platform)

Part No. S/E	S/E X-Treme Coating	Dia. of Cut	Tip Dia.	OAL
AS51660	AS51660X	1/4	.063	2-1/2
AS51690	AS51690X	1/4	.060	2-1/2
AS516120	AS516120X	1/4	.060	2-1/2
AS52460	AS52460X	3/8	.068	2-1/2
AS52490	AS52490X	3/8	.070	2-1/2
AS524120	AS524120X	3/8	.070	2-1/2
AS53260	AS53260X	1/2	.100	3
AS53290	AS53290X	1/2	.100	3
AS532120	AS532120X	1/2	.100	3
AS54090	AS54090X	5/8	.100	3
AS54890	AS54890X	3/4	.125	3

For guidance to calculate surface footage & chip load for Destiny End Mills refer to the Technical Section on page 7.



4 Flute, Single End, 60 Degree

Part No. S/E	S/E TiCN Coating	S/E X-Treme Coating	Dia. of Cut	Tip Dia.	OAL
AS41660	N/A	AS41660X	1/4	0.060	2-1/2
AS42460	N/A	AS42460X	3/8	0.060	2-1/2
AS43260	AS43260N	AS43260X	1/2	0.060	3

For guidance to calculate surface footage & chip load for Destiny End Mills refer to the Technical Section on page 7.



4 Flute, Single End, 82 Degree

Part No. S/E	S/E TiCN Coating	S/E X-Treme Coating	Dia. of Cut	Tip Dia.	OAL
AS41682	N/A	AS41682X	1/4	0.060	2-1/2
AS42482	N/A	AS42482X	3/8	0.060	2-1/2
AS43282	N/A	AS43282X	1/2	0.060	3

N: TiCN Coating
X: X-Treme Coating

Tolerances: Chamfer Tools

End Mill Diameter: $-.0001"$ to $-.0003"$
Shank Diameter: $+.000"$ to $-.0003"$

SEE IT IN ACTION!



P

Steel

N

Aluminum



P Steel
N Aluminum



4 Flute, Single End, 90 Degree

Part No. S/E	S/E TiCN Coating	S/E X-Treme Coating	Dia. of Cut	Tip Dia.	OAL
AS41690	AS41690N	AS41690X	1/4	0.060	2-1/2
AS42490	AS42490N	AS42490X	3/8	0.060	2-1/2
AS43290	AS43290N	AS43290X	1/2	0.060	3
AS44890	AS44890N	AS44890X	3/4	0.060	4

N: TiCN Coating
X: X-Treme Coating

For guidance to calculate surface footage & chip load for Destiny End Mills refer to the Technical Section on page 7.



4 Flute, Single End, 90 Degree, with Point

Part No. S/E	S/E X-Treme Coating	Dia. of Cut	OAL
AS41690PT	AS41690PTX	1/4	2-1/2
AS42490PT	AS42490PTX	3/8	2-1/2
AS43290PT	AS43290PTX	1/2	3
AS44890PT	AS44890PTX	3/4	4

For guidance to calculate surface footage & chip load for Destiny End Mills refer to the Technical Section on page 7.



4 Flute, Double End, 90 Degree

Part No. S/E	S/E TiCN Coating	S/E X-Treme Coating	Dia. of Cut	Tip Dia.	OAL
AD41690	AD41690N	AD41690X	1/4	0.060	2-1/2
AD42490	AD42490N	AD42490X	3/8	0.060	2-1/2
AD43290	AD43290N	AD43290X	1/2	0.060	3
AD44890	AD44890N	AD44890X	3/4	0.060	4

For guidance to calculate surface footage & chip load for Destiny End Mills refer to the Technical Section on page 7.



4 Flute, Double End, 90 Degree, with Point

Part No. S/E	S/E X-Treme Coating	Dia. of Cut	OAL
AD41690PT	AD41690PTX	1/4	2-1/2
AD42490PT	AD42490PTX	3/8	2-1/2
AD43290PT	AD43290PTX	1/2	3
AD44890PT	AD44890PTX	3/4	4

For guidance to calculate surface footage & chip load for Destiny End Mills refer to the Technical Section on page 7.

Tolerances: Chamfer Tools

End Mill Diameter: $-.0001''$ to $-.002''$
Shank Diameter: $+.000''$ to $-.0003''$

SEE IT IN ACTION!





4 Flute, Single End, 120 Degree

Part No. S/E	S/E X-Treme Coating	Dia. of Cut	Tip Dia.	OAL
AS432120	AS432120X	1/2	0.060	3

N: TiCN Coating
X: X-Treme Coating

For guidance to calculate surface footage & chip load for Destiny End Mills refer to the Technical Section on page 7.



Spot Drills-Carbide, 2 Flute, 90° 120° 140°

Part No. Uncoated	AlTiN Coating	Shank Dia.	OAL
SPD0890	SPD0890C	1/8	3
SPD1290	SPD1290C	3/16	3
SPD1690	SPD1690C	1/4	4
SPD2490	SPD2490C	3/8	4
SPD3290	SPD3290C	1/2	4
SPD08120	SPD08120C	1/8	3
SPD12120	SPD12120C	3/16	3
SPD16120	SPD16120C	1/4	4
SPD24120	SPD24120C	3/8	4
SPD32120	SPD32120C	1/2	4
SPD08140	SPD08140C	1/8	3
SPD12140	SPD12140C	3/16	3
SPD16140	SPD16140C	1/4	4
SPD24140	SPD24140C	3/8	4
SPD32140	SPD32140C	1/2	4

For guidance to calculate surface footage & chip load for Destiny End Mills refer to the Technical Section on page 7.



Chamfer Endmills Viper, 2 Flute, 90° Point

Part No. Uncoated	Stealth Coating	Shank Dia.	LOC	OAL
CMV21612	CMV21612S	1/4	3/4	2-1/2
CMV22414	CMV22414S	3/8	7/8	2-1/2
CMV23220	CMV23220S	1/2	1-1/4	3
CMV24826	CMV24826S	3/4	1-5/8	4

C: AlTiN Coating (at end of number)
S: Stealth Coating

For guidance to calculate surface footage & chip load for Destiny End Mills refer to the Technical Section on page 7.

—Black Stealth is an invisible, lubricating coating that is covered in a black material to support identification between uncoated and coated tools.



SPD08120

CMV23220

P

Steel

N

Aluminum

SEE IT IN ACTION!





Drill Mills, 2 Flute, Variable Helix, 135° Point

Part No. Uncoated	Stealth Coating	Shank Dia.	LOC	OAL
DM20808	DM20808S	1/8	1/2	2
DM21210	DM21210S	3/16	5/8	2
DM21612	DM21612S	1/4	3/4	2-1/2
DM22416	DM22416S	3/8	1	3
DM23224	DM23224S	1/2	1-1/2	4

For guidance to calculate surface footage & chip load for Destiny End Mills refer to the Technical Section on page 7.



Drill Mills, 3 Flute Variable Helix, 135° Point

Part No. Uncoated	AlTiN Coating	Shank Dia.	LOC	OAL
DM30808	DM30808C	1/8	1/2	2
DM31210	DM31210C	3/16	5/8	2
DM31612	DM31612C	1/4	3/4	2-1/2
DM32416	DM32416C	3/8	1	3
DM33224	DM33224C	1/2	1-1/2	4

For guidance to calculate surface footage & chip load for Destiny End Mills refer to the Technical Section on page 7.



Countersinks, 1 Flute, 60° 82° 90°

Part No. Uncoated	Stealth Coating	Dia. of Cut	Shank Dia.	Degree	OAL
CTS0860	CTS0860S	1/8	1/8	60°	2
CTS0890	CTS0890S	1/8	1/8	90°	2
CTS1682	CTS1682S	1/4	1/4	82°	2-1/2
CTS1690	CTS1690S	1/4	1/4	90°	2-1/2
CTS2482	CTS2482S	3/8	3/8	82°	2-1/2
CTS2490	CTS2490S	3/8	3/8	90°	2-1/2
CTS3282	CTS3282S	1/2	1/2	82°	3
CTS3290	CTS3290S	1/2	1/2	90°	3

For guidance to calculate surface footage & chip load for Destiny End Mills refer to the Technical Section on page 7.

C: AlTiN Coating (at end of number)

S: Stealth Coating

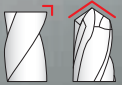
— Black Stealth is an invisible, lubricic coating that is covered in a black material to support identification between uncoated and coated tools.



DM21612

DM31612

CTS2482



Tolerances: Cutting Tools

End Mill Diameter: $-.0001''$ to $-.002''$
Shank Diameter: $+.000''$ to $-.0003''$

SEE IT IN ACTION!

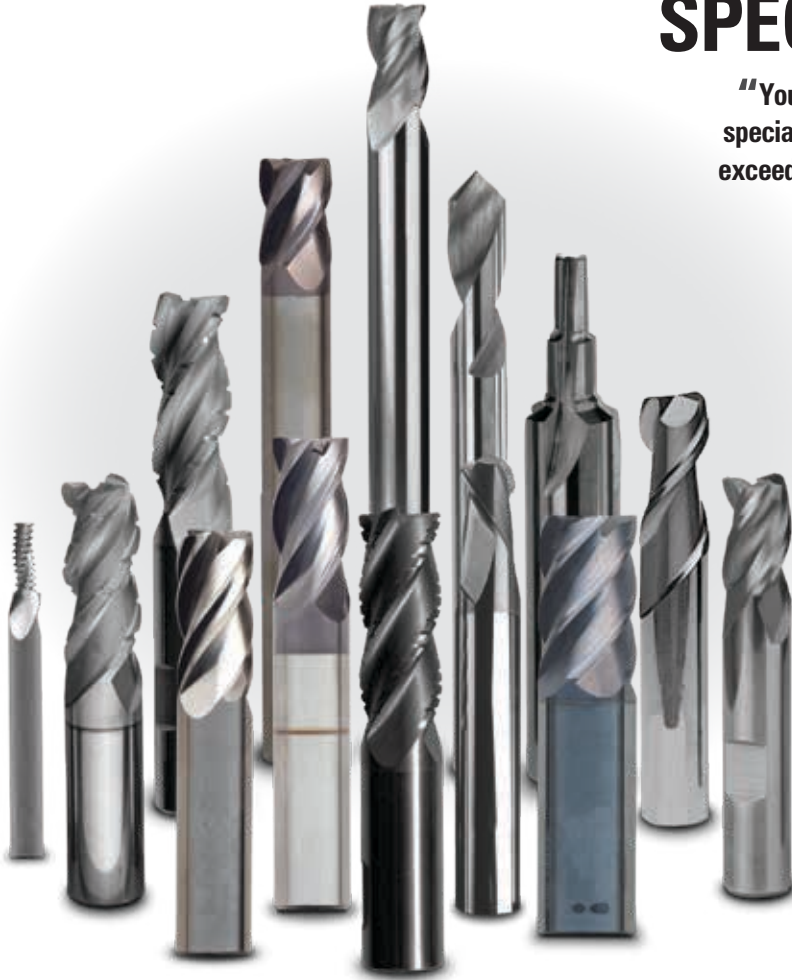




SPECIAL TOOLS

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— END USER, MERIDIAN, ID



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www.youtube.com/user/destinytool





DESTM290 DESTM290L DESTM3816H



Thread Mills – Single Profile

Part No. S/E	Thread Size	Dia. of Cut	Shank Dia.	LOC	No. of Flutes	Neck Dia.	Min. Pitch	Max. Pitch	OAL
DESTM098	#6	0.098	3/16	0.250	3	0.049	32	64	2
DESTM098L	#6	0.098	3/16	0.400	3	0.049	32	64	2
DESTM120	#8	0.120	3/16	0.300	3	0.07	32	56	2
DESTM120L	#8	0.120	3/16	0.500	3	0.07	32	56	2
DESTM138	#10	0.138	3/16	0.400	3	0.073	24	56	2
DESTM138L	#10	0.138	3/16	0.600	3	0.073	24	56	2
DESTM182	1/4	0.182	1/4	0.400	4	0.104	20	56	2
DESTM182L	1/4	0.182	1/4	0.650	4	0.104	20	56	2-1/2
DESTM240	5/16	0.240	1/4	0.500	4	0.153	18	48	2-1/2
DESTM240L	5/16	0.240	1/4	0.800	4	0.153	18	48	2-1/2
DESTM290	3/8	0.290	3/8	0.600	4	0.192	16	40	3
DESTM290L	3/8	0.290	3/8	1.000	4	0.192	16	40	3
DESTM372	1/2	0.372	3/8	0.750	4	0.24	12	32	3
DESTM372L	1/2	0.372	3/8	1.200	4	0.24	12	32	3
DESTM488	5/8	0.488	1/2	0.850	5	0.34	11	32	3-1/2
DESTM488L	5/8	0.488	1/2	1.350	5	0.34	11	32	3-1/2

For guidance to calculate surface footage & chip load for Destiny End Mills refer to the Technical Section on page 7.



