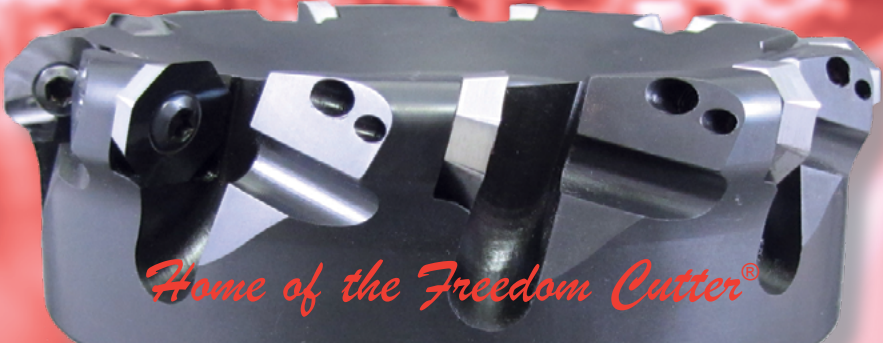
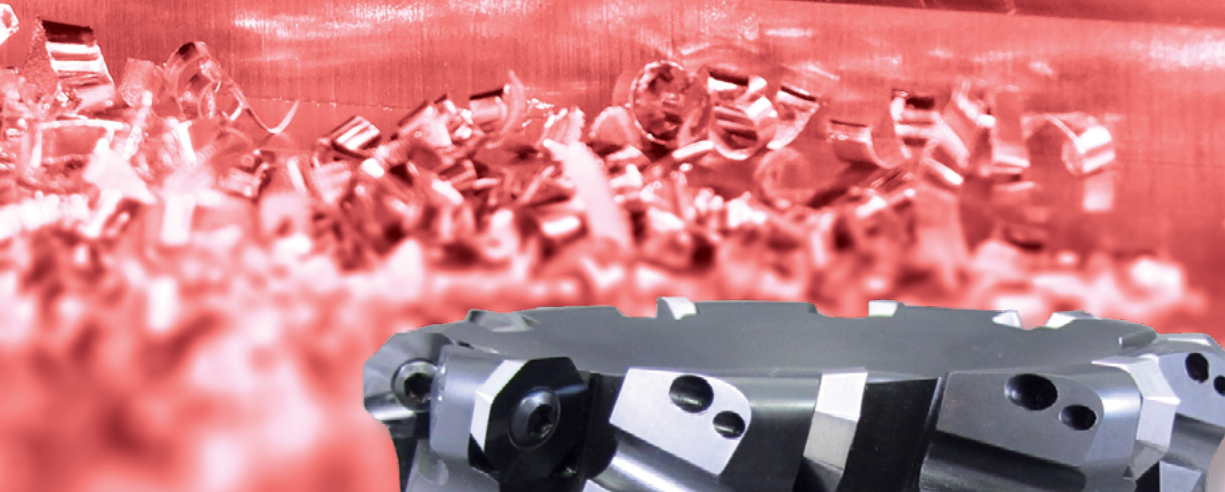




# High-Performance Indexable Carbide Milling Systems



*Home of the Freedom Cutter®*



American Made  
American Designed  
American Owned

“Reprogram your milling expectations.”



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Mil-Tec was created to bring the shearing action of traditional solid carbide machining to indexable carbide face & end milling. Along the way, we pioneered and patented the Freedom Cutter® (allowing 3 insert shapes to fit into the same cutter body pocket) and the Mil-Loc (a positioning device allowing 8 indexes on a round insert). We use only the best technology available from throughout the world, combined into a product line that offers the ultimate in milling application productivity. All of our inserts are precision ground and are suitable for use on a diverse range of materials and machine tools. Our toughest task in application training is getting prospective customers to run our product FAST ENOUGH to take full advantage of the Mil-Tec design. Once accomplished, a Mil-Tec customer is usually one for life.

We guarantee your satisfaction. This Company was created with a total “white-paper” approach; there are no compromises regarding performance. Our goal is to delight our customers.

We are extremely proud of Mil-Tec’s products, and are confident you will enjoy using it as much as we enjoy manufacturing it.

Sincerely,

David Povich  
President

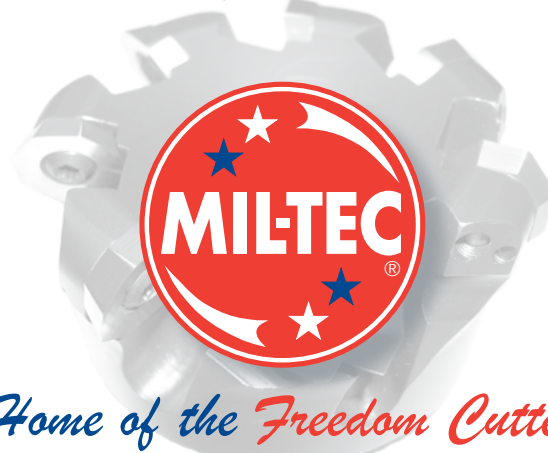


American Made  
American Designed  
American Owned

**ABOUT THIS CATALOG & PRODUCT LINE:** The Mil-Tec product line presentation has been greatly simplified with the addition of EDP numbers. While the “old” nomenclature has been discarded from use in this publication, rest assured it will still appear on packaging and sales documentation. Alongside it will be new EDP #'s and an updated, logic-based numbering system used for Freedom Cutter inserts (see page # 10 for more information). Our goal is to make this product line as efficient to understand, sell, purchase, and utilize as it is transferring heat from the workpiece to the chip.

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Phone (800) 564-5832 Fax (866) 244-0298 miltecusa.com toolalliance.com eMail: sales@miltecusa.com



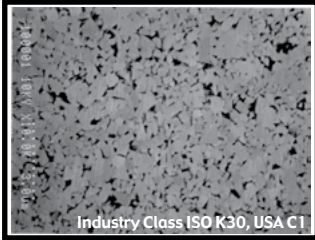
Home of the Freedom Cutter®





# Components of Guaranteed Quality

**COMPONENT #1: Carbide Substrate** From being the first Company to introduce MicroGrain carbide to the mass-market round tool industry through the present day, **Tool Alliance®** has consistently innovated new powder and grade combinations for demanding applications. We recognize that our material is the very first Significant Characteristic. By creating partnerships with a limited number of tungsten powder and cemented-carbide material suppliers, we are able to guarantee that our customers receive precision-tolerance tools ground from only the purest, finest grades available worldwide. The following photograph of **Ultra-Carb® 2** demonstrates the complexity of the compound we commonly refer to as Cemented Carbide. Taken at magnification of 10,000 X through an SEM (Scanning Electron Microscope), the visible grains are tungsten while the cobalt binder appears as dark shadows. The largest tungsten grains appearing in the Ultra-Carb photo are less than one micron in size.



## ULTRA-Carb® 1

Cobalt Percentage: 12%  
Grain Size (µm): ≤ 1.9  
Hardness: 90.2 HRA  
TRS (PSI): 540,000  
Density (gm/cc): 14.1  
Code C1 / K40

## ULTRA-Carb® 2

Cobalt Percentage: 10%  
Grain Size (µm): ≤ 1.0  
Hardness: 91.6 HRA  
TRS (PSI): 480,000  
Density (gm/cc): 14.5  
Code C1 / K30

## ULTRA-Carb® 5

Cobalt Percentage: 11.5%  
Grain Size (µm): ≤ 1.9  
Hardness: 91.0 HRA  
TRS (PSI): 350,000  
Density (gm/cc): 12.9  
Code C5 / P40 / M30

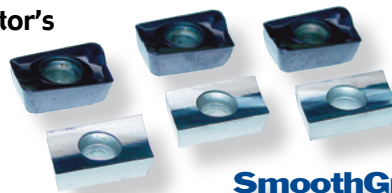
**COMPONENT #2: The Grinding Process** After selecting the best material available, **Mil-Tec** has perfected the manufacturing technology to optimize 100% of its physical properties. We call this process **SmoothGrind®**. Years in development, SmoothGrind is the result of a proprietary combination of material, abrasive, coolant, machine-tool, software, and grinding method technologies that produce cutting tools with superior qualitative characteristics. Sharper and longer lasting cutting edges, enhanced workpiece finishes, and improved lubricity are just some of the benefits brought to you by the latest indexable carbide rotary tooling advances from Mil-Tec. The following photograph displays a Mil-Tec insert featuring SmoothGrind (bottom) versus a major competitor's product (top). Our 100% precision-ground shearing, positive geometries create cutting forces much more similar to solid carbide milling than traditional pressed and sintered insert milling. Love your machine tool? Love your spindle? Treat them right and lower your maintenance costs at the same time you increase your throughput and improve your part finish.

## SHEAR DISBELIEF

- OURS** Shears material with positive ground geometry **Carries heat off with the chip** Leaves the workpiece cool to the touch
- THEIRS** Pushes material with pressed geometry **Punishes the workpiece** Punishes the entire machine tool assembly

"REPROGRAM YOUR MILLING EXPECTATIONS"

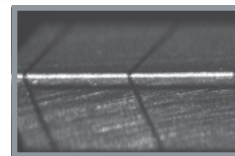
### Competitor's



SmoothGrind®



## SmoothEdge®



Freedom Cutter insert cutting edge magnified to display SE2 hone.

### COMPONENT #3: The Edge Preparation Process

Our cutting edges are literally too sharp for certain materials. For our carbide inserts and now increasingly for our solid carbide round tools, proper edge preparation can yield huge productivity improvements to "out of the box" tool application. Using a treatment we call **SmoothEdge®** and performed on machine tools developed in our own R&D lab, we've taken the mystery out of tool "break-in" and provided a consistency that can be counted on time and again. The process for inserts selects from either **SmoothEdge 1**, a light brush hone, to **SmoothEdge 2**, which doubles the cycle. Both will sound and run smooth from the first cut and protect your tooling investment from unnecessary potential for chipping during your initial tooling paths. Big productivity gains can be achieved in certain applications as well due to improved chip formation and evacuation. In addition, a microblasting treatment using extremely fine aluminum oxide powder is provided with all coated inserts, further prepping the cutting edge. For aluminum grades and certain other non-ferrous materials, we eliminate the process to achieve maximum edge sharpness.

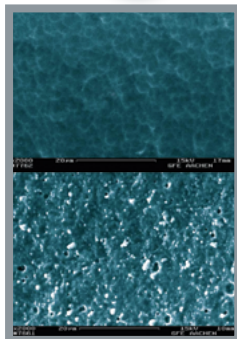
**COMPONENT #4: The Tooling Process** All the best physical ingredients are wasted unless they are all pulled together in a comprehensive system that maximizes their respective attributes. Mil-Tec calls this process **SmoothContricity®**. Our indexable products are designed to run more like solid carbide end mills versus the traditional pressed & sintered insert. SmoothContricity ensures that optimum results can be obtained by minimizing run-out (TIR), and providing industry-leading tolerances on diameter & radius. Combined, these attributes allow our consumers to reach full machining potential and position the cutting tool as a systematic contributor to process consistency and repeatability. Furthermore, you'll see benefits through the production stream like reduced maintenance costs, more uptime, better part finishes, and more.

SmoothContricity®





# Components of Guaranteed Quality continued from Page #3



Our coating @ 2,000X (top).  
Everybody else's (bottom).

## SmoothCoat®

**COMPONENT #5: The Coating Process** The challenge of finding a coating method to leverage 100% of the inherent assets of our carbide grade and grinding technologies was difficult. What we finally discovered was such a perfect fit and so logical for our product lines that we invested heavily into the process we now call **SmoothCoat®**. Much more than simply the standard arc-deposited PVD coating, SmoothCoat involves sputter multi-layering and a multi-step prep & post operation called Micro-Blasting. The advantages of this procedure include relieving of tensile stresses underneath the cutting edge, increased stability of the coating surface, and perhaps most importantly, elevating **SmoothGrind** even another notch by leveling and activating the cemented carbide substrate. The result is a smooth, shiny, tough, and durable surface that can withstand tomorrow's machining requirements and outlast competitive coatings. Additionally, we've made it a standard feature on thousands of our standard catalog items. Our coating services are performed within our own factories for quality & extremely quick turnaround times.

**Coating Availability** Order by adding the suffix TA, TN, AT, TC, A1, D1, or D2 to the EDP #.



UnCoated



TiAlN



TiN



AlTiN HSN<sup>2</sup>



TiCN



TiB<sub>2</sub>



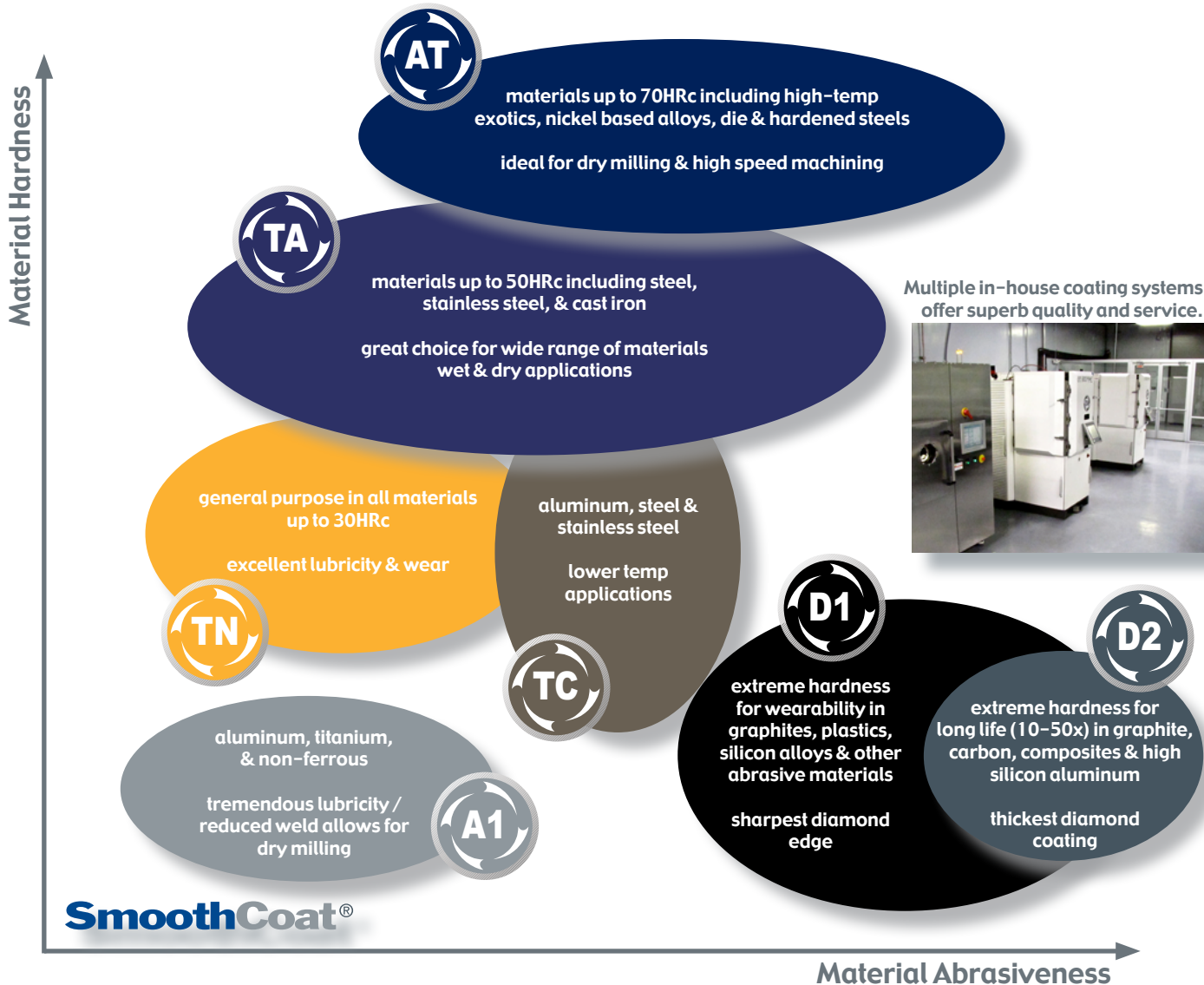
PVD Diamond



CVD Diamond

Standard Coatings available at "Coated" List Price

Premium Coatings available



SmoothCoat®

Material Abrasiveness



# The Mil-Tec Freedom Cutter® Plus+ Series

- Superb Accuracy & Strength
- Perfect for all material groups
- New Plus+ Geometry
- Hardened steel
- 3 insert shapes fit each pocket
- Unbeatable versatility
- Torx screw system
- Works with wide range of HP
- Uses precision-ground Freedom Cutter inserts
- From 2" to 12" diameter
- Cuts a 90° shoulder with SA90, SS90, or PS90 insert



The Freedom Cutter system features the ultimate in face-milling versatility. Each cutter body pocket accepts all three insert shapes, and each insert is available in a huge variety of geometries, radius sizes, carbide substrates, hones & coatings. Our cutter bodies are precision machined from hardened steel to exacting, repeatable tolerances. Special pocket geometry allows for eight indexes on Octagon & Round inserts, and four on Square. The Freedom Cutter milling system allows you to maximize your capabilities while minimizing your investment in cutter bodies. Now, the Freedom Cutter features our new Plus+ geometry, offering increased pocket density and superb body strength!



## Select a Freedom Cutter Plus+ Shell Mill Style Body

All Freedom Cutter Bodies are machined in our own modern CNC factory in Fort Myers, FL from special pre-hardened steel to exacting tolerances. We manufacture standards & specials such as metric, coolant-thru, cartridge style, aluminum, or other cutter bodies with lead times as quick as one week.

new sizes

Cutter Diameter	Bore	Keyway	Height	Insert Pockets	FC Plus+ Body Part Number	EDP Number	Body List Price USD
2"	3/4	5/16	1.725	3	FC-2-3	02001	\$220.00
2"	3/4	5/16	1.725	4	FC-2-4	02002	\$242.00
2"	1/2	1/4	1.725	4	FC-2-4NS	02000	\$264.00
2-1/2	1-1/4	1/2	1-7/8	4	FC-2.5-4	02003	\$302.50
2-1/2	1"	.380	1-7/8	4	FC-2.5-4NS	02004	\$302.50
3"	1-1/4	1/2	1-7/8	4	FC-3-4	02005	\$357.50
3"	1"	.380	1-7/8	4	FC-3-4NS	02006	\$357.50
3"	1-1/4	1/2	1-7/8	5	FC-3-5	02007	\$379.50
3"	1"	.380	1-7/8	5	FC-3-5NS	02008	\$379.50
3"	3/4	5/16	1-7/8	5	FC-3-5NS-3/4	02025	\$379.50
3"	1-1/4	1/2	1-7/8	7	FC-3-7	02009	\$401.50
3"	1"	.380	1-7/8	7	FC-3-7NS	02010	\$401.50
3-1/2	1-1/2	5/8	1-7/8	5	FC-3.5-5	02011	\$423.50
3-1/2	1"	.380	1-7/8	5	FC-3.5-5NS-1	02225	\$423.50
3-1/2	1-1/4	1/2	1-7/8	5	FC-3.5-5NS-1.25	02226	\$423.50
4"	1-1/2	5/8	1-7/8	6	FC-4-6	02012	\$495.00
4"	1-1/2	5/8	1-7/8	8	FC-4-8	02013	\$528.00
4"	1-1/4	1/2	1-7/8	6	FC-4-6NS-1.25	02027	\$495.00
4"	1"	.380	1-7/8	6	FC-4-6NS-1	02026	\$495.00
4-1/2	1-1/2	5/8	1-7/8	6	FC-4.5-6	02014	\$577.50
5"	1-1/2	5/8	1.950	6	FC-5-6	02015	\$616.00
5"	1-1/2	5/8	1.950	9	FC-5-9	02016	\$649.00
5"	1"	.380	1.950	6	FC-5-6NS-1	02028	\$616.00
5"	1-1/4	1/2	1.950	6	FC-5-6NS-1.25	02029	\$616.00
6"	1-1/2	5/8	1.950	8	FC-6-8	02017	\$682.00
6"	1-1/2	5/8	1.950	10	FC-6-10	02018	\$726.00
6"	1"	.380	1.950	8	FC-6-8NS-1	02030	\$682.00
6"	1-1/4	1/2	1.950	8	FC-6-8NS-1.25	02031	\$682.00



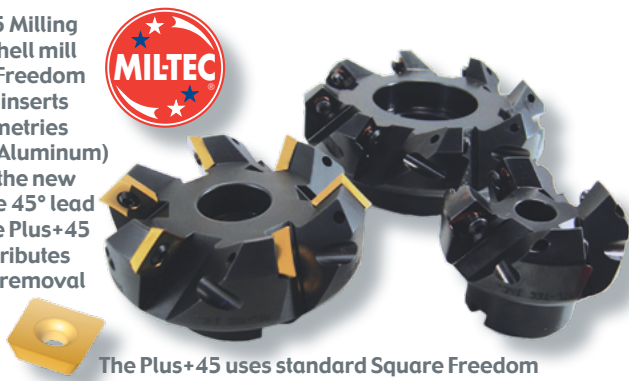
## Select a Freedom Cutter Plus+ Large Diameter Face Mill Style Body

The Large Diameter Freedom Cutter Face Mill features a 4" bolt circle pattern. The CB (counterbore) design is for direct attachment to the spindle face (counterbore diameter is 5-1/16"), while the FB (flat back) is used with standard shell mill holders.

Cutter Diameter	Bore	Keyway	Height	Insert Pockets	FC Plus+ Large Body Part Number	EDP Number	Body List Price USD
8"	2"	1"	2"	9	FC-8-9-CB	02019	\$968.00
8"	2-1/2	1"	2"	9	FC-8-9-FB	02020	\$968.00
10"	2-1/2	1"	2-1/2	10	FC-10-10-CB	02021	\$1210.00
10"	2-1/2	1"	2-1/2	10	FC-10-10-FB	02022	\$1210.00
12"	2-1/2	1"	2-1/2	11	FC-12-11-FB	02023	\$1452.00
14"	2-1/2	1"	2-1/2	14	FC-14-14-FB	02034	\$2475.00
16"	2-1/2	1"	2-1/2	16	FC-16-16-FB	02035	\$3355.00

# The Mil-Tec Freedom Cutter® Plus+45 Series

The Freedom Cutter Plus+45 Milling System is a 45° lead angle shell mill that utilizes square shaped Freedom Cutter Inserts. Because our inserts have precision ground geometries ranging from the SA (Super Aluminum) to our workhorse NP grind, the new Plus+45 is the most versatile 45° lead face mill in the industry. The Plus+45 powerful combination of attributes generates maximum metal removal rates in the toughest alloys!



The Plus+45 uses standard Square Freedom Cutter Inserts up to .125 maximum radius.

- 45° lead angle for smooth cut
- Perfect for all material groups including toughest alloys
- Precise tolerances
- Hardened steel
- Accepts standard square Freedom Cutter inserts
- Utilizes FC insert geometry
- Torx screw system
- Depths of cut up to .400
- Unbeatable productivity
- From 2" to 6" diameter

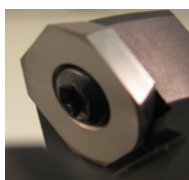
## Select a Freedom Cutter Plus+45 Shell Mill Style Body

All Freedom Cutter Plus+45 Bodies are machined in our own modern CNC factory in Fort Myers, FL from special pre-hardened steel to exacting tolerances. We manufacture standards & specials such as metric, coolant-thru, cartridge style, aluminum, or other cutter bodies with lead times as quick as one week. \*Cutter diameter is measured to centerline of insert.

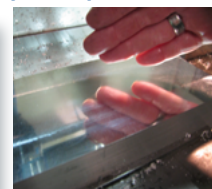
Cutter Diameter*	Bore	Keyway	Height	Insert Pockets	FC Plus+45 Body Part Number	EDP Number	Body List Price USD
2"	3/4	5/16	2"	4	FC45-2-4	02050	\$242.00
3"	1-1/4	1/2	2"	6	FC45-3-6	02051	\$385.00
3"	1"	.380	2"	6	FC45-3-6NS	02052	\$401.50
4"	1-1/2	5/8	2"	8	FC45-4-8	02053	\$528.00
5"	1-1/2	5/8	2"	9	FC45-5-9	02054	\$649.00
6"	1-1/2	5/8	2"	10	FC45-6-10	02055	\$726.00

## new! Mil-Tec Freedom Cutter Plus+45 Specialized Square Inserts with Wiper flats

Mil-Tec now offers a Wiper insert for the Plus+45 Series. This new insert geometry can semi-finish and finish. Milled workpiece surfaces as low as 15RA are now possible by combining a traditional wiper design with our high positive shearing cutter pocket.



Plus+45 Wiper Insert	EDP#	Price	Application
S-SS-W45-20UC	41013UC	\$14.50	Semi-Finish / Finish • Aluminum
Z-SA-W45-20UC	41014UC	\$14.50	Finish • Aluminum
S-SS-W45-51TA	41011TA	\$15.50	Semi-Finish / Finish • Steel & Stainless
S-PS-W45-51TA	41012TA	\$15.50	Semi-Finish / Finish • Steel, Stainless & Exotics
S-PS-W45-21TA	41021TA	\$15.50	Semi-Finish / Finish • Stainless & Exotics



## new! The Mil-Tec High Feed Freedom Cutter® Please see Technical Information on Page #29.

### Select a High Feed (HFC) Freedom Cutter (Shank & Shell Mill Styles)

The new Mil-Tec High Feed Freedom Cutter brings incredible metalworking performance to smaller CNC's & 40-taper spindles milling Steels & Stainless (up to 300 IPM) and Titanium & Exotics (up to 500 SFPM @ 50 IPM). Recommended High Feed inserts are listed below.

Cutter Diameter	Shank Diameter	OAL	Insert Pockets	HFC Shank Body Part Number	EDP Number	Body List Price USD
1-1/2	1"	4"	2	HFC-1.5-2-8	02152	\$231.00
1-1/2	1-1/4	4"	2	HFC-1.5-2-10	02153	\$231.00
2"	1"	4"	3	HFC-2-3-8	02154	\$341.00
2"	1-1/4	4"	3	HFC-2-3-10	02155	\$341.00

Cutter Diameter	Bore	Keyway	Height	Insert Pockets	HFC Shell Body Part Number	EDP Number	Body List Price USD
2"	3/4	5/16	1.725	4	HFC-2-4ML	02165	\$275.00
2-1/2	1"	.380	1-7/8	4	HFC-2.5-4NS	02156	\$357.50
2-1/2	1-1/4	1/2	1-7/8	4	HFC-2.5-4ML	02157	\$357.50
3"	1"	.380	1-7/8	5	HFC-3-5NS	02158	\$418.00
3"	1-1/4	1/2	1-7/8	5	HFC-3-5ML	02159	\$418.00
4"	1-1/2	5/8	1-7/8	6	HFC-4-6ML	02160	\$550.00

**Ideal High Feed Inserts**  
New for 2020, A2 coating doubles the thickness for increased wear.

This insert is recommended for roughing steel, Stainless, and cast iron.



EDP#	Shape	Radius	# indexes	Price
72752AT	Square	.125	4	\$15.50
72752A2	Square	.125	4	\$16.50

This insert is ideal for roughing Stainless, Titanium, Inconel, and high-temp alloys.



EDP#	Shape	Radius	# indexes	Price
63712AT	Square 90	.125	2	\$15.50





# Freedom Cutter® Specialty Styles

- Freedom Cutter with Dedicated Round insert (FCDR)
- Freedom Cutter with Low Profile cutter body (FCLP & FCLPA)

The Freedom Cutter is available in customized solutions for difficult milling applications. These specialized cutter bodies utilize the same insert family as all Freedom Cutter series and are precision machined in our factory from tough heat treated steel.

## Select a Freedom Cutter with Dedicated Round insert support (FCDR) Cutter Body new!

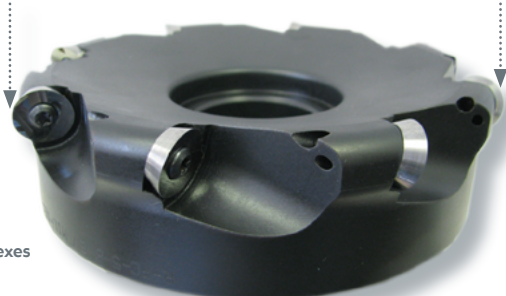
This Freedom Cutter style is used only with Round inserts. The pocket is precision machined to perfectly match a round Freedom Cutter insert and utilize our unique Mil-Loc screw system for tight tolerance, high-speed milling utilizing the Round geometry. Cutter diameters are based on the OD of the insert. Insert radius is .312 and features eight indexes.



Cutter Diameter*	Bore	Keyway	Height	Insert Pockets	FC Dedicated Round Body Part Number	EDP Number	Body List Price USD
2"	3/4	5/16	1.725	3	FCDR-2-3	02170	\$264.00
3"	1-1/4	1/2	1-7/8	5	FCDR-3-5	02171	\$390.50
4"	1-1/2	5/8	1-7/8	6	FCDR-4-6	02173	\$506.00
5"	1-1/4	1/2	1.950	6	FCDR-5-6	02175	\$638.00
6"	1-1/2	5/8	1.950	8	FCDR-6-8	02176	\$704.00
8"	2-1/2	1"	2"	9	FCDR-8-9**	02178	\$990.00
10"	2-1/2	1"	2"	10	FCDR-10-10**	02179	\$1254.00
12"	2-1/2	1"	2"	11	FCDR-12-11**	02180	\$1496.00

\*FCDR Effective Cutter Diameter is to the outside edge of insert

\*\* 4" Bolt circle pattern

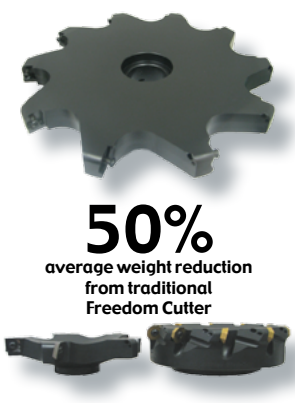


Utilizing standard Round Freedom Cutter inserts, the FCDR features totally reengineered geometry to maximize performance in Steels, Stainless, Titanium, and a wide range of High-Temp alloys. The round pocket provides increased strength and insert support. New geometry increases the shear angle resulting in increased metal removal rates and longer tool life.



## Select a Freedom Cutter with a Low Profile & reduced weight (FCLP) Steel Cutter Body

The Low Profile Freedom Cutter is precision machined from heat-treated steel with reduced body mass and undersized bores for light and medium duty applications on smaller capacity CNC's. Total cutter weight is reduced 40% to 60% dependent upon diameter. The FCLP features the traditional Freedom Cutter pocket and accepts all standard Freedom Cutter inserts.



Cutter Diameter	Bore	Keyway	Height	Weight	Insert Pockets	FC Low Profile Body Part Number	EDP Number	Body List Price USD
4"	1-1/4	1/2	1-5/8	1 lb 12 oz	6	FCLP-4-6	02036	\$495.00
4"	1-1/2	5/8	1-5/8	1 lb 14 oz	8	FCLP-4-8	02037	\$528.00
5"	1-1/4	1/2	1-5/8	3 lb	6	FCLP-5-6	02038	\$616.00
5"	1-1/2	5/8	1-5/8	2 lb 9 oz	6	FCLP-5-6-2	02045	\$616.00
5"	1-1/2	5/8	1-5/8	3 lb	9	FCLP-5-9	02039	\$649.00
6"	1"	.380	1-5/8	3 lb 7 oz	5	FCLP-6-5NS	02046	\$682.00
6"	1-1/4	1/2	1-5/8	3 lb 9 oz	8	FCLP-6-8	02040	\$682.00
6"	1-1/2	5/8	1-5/8	3 lb	9	FCLP-6-9	02041	\$726.00
7"	1-1/2	5/8	1-5/8	5 lb 8 oz	9	FCLP-7-9	02042	\$847.00
8"	1-1/2	5/8	1-5/8	7 lb	10	FCLP-8-10	02043	\$968.00
10"	1-1/2	5/8	1-5/8	12 lb 12 oz	10	FCLP-10-10	02044	\$1210.00
12"	1-1/2	5/8	1-5/8	24 lb	11	FCLP-12-11	02047	\$1320.00

## new! Now available in an even lighter weight design, the (FCLPA) Aluminum Cutter Body

This Low Profile Freedom Cutter is precision machined from aluminum, taking the reduced weight design to another level. The new FCLPA is designed for finishing cuts in plastics, non-metals, and non-ferrous alloys. Standard FC inserts can be used, including the SS Super Shear, D1 & D2 diamond coated, and PCD-tipped. The slim, lightweight design with small bore sizes are perfect for small CNC's and allows for a single finishing cut with a large cutter.



Cutter Diameter	Bore	Keyway	Height	Weight	Insert Pockets	FC Low Profile Body Part Number	EDP Number	Body List Price USD
4"	1"	.380	1-5/8	6 oz	3	FCLPA-4-3NS	02300	\$495.00
4"	1-1/4	1/2	1-5/8	6 oz	3	FCLPA-4-3	02301	\$495.00
5"	1"	.380	1-5/8	15 oz	3	FCLPA-5-3NS	02302	\$616.00
5"	1-1/4	1/2	1-5/8	15 oz	3	FCLPA-5-3	02303	\$616.00
6"	1"	.380	1-5/8	1 lb	3	FCLPA-6-3NS	02304	\$682.00
6"	1-1/4	1/2	1-5/8	1 lb	3	FCLPA-6-3	02305	\$682.00
7"	1-1/4	1/2	1-5/8	1 lb 6 oz	5	FCLPA-7-5	02306	\$847.00
8"	1-1/4	1/2	1-5/8	2 lb 1 oz	5	FCLPA-8-5	02307	\$968.00

# Freedom Cutter® Specialty Styles

The Freedom Cutter is available in customized solutions for difficult milling applications. These specialized cutter bodies utilize the same insert family as all Freedom Cutter series.