Thread Mills – Helical, Coated

Part No. S/E	Thread Size	Shank Dia. of Cut	Dia.	LOC	OAL	No. of Flutes
DESTM-4-40-H	4 - 40	1/8	0.085	5/32	2	3
DESTM-6-32-H	6 - 32	1/8	0.095	7/32	2	3
DESTM-8-32-H	8 - 32	1/8	0.115	1/4	2	3
DESTM-8-36-H	8 - 36	1/8	0.115	1/4	2	3
DESTM-10-24-H	10 - 24	3/16	0.120	5/16	2	3
DESTM-10-32-H	10 - 32	3/16	0.120	5/16	2	3
DESTM-1/4-20-H	1/4 - 20	3/16	0.180	1/2	2-1/2	3
DESTM-1/4-28-H	1/4 - 28	3/16	0.180	1/2	2-1/2	3
DESTM-5/16-18-H	5/16 - 18	1/4	0.240	5/8	2-1/2	3
DESTM-5/16-24-H	5/16 - 24	1/4	0.240	5/8	2-1/2	3
DESTM-3/8-16-H	3/8 - 16	5/16	0.290	3/4	3	4
DESTM-3/8-24-H	3/8 - 24	5/16	0.290	3/4	3	4
DESTM-7/16-14-H	7/16 - 14	3/8	0.340	3/4	3	4
DESTM-7/16-20-H	7/16 - 20	3/8	0.340	3/4	3	4
DESTM-1/2-13-H	1/2 - 13	3/8	0.350	7/8	3-1/2	4
DESTM-1/2-20-H	1/2 - 20	3/8	0.350	7/8	3-1/2	4
DESTM-9/16-12-H	9/16 - 12	1/2	0.370	7/8	3-1/2	4
DESTM-9/16-18-H	9/16 - 18	1/2	0.370	7/8	3-1/2	4
DESTM-5/8-11-H	5/8 - 11	1/2	0.470	1-1/4	3-1/2	5
DESTM-5/8-18-H	5/8 - 18	1/2	0.470	1-1/4	3-1/2	5
DESTM-3/4-10-H	3/4 - 10	1/2	0.495	1-1/4	3-1/2	5
DESTM-3/4-12-H	3/4 - 12	1/2	0.495	1-1/4	3-1/2	5
DESTM-3/4-16-H	3/4 - 16	1/2	0.495	1-1/4	3-1/2	5

For guidance to calculate surface footage & chip load for Destiny End Mills refer to the Technical Section on page 7.

P
Steel

M
Stainless

S
High Temp



Thread Mills – Helical with Side Coolant, Coated

Part No. S/E	Thread Size	Shank Dia. of Cut	Dia.	LOC	OAL	No. of Flutes
DESTM-1/4-20-HSC	1/4 - 20	3/16	0.180	1/2	2-1/2	3
DESTM-1/4-28-HSC	1/4 - 28	3/16	0.180	1/2	2-1/2	3
DESTM-5/16-18-HSC	5/16 - 18	1/4	0.240	5/8	2-1/2	3
DESTM-5/16-24-HSC	5/16 - 24	1/4	0.240	5/8	2-1/2	3
DESTM-3/8-16-HSC	3/8 - 16	5/16	0.290	3/4	3	4
DESTM-3/8-24-HSC	3/8 - 24	5/16	0.290	3/4	3	4
DESTM-7/16-14-HSC	7/16 - 14	3/8	0.340	3/4	3	4
DESTM-7/16-20-HSC	7/16 - 20	3/8	0.340	3/4	3	4
DESTM-1/2-13-HSC	1/2 - 13	3/8	0.350	7/8	3-1/2	4
DESTM-9/16-12-HSC	9/16 - 12	1/2	0.370	7/8	3-1/2	4
DESTM-9/16-18-HSC	9/16 - 18	1/2	0.370	7/8	3-1/2	4
DESTM-5/8-11-HSC	5/8 - 11	1/2	0.470	1-1/4	3-1/2	5
DESTM-5/8-18-HSC	5/8 - 18	1/2	0.470	1-1/4	3-1/2	5
DESTM-3/4-10-HSC	3/4 - 10	1/2	0.495	1-1/4	3-1/2	5
DESTM-3/4-12-HSC	3/4 - 12	1/2	0.495	1-1/4	3-1/2	5
DESTM-3/4-16-HSC	3/4 - 16	1/2	0.495	1-1/4	3-1/2	5

For guidance to calculate surface footage & chip load for Destiny End Mills refer to the Technical Section on page 7.



Thread Mills – Helical with Straight Coolant, Coated

Part No. S/E	Thread Size	Shank Dia. of Cut	Dia.	LOC	OAL	No. of Flutes
DESTM-1/4-20-HC	1/4 - 20	3/16	0.180	1/2	2-1/2	3
DESTM-1/4-28-HC	1/4 - 28	3/16	0.180	1/2	2-1/2	3
DESTM-5/16-18-HC	5/16 - 18	1/4	0.240	5/8	2-1/2	3
DESTM-5/16-24-HC	5/16 - 24	1/4	0.240	5/8	2-1/2	3
DESTM-3/8-16-HC	3/8 - 16	5/16	0.290	3/4	3	4
DESTM-3/8-24-HC	3/8 - 24	5/16	0.290	3/4	3	4
DESTM-7/16-14-HC	7/16 - 14	3/8	0.340	3/4	3	4
DESTM-7/16-20-HC	7/16 - 20	3/8	0.340	3/4	3	4
DESTM-1/2-13-HC	1/2 - 13	3/8	0.350	7/8	3-1/2	4
DESTM-9/16-12-HC	9/16 - 12	1/2	0.370	7/8	3-1/2	4
DESTM-9/16-18-HC	9/16 - 18	1/2	0.370	7/8	3-1/2	4
DESTM-5/8-11-HC	5/8 - 11	1/2	0.470	1-1/4	3-1/2	5
DESTM-5/8-18-HC	5/8 - 18	1/2	0.470	1-1/4	3-1/2	5
DESTM-3/4-10-HC	3/4 - 10	1/2	0.495	1-1/4	3-1/2	5
DESTM-3/4-12-HC	3/4 - 12	1/2	0.495	1-1/4	3-1/2	5
DESTM-3/4-16-HC	3/4 - 16	1/2	0.495	1-1/4	3-1/2	5

For guidance to calculate surface footage & chip load for Destiny End Mills refer to the Technical Section on page 7.



DESTM71620HSC

DESTM3816HC

Tolerances: Special Tools

End Mill Diameter: $-.0001"$ to $-.002"$
Shank Diameter: $+.000"$ to $-.0003"$

SEE IT IN ACTION!





ENG1260 CRC12R047047

P Steel	M Stainless	S High Temp
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BV0601



Carbide Engraving Cutters

Part No. Uncoated	X-Treme Coating	Shank Dia.	Tip Degree	OAL
ENG0860	ENG0860X	1/8	60	1-1/2
ENG1240	ENG1240X	3/16	40	2
ENG1260	ENG1260X	3/16	60	2
ENG1640	ENG1640X	1/4	40	2-1/2
ENG1660	ENG1660X	1/4	60	2-1/2

For guidance to calculate surface footage & chip load for Destiny End Mills refer to the Technical Section on page 7.



Corner Rounding Carbide End Mills With Helical Platform

Part No. Uncoated	X-Treme Coating	Shank Dia.	Radius	Pilot Dia.	OAL
CRC08R010047	CRC08R010047X	1/8	0.010	P047	1-1/2
CRC08R015047	CRC08R015047X	1/8	0.015	P047	1-1/2
CRC08R020047	CRC08R020047X	1/8	0.020	P047	1-1/2
CRC08R020080	CRC08R020080X	1/8	0.020	P080	1-1/2
CRC08R025047	CRC08R025047X	1/8	0.025	P047	1-1/2
CRC08R025070	CRC08R025070X	1/8	0.025	P070	1-1/2
CRC08R031047	CRC08R031047X	1/8	0.031	P047	1-1/2
CRC08R039047	CRC08R039047X	1/8	0.039	P047	1-1/2
CRC12R047047	CRC12R047047X	3/16	0.047	P047	2
CRC12R050047	CRC12R050047X	3/16	0.050	P047	2
CRC12R062047	CRC12R062047X	3/16	0.062	P047	2
CRC16R031140	CRC16R031140X	1/4	0.031	P140	2-1/2
CRC16R040140	CRC16R040140X	1/4	0.040	P140	2-1/2
CRC16R048047	CRC16R048047X	1/4	0.048	P047	2-1/2
CRC16R062090	CRC16R062090X	1/4	0.062	P090	2-1/2
CRC16R078047	CRC16R078047X	1/4	0.078	P047	2-1/2
CRC16R093047	CRC16R093047X	1/4	0.093	P047	2-1/2
CRC20R060047	CRC20R060047X	5/16	0.060	P047	2-1/2
CRC20R070047	CRC20R070047X	5/16	0.070	P047	2-1/2
CRC24R093125	CRC24R093125X	3/8	0.093	P125	2-1/2
CRC24R125115	CRC24R125115X	3/8	0.125	P115	2-1/2
CRC32R125235	CRC32R125235X	1/2	0.125	P235	3
CRC32R125240	CRC32R125240X	1/2	0.125	P240	4
CRC40R2500125	CRC40R2500125X	5/8	0.250	P125	6

For guidance to calculate surface footage & chip load for Destiny End Mills refer to the Technical Section on page 7.

X: X-Treme Coating



Ball Engraving Tools

Part No. Uncoated	Part No. Stealth	Dia. of Cut	Shank Dia.	LOC	OAL
BV20201	BV20201S	1/32	1/8	3/64	1-1/2
BV20301	BV20301S	3/64	1/8	5/64	1-1/2
BV20401	BV20401S	1/16	1/8	3/32	1-1/2
BV20601	BV20601S	3/32	1/8	9/64	1-1/2

For guidance to calculate surface footage & chip load for Destiny End Mills refer to the Technical Section on page 7.



**Solid Carbide Dovetail Cutters For O-Ring Grooves
With Helical Platform**

Part No. Uncoated	X-Treme Coating	Shank OAL	O-Ring Dia.	Size	Neck at Rad. N	Major Dia. M	Rad. OD T	Rad. OD B	No. of Flutes	LOC	Sharp APD*
DT062-5	DT062-5X	3/16 x 2	.070	1/16	.00595	.00830	0.005	0.015	2	.051±001	.052*
DT062	DT062X	3/16 x 2	.070	1/16	.00640	.00880	0.005	0.015	2	.051±001	.057*
DT093-8	DT093-8X	3/16 x 2	.103	3/32	.00850	.01320	0.010	0.015	2	.082±001	.077*
DT093	DT093X	3/16 x 2	.103	3/32	.00930	.01400	0.010	0.015	2	.082±001	.085*
DT125-10	DT125-10X	1/4 x 2-1/2	.139	1/8	.01150	.01710	0.010	0.031	3	.112±001	.105*
DT125	DT125X	1/4 x 2-1/2	.139	1/8	.01250	.01810	0.010	0.031	3	.112±001	.115*
DT187-12	DT187-12X	5/16 x 2-1/2	.210	3/16	.01760	.02810	0.015	0.031	3	.172±001	.161*
DT187	DT187X	5/16 x 2-1/2	.210	3/16	.01880	.02930	0.015	0.031	3	.172±001	.173*
DT250-15	DT250-15X	3/8 x 2-1/2	.275	1/4	.02330	.03580	0.015	0.062	3	.2325±001	.218*
DT250	DT250X	3/8 x 2-1/2	.275	1/4	.02480	.03730	0.015	0.062	3	.2325±001	.233*
DT375-15	DT375-15X	1/2 x 3	.375	3/8	.03240	.04850	0.020	0.093	3	.317±002	.302*
DT375	DT375X	1/2 x 3	.375	3/8	.03390	.05000	0.020	0.093	3	.317±002	.317*

X: X-Treme Coating

Note: 3/16" Shank are 2 Flute, 1/4" thru 1/2" are 3 Flute

For guidance to calculate surface footage & chip load for Destiny End Mills refer to the Technical Section on page 7.



DT250

Solid Carbide Dovetail Cutters For O-Ring Grooves

WITHOUT Drop Hole Provision

Part No. Uncoated	X-Treme Coating	Shank OAL	O-Ring Dia.	Size	Neck at Rad. N	Major Dia. M	Rad. OD T	Rad. OD B	No. of Flutes	LOC	Sharp APD*
DTNDH062	DTNDH062X	3/16 X 2	.070	1/16	.036	.060	.005	.015	1	.051±001	.057*
DTNDH093	DTNDH093X	3/16 X 2	.103	3/32	.048	.094	.010	.015	1	.082±001	.085*
DTNDH125	DTNDH125X	3/16 X 2	.139	1/8	.068	.124	.010	.031	2	.112±001	.115*
DTNDH187	DTNDH187X	1/4 X 2	.210	3/16	.083	.187	.015	.031	2	.172±001	.173*
DTNDH250	DTNDH250X	5/16 X 2.5	.275	1/4	.123	.247	.015	.062	2	.2325±001	.233*
DTNDH375	DTNDH375X	3/8 X 2.5	.375	3/8	.178	.337	.020	.094	3	.317±002	.317*

X: X-Treme Coating

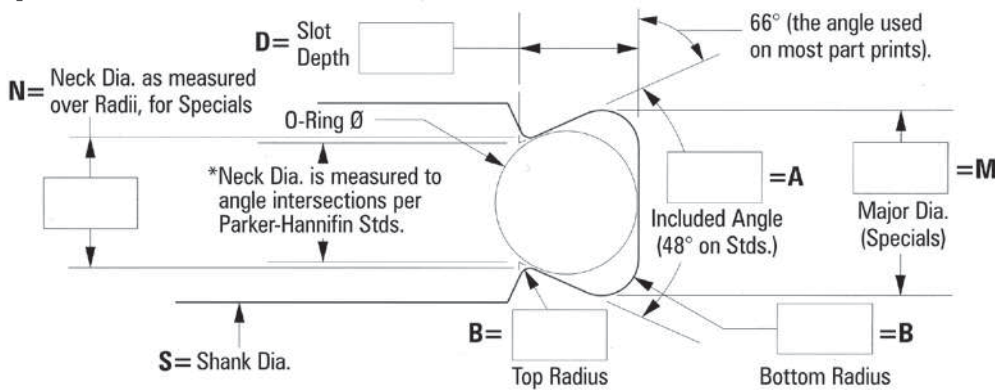
For guidance to calculate surface footage & chip load for Destiny End Mills refer to the Technical Section on page 7.