- Freedom Cutter with Extended Reach Shank (FCR)
- Freedom Cutter with Integrated R8 Shank (FC8)
- Freedom Cutter that Ramps & Plunges (RPX)
- Freedom Cutter with Coolant Holes (FCC)  
Shank diameter tolerance -.0002 / -.0005

## Select a Freedom Cutter with Extended Reach (FCR) Shank Style Body

This Freedom Cutter offers extended reach capabilities, bringing the benefits of the FC milling system to a wide variety of application demands.



Cutter Diameter	Shank	Head Length	OAL	Insert Pockets	FC Shank Body Part Number	EDP Number	Body List Price USD
1"	3/4	1-3/4	4"	1	FCR-1-1-6	02070	\$110.00
1"	1-1/4	1-3/4	4"	1	FCR-1-1-10	02071	\$110.00
1"	1"	1-3/4	7"	1	FCR-1-1-8E	02072	\$143.00
1"	1-1/4	1-3/4	7"	1	FCR-1-1-10E	02073	\$187.00
1-1/4"	3/4	1-3/4	4"	2	FCR-1.25-2-6	02074	\$165.00
1-1/4"	1"	1-3/4	4"	2	FCR-1.25-2-8	02075	\$165.00
1-1/4"	1-1/4	1-3/4	4"	2	FCR-1.25-2-10	02076	\$165.00
1-1/4"	1-1/4	1-3/4	7"	2	FCR-1.25-2-10E	02077	\$198.00
1-1/2"	3/4	1-3/4	4"	3	FCR-1.5-3-6	02078	\$209.00
1-1/2"	1"	1-3/4	4"	3	FCR-1.5-3-8	02079	\$209.00
1-1/2"	1"	1-3/4	7"	3	FCR-1.5-3-8E	02088	\$209.00
1-1/2"	1-1/4	1-3/4	4"	3	FCR-1.5-3-10	02080	\$209.00
1-1/2"	1-1/4	1-3/4	7"	3	FCR-1.5-3-10E	02081	\$247.50
1-3/4"	3/4	1-3/4	4"	3	FCR-1.75-3-6	02082	\$242.00
1-3/4"	1-1/4	1-3/4	4"	3	FCR-1.75-3-10	02083	\$242.00
1-3/4"	1-1/4	1-3/4	7"	3	FCR-1.75-3-10E	02084	\$280.50
2"	3/4	1-3/4	4"	4	FCR-2-4-6	02089	\$330.00
2"	1"	1-3/4	4"	4	FCR-2-4-8	02087	\$330.00
2"	1-1/4	1-3/4	4"	3	FCR-2-3-10	02085	\$286.00
2"	1-1/4	1-3/4	4"	4	FCR-2-4-10	02086	\$308.00

## Select a Freedom Cutter with integral R8 Shank (FC8) Style Body

This Freedom Cutter features a one-piece R8 shank, bringing the versatility of the FC milling system to small shops, maintenance rooms, repair facilities, etc. You'll be amazed at the productivity our free-cutting, positive geometry brings to low-horsepower mills!



Cutter Diameter	OAL	Insert Pockets	FC R8 Shank Body Part Number	EDP Number	Body List Price USD
1-1/2"	5-1/8	3	FC8-1.5	02090	\$220.00
2"	5-1/8	3	FC8-2.0	02091	\$286.00
3"	5-1/8	5	FC8-3.0	02092	\$495.00

## Select a Freedom Cutter that Ramps & Plunges (RPX) w/ Shank or Shell Style Body

This Freedom Cutter style can ramp and plunge. Ramp up to 30° and .187 DOC, and plunge to .187 DOC. Standard milling can also be accomplished; 8-index geometries (Octagon & Round) have a maximum .150 DOC, while 4-index geometries (Square) go up to .312 depth.



Shank Style

Shell Mill Style

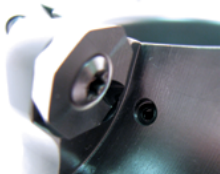
Cutter Diameter	Shank	Head Length	OAL	Insert Pockets	RPX Shank Style Body Part Number	EDP Number	Body List Price USD
1-1/2"	1-1/4	1"	4"	2	RPXS-1.5-2-10	02144	\$192.50
1-3/4"	1-1/4	1"	4"	2	RPXS-1.75-2-10	02145	\$214.50
2"	1-1/4	1.55	4"	3	RPXS-2-3-10	02146	\$286.00
2-1/2"	1-1/4	1.55	4"	3	RPXS-2.5-3-10	02147	\$357.50
3"	1-1/4	1.55	4"	4	RPXS-3-4-10	02148	\$418.00
3-1/2"	1-1/2	1.55	4"	4	RPXS-3.5-4-12	02149	\$434.50

Cutter Diameter	Bore	Keyway	Height	Insert Pockets	RPX Shell Mill Body Part Number	EDP Number	Body List Price USD
2"	3/4	5/16	1.725	3	RPX-2-3	02140	\$220.00
3"	1"	.380	1-7/8	4	RPX-3-4	02141	\$357.50
4"	1-1/2	5/8	1-7/8	6	RPX-4-6	02142	\$495.00
6"	1-1/2	5/8	1.950	8	RPX-6-8	02143	\$682.00

## Select a Freedom Cutter with Coolant Hole (FCC) Shell Mill Style Body

This Freedom Cutter style is designed for both air and fluid coolant technologies. A custom cap screw is included with the 2" and 3" FCC, while a special 1-1/2" CBS bolt is required for larger diameters.



Cutter Diameter	Bore	Keyway	Height	Insert Pockets	FC Coolant Body Part Number	EDP Number	Body List Price USD
2"	3/4	5/16	1-3/4	4	FCC-2-4	02100	\$330.00
3"	1-1/4	1/2	1-7/8	5	FCC-3-5	02101	\$489.50
3"	1"	.380	1-7/8	5	FCC-3-5-NS	02102	\$489.50
4"	1-1/2	5/8	1-7/8	6	FCC-4-6	02103	\$627.00
6"	1-1/2	5/8	1.950	8	FCC-6-8	02104	\$858.00



# Freedom Cutter® Specialty Styles



The Freedom Cutter is available in customized solutions for difficult milling applications. These specialized cutter bodies utilize the same insert family as all Freedom Cutter series.

- Freedom Cutter with Chamfer Angles (FCH & FDCH)
  - Dedicated Finishing Freedom Cutter (DFC)
  - Freedom Cutter with Square Insert Support (FCS)
  - Freedom Cutter with Aluminum Body Design (FCA)
- Shank diameter tolerance -.0002 / -.0005

**Select a Freedom Cutter that Chamfers on 1 (FCH) or 2 (FDCH) sides with Shank Style Body**  
 This Freedom Cutter style chamfers up to a .600 width with a standard square FC insert. Length is measured to tip of insert, and listed diameter is from front tip of insert to opposing front tip.



Included Angle	Cutter Diameter	Shank	OAL	Insert Pockets	FC Chamfer Body Part Number	EDP Number	Body List Price USD
60°	1"	3/4	3-1/2	2	FCH30-8-2-6	02110	\$176.00
82°	1"	3/4	3-1/2	2	FCH41-8-2-6	02115	\$176.00
90°	7/8	3/4	3-1/2	2	FCH45-7-2-6	02111	\$176.00
90°	7/8	1"	3-1/2	2	FCH45-7-2-8	02112	\$176.00
90°	1-1/2	1"	3-1/2	2	FCH45-12-2-8	02114	\$236.50
100°	7/8	3/4	3-1/2	2	FCH50-7-2-6	02116	\$176.00
120°	7/8	3/4	3-1/2	2	FCH60-7-2-6	02113	\$176.00
90° x 2	2"	3/4	3-1/2	2	FDCH-45-16-2-6	02119	\$250.00



## Select a Dedicated Finishing (DFC) Freedom Cutter (Shank & Shell Mill Styles)

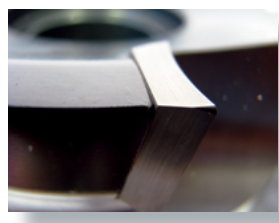
The DFC Freedom Cutter in conjunction with the required Square NP Geometry acts as a dedicated finisher / wiper combination in applications that demand exceptional surface finish and flatness using our NP inserts w/ .062 radius. Use #72553TA for steels & #72520UC for aluminum.



Cutter Diameter	OAL	Shank Diameter	Insert Pockets	DFCA Shank Body Part Number	EDP Number	Body List Price USD	
1"	4"	3/4	1	DFCA-1-1-6	02060	\$192.50	
1"	4"	1-1/4	1	DFCA-1-1-10	02061	\$192.50	
Cutter Diameter	Height	Keyway	Bore	Insert Pockets	DFCA Shell Body Part Number	EDP Number	Body List Price USD
2"	1.725	5/16	3/4	2	DFCA-2-2	02062	\$220.00
3"	1-7/8	1/2	1-1/4	2	DFCA-3-2	02063	\$330.00
3"	1-7/8	.380	1"	2	DFCA-3-2NS	02064	\$330.00
4"	1-7/8	5/8	1-1/2	2	DFCA-4-2	02065	\$440.00
5"	1.950	5/8	1-1/2	2	DFCA-5-2	02066	\$550.00
6"	1.950	5/8	1-1/2	2	DFCA-6-2	02067	\$660.00
8"	2"	1"	2-1/2	2	DFCA-8-2FB	02068	\$880.00

## Select a Freedom Cutter with Square Insert Support (FCS) Shell Mill Style Body

This Freedom Cutter style is used only with Square inserts. The pocket shoulder is extended to provide additional corner support for dedicated high-speed milling utilizing the Square geometry.



Cutter Diameter	Bore	Keyway	Height	Insert Pockets	FC Sq. Support Body Part Number	EDP Number	Body List Price USD
2"	3/4	5/16	1.725	3	FCS-2-3	02120	\$242.00
2"	3/4	5/16	1.725	4	FCS-2-4	02121	\$269.50
2-1/2	1-1/4	1/2	1-7/8	4	FCS-2.5-4	02122	\$341.00
2-1/2	1"	.380	1-7/8	4	FCS-2.5-4-NS	02123	\$341.00
3"	1-1/4	1/2	1-7/8	4	FCS-3-4	02124	\$385.00
3"	1-1/4	1/2	1-7/8	5	FCS-3-5	02125	\$412.50
3"	1"	.380	1-7/8	5	FCS-3-5-NS	02126	\$412.50
4"	1-1/2	5/8	1-7/8	6	FCS-4-6	02127	\$550.00
5"	1-1/2	5/8	1.950	6	FCS-5-6	02128	\$682.00
6"	1-1/2	5/8	1.950	8	FCS-6-8	02129	\$770.00

## Select a Freedom Cutter with Aluminum construction (FCA) Shell Mill Style Body

This Freedom Cutter style is machined entirely from 6061 T6 Aluminum. It is an ideal solution for router and restricted spindle-weight applications.



Cutter Diameter	Bore	Keyway	Height	Weight	Insert Pockets	FC Aluminum Body Part Number	EDP Number	Body List Price USD
2"	3/4	5/16	1.725	5 oz	3	FCA-2-3	02130	\$242.00
2"	3/4	5/16	1.725	5 oz	4	FCA-2-4	02131	\$269.50
3"	1-1/4	1/2	1-7/8	12 oz	5	FCA-3-5	02132	\$412.50
3"	1"	.380	1-7/8	12 oz	5	FCA-3-5-NS	02133	\$412.50
4"	1-1/2	5/8	1-7/8	1 lb	6	FCA-4-6	02134	\$550.00
6"	1-1/2	5/8	1.950	3 lb	8	FCA-6-8	02135	\$770.00
8"	2-1/2	1"	2"	5 lb	9	FCA-8-9	02136	\$1045.00
10"	2-1/2	1"	2-1/2	10 lb	10	FCA-10-10	02137	\$1320.00



# Mil-Tec Freedom Cutter® Inserts Nomenclature Guide & Technical Information

Example: ① Octagon ② Super Shear ③ .062 ④ Ultra-Carb 2 ⑤ SmoothEdge 1 ⑥ TiAlN

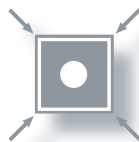
Insert Description = **O-SS-062-2-1-TA**, or **OSS06221TA** (every Freedom Cutter Insert has 10 characters total)  
Note that the combination of ④ Carbide, ⑤ Edge Prep & ⑥ Coating constitute the **Insert Grade** ("21TA" in this example)



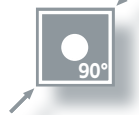
## Insert Shape Availability order as O, S, Z, or R



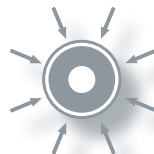
Octagon (O)



Square (S)



Square 90 (Z)



Round (R)

Each arrow represents a cutting edge index.

Octagon (O) = 8 indexes  
Square (S) = 4 indexes  
Square 90 (Z) = 2 indexes  
Round (R) = 8 indexes



## Geometry Availability order as SS, PS, NP, MS, GP, or SA



High positive grind available in all shapes. Ideal for aluminum, non-ferrous, plastic, & non-metals.



Medium positive grind for steel, stainless, and exotics. The perfect "all-application" geometry.



Strongest insert and designed for heavy feed rates. Ideal for steel, stainless, & heat-treated alloys.



Molded and ground chip control; ideal for stainless & exotics including titanium and inconel.



Flat top grind for all materials.



Maximum high positive grind for milling 90° corner in Aluminum. Available in Square 90 (Z) shape.



Super Shear grind for milling 90° corner available in Square 90 (Z).



Power Shear grind for milling 90° corner available in Square 90 (Z).



## Radius Availability order as 000, 005, 016, 032, 047, 062, 093, 125, 187, 250, or 312

Octagon shape available in 062 only; Round is 312 by default.

Radius =	000	005	016	032	047	062	093	125	187	250	312
decimal	.000	.005	.016	.032	.047	.062	.093	.125	.187	.250	.312
metric	0.00 mm	0.13 mm	0.40 mm	0.81 mm	1.20 mm	1.57 mm	2.36 mm	3.18 mm	4.75 mm	6.35 mm	7.92 mm



## Carbide Classification Availability order as 1, 2, or 5



Toughest Carbide  
All applications + Exotics



Hardest Carbide  
Cast Iron, Stainless  
Low Carbon Steels



Tough + Hard Carbide  
Steels, Stainless  
Hard materials

Please note that the combination of ④ Carbide, ⑤ Edge Prep & ⑥ Coating constitute the **Insert Grade**, i.e. "21TA"



## Edge Prep Availability order as 0, 1, or 2



### SmoothEdge® 0

No Hone, Upsharp = 0  
Razor sharp for max shearing  
Plastics, Aluminum, Non-Ferrous

### SmoothEdge® 1

Light Hone = 1  
Added edge strength w/high shear  
General Purpose for most materials

### SmoothEdge® 2

Heavy Hone = 2  
Strongest cutting edge  
Exotics, PH Stainless, Heat treated alloys



## Coating Availability order as UC, TA, TN, A1, AT, D1, D2, or TC



UnCoated



TiAlN



TiN



TiB2



AlTiN



PVD Diamond



CVD Diamond



TiCN

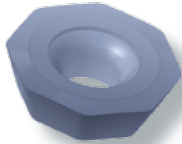
• All selections not available • Stocked catalog standards are listed by EDP# on pages # 12 to # 17 • Specials available upon quotation  
Mil-Tec Freedom Cutter inserts can be ordered in hundreds of variations. The ability to match a specific application with geometry, coating, edge prep and carbide substrate make the Freedom Cutter the perfect application-specific milling system.



# Mil-Tec Freedom Cutter® Insert Pricing & Availability

• All Freedom Cutter Inserts have a 5/8" Inscribed Circle and are 3/16" thick • Inserts are sold in packs of 10  
 Prices displayed are for standard FC inserts with standard coating; premium prices apply for PCD, Silicon Nitride and D2 coatings.  
 Available catalog standards are listed by EDP number on pages #12 to #17. Specials available upon quotation.

## Octagon



**UnCoated: \$14.50** USD each  
 Only \$1.81 per uncoated index!

**Coated: \$15.50** USD each  
 Less than \$1.94 per coated index!



All Octagon Freedom Cutter inserts and geometries feature the .062 Radius on all 8 index corners.



Sample Order:  
 O-NP-062-5-1-TA  
 or ONP06251TA



## Square



**UnCoated: \$14.50** USD each  
 Only \$3.63 per uncoated index!

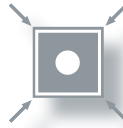
**Coated: \$15.50** USD each  
 Less than \$3.88 per coated index!



All Square Freedom Cutter inserts are available with 9 different corner radii and have either 4 (S) or 2 (Z) indexes.



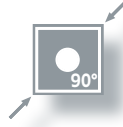
Sample Order:  
 S-SS-005-1-0-UC  
 or SSS00510UC



cuts 90° with 4 indexes:



cuts 90° cutting with 2 indexes:



## Round



**UnCoated: \$14.50** USD each  
 Only \$1.81 per uncoated index!

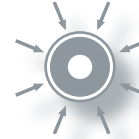
**Coated: \$15.50** USD each  
 Less than \$1.94 per coated index!



All Round Freedom Cutter inserts and geometries feature our patented Mil-Loc locating system, which assures solid pocket positioning and 8 total indexes. The Round insert by default features a .312 radius.