P
Steel

M
Stainless

S
High Temp

Special Order Form



- _____ S = Shank Dia.
- _____ M = Major Dia.
- _____ N = Neck Dia.
- _____ D = Slot Depth
- _____ A = Incl. Angle
- _____ T = Top Radius
- _____ B = Bottom Radius

Entrance Hole: Yes _____ No _____ Size _____

OAL: _____

Specify Tolerance _____

We will ship special Dove Tails in 2-3 working days and FAX a 10X drawing for final approval upon your order.

Toll Free: 800-527-8665 T: 408-988-8898
F: 408-988-2606 F: 800-870-1933

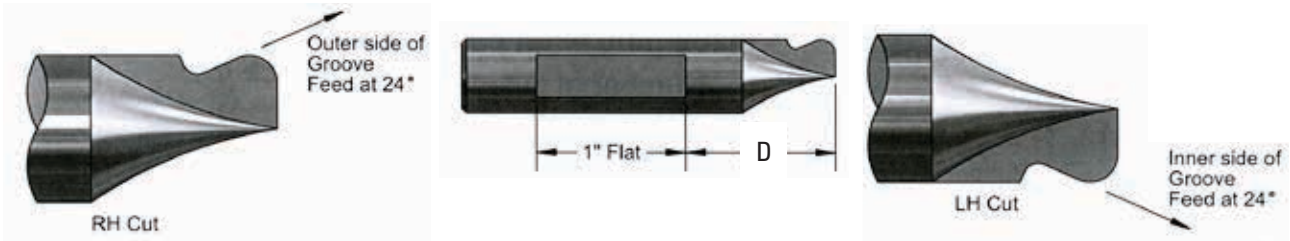




Solid Carbide O-Ring Dovetails for Lathes



Single flute carbide O-Ring form tools for lathe applications that match Parker-Hannifin standards

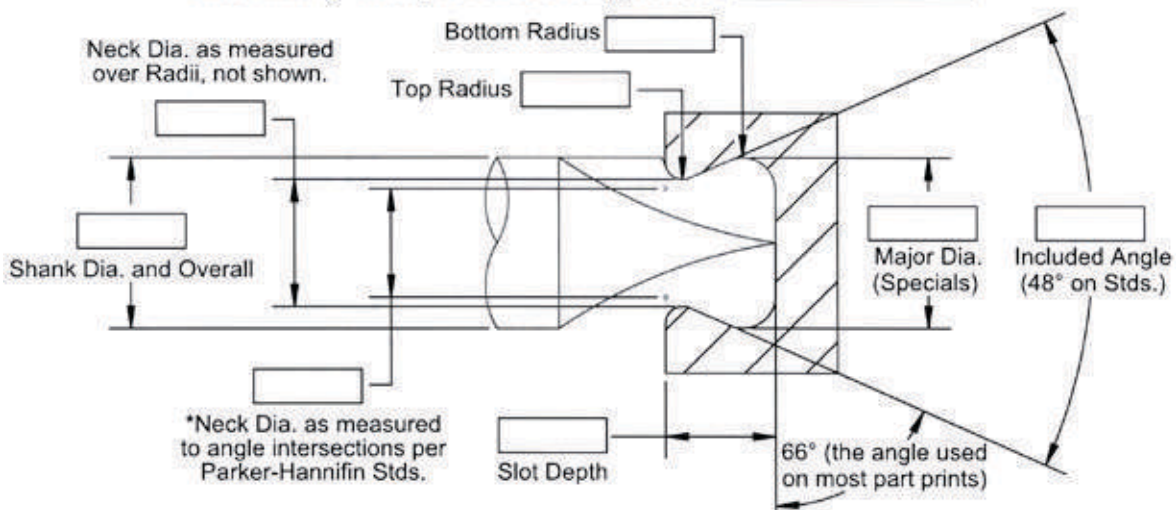


Solid Carbide O-Ring Dovetails for Lathes with Helical Platform

NUMBER		O-Ring DIA.	Neck DIA	Slot Depth	Top Rad.	Bottom Rad.	D	Shank & OAL
RH Cut	LH Cut							
DTL04051-RH	DTL04051-LH	.070	.057	.051	.005	.015	1/2	3/16x2
DTL04054-RH	DTL04054-LH	.070	.059	.054	.005	.016	1/2	3/16x2
DTL06085-RH	DTL06085-LH	.103	.085	.082	.010	.015	1/2	3/16x2
DTL08115-RH	DTL08115-LH	.139	.115	.112	.010	.031	5/8	1/4x2
DTL12172-RH	DTL12172-LH	.210	.173	.172	.015	.031	5/8	5/16x2.5
DTL16232-RH	DTL16232-LH	.275	.233	.232	.015	.062	1	3/8x2.5
DTL24317-RH	DTL24317-LH	.375	.317	.317	.020	.094	1	1/2x2.5

SPECIAL IN 2-3 WORKING DAYS

Machining what part material, please? _____





Tool Reconditioning

- NO TAPER
- NO BURNING
- REFLUTING CAPABILITIES
- RUN OUTS NO MORE

WE RECONDITION: Carbide End Mills, High Speed Steel End Mills, Angle Mills, Ball Mills, Taps, Counter Sinks, Drills, Spot Drills, Reamers, Shell Mills, Counter Bores, Chamfer Mills, and more!



We offer an approximate turn-around of three weeks following receipt of purchase order. Special arrangements may be available for a shorter turn-around time, upon availability.

Pick-up and Delivery Service Upon Availability:

800-527-8665 Phone: 408-988-8898
Fax: 408-988-2606 Toll Free Fax: 800-870-1933



Tool Quote Form

Customer's Name: _____ Contact: _____

Phone: _____ Fax: _____ E-mail: _____

1. Is this a repeat inquiry / order: _____ Yes _____ No
If yes, please identify by customer part #: _____ Destiny Part #: _____
2. Single End or Double End? _____
3. Number of Flutes? _____ *(Tapered are 3 Flute generally)*
4. Cutting Diameter & Tolerance: _____
5. Length of Cut: _____
6. Length Below Shank, LBS: _____
7. Overall Length: _____
8. Shank Diameter and Type: _____
9. Hand of Cut and Helix Angle: _____
10. Type of End-Square, Cut to Center or Ball: _____
11. Type and Hardness of Material to be Machined: _____
12. Coating Required: Annual Usage: _____
13. Quantity Required: _____
14. Quantity shipping Variation is +I-10% (Unless otherwise stated): _____
15. Style of Special End Mill: Conventional, Tapered, or Rougher: _____
16. Taper per side: _____ Taper incl. angle: _____ Tip diameter: _____

17. Comments: _____

NOTE: To avoid delays in the manufacturing or inquiry of our tools, it is essential that all information is provided. All orders or inquiries for special end mills must show the customer's name. This important procedure makes for much faster reference should it be necessary. If you want an immediate quote on specials, Fax your specifications to:

Fax: 800-870-1933 or Call: 1-800-527-TOOL



Inquiry And Consultation Report

Destiny Tool is committed to working with you to help reduce your cost on all milling. Simply photo copy this page, fill it in and send us the information requested. We will provide you with our best advice.

Company Name: _____ **Date:** _____

Street: _____

City: _____ State: _____ Zip Code: _____

Phone: _____ Fax: _____ E-mail: _____

Contact: _____ Title: _____

Description of Tool Currently Being Used:

Brand Name: _____ Part #: _____

HSS: _____ Carbide: _____ Coated: _____

Diameter: _____ No. of Flutes: _____

Flute Length Engaged in the Cut: _____

Depth of Material Being Cut per Pass: _____

Current RPM: _____ Current Feed Rate: _____

Description of Material Being Machined:

Name of Material: _____ AISI Number: _____

Condition of Material: Brinell _____ Rockwell _____ Other _____

Type of Cut: Profile _____ Slot _____ Pocket _____

Climb Milling: _____ Conventional Milling: _____

Material to be Milled: Length _____ Width _____

Description of Machine Tool and Fixtures:

Machine Make: _____

Vertical: _____ Horizontal: _____ Horsepower: _____

Spindle Speed Range: _____ Table Feed Range: _____

Coolant Available: Flood: _____ Dry: _____



Tool Performance Report

Company Name: _____ **Date:** _____

Street: _____

City: _____ State: _____ Zip Code: _____

Phone: _____ Fax: _____ E-mail: _____

Contact: _____ Title: _____

Application: _____

Brand Name: _____ **Part No.** _____

Technical Data: _____

Machine Type: _____ HP: _____ # Spindles: _____

RMS Req.: _____ Coolant: _____

Speed: _____ RPM: _____ SFM: _____

Feed: _____ IPM: _____

Material: _____ Hardness: _____

Chip Load Per Tooth: _____ Majority of Cuts: _____

Depth Per Cut: _____ Shallow Slotting _____ Deep Slotting < 1 xd.

Axial = A: _____ Med. Radial < .25 x d.

Radial = R: _____ Med. Radial > .300 x d.

Tool Specification: _____ **Lot No.** _____

Diam: _____ Shank Diam.: _____ LOC: _____

OAL: _____ No. Flts: _____ Hand of Cut: _____

End Style: _____ Tool Mat'l.: _____ Helix: _____

Coating: _____ Neck reach Relieved (LBS): _____

Destiny Tool Distributor: _____ **Contact:** _____

Destiny Tool Representative: _____

Comments: _____

Results: _____

Terms And Conditions

Terms

2% Ten days, Net 30 days.

Shipping

F.O.B. Santa Clara, California.

All shipments ship ground, unless otherwise specified.

Orders must be in by 3:00 p.m. for same day shipping.

Customer Alterations

DESTINY TOOL cannot be responsible for the performance of, or compliance of Specifications, nor can we accept, for return, any tool that has been altered in any way by our customers. This includes surface treatments, coatings, flats, tangs, markings, or any geometry alterations.

Product Warranty

We guarantee our products will conform to the specifications listed on the customer's blueprints, orders, and quotation requests. Dimensions, specifications, and tolerances not listed, will be furnished to the current Destiny Tool manufacturing standards. Our warranty is limited to the repair, replacement, or full credit for the tools found not to be within specifications, at our option.

Return Policy

No merchandise can be returned without prior authorization. Credit will not be issued for merchandise returned without a return authorization number. Stock over 3 months old may not be returned. All returns will be subject to a 15% restocking fee. Shop minimum of \$50 for all specials.

Specials

Orders for special tools, non-catalog or modified tools, are accepted on a no cancellation basis, and tools are not returnable. A confirming purchase order is required before any work begins on special tools. A 10% over or under shipment on a special is acceptable based on industry standards, unless no over shipment is stated at time of order.

Errors

DESTINY TOOL cannot be held responsible for incorrect parts made with our products, due to mislabeling, or defect. We assume all tools used by our customers are inspected before use, and that first part inspection in customer's plant is the rule. We will replace or credit tools in those situations.

Trademarks

Trademarks are the property of their perspective owners.

Test Tool Policy

Orders will be accepted for test tools under the following conditions:

- All test orders must clearly state "Test Order" "Guaranteed Trial Order" or "GTO" or any other indication included within the various order entry software commonly used by industrial distributors. This designation must appear ON THE FRONT of the Purchase Order and/or within the purchase order number itself. (Binding Purchase Order)
- The order must show end-user customers name in the notation and or the drop ship special instructions.
- Orders will be billed as a normal order, with standard FOB point and payment terms.
- Full credit for tools for failed tests will only be given upon the receipt of a written request (RGA) accompanied by a valid test report and the broken tool(s). This test report must show all cutting conditions as well as mode of failure.
- Credit WILL NOT be given for outbound freight. This is the total responsibility of the distributor for tools that were tested and performed successfully.
- Credit WILL be issued for orders and direct shipping both to and from end-user, or distributor, for failed test tools, ground shipping only.

PRICES are subject to change without notice.



Request for Return Goods Authorization (RGA)

Authorization Number: _____ Date: _____

Distributor Information

Distributor P.O.: _____

Distributor Name: _____ Distributor Number: _____

Street: _____

City: _____ State: _____ Zip Code: _____

Phone: _____ Fax: _____ E-mail: _____

Contact: _____ Title: _____

Agent Information

Agent Name: _____ Agent Number: _____

Street: _____

City: _____ State: _____ Zip Code: _____

Phone: _____ Fax: _____ E-mail: _____

Contact: _____ Title: _____

Customer Information

Customer Name: _____ Customer Number: _____

Street: _____

City: _____ State: _____ Zip Code: _____

Phone: _____ Fax: _____ E-mail: _____

Contact: _____ Title: _____

Destiny Tool Part Number: _____

Description of Tool: _____

Lot #/Approx date of purchase: _____

Reason for Return: _____

For additional items, please provide information as stated above on a separate sheet of paper and attach to this form.

Toll Free: 800-527-8665
T: 408-988-8898
F: 408-988-2606
F: 800-870-1933

Terms & Policies

General Understanding

Destiny Tool is committed to working with industrial distributor partners. We understand that due to the uniqueness in substrate, geometry, design and coating our products require additional technical support when compared to 'commodity' cutting tools that are sold on 'price points.'

Red Label/ Blue Label Shipments

These orders take priority. We operate under the assumption that if someone is ordering our tools for quick delivery that the customer job is late and the machine is down. We strive to make sure that our end-user customers can rely on Destiny Tool to deliver their tools in a timely fashion.

General Warranty

Our Warranty is in lieu of all other warranties, expressed, or implied. Implied warranty means goods sold will be merchantable and fit for the ordinary purposes for which they are to be used. Our sole liability in any claim shall in no case exceed the cost of replacement or repair as provided herein. No other warranty is expressed or implied and in no case will Destiny Tool be liable for any special, incidental or consequential damages.

Product Warranty

We Guarantee our products will conform to the specifications listed on the customer's blueprints, orders, and quotation requests. Dimensions, specifications, and tolerances not listed, will be furnished to the current Destiny Tool manufacturing standards. Our warranty is limited to the repair, replacement, or full credit for the tools found not to be within specifications, at our option.