Sample Order:  
 R-PS-312-2-1-TA  
 or RPS31221TA



## Freedom Cutter® Spare Parts

Wrenches, Screws, Arbors & More



Part #	Description	Price USD	Pack Q	EDP#
FCS-1032T	T20 Torx Insert Screw	\$16.50	12	99100
FCW-125T	T20 Torx Wrench wire style	\$16.50	10	99101
FCW-T20	T20 Torx Wrench w/ handle	\$11.00	1	99102
MLS-632	Mil-Loc Screws	\$16.50	12	99103
MLK-62	Mil-Loc Wrench	\$16.50	10	99104
HT-1	Hardness Tester	\$165.00	1	99105
MT-AS	Anti-Seize tube	\$1.10	1	99106
CBS-15	Pancake Washer & Bolt	\$104.00	1	99107
3/4-1.37"	CAT40 shell mill arbor 3/4" pilot	\$126.50	1	22711
1-2.06"	CAT40 shell mill arbor 1" pilot	\$126.50	1	22713
1-1/4-2.20"	CAT40 shell mill arbor 1-1/4" pilot	\$135.30	1	22715
1-1/2-2.21"	CAT40 shell mill arbor 1-1/2" pilot	\$150.70	1	22717
3/4-1.37"	R8 shell mill arbor 3/4" pilot	\$89.10	1	22811
1-2.06"	R8 shell mill arbor 1" pilot	\$96.30	1	22813
1-1/4-2.20"	R8 shell mill arbor 1-1/4" pilot	\$109.50	1	22815
1-1/2-2.21"	R8 shell mill arbor 1-1/2" pilot	\$148.50	1	22817

Tighten to 28 - 30 Inch Pounds





# Mil-Tec Freedom Cutter® Inserts: Octagon

- SmoothGrind® precision grinding
- SmoothCoat® PVD hard coatings
- 8 indexes for value / .062 radius
- Positive Geometry / free cutting
- 5 Different geometries
- Fits all Freedom Cutter pockets
- 5/8" IC with 3/16" thickness
- Same insert works with Fractional and Metric bodies



The Mil-Tec Octagon Freedom Cutter insert features eight indexes and is available in five different precision ground geometries. Inserts are sold in packs of ten.

Octagons feature a .062 radius on all eight indexes.

Note FC inserts are sold in packs of 10. List prices are for individual inserts. EDP#s listed below.

FC Insert List Prices	UnCoated	\$14.50
	Coated	\$15.50



**SS Super Shear High Dish SmoothGrind®**  
High positive grind available in all shapes. Ideal for aluminum, non-ferrous, plastic, & non-metals.



**PS Power Shear Medium Dish SmoothGrind®**  
Medium positive grind for steel, stainless, and exotics. The perfect "all-application" geometry.



**NP Negative / Positive Frustraconical Land SmoothGrind®**  
Strongest insert and designed for heavy feed rates. Ideal for steel, stainless, & heat-treated alloys.



**MS Mag-Na-Shear Pre-Formed + SmoothGrind®**  
Molded and ground chip control; ideal for stainless & exotics including titanium and incol.



**GP General Purpose Flat Top SmoothGrind®**  
Flat top grind for all materials.

*Class / Edge Prep	UnCoated	TiAlN	TiN	TiB2	AlTiN
1-0	50010UC	50010TA	50010TN	50010A1	50010AT
1-1	50011UC	50011TA	50011TN	50011A1	50011AT
1-2	50012UC	50012TA	50012TN	50012A1	50012AT
2-0	50020UC	50020TA	50020TN	50020A1	50020AT
2-1	50021UC	50021TA	50021TN	50021A1	50021AT
2-2	50022UC	50022TA	50022TN	50022A1	50022AT
5-0	50050UC	50050TA	50050TN	50050A1	50050AT
5-1	50051UC	50051TA	50051TN	50051A1	50051AT
5-2	50052UC	50052TA	50052TN	50052A1	50052AT
1-0	60010UC	60010TA	60010TN	60010A1	60010AT
1-1	60011UC	60011TA	60011TN	60011A1	60011AT
1-2	60012UC	60012TA	60012TN	60012A1	60012AT
2-0	60020UC	60020TA	60020TN	60020A1	60020AT
2-1	60021UC	60021TA	60021TN	60021A1	60021AT
2-2	60022UC	60022TA	60022TN	60022A1	60022AT
5-0	60050UC	60050TA	60050TN	60050A1	60050AT
5-1	60051UC	60051TA	60051TN	60051A1	60051AT
5-2	60052UC	60052TA	60052TN	60052A1	60052AT
1-0	70010UC	70010TA	70010TN	70010A1	70010AT
1-1	70011UC	70011TA	70011TN	70011A1	70011AT
1-2	70012UC	70012TA	70012TN	70012A1	70012AT
2-0	70020UC	70020TA	70020TN	70020A1	70020AT
2-1	70021UC	70021TA	70021TN	70021A1	70021AT
2-2	70022UC	70022TA	70022TN	70022A1	70022AT
5-0	70050UC	70050TA	70050TN	70050A1	70050AT
5-1	70051UC	70051TA	70051TN	70051A1	70051AT
5-2	70052UC	70052TA	70052TN	70052A1	70052AT
1-0	80010UC	80010TA	80010TN	80010A1	80010AT
1-1	80011UC	80011TA	80011TN	80011A1	80011AT
1-2	80012UC	80012TA	80012TN	80012A1	80012AT
5-0	80050UC	80050TA	80050TN	80050A1	80050AT
5-1	80051UC	80051TA	80051TN	80051A1	80051AT
5-2	80052UC	80052TA	80052TN	80052A1	80052AT
1-0	90010UC	90010TA	90010TN	90010A1	90010AT
1-1	90011UC	90011TA	90011TN	90011A1	90011AT
1-2	90012UC	90012TA	90012TN	90012A1	90012AT
2-0	90020UC	90020TA	90020TN	90020A1	90020AT
2-1	90021UC	90021TA	90021TN	90021A1	90021AT
2-2	90022UC	90022TA	90022TN	90022A1	90022AT
5-0	90050UC	90050TA	90050TN	90050A1	90050AT
5-1	90051UC	90051TA	90051TN	90051A1	90051AT
5-2	90052UC	90052TA	90052TN	90052A1	90052AT

\*Carbide Classification Availability order as 1, 2, or 5

- ULTRA-Carb® 1**  
Toughest Grade  
All applications + Exotics
- ULTRA-Carb® 2**  
Hardest Grade  
Cast Iron, Stainless  
Low Carbon Steels
- ULTRA-Carb® 5**  
Tough + Hard  
Steels, Stainless  
Hard materials

\*Edge Prep Availability order as 0, 1, or 2

- SmoothEdge® 0**  
No Hone, Upsharp = 0  
Razor sharp for max shearing  
Plastics, Aluminum, Non-Ferrous
- SmoothEdge® 1**  
Light Hone = 1  
Added edge strength w/high shear  
General Purpose for most materials
- SmoothEdge® 2**  
Heavy Hone = 2  
Strongest cutting edge  
Exotics, PH Stainless, Heat treated alloys

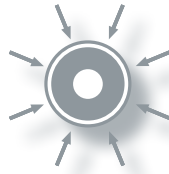
Please note that the combination of Carbide Class, Edge Prep & Coating constitute the insert Grade (i.e. "52AT" or 5-2-AT).





# Mil-Tec Freedom Cutter® Inserts: Round

- SmoothGrind® precision grinding
- SmoothCoat® PVD hard coatings
- 8 indexes for value / .312 radius
- Positive Geometry / free cutting
- 4 Different geometries
- Fits all Freedom Cutter pockets
- 5/8" IC with 3/16" thickness
- Exclusive Mil-Loc indexing screw
- Same insert works with Fractional and Metric bodies



Round (R)

The Mil-Tec Round Freedom Cutter insert features eight indexes and is available in four different precision ground geometries. Inserts are sold in packs of ten.

Note: 8 indexes for Axial Depth below .090; 4 indexes for greater depths. Rounds feature a .312 radius on all eight indexes.

Note FC inserts are sold in packs of 10. List prices are for individual inserts. EDP#'s listed below.

FC Insert List Prices

UnCoated	\$14.50
Coated	\$15.50



See Figure #3 on Page 19 for Mil-Loc screw info



\*Class / Edge Prep

UnCoated

TiAlN

TiN

TiB2

AlTiN

1-0	51010UC	51010TA	51010TN	51010A1	51010AT
1-1	51011UC	51011TA	51011TN	51011A1	51011AT
1-2	51012UC	51012TA	51012TN	51012A1	51012AT
2-0	51020UC	51020TA	51020TN	51020A1	51020AT
2-1	51021UC	51021TA	51021TN	51021A1	51021AT
2-2	51022UC	51022TA	51022TN	51022A1	51022AT
5-0	51050UC	51050TA	51050TN	51050A1	51050AT
5-1	51051UC	51051TA	51051TN	51051A1	51051AT
5-2	51052UC	51052TA	51052TN	51052A1	51052AT
1-0	61010UC	61010TA	61010TN	61010A1	61010AT
1-1	61011UC	61011TA	61011TN	61011A1	61011AT
1-2	61012UC	61012TA	61012TN	61012A1	61012AT
2-0	61020UC	61020TA	61020TN	61020A1	61020AT
2-1	61021UC	61021TA	61021TN	61021A1	61021AT
2-2	61022UC	61022TA	61022TN	61022A1	61022AT
5-0	61050UC	61050TA	61050TN	61050A1	61050AT
5-1	61051UC	61051TA	61051TN	61051A1	61051AT
5-2	61052UC	61052TA	61052TN	61052A1	61052AT
1-0	71010UC	71010TA	71010TN	71010A1	71010AT
1-1	71011UC	71011TA	71011TN	71011A1	71011AT
1-2	71012UC	71012TA	71012TN	71012A1	71012AT
2-0	71020UC	71020TA	71020TN	71020A1	71020AT
2-1	71021UC	71021TA	71021TN	71021A1	71021AT
2-2	71022UC	71022TA	71022TN	71022A1	71022AT
5-0	71050UC	71050TA	71050TN	71050A1	71050AT
5-1	71051UC	71051TA	71051TN	71051A1	71051AT
5-2	71052UC	71052TA	71052TN	71052A1	71052AT
1-0	91010UC	91010TA	91010TN	91010A1	91010AT
1-1	91011UC	91011TA	91011TN	91011A1	91011AT
1-2	91012UC	91012TA	91012TN	91012A1	91012AT
2-0	91020UC	91020TA	91020TN	91020A1	91020AT
2-1	91021UC	91021TA	91021TN	91021A1	91021AT
2-2	91022UC	91022TA	91022TN	91022A1	91022AT
5-0	91050UC	91050TA	91050TN	91050A1	91050AT
5-1	91051UC	91051TA	91051TN	91051A1	91051AT
5-2	91052UC	91052TA	91052TN	91052A1	91052AT



**SS**  
Super Shear  
High Dish  
SmoothGrind®

High positive grind available in all shapes. Ideal for aluminum, non-ferrous, plastic, & non-metals.



**PS**  
Power Shear  
Medium Dish  
SmoothGrind®

Medium positive grind for steel, stainless, and exotics. The perfect "all-application" geometry.



**NP**  
Negative / Positive  
Frustraconical Land  
SmoothGrind®

Strongest insert and designed for heavy feed rates. Ideal for steel, stainless, & heat-treated alloys.



**GP**  
General Purpose  
Flat Top  
SmoothGrind®

Flat top grind for all materials.

\*Carbide Classification Availability order as 1, 2, or 5

**ULTRA-Carb® 1**

Toughest Grade  
All applications + Exotics

**ULTRA-Carb® 2**

Hardest Grade  
Cast Iron, Stainless  
Low Carbon Steels

**ULTRA-Carb® 5**

Tough + Hard  
Steels, Stainless  
Hard materials

\*Edge Prep Availability order as 0, 1, or 2

**SmoothEdge® 0**

No Hone, Upsharp = 0  
Razor sharp for max shearing  
Plastics, Aluminum, Non-Ferrous

**SmoothEdge® 1**

Light Hone = 1  
Added edge strength w/ high shear  
General Purpose for most materials

**SmoothEdge® 2**

Heavy Hone = 2  
Strongest cutting edge  
Exotics, PH Stainless, Heat treated alloys

Please note that the combination of Carbide Class, Edge Prep & Coating constitute the insert **Grade** (i.e. "52AT" or 5-2-AT).

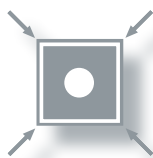


**USING THE MIL-LOC FEATURE FOR ROUND INSERTS:** The Mil-Loc keeps Round inserts from spinning under load and ensures 8 indexes. Using the 1/16" hex key included with every cutter, turn the screw from the back side so that the half-dog on the special Mil-Loc screw protrudes about .030". Be sure that the thread of the screw is not above the bottom of the pocket. Place the insert into the pocket so that the matching indents in the back of the insert align with the Mil-Loc screw in the cutter pocket. Tighten the insert normally with the center screw. Be sure to retract the Mil-Loc screw completely when using Octagon or Square inserts.



# Mil-Tec Freedom Cutter® Inserts: Square

- SmoothGrind® precision grinding
- SmoothCoat® PVD hard coatings
- 4 indexes for value / 9 radius sizes
- Positive Geometry / free cutting
- 4 Different geometries
- Fits all Freedom Cutter pockets
- 5/8" IC with 3/16" thickness
- Same insert works with Fractional and Metric bodies



Square (S)

The Mil-Tec Square Freedom Cutter insert features four indexes and is available in four different precision ground geometries. Inserts are sold in packs of ten.

Squares feature a sharp corner or 9 different radii. Available coatings are listed under the Geometry.

- Add coating suffix to the listed EDP# (i.e. #52010A1).

Note FC inserts are sold in packs of 10. List prices are for individual inserts. EDP#'s listed below.

FC Insert List Prices

UnCoated	\$14.50
Coated	\$15.50



**SS**  
Super Shear High Dish SmoothGrind®

High positive grind available in all shapes. Ideal for aluminum, non-ferrous, plastic, & non-metals.



*Class / Edge Prep	Square	.005	.016	.032	.047	.062	.093	.125	.187	.250
1-0	52010	52110	52210	52310	52410	52510	52610	52710	52810	52910
1-1	52011	52111	52211	52311	52411	52511	52611	52711	52811	52911
1-2	52012	52112	52212	52312	52412	52512	52612	52712	52812	52912
2-0	52020	52120	52220	52320	52420	52520	52620	52720	52820	52920
2-1	52021	52121	52221	52321	52421	52521	52621	52721	52821	52921
2-2	52022	52122	52222	52322	52422	52522	52622	52722	52822	52922
5-0	52050	52150	52250	52350	52450	52550	52650	52750	52850	52950
5-1	52051	52151	52251	52351	52451	52551	52651	52751	52851	52951
5-2	52052	52152	52252	52352	52452	52552	52652	52752	52852	52952



**PS**  
Power Shear Medium Dish SmoothGrind®

Medium positive grind for steel, stainless, and exotics. The perfect "all-application" geometry.



1-0	62010	62110	62210	62310	62410	62510	62610	62710	62810	62910
1-1	62011	62111	62211	62311	62411	62511	62611	62711	62811	62911
1-2	62012	62112	62212	62312	62412	62512	62612	62712	62812	62912
2-0	62020	62120	62220	62320	62420	62520	62620	62720	62820	62920
2-1	62021	62121	62221	62321	62421	62521	62621	62721	62821	62921
2-2	62022	62122	62222	62322	62422	62522	62622	62722	62822	62922
5-0	62050	62150	62250	62350	62450	62550	62650	62750	62850	62950
5-1	62051	62151	62251	62351	62451	62551	62651	62751	62851	62951
5-2	62052	62152	62252	62352	62452	62552	62652	62752	62852	62952



**NP**  
Negative / Positive Frustrical Land SmoothGrind®

Strongest insert and designed for heavy feed rates. Ideal for steel, stainless, & heat-treated alloys.



1-0	72010	72110	72210	72310	72410	72510	72610	72710	72810	72910
1-1	72011	72111	72211	72311	72411	72511	72611	72711	72811	72911
1-2	72012	72112	72212	72312	72412	72512	72612	72712	72812	72912
2-0	72020	72120	72220	72320	72420	72520	72620	72720	72820	72920
2-1	72021	72121	72221	72321	72421	72521	72621	72721	72821	72921
2-2	72022	72122	72222	72322	72422	72522	72622	72722	72822	72922
5-0	72050	72150	72250	72350	72450	72550	72650	72750	72850	72950
5-1	72051	72151	72251	72351	72451	72551	72651	72751	72851	72951
5-2	72052	72152	72252	72352	72452	72552	72652	72752	72852	72952



**GP**  
General Purpose Flat Top SmoothGrind®

Flat top grind for all materials.