Claims

Although goods are considered sold, and our responsibility ceases when delivery is made to the transportation company, in the event of goods being lost in transit, we will make every effort on behalf of customers to have lost goods found, or to have the transportation company make proper restitution for loss. Damage claims must be made against the carrier.

Errors

Destiny Tool cannot be held responsible for incorrect parts made with our products, due to mislabeling, or defect. We assume all tools used by our customers are inspected before use, and that first part inspection in customer's plant is the rule. We will replace or credit tools in those situations.

Prices

Prices are subject to change without notice.

Safety

Any cemented carbide endmill or cutting tools may chip, break or shatter under improper use. Additionally, the use of cutting tools can potentially cause hazardous dust and particles causing health related issues. Always ensure the use of adequate ventilation, protective clothing, machine guards and safety glasses before each and every use. Government regulations may require additional safeguards.



Distributor Order and Shipping Policy

Orders will be accepted only by fax, email or via direct entry into Destiny Tool's online order entry system. There is a minimum order value of \$75.00.

Only orders that are clearly legible and are on a distributor letterhead or official company purchase order form, showing a valid PO number will be processed.

Customer Service hours are 8:00 AM until 5:00 PM, PST, Monday through Friday

Cut-off time for orders to be processed same day is 3:00 PM PST

Our Customer Service and shipping department strive to process all orders the same day, with the following conditions and exceptions:

- Orders are received before the above-mentioned cut-off time
- Items requested are in stock in our inventory
- Priority will be given to expedited shipments such as UPS Red or Blue
- Large stock or replenishment orders will be processed and shipped as time allows. Normal process time is 1-2 business days but every attempt will be made to ship within 24 hours.

Please check with Customer Service for delivery of items that are out of stock.

Returns/ Return Goods Authorization

Prior to returning any merchandise, a request for an authorization number must be made with our Customer Service Department. Please send your request showing quantity and description of each item, as well as date it was purchased.

Once a review of your request is made by our Customer Service Department, a list of acceptable items for return as well as an Return Goods Authorization (RGA) number will be sent. Items which are non-stock or special order will not be acceptable for return.

Only shipments showing the authorized RGA number plainly on top of shipment boxes as well as return paperwork will be accepted for review.

Distributor is responsible for return freight unless the shipment was an error of Destiny Tool.

A final review of products will be made once we receive the authorized return. Generally, products will be accepted, and credit given, only for products which meet the criteria outlined below "Conditions of Return – Products"

Products, which do not meet the criteria, will either be shipped back to the distributor at their expense or an additional restock charge above the normal handling fee will be assessed. Customer Service will notify you if the situation arises.

Credits will be given for actual net price paid less a 15% handling fee or full credit with an offsetting order for the same or greater amount as the credit.

A 15% handling fee will apply to all returns but may be waived should the return be a result of a obvious order error.

Conditions of Return – Products:

- Returned item must be a current Destiny Tool standard stocked product as per the current Price/Stock Schedule.
- Products must be in original full packaged quantities and in a condition that will allow immediate restocking upon receipt at the Destiny Tool central stocking warehouse.
- For volume stocking distributors all returned items must have been purchased, within the previous 14-month period, from the date of the return. A copy of the original invoice, or the original invoice number and Destiny Tool order number must be provided with the returned Products.
- Standard Products that become obsolete by Destiny Tool are subject to review and may be rejected upon receipt of the return by Destiny Tool.



- Special Products may not be returned to Destiny Tool for credit, except for quality reasons and/or to be reworked.
- Any broken Products packages, marked and defaced labels and/or packages will be rejected for return credit by Destiny Tool.
- Returned materials must be properly packaged for shipment. Any carrier damage is the responsibility of the Distributor.
- All returned Products, upon receipt by Destiny Tool, will be inspected, accepted, or rejected.
- Returned items, which do not conform, will not be returned to the Distributor and the value of non-conforming items will be deducted from the Distributor credit. Any Products not meeting all the return policy conditions, identified herein will be scrapped by Destiny Tool.
- Non-Destiny Tool items received by Destiny Tool, which have been included in a Distributor Products return will be returned to the Distributor.

Authorization – Distributor Inventory:

- Distributor inventory for return is defined as excess inventory, stock rotation or return as a result of termination.
- The total value of all excess inventory returns and /or stock rotations, within a given calendar year, is limited to 3% of the previous year's purchases which is calculated on prior fiscal year purchases and may be split into a maximum of two (2) returns within a given calendar year.
- Returns as a result of termination must be completed within 60 days of termination.
- For pre-approval, the Distributor must submit a Returned Good Authorization (RGA) listing all Products for return to the assigned Destiny Tool Regional Manager and/or Manufacturer's Agent. The Distributor list of Products submitted to request a return from Destiny Tool must include, in addition to any conditions herein, EDP part number, product description, quantity, and reason for return. Destiny Tool reserves the right to reject a Distributor excess inventory return, by item, based upon the review of a 12-month global demand and product classification. Proposed return quantities in excess of the 12-month global demand will not be approved for return. Based upon this information, a preliminary approval for return will be forwarded to the Distributor and assigned Regional Operation Center.
- Destiny Tool will issue a Returned Goods Authorization, hereinafter called RGA, to the Distributor.
- RGA product shipments must be received by Destiny Tool within 60 days of the written RGA issue date. After 60 days, the RGA is considered to be invalid. Material received by Destiny Tool on an expired RGA will be returned to the Distributor at the expense of the Distributor. An additional \$50.00 processing and handling charge will be accessed to the Distributors account on all expired RGA's received by Destiny Tool.

General Distributor & Customer Returns:

Distributor may also return Products for credit at any time for the following reasons:

Product Quality

- Over Shipment (above standard terms & conditions)
- Incorrect Item Shipped/Received
- Due To Customer Order Error
- Material Shipped in Error by Destiny Tool.
- Distributor will obtain a RGA for these types of returns, from Destiny Tool.

General Terms & Procedures:

- A 15% restocking charge will be applied to all excess inventory and/or stock rotation returns, except when the Distributor enters an offsetting purchase order for Products in equal to or greater value than the amount of the return credit issued. The offsetting order must be entered with Destiny Tool at the time the approved RGA is scheduled for return to Destiny Tool.
- No Distributor inventory returns will be accepted in the month of December by Destiny Tool.
- All return packages must be clearly labeled, with issued RGA number affixed to the package. A packing slip along with other return documentation must be enclosed or securely attached to the outside of the package. This information is subject to inspection prior to issuance of credit.
- Destiny Tool will issue a final credit to the Distributor on or before 30 days of receipt of returned material.
- Distributor will be advised of any non-conforming return Products. Dispute of any such return will be resolved with local Regional Manager and/or Manufacturer's Agent. Any such dispute must be resolved on or before 60 days of issued credit. Disputed returned materials that are not resolved within 60 days and/or any unauthorized returned product deduction by the Distributor may result in the suspension of the functional discount component for a period of three months.
- Distributor agrees to comply with any and all Destiny Tool forms and/or formats required to process returned materials.
- In addition to the terms and conditions herein, Destiny Tool reserves the right to charge an administration fee on any Distributor return. Should Destiny Tool at its sole discretion, invoke this right, the Distributor will be notified in writing within 15 Days of receipt of returned Products. This fee shall not exceed \$100 per return, and will be deducted from the credit issued to the Distributor. Once implemented the administration fee may remain in effect for all subsequent Products returns of the Distributor.

Blanket Order Policy

Blanket orders will be accepted with the following conditions:

- Minimum order value for each line item will be \$200.
- Blanket order must contain releases of no more than 12 consecutive months.
- Prices will remain firm over the term of the blanket.
- Release dates may be moved ahead of originally scheduled dates but may not be moved back.
- Quantities of each line item may be increased but not decreased.
- There will be no cancellation or changes of blanket orders without review and approval of Destiny Tool Sales Management.



Part Number Index

Part Number	Page	Part Number	Page	Part Number	Page	Part Number	Page	Part Number	Page
AD20890	72	AS20890X	71	AS32460X	72	AS44890	74	BDR23220S	32
AD20890N	72	AS21290	71	AS32490	72	AS44890N	74	BDR23220Z	32
AD20890X	72	AS21290N	71	AS32490X	72	AS44890PT	74	BDR2401227	32
AD21290	72	AS21290X	71	AS332120	72	AS44890PTX	74	BDR2401227S	32
AD21290N	72	AS21660	71	AS332120X	72	AS44890X	74	BDR2401227Z	32
AD21290X	72	AS21660N	71	AS33260	72	AS516120	73	BDR24026	32
AD21690	72	AS21660X	71	AS33260X	72	AS516120X	73	BDR24026S	32
AD21690N	72	AS21682	71	AS33290	72	AS51660	73	BDR24026Z	32
AD21690X	72	AS21682N	71	AS33290X	72	AS51660X	73	BDR2481627	32
AD22490	72	AS21682X	71	AS34090	72	AS51690	73	BDR2481627S	32
AD22490N	72	AS21690	71	AS34090X	72	AS51690X	73	BDR2481627Z	32
AD22490X	72	AS21690N	71	AS34890	72	AS524120	73	BDR24826	32
AD23290	72	AS21690X	71	AS34890X	72	AS524120X	73	BDR24826S	32
AD23290N	72	AS22460	71	AS41660	73	AS52460	73	BDR24826Z	32
AD23290X	72	AS22460N	71	AS41660X	73	AS52460X	73	BDR24836	32
AD24890	72	AS22460X	71	AS41682	73	AS52490	73	BDR24836S	32
AD24890N	72	AS22482	71	AS41682X	73	AS52490X	73	BDR24836Z	32
AD24890X	72	AS22482X	71	AS41690	74	AS532120	73	BDVH40804C	44
AD41690	74	AS22490	71	AS41690N	74	AS532120X	73	BDVH40806C	44
AD41690N	74	AS22490N	71	AS41690PT	74	AS53260	73	BDVH40808C	44
AD41690PT	74	AS22490X	71	AS41690PTX	74	AS53260X	73	BDVH41205C	44
AD41690PTX	74	AS232120	72	AS41690X	74	AS53290	73	BDVH41210C	44
AD41690X	74	AS232120X	72	AS42460	73	AS53290X	73	BDVH41606C	44
AD42490	74	AS23260	71	AS42460X	73	AS54090	73	BDVH41608C	44
AD42490N	74	AS23260N	71	AS42482	73	AS54090X	73	BDVH41612C	44
AD42490PT	74	AS23260X	71	AS42482X	73	AS54890	73	BDVH42008C	44
AD42490PTX	74	AS23282	71	AS42490	74	AS54890X	73	BDVH42013C	44
AD42490X	74	AS23282X	71	AS42490N	74	BDR2160817	32	BDVH42408C	44
AD43290	74	AS23290	71	AS42490PT	74	BDR2160817S	32	BDVH42414C	44
AD43290N	74	AS23290N	71	AS42490PTX	74	BDR2160817Z	32	BDVH43210C	44
AD43290PT	74	AS23290X	71	AS42490X	74	BDR21612	32	BDVH43216C	44
AD43290PTX	74	AS24890	71	AS432120	75	BDR21612S	32	BDVH43220C	44
AD43290X	74	AS24890N	71	AS432120X	75	BDR21612Z	32	BDVH44012C	44
AD44890	74	AS24890X	71	AS43260	73	BDR2240817	32	BDVH44020C	44
AD44890N	74	AS316120	72	AS43260N	73	BDR2240817S	32	BDVH44816C	44
AD44890PT	74	AS316120X	72	AS43260X	73	BDR2240817Z	32	BDVH44824C	44
AD44890PTX	74	AS31660	72	AS43282	73	BDR22416	32	BDVH46424C	44
AD44890X	74	AS31660X	72	AS43282X	73	BDR22416S	32	BV20201	18
AS20882	71	AS31690	72	AS43290	74	BDR22416Z	32		
AS20882N	71	AS31690X	72	AS43290N	74	BDR2321227	32		
AS20882X	71	AS324120	72	AS43290PT	74	BDR2321227S	32		
AS20890	71	AS324120X	72	AS43290PTX	74	BDR2321227Z	32		
AS20890N	71	AS32460	72	AS43290X	74	BDR23220	32		