1-0	92010	92110	92210	92310	92410	92510	92610	92710	92810	92910
1-1	92011	92111	92211	92311	92411	92511	92611	92711	92811	92911
1-2	92012	92112	92212	92312	92412	92512	92612	92712	92812	92912
2-0	92020	92120	92220	92320	92420	92520	92620	92720	92820	92920
2-1	92021	92121	92221	92321	92421	92521	92621	92721	92821	92921
2-2	92022	92122	92222	92322	92422	92522	92622	92722	92822	92922
5-0	92050	92150	92250	92350	92450	92550	92650	92750	92850	92950
5-1	92051	92151	92251	92351	92451	92551	92651	92751	92851	92951
5-2	92052	92152	92252	92352	92452	92552	92652	92752	92852	92952



**MS**  
Mag-Na-Shear Pre-Formed + SmoothGrind®

Molded and ground chip control; ideal for stainless & exotics including titanium and inconel.



**new!**

Use this sole Square AT coated Mag-Na-Shear selection for heavy wear and high heat resistance in stainless, titanium, & high temp alloy apps.

\*Carbide Classification Availability order as 1, 2, or 3

**ULTRA-Carb® 1**  
Toughest Grade  
All applications + Exotics

**ULTRA-Carb® 2**  
Hardest Grade  
Cast Iron, Stainless  
Low Carbon Steels

**ULTRA-Carb® 5**  
Tough + Hard  
Steels, Stainless  
Hard materials

\*Edge Prep Availability order as 0, 1, or 2

**SmoothEdge® 0**  
No Hone, Upsharp = 0  
Razor sharp for max shearing  
Plastics, Aluminum, Non-Ferrous

**SmoothEdge® 1**  
Light Hone = 1  
Added edge strength w/high shear  
General Purpose for most materials

**SmoothEdge® 2**  
Heavy Hone = 2  
Strongest cutting edge  
Exotics, PH Stainless, Heat treated alloys

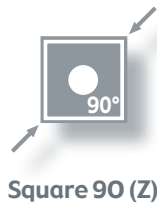
Please note that the combination of Carbide Class, Edge Prep & Coating constitute the insert Grade (i.e. "52AT" or 5-2-AT).





# Mil-Tec Freedom Cutter® Inserts: Square 90°

- SmoothGrind® precision grinding
- SmoothCoat® PVD hard coatings
- 2 indexes for value / 9 radius sizes
- Positive Geometry / free cutting
- 3 Different geometries
- Fits all Freedom Cutter pockets
- 5/8" IC with 3/16" thickness
- Cuts true 90° corner
- Same insert works with Fractional and Metric bodies



The Mil-Tec Square 90° Freedom Cutter insert features two indexes and is available in three different precision ground geometries. Inserts are sold in packs of ten.

Squares feature a sharp corner or 9 different radii. Available coatings are listed under the Geometry.

- Add coating suffix to the listed EDP# (i.e. #53010A1).

Note FC inserts are sold in packs of 10. List prices are for individual inserts. EDP#'s listed below.

FC Insert List Prices	UnCoated	\$14.50
	Coated	\$15.50



See Figure #2 on Page 19 for 90° loading info

\*Class / Edge Prep Square .005 .016 .032 .047 .062 .093 .125 .187 .250



Maximum high positive grind for square inserts with 90° shoulder. "Super Aluminum" geometry.



1-0	43010	43110	43210	43310	43410	43510	43610	43710	43810	43910
1-1	43011	43111	43211	43311	43411	43511	43611	43711	43811	43911
1-2	43012	43112	43212	43312	43412	43512	43612	43712	43812	43912
2-0	43020	43120	43220	43320	43420	43520	43620	43720	43820	43920
2-1	43021	43121	43221	43321	43421	43521	43621	43721	43821	43921
2-2	43022	43122	43222	43322	43422	43522	43622	43722	43822	43922
5-0	43050	43150	43250	43350	43450	43550	43650	43750	43850	43950
5-1	43051	43151	43251	43351	43451	43551	43651	43751	43851	43951
5-2	43052	43152	43252	43352	43452	43552	43652	43752	43852	43952



High positive grind available in all shapes. Ideal for aluminum, non-ferrous, plastic, & non-metals.



1-0	53010	53110	53210	53310	53410	53510	53610	53710	53810	53910
1-1	53011	53111	53211	53311	53411	53511	53611	53711	53811	53911
1-2	53012	53112	53212	53312	53412	53512	53612	53712	53812	53912
2-0	53020	53120	53220	53320	53420	53520	53620	53720	53820	53920
2-1	53021	53121	53221	53321	53421	53521	53621	53721	53821	53921
2-2	53022	53122	53222	53322	53422	53522	53622	53722	53822	53922
5-0	53050	53150	53250	53350	53450	53550	53650	53750	53850	53950
5-1	53051	53151	53251	53351	53451	53551	53651	53751	53851	53951
5-2	53052	53152	53252	53352	53452	53552	53652	53752	53852	53952



Medium positive grind for steel, stainless, and exotics. The perfect "all-application" geometry.



1-0	63010	63110	63210	63310	63410	63510	63610	63710	63810	63910
1-1	63011	63111	63211	63311	63411	63511	63611	63711	63811	63911
1-2	63012	63112	63212	63312	63412	63512	63612	63712	63812	63912
2-0	63020	63120	63220	63320	63420	63520	63620	63720	63820	63920
2-1	63021	63121	63221	63321	63421	63521	63621	63721	63821	63921
2-2	63022	63122	63222	63322	63422	63522	63622	63722	63822	63922
5-0	63050	63150	63250	63350	63450	63550	63650	63750	63850	63950
5-1	63051	63151	63251	63351	63451	63551	63651	63751	63851	63951
5-2	63052	63152	63252	63352	63452	63552	63652	63752	63852	63952

\*Carbide Classification Availability order as 1, 2, or 5

<b>ULTRA-Carb® 1</b>	<b>ULTRA-Carb® 2</b>	<b>ULTRA-Carb® 5</b>
Toughest Grade All applications + Exotics	Hardest Grade Cast Iron, Stainless Low Carbon Steels	Tough + Hard Steels, Stainless Hard materials

\*Edge Prep Availability order as 0, 1, or 2

<b>SmoothEdge® 0</b>	<b>SmoothEdge® 1</b>	<b>SmoothEdge® 2</b>
No Hone, Upsharp = 0 Razor sharp for max shearing Plastics, Aluminum, Non-Ferrous	Light Hone = 1 Added edge strength w/high shear General Purpose for most materials	Heavy Hone = 2 Strongest cutting edge Exotics, PH Stainless, Heat treated alloys

Please note that the combination of Carbide Class, Edge Prep & Coating constitute the insert Grade (i.e. "52AT" or 5-2-AT).



## SHEAR DISBELIEF

- OURS** Shears material with positive ground geometry **Carries** heat off with the chip **Leaves** the workpiece cool to the touch
- THEIRS** Pushes material with pressed geometry **Punishes** the workpiece **Punishes** the entire machine tool assembly

"REPROGRAM YOUR MILLING EXPECTATIONS"



# Mil-Tec Freedom Cutter® Inserts: Wipers

- SmoothGrind® precision grinding
- SmoothCoat® PVD hard coatings
- Improves Visual & Measured finish
- Positive Geometry / free cutting
- Used with standard FC inserts
- Fits all Freedom Cutter pockets
- 5/8" IC with 3/16" thickness
- Same insert works with Fractional and Metric bodies

The Mil-Tec Wiper insert improves visual and measured surface finish on all materials. Inserts are sold in packs of ten. NP style used in conjunction with standard FC inserts by using 1 Wiper as replacement in assembly. SS, SS90, and SA90 Wipers are used as direct replacement for all inserts within the cutter.

- Add coating suffix to the listed EDP# (i.e. #41006A1).

Note FC inserts are sold in packs of 10. List prices are for individual inserts. EDP#'s listed below.

FC Insert List Prices	UnCoated	\$14.50
	Coated	\$15.50



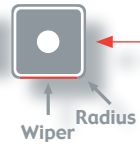
**NP**  
Negative / Positive  
Frustricoconical Land  
SmoothGrind®

*Class / Edge Prep	Rad	.016	.032	.047	.062	.093	.125	.187	.250
2-0	73020	73120	73220	73320	73420	73520	73620	73720	
5-1	73051	73151	73251	73351	73451	73551	73651	73751	

Produces lowest RA finishes. Ideal for steel, stainless, heat-treated alloys and more.



**Square NP** with radius to be used with NP, PS, PS90, SS, and SS90 **Square** Freedom Cutter inserts. One wiper insert is used per cutter body assembly. Match the Wiper radius to the balance of the inserts. Note these inserts have a single index which is laser-etched for easy identification.



**NP**  
Negative / Positive  
Frustricoconical Land  
SmoothGrind®

*Class / Edge Prep	45° Lead
2-0	73820
5-1	73851

Produces lowest RA finishes. Ideal for steel, stainless, heat-treated alloys and more.



**Octagon NP** with 45° Lead to be used with NP, PS, and SS **Octagon** Freedom Cutter inserts. One wiper insert is used per cutter body assembly. Note these inserts have a single index which is laser-etched for easy identification.



NP wipers have a single index and are installed in only one cutter pocket.



**SS**  
Super Shear  
High Dish  
SmoothGrind®

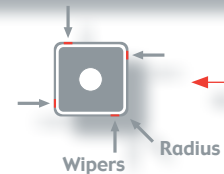
*Class / Edge Prep	Rad	.032	.062
2-0	41006	73920	

High positive with integral wiper. Good finishes with general milling. Ideal for aluminum & non-ferrous.



**Square SS** with .032 radius for Aluminum applications. Note these inserts have a Wiper on each index and should be installed in every cutter body pocket.

SS Aluminum wipers have four indexes and are installed in every cutter pocket.



**SS90**  
Super Shear 90°  
High Dish  
SmoothGrind®

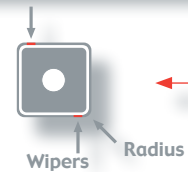
*Class / Edge Prep	Rad	.032
2-0	41007	

High positive with integral wiper. Good finishes with general milling. Ideal for aluminum & non-ferrous.



**Square SS90** with .032 radius for Aluminum applications. Note these inserts have a Wiper on each index and should be installed in every cutter body pocket.

SS90 & SA90 wipers have two indexes and are installed in every cutter pocket.



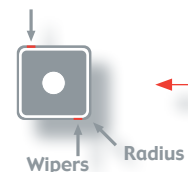
**SA90**  
Super Aluminum  
Extreme Dish  
SmoothGrind®

*Class / Edge Prep	Rad	.032
2-0	41008	

Max positive with integral wiper. Good finishes with general milling. Ideal for aluminum & non-ferrous.



**Square SA90** with .032 radius for Aluminum applications. Note these inserts have a Wiper on each index and should be installed in every cutter body pocket.

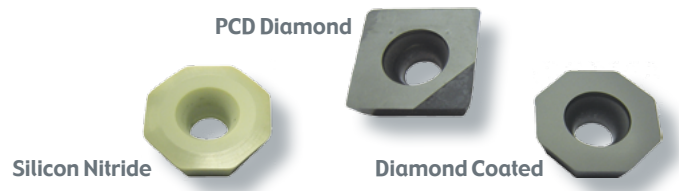




# Mil-Tec Freedom Cutter® Inserts: Special Apps

- SmoothGrind® precision grinding
- SmoothCoat® D1 and D2 Diamond
- PCD Diamond-tipped
- Silicon Nitride (solid)
- Positive Geometry / free cutting
- Fits all Freedom Cutter pockets
- 5/8" IC with 3/16" thickness
- Same insert works with Fractional and Metric bodies

Mil-Tec Freedom Cutter Special App inserts feature substrates and materials for unique machining environments. **PCD & D2 inserts on this page are priced, packaged and sold individually.**



Mil-Tec's PCD-tipped inserts offer incredible tool life in materials including graphite, hard carbon, filled-plastics, fiberglass, reinforced & metal matrix composites, silicon aluminum, and more. PCD also offers consistent machining finishes. GP Flat Top geometry. **PCD tip length = .190 ±.008**



Part #	Description	Price USD each	EDP#
S-GP-000-PCD	PCD Square General Purpose	\$98.00	41020
S-GP-005-PCD	PCD Square General Purpose w/ .005R	\$98.00	41021
S-GP-016-PCD	PCD Square General Purpose w/ .016R	\$98.00	41022
S-GP-032-PCD	PCD Square General Purpose w/ .032R	\$98.00	41023
S-GP-062-PCD	PCD Square General Purpose w/ .062R	\$98.00	41024
S-GP-090-PCD	PCD Square General Purpose w/ .090R	\$98.00	41025
S-GP-125-PCD	PCD Square General Purpose w/ .125R	\$98.00	41026
S-GP-45D-PCD	PCD Square General Purpose w/ 45° angle	\$98.00	41027



Mil-Tec's D2 CVD Diamond coating is thicker and harder than D1. Used for the same application range, D2 will offer substantially longer tool life.

Part #	Description	Price USD each	EDP#
O-GP-062-D2	D2 Diamond Octagon GenPurpose w/ .062R	\$74.00	41004D2
S-GP-032-D2	D2 Diamond Square GenPurpose w/ .032R	\$74.00	41104D2

PCD & D2 inserts sold individually  
D1 & SN inserts sold in 10-packs



Mil-Tec's D1 PVD Diamond coated inserts offer a smooth and hard surface for excellent performance at a value price. Our thinnest diamond, D1 retains an extremely sharp cutting edge and is ideal for abrasive materials such as composites, graphite, fiberglass, filled-plastics, silicon aluminum, and more.

Please note, these inserts are stocked, but ANY Freedom Cutter insert can be D1 coated and shipped typically within 2 weeks.

Part #	Description	Price USD each	EDP#
O-SS-062-2-0-D1	D1 Diamond Octagon Super Shear w/ .062R	\$19.00	50020D1
O-PS-062-2-0-D1	D1 Diamond Octagon Power Shear w/ .062R	\$19.00	60020D1
O-NP-062-2-0-D1	D1 Diamond Octagon NP w/ .062R	\$19.00	70020D1
O-GP-062-2-0-D1	D1 Diamond Octagon GenPurpose w/ .062R	\$19.00	90020D1
Z-SS-032-2-0-D1	D1 Diamond Square 90° Super Shear	\$19.00	53320D1
Z-PS-032-2-0-D1	D1 Diamond Square 90° Power Shear	\$19.00	63320D1
S-NP-032-2-0-D1	D1 Diamond Square NP	\$19.00	72320D1
S-GP-032-2-0-D1	D1 Diamond Square General Purpose	\$19.00	92320D1
R-SS-312-2-0-D1	D1 Diamond Round Super Shear w/ .312R	\$19.00	51020D1
R-PS-312-2-0-D1	D1 Diamond Round Power Shear w/ .312R	\$19.00	61020D1
R-GP-312-2-0-D1	D1 Diamond Round General Purpose w/ .312R	\$19.00	91020D1



Mil-Tec's solid Silicon Nitride inserts are ideal for use in Cast Iron and can be used at higher speeds (2500 SFPM) resulting in improved finish and longer insert life.

Part #	Description	Price USD each	EDP#
O-NP-062-S1-UC	Silicon Nitride Octagon NP w/ .062R	\$24.50	41001
S-NP-032-S1-UC	Silicon Nitride Square NP w/ .032R	\$24.50	41002



Watch video demonstrations of all our products at the Tool Alliance channel on YouTube.





# Mil-Tec Freedom Cutter® Madness & Kits

Mil-Tec offers some of the indexable industry's best sales promotions and, even better, the Madness never ends! Our Madness and Kit programs are available throughout the year and can be applied to our most popular Freedom Cutter body and insert combinations using the following methods:

## MADNESS! MADNESS! MADNESS! MADNESS!

**Madness:** Select any Freedom Cutter **Plus+**, **Plus+45**, or **High Feed Shell Mill** cutter\* on page #5 or #6 for **\$50 per inch** when purchasing ten Freedom Cutter inserts per inch of cutter body.

Example: 3" FC is \$150 + 30 coated FC inserts @ \$15.50 each = \$615 total cost

\*Shell Mills only (6" & smaller). Inserts can be mixed in lots of 10 each (case quantities).



**Kits:** We've taken our most popular sizes and Octagon geometry, included ten inserts, wrenches, extra screws & anti-seize, placed it all in a handy package, and discounted the price.



Mil-Tec's Octagon shape has eight cutting indexes and a .062 radius size.



High positive grind available in all shapes. Ideal for aluminum, non-ferrous, plastic, & non-metals.

Use this Kit for Aluminum

Diameter	2"	3"	4"
EDP#	02202A1	02203A1	02204A1
Price	\$338.00	\$455.00	\$552.00

#50020A1 insert w/FC-2-4, FC-3-5/5NS, or FC-4-6



Molded and ground chip control; ideal for stainless & exotics including titanium and inconel.

Use this Kit for Titanium & Exotic alloys

Diameter	2"	3"	4"
EDP#	02211AT	02212AT	02213AT
Price	\$338.00	\$455.00	\$552.00

#80012AT insert w/FC-2-4, FC-3-5/5NS, or FC-4-6



Medium positive grind for steel, stainless, and exotics. The perfect "all-application" geometry.

Use this Kit for Mild Steel & Stainless

Diameter	2"	3"	4"
EDP#	02205TA	02206TA	02207TA
Price	\$338.00	\$455.00	\$552.00

#60051TA insert w/FC-2-4, FC-3-5/5NS, or FC-4-6



Strongest insert and designed for heavy feed rates. Ideal for steel, stainless, & heat-treated alloys.

Use this Kit for Alloy Steel & PH Stainless

Diameter	2"	3"	4"
EDP#	02208TA	02209TA	02210TA
Price	\$338.00	\$455.00	\$552.00

#70052TA insert w/FC-2-4, FC-3-5/5NS, or FC-4-6



**Starter Kit:** We've taken a 3" Freedom Cutter face mill combined with a 3/4 and 1" High Velocity indexable end mill, plus a compliment of our most popular inserts (+ screws / wrenches) to create a fantastic Starter Kit. This single kit will allow for a diverse array of machining applications on a wide variety of materials (aluminum, stainless, steels, titanium), all bundled together at a value price!

**Contents:**

3" Freedom Cutter Body (#02007 or #02008) w/ 10 total Octagon inserts

- 5 inserts O-SS-062-20UC for aluminum (#50020UC)
- 5 inserts O-PS-062-52TA for steel / stainless (#60052TA)

3/4" HV3HD End Mill cutter body (#20005) w/ 4 total inserts

- 2 inserts HV3HD-032S-20UC for aluminum (#30020UC)
- 2 inserts HV3HD-032P-11AT for steels / exotics (#30024AT)

1" HV5HD End Mill cutter body (#10000) w/ 6 total inserts

- 2 inserts HV5HD-032S-20UC for aluminum (#40070UC)
- 2 inserts HV5HD-032P-51AT for steels / exotics (#40023AT)
- 2 inserts HV5HD-032P-11AT for titanium / exotics (#40024AT)

Plus screws, wrenches, and anti-seize



Pick a Starter Kit by FC Bore Diameter

FC Bore Diameter	1"	1-1/4"
EDP#	02200	02201
Price	\$625.00	\$625.00

# Mil-Tec Freedom Cutter® Facts, Tips & Hints

**GRADE:** Please note that the combination of Carbide Class, Edge Prep & Coating constitute the insert **Grade** (i.e. "52AT" or 5-2-AT).

**EFFECTIVE CUTTER DIAMETERS:** The cutting diameter of your Freedom Cutter will change relative to the cutter body depending upon the shape of the insert selected (see Figure 1). When using Square inserts, the cutting diameter (measured to the outside edge of the insert) will equal the body diameter. When using Octagon inserts, the cutting diameter is reduced approximately 3/8" from the body diameter. When using Round inserts, cutting diameter is reduced approximately 5/8" below the body diameter. Within the Freedom Cutter family, note the Plus+45 alone measures to centerline of insert (see graphic below; the Heavy Duty Series shares this characteristic).

- THINGS TO REMEMBER:**
- Always run Stainless dry (coolant may be used only on very light finishing cuts of .005 - .015)
  - SFPM & chip load recommendations are based on 2/3's width of cutter and climb milling
  - Recommended depth of cut (DOC) ranges from .025 to .150
  - For finishing cuts leave feed rate unchanged but increase RPM by 10% to 30%, with DOC at .015 to .030
  - Recommended Speeds & Feeds are starting parameters and may require adjustment dependent upon material & machine condition

**LOADING OF 90° INSERTS:** When using any 90° insert, ensure that each insert is placed into the pocket with the straight, 90° edge on the periphery of the cutter body (concave edge is down, see Figure 2).

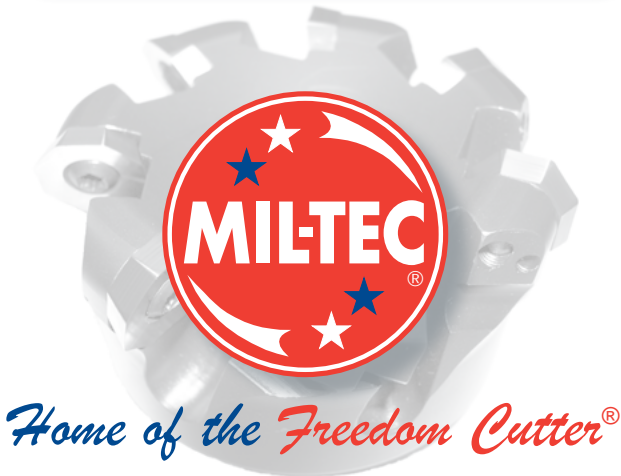
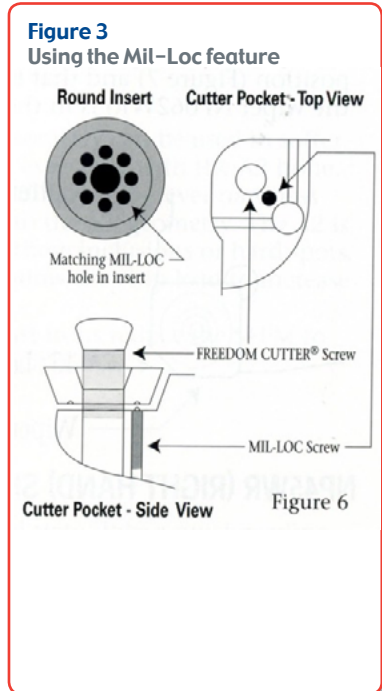
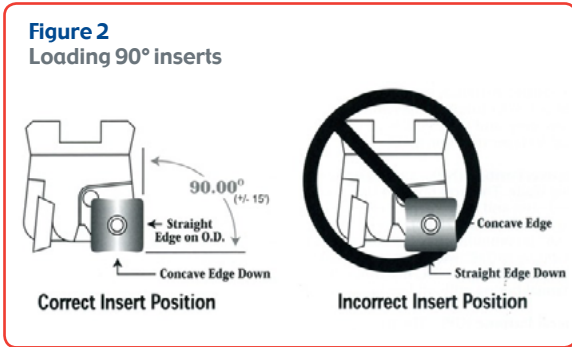
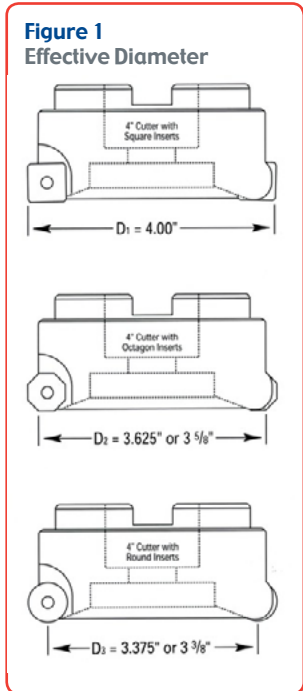
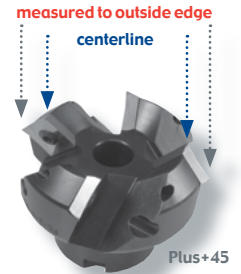
**USING THE MIL-LOC FEATURE FOR ROUND INSERTS:** The Mil-Loc keeps Round inserts from spinning under load and ensures 8 indexes. Using the 1/16" hex key included with every cutter, turn the screw from the back side so that the half-dog on the special Mil-Loc screw protrudes about .030". Be sure that the thread of the screw is not above the bottom of the pocket. Place the insert into the pocket so that the matching indents in the back of the insert align with the Mil-Loc screw in the cutter pocket. Tighten the insert normally with the center screw. Be sure to retract the Mil-Loc screw completely when using Octagon or Square inserts (see Figure 3).

**Commonly Used Formulas:**

Surface Feet Minute (SFM) = RPM x Diam. x .262  
 Revolutions Per Minute (RPM) = 3.82 x (SFM / Diam.)  
 Feed Rate (IPM) = IPT x #teeth x RPM  
 Feed Per Tooth (IPT) = IPM / (#teeth x RPM)  
 Convert Inches to millimeters: Multiply by 25.4  
 Convert millimeters to Inches: Multiply by .03937

\*Freedom Cutter Effective Cutter Diameter is to the outside edge of insert (see text above for effect of different insert shapes) except for Plus+45, which is measured to centerline.

See our Metric sizes on pages #31 to #33!  
 All metric sizes utilize our standard Freedom Cutter inserts.

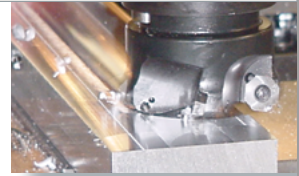




# Mil-Tec Freedom Cutter® Speeds and Feeds

Speeds and Feeds for the most common material groups plus typical insert selection. Recommendations based on cut using 2/3rds body width and .150 or less axial depth. Speed in Surface Feet Per Minute (SFPM). Feed in inches per tooth.

\*Grade references the last 4 characters of the complete 10 symbol insert name.  
 \*\*Feed Rate for Square is low to mid-range; Octagon & Round mid to high-range.



See these EDP#s for our most popular insert selections sorted by shape and material. These items also feature a 95% + stock availability.



1<sup>st</sup> Choice Class / Prep Coating



Material	Alloy Grade	Mil-Tec Geometry	Octagon 1 <sup>st</sup> Choice	Square 1 <sup>st</sup> Choice	Round 1 <sup>st</sup> Choice	Mil-Tec Grade* (last 4 characters)	Coolant	Speed SFPM	Feed Rate**
Non-Ferrous	6061, 7075	Super Shear SS	<a href="#">#50020UC</a>	<a href="#">#52320UC</a>	<a href="#">#51020A1</a>	20UC or 20A1	W or D	1000 - 5000	.003 - .018
	Copper, Brass	Super Shear SS	<a href="#">#50020UC</a>	<a href="#">#52320UC</a>	<a href="#">#51020UC</a>	20UC or 20A1	Wet	800 - 2000	.003 - .010
	Plastics	Super Shear SS	<a href="#">#50020UC</a>	<a href="#">#52320UC</a>	<a href="#">#51020UC</a>	20UC or 20A1	W or D	500 - 3000+	.003 - .018
Steels	1018, 1020	Power Shear PS	<a href="#">#60051TA</a>	<a href="#">#62351TA</a>	<a href="#">#61051TA</a>	51TA or 52TA	Dry	800 - 1200	.003 - .010
	4140, 4340, P20	Power Shear PS	<a href="#">#60051TA</a>	<a href="#">#62352TA</a>	<a href="#">#61051TA</a>	51TA or 52TA	Dry	600 - 1200	.002 - .008
	A2, D2, H13	Power Shear PS	<a href="#">#60052TA</a>	<a href="#">#62352TA</a>	<a href="#">#61052TA</a>	52TA	Dry	400 - 1200	.002 - .006
Steels	1018, 1020	Neg / Positive NP	<a href="#">#70051TA</a>	<a href="#">#72351TA</a>	<a href="#">#71051TA</a>	51TA or 52TA	Dry	800 - 1200	.006 - .018
	4140, 4340, P20	Neg / Positive NP	<a href="#">#70051TA</a>	<a href="#">#72351TA</a>	<a href="#">#71051TA</a>	51TA or 52TA	Dry	600 - 1200	.006 - .012
	A2, D2, H13	Neg / Positive NP	<a href="#">#70052TA</a>	<a href="#">#72352TA</a>	<a href="#">#71052TA</a>	52TA	Dry	400 - 1200	.006 - .012
Stainless	13-8, 15-5, 17-4	Power Shear PS	<a href="#">#60052TA</a>	<a href="#">#62352TA</a>	<a href="#">#61052TA</a>	52TA or 22TA	Dry	500 - 1200	.002 - .010
	303, 304, 316	Power Shear PS	<a href="#">#60051TA</a>	<a href="#">#62351TA</a>	<a href="#">#61051TA</a>	51TA or 21TA	Dry	800 - 1300	.002 - .015
	420, 440C	Power Shear PS	<a href="#">#60052TA</a>	<a href="#">#62352TA</a>	<a href="#">#61052TA</a>	51TA or 52TA	Dry	800 - 1200	.002 - .012
Stainless	13-8, 15-5, 17-4	Neg / Positive NP	<a href="#">#70052TA</a>	<a href="#">#72352TA</a>	<a href="#">#71052TA</a>	52TA or 22TA	Dry	500 - 1200	.006 - .012
	303, 304, 316	Neg / Positive NP	<a href="#">#70051TA</a>	<a href="#">#72351TA</a>	<a href="#">#71051TA</a>	51TA or 21TA	Dry	800 - 1300	.006 - .020
	420, 440C	Neg / Positive NP	<a href="#">#70052TA</a>	<a href="#">#72352TA</a>	<a href="#">#71052TA</a>	51TA or 52TA	Dry	800 - 1200	.006 - .014
High Temp	Inconel	Power Shear PS	<a href="#">#60012TA</a>	<a href="#">#62312TA</a>	<a href="#">#61012TA</a>	12TA or 52TA	Wet	50 - 180	.002 - .006
	Titanium	Power Shear PS	<a href="#">#60012TA</a>	<a href="#">#62312TA</a>	<a href="#">#61012TA</a>	12TA or 52TA	Wet	70 - 300	.002 - .006
High Temp	Inconel	Mag Na Shear MS	<a href="#">#80012TA</a>	<a href="#">#80311AT</a>	n/a	12TA or 52TA	Wet	50 - 250	.002 - .004
	Titanium	Mag Na Shear MS	<a href="#">#80012TA</a>	<a href="#">#80311AT</a>	n/a	12TA or 52TA	Wet	70 - 300	.002 - .004
Cast Iron	Gray Iron	Power Shear PS	<a href="#">#60022TA</a>	<a href="#">#62322TA</a>	<a href="#">#61022TA</a>	22TA or 52TA	Dry	500 - 1200	.004 - .010
	Ductile Iron	Power Shear PS	<a href="#">#60022TA</a>	<a href="#">#62322TA</a>	<a href="#">#61022TA</a>	22TA or 52TA	Dry	600 - 1200	.004 - .010
Cast Iron	Gray Iron	Neg / Positive NP	<a href="#">#70022TA</a>	<a href="#">#72322TA</a>	<a href="#">#71022TA</a>	22TA or 52TA	Dry	500 - 1200	.006 - .014
	Ductile Iron	Neg / Positive NP	<a href="#">#70022TA</a>	<a href="#">#72322TA</a>	<a href="#">#71022TA</a>	22TA or 52TA	Dry	600 - 1200	.006 - .014

FC Series Specifications: Body Diameter ±.005, TIR with installed insert ±.001

Material	Operating Tips
Non-Ferrous	Our 20UC grade is ideal in aluminum and plastics. The polished surface provides a smooth cutting face with a low coefficient of friction. This grade also features an extremely sharp cutting edge for free cutting in soft or gummy materials. The 20A1 grade includes A1 coating. A1 adds additional lubricity and dramatically reduces chip welding. 20A1 is ideal in low coolant or dry machining applications.
Steels	We feature 2 primary grades for steel alloys, 51TA and 52TA. Both use a wear resistant carbide substrate that has been designed for performance in high heat applications. SmoothCoat TA provides further wear resistance, thermal protection, and lubricity. Our TA (a hybrid version of TiAlN) is well suited for dry machining of steel alloys. The difference between the 51TA and 52TA is the edge preparation; 52TA's heavier hone adds strength in the toughest alloys and heat treated steels, and is effective in reducing edge chipping in applications where vibration is a concern.
Stainless Steel	Variations of stainless steel are immense. 15-5 PH and 440C can be heat treated and have increased hardness. Others such as 304 and 316 will work harden and are gummy to machine. The challenge is to find the optimal combination of hardness and wear resistance that is balanced with toughness to prevent excessive chipping. We offer several grades that feature our SmoothEdge hone and TA coating to obtain the perfect balance.
High Temp	Titanium, Inconel, and other chromium / nickel alloys can be a challenge to machine. They were developed specifically for airframe applications where strength and toughness are primary goals. Insert toughness and wear characteristics are critical due to the slower speeds these materials are machined at. Our 12TA provides an excellent balance of both. For finishing applications, our 52TA can be highly effective due to outstanding wear abilities.
Cast Iron	Materials featuring short chips like cast iron require high cutting edge toughness. Casted materials can feature voids and inclusions that are destructive to cutting tools. Our 22TA and 52TA grades are designed to withstand these attributes. 22TA, the first choice, exhibits great toughness while 52TA has better wear resistance.



# The Mil-Tec HV3HD High-Velocity End Mill Series



Heavy Duty, High-Velocity. The new HV3HD is the perfect mix of performance and versatility. The 100% ground and polished insert features both positive axial and radial rake, allowing the HV3HD to literally shear through the toughest materials and allowing the chip to carry away a high percentage of the generated heat. If you've been an APKT user, get ready to step up to the high-performance plate. Let's get started!