Part Number Index

Part Number	Page	Part Number	Page	Part Number	Page	Part Number	Page	Part Number	Page
BV20201	80	BV22008S	18	BV26420	18	BV3321227	26	C208N045	64
BV20201S	18	BV22013	18	BV26420S	18	BV3321227S	26	C208N045C	64
BV20201S	80	BV22013S	18	BV26432	18	BV33212S	25	C208N047	64
BV20301	18	BV224080	19	BV26432S	18	BV33216	25	C208N047C	64
BV20301	80	BV224080S	19	BV30805	25	BV33216S	25	C208N055	64
BV20301S	18	BV2240817	19	BV30805S	25	BV332200	26	C208N055C	64
BV20301S	80	BV2240817S	19	BV30806	25	BV332200S	26	C208N062	64
BV20401	18	BV22410	18	BV30806S	25	BV33220	25	C208N062C	64
BV20401	80	BV22410S	18	BV30808	25	BV33220S	25	C208N078	64
BV20401S	18	BV2241617	19	BV30808S	25	BV34012	25	C208N078C	64
BV20401S	80	BV2241617S	19	BV31206	25	BV3401227	26	C208N093	64
BV20601	18	BV22416	18	BV31206S	25	BV3401227S	26	C208N093C	64
BV20601	80	BV22416S	18	BV31210	25	BV34012S	25	C208N100	64
BV20601S	18	BV2321017	19	BV31210S	25	BV34020	25	C208N100C	64
BV20601S	80	BV2321017S	19	BV316060	26	BV34020S	25	C208N120	64
BV20805	18	BV23212	18	BV316060S	26	BV34026	25	C208N120C	64
BV20805S	18	BV2321227	19	BV3160617	26	BV34026S	25	C208S010	64
BV20806	18	BV2321227S	19	BV3160617S	26	BV348160	26	C208S010C	64
BV20806S	18	BV23212S	18	BV31608	25	BV348160S	26	C208S015	64
BV20808	18	BV23216	18	BV31608S	25	BV34816	25	C208S015C	64
BV20808S	18	BV23216S	18	BV3161217	26	BV3481627	26	C208S020	64
BV21206	18	BV232200	19	BV3161217S	26	BV3481627S	26	C208S020C	64
BV21206S	18	BV232200S	19	BV31612	25	BV34816S	25	C208S025	64
BV21210	18	BV23220	18	BV31612S	25	BV34826	25	C208S025C	64
BV21210S	18	BV23220S	18	BV3200717	26	BV34826S	25	C208S030	64
BV216060	19	BV24012	18	BV3200717S	26	BV364200	26	C208S030C	64
BV216060S	19	BV2401227	19	BV32008	25	BV364200S	26	C208S031	64
BV2160617	19	BV2401227S	19	BV32008S	25	BV36420	25	C208S031C	64
BV2160617S	19	BV24012S	18	BV32013	25	BV36420S	25	C208S045	64
BV21608	18	BV24020	18	BV32013S	25	BV36432	25	C208S045C	64
BV21608S	18	BV24020S	18	BV324080	26	BV36432S	25	C208S047	64
BV2161217	19	BV24026	18	BV324080S	26	C208N010	64	C208S047C	64
BV2161217S	19	BV24026S	18	BV3240817	26	C208N010C	64	C208S055	64
BV21612	18	BV248160	19	BV3240817S	26	C208N015	64	C208S055C	64
BV21612S	18	BV248160S	19	BV32410	25	C208N015C	64	C208S062	64
BV2200717	19	BV24816	18	BV32410S	25	C208N020	64	C208S062C	64
BV2200717S	19	BV2481627	19	BV3241617	26	C208N020C	64	C208S078	64
BV22008	18	BV2481627S	19	BV3241617S	26	C208N025	64	C208S078C	64
		BV24816S	18	BV32416	25	C208N025C	64	C208S093	64
		BV24826	18	BV32416S	25	C208N030	64	C208S093C	64
		BV24826S	18	BV3321017	26	C208N030C	64	C208S100	64
		BV264200	19	BV3321017S	26	C208N031	64	C208S100C	64
		BV264200S	19	BV33212	25	C208N031C	64	C208S120	64



Part Number Index

Part Number	Page	Part Number	Page	Part Number	Page	Part Number	Page	Part Number	Page
C208S120C	64	C408S047	64	CRC12R062047X	80	DESTM-1/2-13-H	78	DESTM-7/16-14-HSC79	
C408N010	64	C408S047C	64	CRC16R031140X	80	DESTM-1/2-13-HC	79	DESTM-7/16-20-H	78
C408N010C	64	C408S055	64	CRC16R031140X	80	DESTM-1/2-13-HSC79		DESTM-7/16-20-HC79	
C408N015	64	C408S055C	64	CRC16R040140X	80	DESTM-1/2-20-H	78	DESTM-7/16-20-HSC79	
C408N015C	64	C408S062	64	CRC16R040140X	80	DESTM-1/4-20-H	78	DESTM-8-32-H	78
C408N020	64	C408S062C	64	CRC16R048047X	80	DESTM-1/4-20-HC	79	DESTM-8-36-H	78
C408N020C	64	C408S078	64	CRC16R048047X	80	DESTM-1/4-20-HSC79		DESTM-9/16-12-H	78
C408N025	64	C408S078C	64	CRC16R062090X	80	DESTM-1/4-28-H	78	DESTM-9/16-12-HC79	
C408N025C	64	C408S093	64	CRC16R062090X	80	DESTM-1/4-28-HC	79	DESTM-9/16-12-HSC79	
C408N030	64	C408S093C	64	CRC16R078047X	80	DESTM-1/4-28-HSC79		DESTM-9/16-18-H	78
C408N030C	64	C408S100	64	CRC16R078047X	80	DESTM-10-24-H	78	DESTM-9/16-18-HC79	
C408N031	64	C408S100C	64	CRC16R093047X	80	DESTM-10-32-H	78	DESTM-9/16-18-HSC79	
C408N031C	64	C408S120	64	CRC16R093047X	80	DESTM-3/4-10-H	78	DESTM098	78
C408N045	64	C408S120C	64	CRC20R060047X	80	DESTM-3/4-10-HC	79	DESTM098L	78
C408N045C	64	CMV21612	75	CRC20R060047X	80	DESTM-3/4-10-HSC79		DESTM120	78
C408N047	64	CMV21612S	75	CRC20R070047X	80	DESTM-3/4-12-H	78	DESTM120L	78
C408N047C	64	CMV22414	75	CRC20R070047X	80	DESTM-3/4-12-HC	79	DESTM138	78
C408N055	64	CMV22414S	75	CRC24R093125X	80	DESTM-3/4-12-HSC79		DESTM138L	78
C408N055C	64	CMV23220	75	CRC24R093125X	80	DESTM-3/4-16-H	78	DESTM182	78
C408N062	64	CMV23220S	75	CRC24R125115X	80	DESTM-3/4-16-HC	79	DESTM182L	78
C408N062C	64	CMV24826	75	CRC24R125115X	80	DESTM-3/4-16-HSC79		DESTM240	78
C408N078	64	CMV24826S	75	CRC32R125235X	80	DESTM-3/8-16-H	78	DESTM240L	78
C408N078C	64	CRC08R010047X	80	CRC32R125235X	80	DESTM-3/8-16-HC	79	DESTM290	78
C408N093	64	CRC08R010047X	80	CRC32R125240X	80	DESTM-3/8-16-HSC79		DESTM290L	78
C408N093C	64	CRC08R015047X	80	CRC32R125240X	80	DESTM-3/8-24-H	78	DESTM372	78
C408N100	64	CRC08R015047X	80	CRC40R2500125X	80	DESTM-3/8-24-HC	79	DESTM372L	78
C408N100C	64	CRC08R020047X	80	CRC40R2500125X	80	DESTM-3/8-24-HSC79		DESTM488	78
C408N120	64	CRC08R020047X	80	CTS0860	76	DESTM-4-40-H	78	DESTM488L	78
C408N120C	64	CRC08R020080X	80	CTS0860S	76	DESTM-5/16-18-H	78	DM20808	76
C408S010	64	CRC08R020080X	80	CTS0890	76	DESTM-5/16-18-HC79		DM20808S	76
C408S010C	64	CRC08R025047X	80	CTS0890S	76	DESTM-5/16-18-HSC79		DM21210	76
C408S015	64	CRC08R025047X	80	CTS1682	76	DESTM-5/16-24-H	78	DM21210S	76
C408S015C	64	CRC08R025070X	80	CTS1682S	76	DESTM-5/16-24-HC79		DM21612	76
C408S020	64	CRC08R025070X	80	CTS1690	76	DESTM-5/16-24-HSC79		DM21612S	76
C408S020C	64	CRC08R031047X	80	CTS1690S	76	DESTM-5/8-11-H	78	DM22416	76
C408S025	64	CRC08R031047X	80	CTS2482	76	DESTM-5/8-11-HC	79	DM22416S	76
C408S025C	64	CRC08R039047X	80	CTS2482S	76	DESTM-5/8-11-HSC79		DM23224	76
C408S030	64	CRC08R039047X	80	CTS2490	76	DESTM-5/8-18-H	78	DM23224S	76
C408S030C	64	CRC12R047047X	80	CTS2490S	76	DESTM-5/8-18-HC	79		
C408S031	64	CRC12R047047X	80	CTS3282	76	DESTM-5/8-18-HSC79			
C408S031C	64	CRC12R050047X	80	CTS3282S	76	DESTM-6-32-H	78		
C408S045	64	CRC12R050047X	80	CTS3290	76	DESTM-7/16-14-H	78		
C408S045C	64	CRC12R062047X	80	CTS3290S	76	DESTM-7/16-14-HC79			



Part Number Index

Part Number	Page	Part Number	Page	Part Number	Page	Part Number	Page	Part Number	Page
DM30808	76	DR24826R030S	31	DR3321227R030Z	34	DR34026R030	33	DR34826R190S	33
DM30808C	76	DR24826R030Z	31	DR33216R030	33	DR34026R030S	33	DR34826R190Z	33
DM31210	76	DR24836R030	31	DR33216R030S	33	DR34026R030Z	33	DR34836R030	33
DM31210C	76	DR24836R030S	31	DR33216R030Z	33	DR34026R060	33	DR34836R030S	33
DM31612	76	DR24836R030Z	31	DR33220R030	33	DR34026R060S	33	DR34836R030Z	33
DM31612C	76	DR3160617R020	34	DR33220R030S	33	DR34026R060Z	33	DR34852R030	33
DM32416	76	DR3160617R020S	34	DR33220R030Z	33	DR34026R093	33	DR34852R030S	33
DM32416C	76	DR3160617R020Z	34	DR33220R045	33	DR34026R093S	33	DR34852R030Z	33
DM33224	76	DR31606R020	33	DR33220R045S	33	DR34026R093Z	33	DR3642027R030	34
DM33224C	76	DR31606R020S	33	DR33220R045Z	33	DR34026R125	33	DR3642027R030S	34
DR2160817R020	31	DR31606R020Z	33	DR33220R060	33	DR34026R125S	33	DR3642027R030Z	34
DR2160817R020S	31	DR31608R020	33	DR33220R060S	33	DR34026R125Z	33	DR3642040R030	34
DR2160817R020Z	31	DR31608R020S	33	DR33220R060Z	33	DR34032R030	33	DR3642040R030S	34
DR21612R020	31	DR31608R020Z	33	DR33220R090	33	DR34032R030S	33	DR3642040R030Z	34
DR21612R020S	31	DR31612R020	33	DR33220R090S	33	DR34032R030Z	33	DR36424R030	33
DR21612R020Z	31	DR31612R020S	33	DR33220R090Z	33	DR3481616R030	34	DR36424R030S	33
DR2240817R020	31	DR31612R020Z	33	DR33220R125	33	DR3481616R030S	34	DR36424R030Z	33
DR2240817R020S	31	DR3240809R020	34	DR33220R125S	33	DR3481616R030Z	34	DR36424R060	33
DR2240817R020Z	31	DR3240809R020S	34	DR33220R125Z	33	DR3481627R030	34	DR36424R060S	33
DR22416R020	31	DR3240809R020Z	34	DR33224R030	33	DR3481627R030S	34	DR36424R060Z	33
DR22416R020S	31	DR3240817R020	34	DR33224R030S	33	DR3481627R030Z	34	DR36424R093	33
DR22416R020Z	31	DR3240817R020S	34	DR33224R030Z	33	DR3481640R030	34	DR36424R093Z	33
DR2321227R030	31	DR3240817R020Z	34	DR33232R030	33	DR3481640R030S	34	DR36424R093S	33
DR2321227R030S	31	DR32410R020	33	DR33232R030S	33	DR3481640R030Z	34	DR36424R125	33
DR2321227R030Z	31	DR32410R020S	33	DR33232R030Z	33	DR34816R030	33	DR36424R125S	33
DR23220R030	31	DR32410R020Z	33	DR3401227R030	34	DR34816R030S	33	DR36424R125Z	33
DR23220R030S	31	DR32416R020	33	DR3401227R030S	34	DR34816R030Z	33	DR3643280R030	34
DR23220R030Z	31	DR32416R020S	33	DR3401227R030Z	34	DR34826R030	33	DR3643280R030S	34
DR2401227R030	31	DR32416R020Z	33	DR34012R030	33	DR34826R030S	33	DR3643280R030Z	34
DR2401227R030S	31	DR3321011R030	34	DR34012R030S	33	DR34826R030Z	33	DR36436R030	33
DR2401227R030Z	31	DR3321011R030S	34	DR34012R030Z	33	DR34826R045	33	DR36436R030S	33
DR24026R030	31	DR3321011R030Z	34	DR34020R030	33	DR34826R045S	33	DR36436R030Z	33
DR24026R030S	31	DR3321017R030	34	DR34020R030S	33	DR34826R045Z	33	DR36452R030	33
DR24026R030Z	31	DR3321017R030S	34	DR34020R030Z	33	DR34826R060	33	DR36452R030S	33
DR2481627R030	31	DR3321017R030Z	34	DR34020R060	33	DR34826R060S	33	DR36452R030Z	33
DR2481627R030S	31	DR3321020R030	34	DR34020R060S	33	DR34826R060Z	33	DR43210R030	34
DR2481627R030Z	31	DR3321020R030S	34	DR34020R060Z	33	DR34826R090	33	DR43210R030S	34
DR24826R030	31	DR3321020R030Z	34	DR34020R093	33	DR34826R090S	33	DR43216R030	34
		DR33210R030	33	DR34020R093S	33	DR34826R090Z	33	DR43216R030S	34
		DR33210R030S	33	DR34020R093Z	33	DR34826R125	33	DR43220R030	34
		DR33210R030Z	33	DR34020R125	33	DR34826R125S	33	DR43220R030S	34
		DR3321227R030	34	DR34020R125S	33	DR34826R125Z	33	DR44020R030	34
		DR3321227R030S	34	DR34020R125Z	33	DR34826R190	33	DR44020R030S	34