- Cuts more like solid carbide than APKT style end mills
- Perfect for all material groups
- Positive Geometry / Free Cutting
- Cuts a 90° shoulder
- PS and SS Geometry
- SmoothGrind® surface polish
- SmoothCoat® PVD hard coatings
- Compatible with our metric radii inserts
- From 5/8" to 1 1/4" diameter range



**new!**  
New Sizes!



## Select an HV3HD Cutter Body

All HV3HD Cutter Bodies are machined in our own modern CNC factory in Fort Myers, FL from special pre-hardened steel to exacting tolerances. We can manufacture specials such as Metric, Left-Hand, Extended Length, Coolant-Thru, Slotters, or other cutter bodies with lead times as quick as one week. Shank diameter is -.0002 / -.0005



Cutter Diameter	Max LOC	LOR	OAL	Shank Diameter	Insert Pockets	HV3HD Body Part Number	EDP Number	Body List Price USD
5/8	.360	1-1/2	3-3/4	3/4	2	HV3HD-5-2-6	20000	\$104.50
5/8	.360	2-3/4	5"	3/4	2	HV3HD-5-2-6L	20001	\$121.00
3/4	.360	1-1/2	3-3/4	3/4	2	HV3HD-6-2-6	20005	\$104.50
3/4	.360	3.8	6"	3/4	2	HV3HD-6-2-6L	20006	\$121.00
1"	.360	1.8	4"	3/4	3	HV3HD-8-3-6	20015	\$121.00
1"	.360	1.8	4"	1"	3	HV3HD-8-3-8	20020	\$121.00
1"	.360	3.8	6"	1"	3	HV3HD-8-3-8L	20021	\$137.50
1"	.360	4.8	7"	1"	3	HV3HD-8-3-8XL	20022	\$165.00
1-1/4	.360	1.8	4"	3/4	4	HV3HD-10-4-6	20025	\$165.00
1-1/4	.360	1.8	4"	1"	4	HV3HD-10-4-8	20030	\$165.00
1-1/4	.360	3.8	6"	1"	4	HV3HD-10-4-8L	20031	\$181.50
1-1/4	.360	1.8	4"	1-1/4	4	HV3HD-10-4-10	20035	\$165.00
1-1/4	.360	3.8	6"	1-1/4	4	HV3HD-10-4-10L	20036	\$181.50

## Select an HV3HD Insert

All HV3HD inserts are parallelogram-shaped and measure 1/4" wide by .360" in length, with precision ground & polished SmoothGrind® and Mil-Tec's unique Super Shear or Power Shear geometry. All inserts have 2 indexes. Length varies by radius.

Note HV3HD inserts are sold in packs of 10. List prices are for individual inserts. EDP #'s listed below.

UnCoated	\$12.50
Coated	\$13.50

### HV3HD Insert List Prices



High positive grind ideal for aluminum, non-ferrous, plastic, & non-metals.



Grade	Rad .005	.016	.032	.062
20UC	30000UC	30010UC	30020UC	30030UC
20A1	30000A1	30010A1	30020A1	30030A1
20D1	30000D1	30010D1	30020D1	30030D1



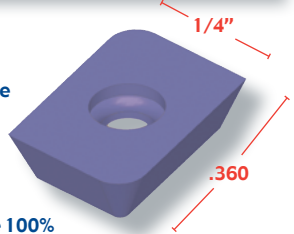
Medium positive grind for steels, stainless, and other higher-hardness range applications.



Grade	Rad .005	.016	.032	.062
51TA	30003TA	30013TA	30023TA	30033TA
11AT	30004AT	30014AT	30024AT	30034AT
21TA	30006TA	30016TA	30026TA	30036TA

## About our Geometry

Mil-Tec's Power Shear has higher edge strength than the Super Shear. The Power Shear is engineered for use in steels, stainless, titanium & inconel, while the Super Shear is ideal for aluminum and other non-ferrous material groups. Both geometries are 100% precision ground and feature Tool Alliance's proprietary SmoothGrind® technology for superior cutting edge properties and increased chip lubricity.



## SHEARDISBELIEF



**OURS** Shears material with positive ground geometry **Carries heat off with the chip** Leaves the workpiece cool to the touch



**THEIRS** Pushes material with pressed geometry **Punishes the workpiece** **Punishes the entire machine tool assembly**

"REPROGRAM YOUR MILLING EXPECTATIONS"

### Carbide Classification designated as 1, 2, or 5

**ULTRA-Carb® 1**  
Toughest Grade  
All applications + Exotics

**ULTRA-Carb® 2**  
Hardest Grade  
Cast Iron, Stainless  
Low Carbon Steels

**ULTRA-Carb® 5**  
Tough + Hard  
Steels, Stainless  
Hard materials

### Edge Prep designated as 0, 1, or 2

**SmoothEdge® 0**  
No Hone, Upsharp = 0  
Razor sharp for max shearing  
Plastics, Aluminum, Non-Ferrous

**SmoothEdge® 1**  
Light Hone = 1  
Added edge strength w/high shear  
General Purpose for most materials

**SmoothEdge® 2**  
Heavy Hone = 2  
Strongest cutting edge  
Exotics, PH Stainless, Heat treated alloys

\*Please note that the combination of Carbide Class, Edge Prep & Coating constitute the insert Grade (i.e. "52AT" or 5-2-AT).



# The Mil-Tec HV5HD High-Velocity End Mill Series

- Cuts more like solid carbide than ADKT style
- Positive Geometry / Free Cutting
- Cuts a 90° shoulder
- PS, SS, & Wiper Geometry
- SmoothGrind® surface polish
- SmoothCoat® PVD hard coatings
- From 5/8" to 4" diameter range



new!

New Sizes!

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## Select an HV5HD Cutter Body

All HV5HD Cutter Bodies are machined in our own modern CNC factory in Fort Myers, FL from special pre-hardened steel to exacting tolerances. We can manufacture specials such as Metric, Left-Hand, Extended Length, Coolant-Thru, Slotters and more with lead times as quick as one week. Shank diameter is -.0002 / -.0005



Shank Style



Shell Style

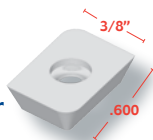
Cutter Diameter	Max LOC	LOR	OAL	Shank Diameter	Insert Pockets	HV5HD Shank Body Part Number	EDP Number	Body List Price USD
5/8	.600	1.8	4"	3/4	1	HV5HD-5-1-6	10066	\$90.00
5/8	.600	3.8	6"	3/4	1	HV5HD-5-1-6L	10067	\$110.00
3/4	.600	1.8	4"	3/4	1	HV5HD-6-1-6	10060	\$99.00
3/4	.600	3.8	6"	3/4	1	HV5HD-6-1-6L	10065	\$121.00
1"	.600	1.8	4"	3/4	2	HV5HD-8-2-6	10000	\$110.00
1"	.600	3.8	6"	3/4	2	HV5HD-8-2-6L	10005	\$126.50
1"	.600	1.8	4"	1"	2	HV5HD-8-2-8	10010	\$110.00
1"	.600	2.8	5"	1"	2	HV5HD-8-2-8-5	10012	\$165.00
1"	.600	3.8	6"	1"	2	HV5HD-8-2-8L	10015	\$126.50
1"	.600	4.8	7"	1"	2	HV5HD-8-2-8-7	10017	\$187.00
1-1/4	.600	1.8	4"	3/4	3	HV5HD-10-3-6	10020	\$154.00
1-1/4	.600	3.8	6"	3/4	3	HV5HD-10-3-6L	10025	\$170.50
1-1/4	.600	1.8	4"	1"	3	HV5HD-10-3-8	10030	\$154.00
1-1/4	.600	3.8	6"	1"	3	HV5HD-10-3-8L	10035	\$170.50
1-1/4	.600	4.8	7"	1"	3	HV5HD-10-3-8-7	10037	\$214.50
1-1/4	.600	1.8	4"	1-1/4	3	HV5HD-10-3-10	10040	\$154.00
1-1/4	.600	3.8	6"	1-1/4	3	HV5HD-10-3-10L	10045	\$170.50
1-1/4	.600	4.8	7"	1-1/4	3	HV5HD-10-3-10-7	10047	\$214.50
1-1/2	.600	1.8	4"	1-1/4	4	HV5HD-12-4-10	10050	\$192.50
1-1/2	.600	3.8	6"	1-1/4	4	HV5HD-12-4-10L	10055	\$209.00
1-1/2	.600	4.8	7"	1-1/4	4	HV5HD-12-4-10-7	10057	\$269.50

Cutter Diameter	Max LOC	Height	Keyway	Bore	Insert Pockets	HV5HD Shell Body Part Number	EDP Number	Body List Price USD
2"	.600	1.850	5/16	3/4	5	HV5HD-2-5	10061	\$275.00
3"	.600	1-7/8	.380	1"	7	HV5HD-3-7NS	10062	\$385.00
3"	.600	1-7/8	1/2	1-1/4	7	HV5HD-3-7	10063	\$385.00
4"	.600	1-7/8	.380	1"	7	HV5HD-4-7	10068	\$450.00
4"	.600	1-7/8	1/2	1-1/4	7	HV5HD-4-7-NS-1.25	10069	\$450.00

## Select an HV5HD Insert Featuring new Wiper geometry!

All HV5HD inserts are parallelogram-shaped and measure 3/8" wide by .600" in length, with precision ground & polished SmoothGrind® and Mil-Tec's unique Super Shear or Power Shear geometry. All inserts have 2 indexes. Length varies by radius.



HV5HD Insert List Prices

Note HV5HD inserts are sold in packs of 10. List prices are for individual inserts. EDP#s listed below.

UnCoated	\$13.50
Coated	\$14.50



**SS**  
Super Shear  
High Dish  
SmoothGrind®

High positive grind ideal for aluminum, non-ferrous, plastic, & non-metals.



Grade	Rad .005	.016	.032	.062	.125
20UC	40050UC	40060UC	40070UC	40080UC	40090UC
20A1	40050A1	40060A1	40070A1	40080A1	40090A1
20D1	40050D1	40060D1	40070D1	40080D1	40090D1
20UC-W	Wiper	40061UC	40071UC	40081UC	40091UC



**PS**  
Power Shear  
Medium Dish  
SmoothGrind®

Medium positive grind for steels, stainless, and other higher-hardness range applications.



Grade	Rad .005	.016	.032	.062	.125
51TA	40003TA	40013TA	40023TA	40033TA	40043TA
11AT	40004AT	40014AT	40024AT	40034AT	40044AT
21TA	40006TA	40016TA	40026TA	40036TA	40046TA
51TA-W	Wiper	40018TA	40028TA	40038TA	40048TA



Mil-Tec's PCD-tipped inserts offer incredible tool life in materials including graphite, hard carbon, filled-plastics, fiberglass, reinforced & metal matrix composites, silicon aluminum, and more. PCD also offers consistent machining finishes. Sold individually. PCD insert length = .175 ± .005



Part #	Description	Price USD each	EDP#
HV5HD-000-PCD	PCD HV5HD Square End	\$98.00	71020
HV5HD-005-PCD	PCD HV5HD w/ .005R	\$98.00	71021
HV5HD-016-PCD	PCD HV5HD w/ .016R	\$98.00	71022
HV5HD-032-PCD	PCD HV5HD w/ .032R	\$98.00	71023
HV5HD-062-PCD	PCD HV5HD w/ .062R	\$98.00	71024
HV5HD-125-PCD	PCD HV5HD w/ .125R	\$98.00	71025

# The Mil-Tec HV5R End Mill for Ramping in Aluminum



- Designed for Ramping (up to 20°), plus Helical Interpolation
- Also general milling in Aluminum
- Positive Geometry / Free Cutting
- Cuts a 90° shoulder
- Special Super Shear Geometry
- SmoothGrind® surface polish
- SmoothCoat® PVD hard coatings
- 2 diameters with 5 overall lengths



The new HV5R is an application specific design for High Velocity, aggressive ramping and 3D contour milling of aluminum. The 100% ground and polished Super Shear insert features both positive axial and radial rake, plus an open end tooth geometry for chip evacuation, allowing the HV5R to excel in deep reach and pocketing apps. Let's get started!



new!



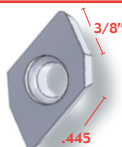
## Select an HV5R Cutter Body

All HV5R Cutter Bodies are machined in our own modern CNC factory in Fort Myers, FL from special pre-hardened steel to exacting tolerances. We can manufacture specials such as Metric, Left-Hand, Extended Length, Coolant-Thru, Slotters and more with lead times as quick as one week. Shank diameter is -.0002 / -.0005 \*max LOC measured with .032 rad

Cutter Diameter	Max LOC*	LOR	OAL	Shank Diameter	Insert Pockets	HV5R Shank Body Part Number	EDP Number	Body List Price USD
1"	.445	1.8	4"	1"	2	HV5R-8-2-8-4	10300	\$137.50
1"	.445	2.8	5"	1"	2	HV5R-8-2-8-5	10301	\$159.50
1"	.445	3.8	6"	1"	2	HV5R-8-2-8-6	10302	\$192.50
1"	.445	4.8	7"	1"	2	HV5R-8-2-8-7	10303	\$220.00
1"	.445	5.8	8"	1"	2	HV5R-8-2-8-8	10304	\$247.50
1-1/4"	.445	1.8	4"	1-1/4"	3	HV5R-10-3-10-4	10305	\$192.50
1-1/4"	.445	2.8	5"	1-1/4"	3	HV5R-10-3-10-5	10306	\$214.50
1-1/4"	.445	3.8	6"	1-1/4"	3	HV5R-10-3-10-6	10307	\$247.50
1-1/4"	.445	4.8	7"	1-1/4"	3	HV5R-10-3-10-7	10308	\$275.00
1-1/4"	.445	5.8	8"	1-1/4"	3	HV5R-10-3-10-8	10309	\$286.00

## Select an HV5R Insert

All HV5R inserts are parallelogram-shaped and measure 3/8" wide by .445" in length, with precision ground & polished SmoothGrind® and Mil-Tec's unique Super Shear geometry. All inserts have 2 indexes. Length varies by radius.



Note HV5R inserts are sold in packs of 10. List prices are for individual inserts. EDP#'s listed below.

HV5HD Insert List Prices	UnCoated	Coated
	\$14.50	\$15.50



**SS**  
Super Shear  
High Dish  
SmoothGrind®

High positive grind ideal for aluminum, non-ferrous, plastic, & non-metals.



Grade	Rad .016	.032	.062	.125
20UC	41020UC	41030UC	41040UC	41050UC
20A1	41020A1	41030A1	41040A1	41050A1
20TC	41020TC	41030TC	41040TC	41050TC



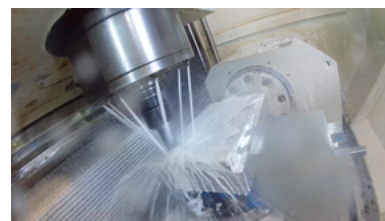
visit the Tool Alliance® YouTube channel....Ready, Set, Cut!™



- Scan this QR Code for our 10° Ramp Angle video
  - 2,500 SFPM @ .003 CPT ramping
  - 2,500 SFPM @ .006 CPT straight milling
  - .150" axial DOC / total depth 1.020"



- Scan this QR Code for our 5° Helical Interpolation video
  - 2,500 SFPM @ .003 CPT interpolation
  - hole diameter 1.872"
  - total axia depth 1.100"





**new!** The Mil-Tec HD5.1 HF High Feed End Mill Series

- HV5 Performance in a new High Feed design
- Cuts more like solid carbide than molded style inserts
- Perfect for all material groups
- Positive Geometry / Free Cutting
- GP and PS Geometry
- SmoothGrind® surface polish
- SmoothCoat® PVD hard coatings



- Up to .050" Axial Depth of Cut
- Chip Loads up to .040"
- Ideal for 40-Taper CNC's
- Shoulder / Ramp milling
- High Feed capabilities in Steels and:
  - Stainless (up to 400 IPM)
  - Titanium
  - High Temp alloys
  - Cast Iron
- See Tech Info on Page #29



Heavy Duty, High Feed. The new HD5.1 HF is the perfect mix of power and versatility. The 100% ground and polished insert features both positive axial and radial rake, allowing the HD5.1 HF to literally shear through the toughest materials and allowing the chip to carry away a high percentage of the generated heat. Both the cutter body and inserts have been re-engineered and optimized for High Feed milling. If you've been a standard ISO insert user, get ready to step up to the High Feed plate. Let's get started!

**SHEAR DISBELIEF** 



**OURS** Shears material with positive ground geometry **Carries heat off with the chip** Leaves the workpiece cool to the touch



**THEIRS** Pushes material with pressed geometry **Punishes the workpiece** Punishes the entire machine tool assembly

"REPROGRAM YOUR MILLING EXPECTATIONS"



Select an **HD5.1 HF** Cutter Body

All HD5.1 HF Cutter Bodies are machined in our own modern CNC factory in Fort Myers, FL from special pre-hardened steel to exacting tolerances. The geometry is optimized for a High Feed design (use HD5.1 HF inserts only). Shank diameter is -.0002 / -.0005



Cutter Diameter	Insert Length	LOR	OAL	Shank Diameter	Insert Pockets	HV5HD Shank Body Part Number	EDP Number	Body List Price USD
1"	.600	1.8	4"	1"	2	HD5.1HF-8-2-8	10110	\$137.50
1"	.600	3.8	6"	1"	2	HD5.1HF-8-2-8L	10111	\$159.50
1-1/4"	.600	1.8	4"	1"	3	HD5.1HF-10-3-8	10112	\$192.50
1-1/4"	.600	3.8	6"	1"	3	HD5.1HF-10-3-8L	10113	\$214.50
1-1/4"	.600	1.8	4"	1-1/4"	3	HD5.1HF-10-3-10	10114	\$192.50
1-1/4"	.600	3.8	6"	1-1/4"	3	HD5.1HF-10-3-10L	10115	\$214.50
1-1/2"	.600	1.8	4"	1-1/4"	4	HD5.1HF-12-4-10	10116	\$247.50
1-1/2"	.600	3.8	6"	1-1/4"	4	HD5.1HF-12-4-10L	10117	\$264.00

Select an **HD5.1 HF** Insert

All HD5.1 HF inserts are parallelogram-shaped and measure 3/8" wide by .600" in length, with precision ground & polished SmoothGrind® and Mil-Tec's unique General Purpose or Power Shear geometry. All inserts have 2 indexes.