Part Number Index

Part Number	Page	Part Number	Page	Part Number	Page	Part Number	Page	Part Number	Page
DR44026R030	34	DTL08115-RH	82	DVH3N045RC	65	DVH4040616RC	68	DVH40808RC	45
DR44026R030S	34	DTL12172-LH	82	DVH3N047RC	65	DVH4040616S	64	DVH4081208C	44
DR44816R040	34	DTL12172-RH	82	DVH3N050RC	65	DVH405010QRC	68	DVH41205C	43
DR44816R040S	34	DTL16232-LH	82	DVH3N055RC	65	DVH405010RC	65	DVH41205R030C	46
DR44826R040	34	DTL16232-RH	82	DVH3N060RC	65	DVH40501C	43	DVH41205RC	45
DR44826R040S	34	DTL24317-LH	82	DVH3N062RC	65	DVH40501RC	45	DVH41207C	43
DR44836R040	34	DTL24317-RH	82	DVH3N078RC	65	DVH405020QRC	68	DVH41207R030C	46
DR44836R040S	34	DTNDH062	81	DVH3N093RC	65	DVH405020RC	65	DVH41207RC	45
DR46424R040	34	DTNDH062X	81	DVH3S015RC	65	DVH40502C	43	DVH4120804C	44
DR46424R040S	34	DTNDH093	81	DVH3S020RC	65	DVH40502RC	45	DVH41210C	43
DR46436R040	34	DTNDH093X	81	DVH3S025RC	65	DVH406010QRC	68	DVH41210RC	45
DR46436R040S	34	DTNDH125	81	DVH3S031RC	65	DVH406010RC	65	DVH41214C	43
DT062-5	81	DTNDH125X	81	DVH3S035RC	65	DVH40601C	43	DVH41214RC	45
DT062-5X	81	DTNDH187	81	DVH3S040RC	65	DVH40601RC	45	DVH41406C	43
DT062	81	DTNDH187X	81	DVH3S045RC	65	DVH406020QRC	68	DVH41406RC	45
DT062X	81	DTNDH250	81	DVH3S047RC	65	DVH406020RC	65	DVH41412C	43
DT093-8	81	DTNDH250X	81	DVH3S050RC	65	DVH40602C	43	DVH41412RC	45
DT093-8X	81	DTNDH375	81	DVH3S055RC	65	DVH40602RC	45	DVH41604RC	45
DT093	81	DTNDH375X	81	DVH3S060RC	65	DVH4060817C	44	DVH41606C	43
DT093X	81	DVH114826C	53	DVH3S062RC	65	DVH4060916	64	DVH41606RC	45
DT125-10	81	DVH114826CC	53	DVH3S078RC	65	DVH4060916	68	DVH416080C	44
DT125-10X	81	DVH114826RCC	53	DVH3S093RC	65	DVH4060916C	68	DVH416080RC	46
DT125	81	DVH114836C	53	DVH4020316	64	DVH4060916RC	68	DVH41608C	43
DT125X	81	DVH114836CC	53	DVH4020316	68	DVH4060916S	64	DVH41608R030C	46
DT187-12	81	DVH114836RCC	53	DVH4020316C	68	DVH407010QRC	68	DVH41608RC	45
DT187-12X	81	DVH114844C	53	DVH4020316RC	68	DVH407010RC	65	DVH41612C	43
DT187	81	DVH114844CC	53	DVH4020316S	64	DVH40701C	43	DVH41612R030C	46
DT187X	81	DVH114844RCC	53	DVH4030916	64	DVH40701RC	45	DVH41612RC	45
DT250-15	81	DVH136432C	53	DVH4030916	68	DVH407020QRC	68	DVH41616C	43
DT250-15X	81	DVH136432CC	53	DVH4030916C	68	DVH407020RC	65	DVH41616RC	45
DT250	81	DVH136432RCC	53	DVH4030916RC	68	DVH40702C	43	DVH41620C	43
DT250X	81	DVH136442C	53	DVH4030916S	64	DVH40702RC	45	DVH41620RC	45
DT375-15	81	DVH136442CC	53	DVH404010QRC	68	DVH408030QRC	68	DVH42005RC	45
DT375-15X	81	DVH136442RCC	53	DVH404010RC	65	DVH408030RC	65	DVH42008C	43
DT375	81	DVH136452C	53	DVH40401C	43	DVH40804C	43	DVH42008R030C	46
DT375X	81	DVH136452CC	53	DVH40401RC	45	DVH40804R030C	46	DVH42008RC	45
DTL04051-LH	82	DVH136452RCC	53	DVH404020QRC	68	DVH40804RC	45	DVH420130C	44
DTL04051-RH	82	DVH3N015RC	65	DVH404020RC	65	DVH408060QRC	68	DVH420130RC	46
DTL04054-LH	82	DVH3N020RC	65	DVH40402C	43	DVH408060RC	65		
DTL04054-RH	82	DVH3N025RC	65	DVH40402RC	45	DVH40806C	43		
DTL06085-LH	82	DVH3N031RC	65	DVH4040616	64	DVH40806R030C	46		
DTL06085-RH	82	DVH3N035RC	65	DVH4040616	68	DVH40806RC	45		
DTL08115-LH	82	DVH3N040RC	65	DVH4040616C	68	DVH40808C	43		



Part Number Index

Part Number	Page	Part Number	Page	Part Number	Page	Part Number	Page	Part Number	Page
DVH42013C.....	43	DVH43220C.....	43	DVH44824C.....	43	DVH51612CC.....	50	DVH53234CC.....	50
DVH42013R030C..	46	DVH43220R060C..	46	DVH44824R060C..	46	DVH51612RC.....	49	DVH53234RC.....	49
DVH42013RC.....	45	DVH43220R125C..	46	DVH44824R090C..	46	DVH51612RCC.....	50	DVH53234RCC.....	50
DVH42406RC.....	45	DVH43220RC.....	45	DVH44824R125C..	46	DVH51616C.....	49	DVH53240C.....	49
DVH4240815RC....	47	DVH43224C.....	43	DVH44824R190C..	46	DVH51616CC.....	50	DVH53240CC.....	50
DVH42408C.....	43	DVH43224RC.....	45	DVH44824RC.....	45	DVH51616RC.....	49	DVH53240RC.....	49
DVH42408R030C..	46	DVH43228RC.....	45	DVH44832000C....	44	DVH51616RCC.....	50	DVH54012C.....	49
DVH42408R060C..	46	DVH43232C.....	43	DVH44832000RC..	46	DVH52007C.....	49	DVH54012RC.....	49
DVH42408RC.....	45	DVH43232RC.....	45	DVH4483200C.....	44	DVH52007RC.....	49	DVH54026C.....	49
DVH42412C.....	43	DVH43236RC.....	45	DVH4483200RC....	46	DVH52013C.....	49	DVH54026CC.....	50
DVH424140C.....	44	DVH43240C.....	43	DVH44832C.....	43	DVH52013CC.....	50	DVH54026RC.....	49
DVH424140RC....	46	DVH43240RC.....	45	DVH44832RC.....	45	DVH52013RC.....	49	DVH54026RCC.....	50
DVH42414C.....	43	DVH43248C.....	43	DVH44836C.....	43	DVH52013RCC.....	50	DVH54034C.....	49
DVH42414RC.....	45	DVH43248RC.....	45	DVH44836RC.....	45	DVH52016C.....	49	DVH54034CC.....	50
DVH42416C.....	43	DVH44010RC.....	45	DVH44840C.....	43	DVH52016CC.....	50	DVH54034RC.....	49
DVH42416R030C..	46	DVH4401218RC....	47	DVH44840RC.....	45	DVH52016RC.....	49	DVH54034RCC.....	50
DVH42416R060C..	46	DVH44012C.....	43	DVH44852C.....	43	DVH52016RCC.....	50	DVH54048C.....	49
DVH42416RC.....	45	DVH44012RC.....	45	DVH44852RC.....	45	DVH52408C.....	49	DVH54048CC.....	50
DVH42420C.....	43	DVH4401600C.....	44	DVH46416C.....	43	DVH52408RC.....	49	DVH54048RC.....	49
DVH42420RC.....	45	DVH4401600RC..	46	DVH46416RC.....	45	DVH52412RC.....	49	DVH54816C.....	49
DVH42424C.....	43	DVH440200C.....	44	DVH4642400C.....	44	DVH52416C.....	49	DVH54816RC.....	49
DVH42424RC.....	45	DVH440200RC....	46	DVH4642400RC....	46	DVH52416CC.....	50	DVH54826C.....	49
DVH42816RC.....	45	DVH44020C.....	43	DVH464240C.....	44	DVH52416RC.....	49	DVH54826CC.....	50
DVH43208RC.....	45	DVH44020R060C..	46	DVH464240RC.....	46	DVH52416RCC.....	50	DVH54826RC.....	49
DVH4321011RC....	47	DVH44020R090C..	46	DVH46424C.....	43	DVH52420C.....	49	DVH54826RCC.....	50
DVH4321017RC....	47	DVH44020R125C..	46	DVH46424R060C..	46	DVH52420CC.....	50	DVH54836C.....	49
DVH43210C.....	43	DVH44020RC.....	45	DVH46424R090C..	46	DVH52420RC.....	49	DVH54836CC.....	50
DVH43210RC.....	45	DVH44024C.....	43	DVH46424R125C..	46	DVH52420RCC.....	50	DVH54836RC.....	49
DVH4321600C.....	44	DVH44024RC.....	45	DVH46424R190C..	46	DVH53210C.....	49	DVH54836RCC.....	50
DVH4321600RC....	46	DVH44032C.....	43	DVH46424RC.....	45	DVH53210RC.....	49	DVH54844C.....	49
DVH432160C.....	44	DVH44032RC.....	45	DVH46432000C....	44	DVH53216C.....	49	DVH54844CC.....	50
DVH432160RC....	46	DVH44036C.....	43	DVH46432000RC..	46	DVH53216CC.....	50	DVH54844RC.....	49
DVH43216C.....	43	DVH44036RC.....	45	DVH4643200C.....	44	DVH53216RC.....	49	DVH54844RCC.....	50
DVH43216R010C..	46	DVH44812RC.....	45	DVH4643200RC....	46	DVH53216RCC.....	50	DVH54848C.....	49
DVH43216R060C..	46	DVH4481600C.....	44	DVH46436C.....	43	DVH53220C.....	49	DVH54848CC.....	50
DVH43216R090C..	46	DVH4481600RC..	46	DVH46436RC.....	45	DVH53220CC.....	50	DVH54848RC.....	49
DVH43216R125C..	46	DVH4481618RC....	47	DVH46452C.....	43	DVH53220RC.....	49	DVH56420C.....	49
DVH43216RC.....	45	DVH4481626RC....	47	DVH46452RC.....	45	DVH53220RCC.....	50	DVH56420RC.....	49
		DVH44816C.....	43	DVH51606C.....	49	DVH53226C.....	49	DVH56432C.....	49
		DVH44816RC.....	45	DVH51606RC.....	49	DVH53226CC.....	50	DVH56432CC.....	50
		DVH448240C.....	44	DVH51608C.....	49	DVH53226RC.....	49	DVH56432RC.....	49
		DVH448240RC....	46	DVH51608RC.....	49	DVH53226RCC.....	50	DVH56432RCC.....	50
		DVH44824125C....	46	DVH51612C.....	49	DVH53234C.....	49	DVH56442C.....	49



Part Number Index

Part Number	Page	Part Number	Page	Part Number	Page	Part Number	Page	Part Number	Page
DVH56442CC.....	50	DVH73240C.....	50	DVH76442C.....	51	DVHR440200RC....	48	P30906.....	36
DVH56442RC.....	49	DVH73240CC.....	50	DVH76442CC.....	50	DVHR44020RC	47	P30906R.....	36
DVH56442RCC.....	50	DVH73240RC.....	51	DVH76442RC.....	52	DVHR44024RC	47	P30906RX.....	36
DVH56452C.....	49	DVH74012C.....	51	DVH76442RCC.....	51	DVHR44036RC	47	P30906X.....	36
DVH56452CC.....	50	DVH74012RC.....	52	DVH76452C.....	51	DVHR4481600RC..	48	P31005D.....	36
DVH56452RC.....	49	DVH74020C.....	51	DVH76452CC.....	50	DVHR4481618RC..	48	P31005DX.....	36
DVH56452RCC.....	50	DVH74020RC.....	52	DVH76452RC.....	52	DVHR4481626RC..	48	P31205D.....	36
DVH71606C.....	51	DVH74026C.....	51	DVH76452RCC.....	51	DVHR44816RC	47	P31205DX.....	36
DVH71606RC.....	52	DVH74026CC.....	50	DVH93220C.....	52	DVHR448240RC....	48	P31206.....	36
DVH71608C.....	51	DVH74026RC.....	52	DVH93226C.....	52	DVHR44824RC	47	P31206R.....	36
DVH71608RC.....	52	DVH74026RCC.....	51	DVH93226CC.....	51	DVHR44836RC	47	P31206RX.....	36
DVH71612C.....	51	DVH74034C.....	51	DVH93226RCC.....	52	DVHR44852RC	47	P31206X.....	36
DVH71612RC.....	52	DVH74034CC.....	50	DVH93234C.....	52	DVHR46416RC	47	P31210.....	36
DVH71616C.....	51	DVH74034RC.....	52	DVH93234CC.....	52	DVHR4642400RC..	48	P31210R.....	36
DVH71616RC.....	52	DVH74034RCC.....	51	DVH93234RCC.....	52	DVHR464240RC....	48	P31210RX.....	36
DVH72007C.....	51	DVH74048C.....	50	DVH94026C.....	52	DVHR46424RC	47	P31210X.....	36
DVH72007RC.....	52	DVH74048CC.....	50	DVH94034C.....	52	DVHR46436RC	47	P31212.....	36
DVH72013C.....	51	DVH74048RC.....	51	DVH94034CC.....	52	DVHR46452RC	47	P31212X.....	36
DVH72013RC.....	52	DVH74816C.....	51	DVH94034RCC.....	52	ENG0860.....	80	P31408D.....	36
DVH72016C.....	51	DVH74816RC.....	52	DVHR41606RC	47	ENG0860X.....	80	P31408DX.....	36
DVH72016RC.....	52	DVH74820C.....	51	DVHR416080RC...	48	ENG1240.....	80	P50804D.....	38
DVH72408C.....	51	DVH74820RC.....	52	DVHR41608RC	47	ENG1240X.....	80	P50804DX.....	38
DVH72408RC.....	52	DVH74826C.....	51	DVHR41612RC	47	ENG1260.....	80	P50805.....	37
DVH72412C.....	51	DVH74826CC.....	50	DVHR42008RC	47	ENG1260X.....	80	P50805X.....	37
DVH72412RC.....	52	DVH74826RC.....	52	DVHR420130RC...	48	ENG1640.....	80	P50808.....	37
DVH72416C.....	51	DVH74826RCC.....	51	DVHR42013RC	47	ENG1640X.....	80	P50808X.....	37
DVH72416RC.....	52	DVH74836C.....	51	DVHR4240815RC..	48	ENG1660.....	80	P50812.....	37
DVH72420C.....	51	DVH74836CC.....	50	DVHR42408RC	47	ENG1660X.....	80	P50812X.....	37
DVH72420RC.....	52	DVH74836RC.....	52	DVHR424140RC...	48	P30706.....	36	P51005D.....	38
DVH73210C.....	51	DVH74836RCC.....	51	DVHR42414RC	47	P30706R.....	36	P51005DX.....	38
DVH73210RC.....	52	DVH74844C.....	51	DVHR42416RC	47	P30706RX.....	36	P51205D.....	38
DVH73216C.....	51	DVH74844CC.....	50	DVHR42420RC	47	P30706X.....	36	P51205DX.....	38
DVH73216RC.....	52	DVH74844RC.....	52	DVHR4321011RC..	48	P30804D.....	36	P51206.....	37
DVH73220C.....	51	DVH74844RCC.....	51	DVHR4321017RC..	48	P30805.....	36	P51206X.....	37
DVH73220RC.....	52	DVH74848C.....	50	DVHR43210RC	47	P30805R.....	36	P51210.....	37
DVH73226C.....	51	DVH74848CC.....	50	DVHR4321600RC..	48	P30805RX.....	36	P51210X.....	37
DVH73226CC.....	50	DVH74848RC.....	51	DVHR432160RC...	48	P30805X.....	36	P51212.....	37
DVH73226RC.....	52	DVH76420C.....	51	DVHR43216RC	47	P30808.....	36	P51212X.....	37
DVH73226RCC.....	51	DVH76420RC.....	52	DVHR43220RC	47	P30808R.....	36		
DVH73234C.....	51	DVH76432C.....	51	DVHR43232RC	47	P30808RX.....	36		
DVH73234CC.....	50	DVH76432CC.....	50	DVHR4401218RC..	48	P30808X.....	36		
DVH73234RC.....	52	DVH76432RC.....	52	DVHR44012RC	47	P30812.....	36		
DVH73234RCC.....	51	DVH76432RCC.....	51	DVHR4401600RC..	48	P30812X.....	36		



Part Number Index

Part Number	Page	Part Number	Page	Part Number	Page	Part Number	Page	Part Number	Page
P51408D	38	P53220	37	P78032X	38	R6321600C	57	R6642400RC	59
P51408DX	38	P53220X	37	P78050	38	R6321600RC	59	R664240C	57
P51608	37	P53224	37	P78050X	38	R632160C	57	R664240RC	59
P51608D	38	P53224X	37	P78080	38	R632160RC	59	R66424C	56
P51608DX	38	P53232	37	P78080X	38	R63216C	56	R66424RC	58
P51608X	37	P53232X	37	R60804C	56	R63216RC	58	R66436C	56
P51612	37	P54012	37	R60806C	56	R63220C	56	R66436RC	58
P51612X	37	P54012X	37	R61205C	56	R63220RC	58	R66452C	56
P51618	37	P54020	37	R61207C	56	R63228RC	58	R66452RC	58
P51618X	37	P54020X	37	R61210C	56	R63232C	56	SPD08120	75
P52008	37	P54026	37	R61214C	56	R63232RC	58	SPD08120C	75
P52008D	38	P54026X	37	R61606C	56	R63236RC	58	SPD08140	75
P52008DX	38	P54032	37	R61606RC	57	R6401218C	57	SPD08140C	75
P52008X	37	P54032X	37	R616080RC	59	R6401218RC	59	SPD0890	75
P52013	37	P54036	37	R61608C	56	R64012C	56	SPD0890C	75
P52013X	37	P54036X	37	R61608RC	57	R64012RC	58	SPD12120	75
P52018	37	P54052	37	R61612C	56	R6401600RC	59	SPD12120C	75
P52018X	37	P54052X	37	R61612RC	57	R640200RC	59	SPD12140	75
P52409D	38	P54816	37	R61616RC	57	R64020C	56	SPD12140C	75
P52409DX	38	P54816X	37	R61620C	56	R64020RC	58	SPD1290	75
P52410	37	P54826	37	R62008C	56	R64024C	56	SPD1290C	75
P52410X	37	P54826X	37	R62008RC	57	R64024RC	58	SPD16120	75
P52416	37	P54832	37	R620130RC	59	R64036C	56	SPD16120C	75
P52416X	37	P54832X	37	R62013C	56	R64036RC	58	SPD16140	75
P52420	37	P54836	37	R62013RC	57	R64040RC	58	SPD16140C	75
P52420X	37	P54836X	37	R6240815C	57	R6481600C	57	SPD1690	75
P52809	37	P54840	37	R6240815RC	59	R6481600RC	59	SPD1690C	75
P52809D	38	P54840X	37	R62408C	56	R6481618C	57	SPD24120	75
P52809DX	38	P54852	37	R62408RC	57	R6481618RC	59	SPD24120C	75
P52809X	37	P54852X	37	R624140C	57	R6481626C	57	SPD24140	75
P52816	37	P56424	37	R624140RC	59	R6481626RC	59	SPD24140C	75
P52816X	37	P56424X	37	R62414C	56	R64816C	56	SPD2490	75
P53210D	38	P56432	37	R62414RC	57	R64816RC	58	SPD2490C	75
P53210DX	38	P56432X	37	R62416C	56	R648240C	57	SPD32120	75
P53212	37	P56440	37	R62416RC	57	R648240RC	59	SPD32120C	75
P53212X	37	P56440X	37	R62420C	56	R64824C	56	SPD32140	75
P53216	37	P56452	37	R62420RC	58	R64824RC	58	SPD32140C	75
P53216X	37	P56452X	37	R6321011C	57	R64836C	56	SPD3290	75
		P56464	37	R6321011RC	59	R64836RC	58	SPD3290C	75
		P56464X	37	R6321017C	57	R64852C	56	V202010	66
		P78020	38	R6321017RC	59	R66416C	56	V202010Q	66
		P78020X	38	R63210C	56	R66416RC	58	V202010QS	66
		P78032	38	R63210RC	58	R6642400C	57	V202010S	66



Part Number Index

Part Number	Page	Part Number	Page	Part Number	Page	Part Number	Page	Part Number	Page
V202020	66	V2051412S	66	V20806	14	V2160609S	16	V22013	14
V202020Q	66	V206010	66	V20806S	14	V21606	14	V22013S	14
V202020QS	66	V206010Q	66	V208080	66	V2160617	16	V22018	14
V202020S	66	V206010QS	66	V208080Q	66	V2160617S	16	V22018S	14
V2020308	66	V206010S	66	V208080QS	66	V21606S	14	V22020	14
V2020308S	66	V20601	14	V208080S	66	V216080	17	V22020S	14
V203010	66	V20601S	14	V20808	14	V216080S	17	V22024	14
V203010Q	66	V206020	66	V20808S	14	V21608	14	V22024S	14
V203010QS	66	V206020Q	66	V20810	14	V21608S	14	V22032	14
V203010S	66	V206020QS	66	V20810S	14	V21610	14	V22032S	14
V203020	66	V206020S	66	V20812	14	V21610S	14	V224080	17
V203020Q	66	V20602	14	V2081216	66	V21612	14	V2240809	16
V203020QS	66	V20602S	14	V2081216S	66	V2161217	16	V2240809S	16
V203020S	66	V2060916	66	V20812S	14	V2161217S	16	V224080S	17
V2031008	66	V2060916S	66	V20816	14	V21612R015	17	V22408	14
V2031008S	66	V207010	66	V20816S	14	V21612R015S	17	V2240817	16
V204010	66	V207010Q	66	V21005	14	V21612R030	17	V2240817S	16
V204010Q	66	V207010QS	66	V21005S	14	V21612R030S	17	V22408S	14
V204010QS	66	V207010S	66	V21009	14	V21612R060	17	V22410	14
V204010S	66	V20701	14	V21009S	14	V21612R060S	17	V22410S	14
V20401	14	V20701S	14	V212040	17	V21612S	14	V22412	14
V20401S	14	V207020	66	V2120404	16	V21616	14	V22412S	14
V204020	66	V207020Q	66	V2120404S	16	V21616S	14	V224160	17
V204020Q	66	V207020QS	66	V212040S	17	V21618	14	V224160S	17
V204020QS	66	V207020S	66	V21205	14	V21618S	14	V22416	14
V204020S	66	V20702	14	V21205S	14	V21620	14	V2241617	16
V20402	14	V20702S	14	V21206	14	V21620S	14	V2241617S	16
V20402S	14	V2080304	16	V21206S	14	V21624	14	V22416R010	17
V2040612	66	V2080304S	16	V21210	14	V21624S	14	V22416R010S	17
V2040612S	66	V208030	66	V21210S	14	V21632	14	V22416R030	17
V205010	66	V208030Q	66	V21212	14	V21632S	14	V22416R030S	17
V205010Q	66	V208030QS	66	V21212S	14	V2200605	16	V22416R060	17
V205010QS	66	V208030S	66	V21216	14	V2200605S	16	V22416R060S	17
V205010S	66	V208040	17	V21216S	14	V220070	17	V22416R093	17
V20501	14	V208040S	17	V2121816	66	V2200708	16	V22416R093S	17
V20501S	14	V20804	14	V2121816S	6	V2200708S	16	V22416S	14
V205020	66	V20804S	14	V21406	14	V220070S	17	V22420	15
V205020Q	66	V20805	14	V21406S	14	V22007	14	V22420S	15
V205020QS	66	V20805S	14	V21412	14	V2200717	16		
V205020S	66	V208060	66	V21412S	14	V2200717S	16		
V20502	14	V208060Q	66	V2160605	16	V22007S	14		
V20502S	14	V208060QS	66	V2160605S	16	V22008	14		
V2051412	66	V208060S	66	V2160609	16	V22008S	14		



Part Number Index

Part Number	Page	Part Number	Page	Part Number	Page	Part Number	Page	Part Number	Page
V22424.....	15	V23220R060S	17	V24020R125.....	17	V24826R125S	17	V26420S.....	15
V22424S.....	15	V23220R093.....	17	V24020R125S	17	V24826R190.....	17	V26424.....	15
V22432.....	15	V23220R093S	17	V24020S.....	15	V24826R190S	17	V2642432.....	16
V22432S.....	15	V23220R125.....	17	V24026.....	15	V24826S.....	15	V2642432S.....	16
V22440.....	15	V23220R125S	17	V24026S.....	15	V24832.....	15	V26424S.....	15
V22440S.....	15	V23220S.....	15	V24032.....	15	V24832S.....	15	V26432.....	15
V22809.....	15	V23224.....	15	V24032S.....	15	V24836.....	15	V26432S.....	15
V22809S.....	15	V23224S.....	15	V24040.....	15	V24836S.....	15	V26436.....	15
V22816.....	15	V23232.....	15	V24040S.....	15	V24840.....	15	V26436S.....	15
V22816S.....	15	V23232S.....	15	V24044.....	15	V24840S.....	15	V26440.....	15
V2321000.....	17	V23236.....	15	V24044S.....	15	V24848.....	15	V26440S.....	15
V2321000S.....	17	V23236S.....	15	V24052.....	15	V24848S.....	15	V26448.....	15
V2321011.....	16	V23240.....	15	V24052S.....	15	V24852.....	15	V26448S.....	15
V2321011S.....	16	V23240S.....	15	V24064.....	15	V24852S.....	15	V26456.....	15
V23210.....	15	V23248.....	15	V24064S.....	15	V24856.....	15	V26456S.....	15
V2321017.....	16	V23248S.....	15	V2481600.....	17	V24856S.....	15	V26464.....	15
V2321017S.....	16	V23264.....	15	V2481600S.....	17	V24864.....	15	V26464S.....	15
V2321048.....	16	V23264S.....	15	V248160.....	17	V24864S.....	15	V26488.....	15
V2321048S.....	16	V2401200.....	17	V248160S.....	17	V24880.....	15	V26488S.....	15
V23210S.....	15	V2401200S.....	17	V2481612.....	16	V24880S.....	15	V302010.....	67
V232120.....	17	V240120.....	17	V2481612S.....	16	V25620.....	15	V302010Q.....	67
V232120S.....	17	V240120S.....	17	V24816.....	15	V25620S.....	15	V302010QS.....	67
V23212.....	15	V2401212.....	16	V2481620.....	16	V25636.....	15	V302010S.....	67
V2321227.....	16	V2401212S.....	16	V2481620S.....	16	V25636S.....	15	V302020.....	67
V2321227S.....	16	V24012.....	15	V2481627.....	16	V264160.....	17	V302020Q.....	67
V2321232.....	16	V2401219.....	16	V2481627S.....	16	V264160S.....	17	V302020QS.....	67
V2321232S.....	16	V2401219S.....	16	V2481632.....	16	V2641612.....	16	V302020S.....	67
V23212S.....	15	V2401227.....	16	V2481632S.....	16	V2641612S.....	16	V303010.....	67
V23216.....	15	V2401227S.....	16	V2481648.....	16	V2641617.....	16	V303010Q.....	67
V23216S.....	15	V2401232.....	16	V2481648S.....	16	V2641617S.....	16	V303010QS.....	67
V232200.....	17	V2401232S.....	16	V24816S.....	15	V2642000.....	17	V303010S.....	67
V232200S.....	17	V2401248.....	16	V24826.....	15	V2642000S.....	17	V303020.....	67
V23220.....	15	V2401248S.....	16	V2482627.....	16	V264200.....	17	V303020Q.....	67
V23220R010.....	17	V24012S.....	15	V2482627S.....	16	V264200S.....	17	V303020QS.....	67
V23220R010S	17	V24020.....	15	V24826R010.....	17	V26420.....	15	V303020S.....	67
V23220R030.....	17	V24020R010.....	17	V24826R010S	17	V2642027.....	16	V304010.....	67
V23220R030S	17	V24020R010S	17	V24826R030.....	17	V2642027S.....	16	V304010Q.....	67
V23220R060.....	17	V24020R030.....	17	V24826R030S	17	V2642032.....	16	V304010QS.....	67
		V24020R030S	17	V24826R060.....	17	V2642032S.....	16	V304010S.....	67
		V24020R060.....	17	V24826R060S	17	V2642035.....	16	V30401.....	20
		V24020R060S	17	V24826R093.....	17	V2642035S.....	16	V30401S.....	20
		V24020R093.....	17	V24826R093S	17	V2642048.....	16	V304020.....	67
		V24020R093S	17	V24826R125.....	17	V2642048S.....	16	V304020Q.....	67



Part Number Index

Part Number	Page	Part Number	Page	Part Number	Page	Part Number	Page	Part Number	Page
V304020QS	67	V308030Q	67	V31212	20	V3161217S	22	V32020	20
V304020S	67	V308030QS	67	V31212S	20	V31612	20	V32020S	20
V30402	20	V308030S	67	V31216	20	V31612R010	24	V32024	20
V30402S	20	V308040	23	V31216S	20	V31612R010S	24	V32024S	20
V305010	67	V308040S	23	V31406	20	V31612R015	24	V32032	20
V305010Q	67	V30804	20	V31406S	20	V31612R015S	24	V32032S	20
V305010QS	67	V30804S	20	V31412	20	V31612R030	24	V32210	20
V305010S	67	V30805	20	V31412S	20	V31612R030S	24	V32210S	20
V30501	20	V30805S	20	V3160605	22	V31612R060	24	V32216	20
V30501S	20	V308060	67	V3160605S	22	V31612R060S	24	V32216S	20
V305020	67	V308060Q	67	V3160609	22	V31612S	20	V324080	23
V305020Q	67	V308060QS	67	V3160609S	22	V31616	20	V3240809	22
V305020QS	67	V308060S	67	V3160617	22	V31616S	20	V3240809S	22
V305020S	67	V30806	20	V3160617S	22	V31618	20	V324080S	23
V30502	20	V30806S	20	V31606	20	V31618S	20	V3240817	22
V30502S	20	V308080	67	V31606R010	24	V31620	20	V3240817S	22
V306010	67	V308080Q	67	V31606R010S	24	V31620S	20	V32408	20
V306010Q	67	V308080QS	67	V31606R015	24	V31624	20	V32408R010	24
V306010QS	67	V308080S	67	V31606R015S	24	V31624S	20	V32408R010S	24
V306010S	67	V30808	20	V31606R030	24	V31628	20	V32408R030	24
V30601	20	V30808S	20	V31606R030S	24	V31628S	20	V32408R030S	24
V30601S	20	V30810	20	V31606R060	24	V31632	20	V32408R060	24
V306020	67	V30810S	20	V31606R060S	24	V31632S	20	V32408R060S	24
V306020Q	67	V30812	20	V31606S	20	V31808	20	V32408R093	24
V306020QS	67	V30812S	20	V316080	23	V31808S	20	V32408R093S	24
V306020S	67	V30816	20	V3160809	22	V31812	20	V32408S	20
V30602	20	V30816S	20	V3160809S	22	V31812S	20	V3241017	22
V30602S	20	V31005	20	V316080S	23	V3200605	22	V3241017S	22
V307010	67	V31005S	20	V31608	20	V3200605S	22	V32410	20
V307010Q	67	V31009	20	V31608R010	24	V320070	23	V32410S	20
V307010QS	67	V31009S	20	V31608R010S	24	V3200708	22	V32412	20
V307010S	67	V312040	23	V31608R015	24	V3200708S	22	V32412R010	24
V30701	20	V3120404	22	V31608R015S	24	V320070S	23	V32412R010S	24
V30701S	20	V3120404S	22	V31608R030	24	V3200717	22	V32412R030	24
V307020	67	V312040S	23	V31608R030S	24	V3200717S	22	V32412R030S	24
V307020Q	67	V31205	20	V31608R060	24	V32007	20	V32412R060	24
V307020QS	67	V31205S	20	V31608R060S	24	V32007S	20	V32412R060S	24
V307020S	67	V31206	20	V31608S	20	V32008	20	V32412R093	24
V30702	20	V31206S	20	V31610	20	V32008S	20		
V30702S	20	V31209	20	V31610S	20	V32013	20		
V3080304	22	V31209S	20	V3161200	23	V32013S	20		
V3080304S	22	V31210	20	V3161200S	23	V32018	20		
V308030	67	V31210S	20	V3161217	22	V32018S	20		



Part Number Index

Part Number	Page	Part Number	Page	Part Number	Page	Part Number	Page	Part Number	Page
V32412R093S	24	V33210	21	V332200S	23	V34012	21	V34026S	21
V32412S	20	V3321048	22	V33220	21	V3401227	22	V34032	21
V3241600	23	V3321048S	22	V33220R010	24	V3401227S	22	V34032S	21
V3241600S	23	V33210R010	24	V33220R010S	24	V3401232	22	V34036	21
V324160	23	V33210R010S	24	V33220R030	24	V3401232S	22	V34036S	21
V324160S	23	V33210R030	24	V33220R030S	24	V3401248	22	V34040	21
V3241617	22	V33210R030S	24	V33220R045	24	V3401248S	22	V34040S	21
V3241617S	22	V33210R045	24	V33220R045S	24	V34012R010	24	V34044	21
V32416	20	V33210R045S	24	V33220R060	24	V34012R010S	24	V34044S	21
V32416R010	24	V33210R060	24	V33220R060S	24	V34012R030	24	V34052	21
V32416R010S	24	V33210R060S	24	V33220R090	24	V34012R030S	24	V34052S	21
V32416R030	24	V33210R090	24	V33220R090S	24	V34012R060	24	V34064	21
V32416R030S	24	V33210R090S	24	V33220R093	24	V34012R060S	24	V34064S	21
V32416R060	24	V33210R093	24	V33220R093S	24	V34012R093	24	V3481600	23
V32416R060S	24	V33210R093S	24	V33220R125	24	V34012R093S	24	V3481600S	23
V32416R093	24	V33210R125	24	V33220R125S	24	V34012R125	24	V348160	23
V32416R093S	24	V33210R125S	24	V33220S	21	V34012R125S	24	V348160S	23
V32416S	20	V33210S	21	V33224	21	V34012S	21	V3481612	22
V32420	20	V332120	23	V33224S	21	V34016	21	V3481612S	22
V32420S	20	V332120S	23	V33228	21	V34016S	21	V3481616	22
V32424	20	V33212	21	V33228S	21	V34020	21	V3481616S	22
V32424S	20	V3321227	22	V33232	21	V34020R010	24	V3481620	22
V32432	20	V3321227S	22	V33232S	21	V34020R010S	24	V3481620S	22
V32432S	20	V3321232	22	V33236	21	V34020R030	24	V34816	21
V32440	20	V3321232S	22	V33236S	21	V34020R030S	24	V3481627	22
V32440S	20	V33212S	21	V33240	21	V34020R060	24	V3481627S	22
V32809	20	V33216	21	V33240S	21	V34020R060S	24	V3481632	22
V32809S	20	V33216R010	24	V33248	21	V34020R093	24	V3481632S	22
V32816	21	V33216R010S	24	V33248S	21	V34020R093S	24	V3481648	22
V32816S	21	V33216R030	24	V33252	21	V34020R125	24	V3481648S	22
V3321000	23	V33216R030S	24	V33252S	21	V34020R125S	24	V34816R010	24
V3321000S	23	V33216R045	24	V33264	21	V34020S	21	V34816R010S	24
V3321011	22	V33216R045S	24	V33264S	21	V34026	21	V34816R030	24
V3321011S	22	V33216R060	24	V33280	21	V34026R010	24	V34816R030S	24
V3321017	22	V33216R060S	24	V33280S	21	V34026R010S	24	V34816R045	24
V3321017S	22	V33216R090	24	V3401200	23	V34026R030	24	V34816R045S	24
V3321020	22	V33216R090S	24	V3401200S	23	V34026R030S	24	V34816R060	24
V3321020S	22	V33216R093	24	V340120	23	V34026R060	24	V34816R060S	24
		V33216R093S	24	V340120S	23	V34026R060S	24	V34816R093	24
		V33216R125	24	V3401212	22	V34026R093	24	V34816R093S	24
		V33216R125S	24	V3401212S	22	V34026R093S	24	V34816R125	24
		V33216S	21	V3401219	22	V34026R125	24	V34816R125S	24
		V332200	23	V3401219S	22	V34026R125S	24	V34816R190	24



Part Number Index

Part Number	Page	Part Number	Page	Part Number	Page	Part Number	Page	Part Number	Page
V34816R190S	..... 24	V34836S	..... 21	V36424	..... 21	V36464S	..... 21	V44836R040S	..... 27
V34816S	..... 21	V34840	..... 21	V3642432	..... 22	V36468	..... 21	V44836S	..... 27
V34820000	..... 23	V34840S	..... 21	V3642432S	..... 22	V36468S	..... 21	V46424	..... 27
V34820000S	..... 23	V34848	..... 21	V36424R030	..... 25	V36488	..... 21	V46424R040	..... 27
V3482000	..... 23	V34848S	..... 21	V36424R030S	..... 25	V36488S	..... 21	V46424R040S	..... 27
V3482000S	..... 23	V34852	..... 21	V36424R060	..... 25	V36496	..... 21	V46424S	..... 27
V34826	..... 21	V34852S	..... 21	V36424R060S	..... 25	V36496S	..... 21	V46436	..... 27
V3482627	..... 22	V34856	..... 21	V36424R093	..... 25	V3803200	..... 23	V46436R040	..... 27
V3482627S	..... 22	V34856S	..... 21	V36424R093S	..... 25	V3803200S	..... 23	V46436R040S	..... 27
V34826R010	..... 24	V34864	..... 21	V36424R125	..... 25	V380320	..... 23	V46436S	..... 27
V34826R010S	..... 24	V34864S	..... 21	V36424R125S	..... 25	V380320S	..... 23		
V34826R030	..... 24	V34868	..... 21	V36424R190	..... 25	V38036	..... 21		
V34826R030S	..... 24	V34868S	..... 21	V36424R190S	..... 25	V38036S	..... 21		
V34826R045	..... 24	V34880	..... 21	V36424S	..... 21	V43210	..... 27		
V34826R045S	..... 24	V34880S	..... 21	V36426R190	..... 25	V43210R030	..... 27		
V34826R060	..... 24	V34896	..... 21	V36426R190S	..... 25	V43210R030S	..... 27		
V34826R060S	..... 24	V34896S	..... 21	V36432000	..... 23	V43210S	..... 27		
V34826R090	..... 25	V35620	..... 21	V36432000S	..... 23	V43216	..... 27		
V34826R090S	..... 25	V35620S	..... 21	V36432	..... 21	V43216R030	..... 27		
V34826R093	..... 25	V35636	..... 21	V3643272	..... 22	V43216R030S	..... 27		
V34826R093S	..... 25	V35636S	..... 21	V3643272S	..... 22	V43216S	..... 27		
V34826R125	..... 25	V364160	..... 23	V3643280	..... 22	V43220	..... 27		
V34826R125S	..... 25	V364160S	..... 23	V3643280S	..... 22	V43220R030	..... 27		
V34826R190	..... 25	V3641612	..... 22	V36432S	..... 21	V43220R030S	..... 27		
V34826R190S	..... 25	V3641612S	..... 22	V36436	..... 21	V43220S	..... 27		
V34826S	..... 21	V3641617	..... 22	V36436R030	..... 25	V44020	..... 27		
V34832	..... 21	V3641617S	..... 22	V36436R030S	..... 25	V44020R030	..... 27		
V34832R010	..... 25	V36420000	..... 23	V36436R060	..... 25	V44020R030S	..... 27		
V34832R010S	..... 25	V36420000S	..... 23	V36436R060S	..... 25	V44020S	..... 27		
V34832R030	..... 25	V3642000	..... 23	V36436R093	..... 25	V44026	..... 27		
V34832R030S	..... 25	V3642000S	..... 23	V36436R093S	..... 25	V44026R030	..... 27		
V34832R045	..... 25	V364200	..... 23	V36436R125	..... 25	V44026R030S	..... 27		
V34832R045S	..... 25	V364200S	..... 23	V36436R125S	..... 25	V44026S	..... 27		
V34832R060	..... 25	V36420	..... 21	V36436S	..... 21	V44816	..... 27		
V34832R060S	..... 25	V3642027	..... 22	V36440	..... 21	V44816R040	..... 27		
V34832R093	..... 25	V3642027S	..... 22	V36440S	..... 21	V44816R040S	..... 27		
V34832R093S	..... 25	V3642032	..... 22	V36448	..... 21	V44816S	..... 27		
V34832R125	..... 25	V3642032S	..... 22	V36448S	..... 21	V44826	..... 27		
V34832R125S	..... 25	V3642035	..... 22	V36452	..... 21	V44826R040	..... 27		
V34832R190	..... 25	V3642035S	..... 22	V36452S	..... 21	V44826R040S	..... 27		
V34832R190S	..... 25	V3642048	..... 22	V36456	..... 21	V44826S	..... 27		
V34832S 21	V3642048S 22	V36456S 21	V44836 27		
V34836 21	V36420S 21	V36464 21	V44836R040 27		



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