Note HD5.1 HF inserts are sold in packs of 10. List prices are for individual inserts. EDP#'s listed below.

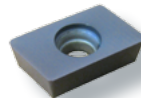
HD5.1 HF Insert List Prices

UnCoated	\$13.50
Coated	\$14.50
A2 Coated	\$15.50



**GP**  
General Purpose  
Flat Top  
SmoothGrind®

Robust, flat top grind for all materials.

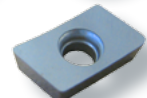


Grade	Rad .032
51UC	42005UC
51AT	42005AT
51A2	42005A2

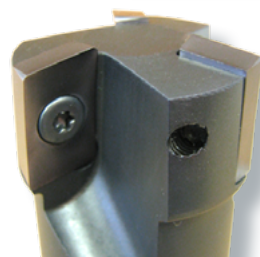


**PS**  
Power Shear  
Medium Dish  
SmoothGrind®

Medium positive grind for steels, stainless, and other higher-hardness range applications.

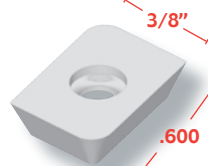


Grade	Rad .032
51UC	40015UC
51AT	40015AT
51A2	40015A2



About our Geometry

Mil-Tec's Power Shear has higher edge strength than our Super Shear. The Power Shear is engineered for use in steels, stainless, titanium & inconel, and coupled with the special pocket design of the HD5.1 cutter is the ideal solution for high feed milling. All geometries are 100% precision ground and feature Tool Alliance's proprietary SmoothGrind® technology for superior cutting edge properties and increased chip lubricity.



AT Coating

Mil-Tec's AT coating is perfect for the high feed roughing of the hard and abrasive materials the HD5.1 HF is designed for and is highly recommended. Our A2 doubles the thickness for increased wear in demanding applications. UC (UnCoated) is displayed for use in apps requiring other special solutions.

# The Mil-Tec HV10 High-Velocity End Mill Series

- Perfect for Aluminum, Non-Ferrous Alloys & more
- Positive Geometry / Free Cutting
- Up to .950 cutting length
- Super Shear & Power Shear Geometry
- SmoothGrind® surface polish
- SmoothCoat® A1 TiB2 hard coating for dry machining
- From 1" to 6" diameter range
- Available in both Shank and Shell Mill style bodies
- New Extended Reach Styles!



The new HV10 is the perfect choice for High Velocity, high performance milling in aluminum, non-ferrous alloys, and more. The 100% ground and polished insert features both positive axial and radial rake, allowing the HV10 to literally shear through the work piece material. The long insert length is ideal for deep axial cuts, and also generates a 90° shoulder. A two screw design lends superior holding strength between insert and body. The razor sharp cutting edge generates smooth, clean cuts resulting in excellent part finishes.



**new!**  
New Sizes!



## Select an HV10 Cutter Body (Shank & Shell Mill Styles)

All HV10 Cutter Bodies are machined in our own modern CNC factory in Fort Myers, FL from special pre-hardened steel to exacting tolerances. We can manufacture specials such as Metric, Left-Hand, Extended Length, Coolant-Thru, Integral Shank, or other cutter bodies with lead times as quick as one week. Shank diameter is -.0002 / -.0005



Shank Style

Cutter Diameter	Max LOC	LOR	OAL	Shank Diameter	Insert Pockets	HV10 Shank Body Part Number	EDP Number	Body List Price USD
1"	.950	2"	4-1/2	1"	1	HV10-1-1-8	10070	\$121.00
1"	.950	4-1/2	7"	1"	1	HV10-1-1-8L	10171	\$159.50
1-1/4	.950	2"	4-1/2	3/4	2	HV10-1.25-2-6	10071	\$165.00
1-1/4	.950	2"	4-1/2	1"	2	HV10-1.25-2-8	10072	\$165.00
1-1/4	.950	4-1/2	7"	1"	2	HV10-1.25-2-8L	10172	\$231.00
1-1/4	.950	2"	4-1/2	1-1/4	2	HV10-1.25-2-10	10073	\$165.00
1-1/4	.950	3-1/2	6"	1-1/4	2	HV10-1.25-2-10E	10077	\$231.00
1-1/4	.950	4-1/2	7"	1-1/4	2	HV10-1.25-2-10L	10174	\$231.00
1-1/2	.950	2"	4-1/2	1"	3	HV10-1.5-3-8	10074	\$198.00
1-1/2	.950	2"	4-1/2	1-1/4	3	HV10-1.5-3-10	10075	\$198.00
1-1/2	.950	3-1/2	6"	1-1/4	3	HV10-1.5-3-10E	10175	\$258.50
1-1/2	.950	4-1/2	7"	1-1/4	3	HV10-1.5-3-10L	10176	\$258.50
2"	.950	2"	4-1/2	1-1/4	3	HV10-2-3-10	10076	\$269.50
2"	.950	4-1/2	7"	1-1/4	3	HV10-2-3-10L	10177	\$352.00



Shell Style

Cutter Diameter	Max LOC	Height	Keyway	Bore	Insert Pockets	HV10 Shell Body Part Number	EDP Number	Body List Price USD
2"	.950	2.15	5/16	3/4	2	HV10-2-2	10080	\$222.50
2"	.950	2.15	5/16	3/4	3	HV10-2-3	10081	\$236.50
3"	.950	2.15	3/8	1"	3	HV10-3-3	10082	\$330.00
3"	.950	2.15	3/8	1"	5	HV10-3-5	10083	\$379.50
4"	.950	2.185	5/8	1-1/2	5	HV10-4-5	10084	\$495.00
5"	.950	2.185	5/8	1-1/2	6	HV10-5-6	10085	\$616.00
6"	.950	2.185	5/8	1-1/2	7	HV10-6-7	10086	\$682.00

## Select an HV10 Insert

All HV10 inserts are parallelogram-shaped and measure 7/16" wide by .950 in length, with precision ground & polished SmoothGrind® and Mil-Tec's unique Super Shear or Power Shear geometry. All inserts have 2 indexes. Length varies by radius.

Note HV10 inserts are sold in packs of 5. List prices are for individual inserts. EDP#s listed below.

**SS** Super Shear High Dish SmoothGrind®  
High positive grind ideal for aluminum, non-ferrous, plastic, & non-metals.

UC A1 D1

**PS** Power Shear Medium Dish SmoothGrind®  
Medium positive grind for steels, stainless, and other medium hardness range applications.

TA A1

UnCoated	\$25.00
Coated	\$28.00



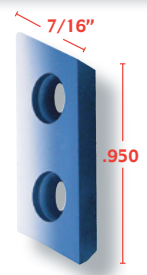
Grade	Rad .005	.032	.062	.090	.125	.187	.250*
20UC	42031UC	42050UC	42060UC	42070UC	42080UC	42082UC	42095UC
20A1	42031A1	42050A1	42060A1	42070A1	42080A1	42082A1	42095A1
20D1	42031D1	42050D1	42060D1	42070D1	42080D1	42082D1	42095D1

Grade	Rad .032	.062	.090	.125	.187	.250*
21TA	42000TA	42010TA	42020TA	42030TA	42032TA	42045TA
21A1	42000A1	42010A1	42020A1	42030A1	42032A1	42045A1

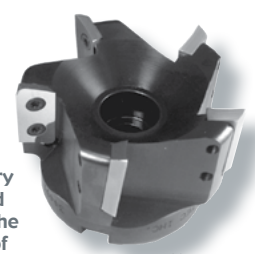
\*Please note the .250 radius requires a slight modification to cutter pocket for clearance.

## About our Geometry

Mil-Tec's Super Shear is ideal for aluminum and other non-ferrous material groups. The geometry is 100% precision ground and feature Tool Alliance's proprietary SmoothGrind® technology for superior cutting edge properties and increased chip lubricity. Power Shear adds toughness for more difficult jobs. Each has been matched with the appropriate Grade, Edge Prep, and Coating for optimum application specific milling results.



Our A1 (TiB2) coating allows for dry machining of many aluminum and non-ferrous applications. Enjoy the cost and environmental benefits of dry machining today!



HV10 Shell Mill Style

# The Mil-Tec HV1 1 High-Velocity End Mill Series new!

- Perfect for Aluminum, Non-Ferrous Alloys & more
- Positive Geometry / Free Cutting
- Up to 1.5" cutting length
- Super Shear Geometry creates super sharp cutting edge
- SmoothGrind® surface polish
- SmoothCoat® A1 TiB2 hard coating for dry machining and D1 PVD Diamond for abrasive materials
- From 1 1/4" to 2" diameter range
- New Extended Reach Styles!



The new HV1 1 is the perfect choice for High Velocity, high performance milling in aluminum, non-ferrous alloys, and more. The 100% ground and polished insert features both positive axial and radial rake, allowing the HV1 1 to literally shear through the work piece material. The long insert length is ideal for deep axial cuts, and also generates a 90° shoulder. A two screw design lends superior holding strength between insert and body. The razor sharp cutting edge generates smooth, clean cuts resulting in excellent part finishes.



## Select an HV1 1 Cutter Body (Shank Mill Styles)

All HV1 1 Cutter Bodies are machined in our own modern CNC factory in Fort Myers, FL from special pre-hardened steel to exacting tolerances. We can manufacture specials such as Metric, Left-Hand, Extended Length, Coolant-Thru, Integral Shank, or other cutter bodies with lead times as quick as one week. Shank diameter is -.0002 / -.0005

Cutter Diameter	Max LOC	LOR	OAL	Shank Diameter	Insert Pockets	HV11 Shank Body Part Number	EDP Number	Body List Price USD
1-1/4	1-1/2	2"	5"	1"	2	HV11-1.25-2-8	10200	\$264.00
1-1/4	1-1/2	2"	5"	1-1/4	2	HV11-1.25-2-10	10201	\$264.00
1-1/4	1-1/2	3-1/2	6-1/2	1-1/4	2	HV11-1.25-2-10E	10202	\$341.00
1-1/4	1-1/2	4-1/2	8"	1-1/4	2	HV11-1.25-2-10L	10203	\$341.00
1-1/2	1-1/2	2"	5"	1"	3	HV11-1.5-3-8	10204	\$308.00
1-1/2	1-1/2	2"	5"	1-1/4	3	HV11-1.5-3-10	10205	\$308.00
1-1/2	1-1/2	3-1/2	6-1/2	1-1/4	3	HV11-1.5-3-10E	10206	\$368.50
1-1/2	1-1/2	4-1/2	8"	1-1/4	3	HV11-1.5-3-10L	10207	\$368.50
2"	1-1/2	2"	5"	1-1/4	3	HV11-2-3-10	10208	\$379.50
2"	1-1/2	3-1/2	6-1/2	1-1/4	3	HV11-2-3-10E	10209	\$462.00
2"	1-1/2	4-1/2	8"	1-1/4	3	HV11-2-3-10L	10210	\$462.00

## Select an HV1 1 Insert

All HV1 1 inserts are parallelogram-shaped and measure 7/16" wide by 1.5" in length, with precision ground & polished SmoothGrind® and Mil-Tec's unique Super Shear geometry. All inserts have 2 indexes. Length varies by radius.

Note HV1 1 inserts are sold in packs of 6. List prices are for individual inserts. EDP #'s listed below.

UnCoated	Coated
\$31.00	\$35.00



High positive grind ideal for aluminum, non-ferrous, plastic, & non-metals.

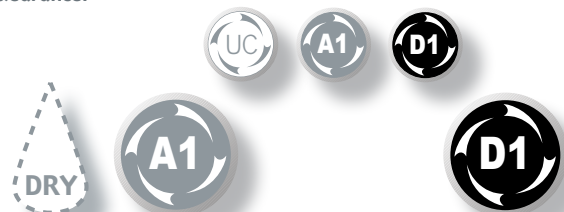
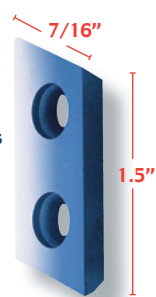
20UC: UnCoated & no edge prep; Aluminum, non-ferrous, non-metals  
 20A1: A1 (TiB2) coated for superior lubricity and reduced chip weld  
 20D1: D1 Diamond coated for wear resistance in abrasive materials

Grade	Rad .032	.062	.090	.125	.187	.250*
20UC	81020UC	81120UC	81220UC	81320UC	81420UC	81520UC
20A1	81020A1	81120A1	81220A1	81320A1	81420A1	81520A1
20D1	81020D1	81120D1	81220D1	81320D1	81420D1	81520D1

\*Please note the .250 radius requires a slight modification to cutter pocket for clearance.

## About our Geometry

Mil-Tec's Super Shear is ideal for aluminum and other non-ferrous material groups. The geometry is 100% precision ground and feature Tool Alliance's proprietary SmoothGrind® technology for superior cutting edge properties and increased chip lubricity. The geometry has been matched with the appropriate Grade, Edge Prep, and Coating for optimum application-specific milling results.



Our A1 (TiB2) coating allows for dry machining of many aluminum and non-ferrous applications. Enjoy the cost and environmental benefits of dry machining today!

Our superhard yet thin D1 PVD Diamond coating is the perfect compliment with SmoothGrind's sharp cutting edge for milling abrasive materials.



The HV1 1's long length creates lengthy, needle-like chips in aluminum.





# new! The Mil-Tec HVC10 and HVC11 Chamfer Mill Series

- Perfect for Aluminum, Non-Ferrous Alloys & more
- Positive Geometry / Free Cutting
- Up to 1 1/4" axial cutting length
- Super Shear & Power Shear Geometry
- SmoothGrind® surface polish
- SmoothCoat® A1 TiB2 hard coating for dry machining in aluminum
- SmoothCoat® D1 PVD Diamond hard coating for abrasive materials
- Uses standard HV10 and HV11 inserts
- 3 standard included angles



The new HVC10 and HVC11 are the perfect choice for high performance chamfering in aluminum, non-ferrous alloys, abrasive materials, and more. The 100% ground and polished insert rake features both positive axial and radial rake, allowing a literal shear through the work piece material. The long insert lengths allow for substantive axial LOC. A two screw design lends superior holding strength between insert and body. Also, the razor sharp cutting edge generates smooth, clean cuts resulting in excellent part finishes.



## Select an HVC10 Chamfer Cutter Body

All HVC10 Chamfer Cutter Bodies are machined in our own modern CNC factory in Fort Myers, FL from special pre-hardened steel to exacting tolerances. We can manufacture special angles with lead times as quick as one week.

Included Angle	Axial LOC*	Minor Diam	Major Diam	Height	Keyway	Bore	Insert Pockets	HVC10 Chamfer Body Part Number	EDP Number	Body List Price USD
60°	.818	1-1/2	2.44	1.85	5/16	3/4	3	HVC10-60	10087	\$319.00
90°	.664	1-1/2	2.87	1.85	5/16	3/4	3	HVC10-90	10088	\$385.00
120°	.467	1-1/2	3.18	1.85	5/16	3/4	3	HVC10-120	10089	\$429.00

\*Please note that axial LOC will change based upon radius size

## Select an HV10 Insert

All HV10 inserts are parallelogram-shaped and measure 7/16" wide by .950 in length, with precision ground & polished SmoothGrind® and Mil-Tec's unique Super Shear or Power Shear geometry. All inserts have 2 indexes. Length varies by radius.

Note HV10 inserts are sold in packs of 5. List prices are for individual inserts. EDP#'s listed below.

UnCoated	\$25.00
Coated	\$28.00

HV10 Insert List Prices



**SS**  
Super Shear  
High Dish  
SmoothGrind®

High positive grind ideal for aluminum, non-ferrous, plastic, & non-metals.



Grade	Rad .005	Rad .032	Rad .062
20UC	42031UC	42050UC	42060UC
20A1	42031A1	42050A1	42060A1
20D1	42031D1	42050D1	42060D1



**PS**  
Power Shear  
Medium Dish  
SmoothGrind®

Medium positive grind for steels, stainless, and other medium hardness range applications.



Grade	Rad .032	Rad .062
21TA	42000TA	42010TA
21A1	42000A1	42010A1



## Select an HV11C Chamfer Cutter Body

All HVC11 Chamfer Cutter Bodies are machined in our own modern CNC factory in Fort Myers, FL from special pre-hardened steel to exacting tolerances. We can manufacture special angles with lead times as quick as one week.

Included Angle	Axial LOC*	Minor Diam	Major Diam	Height	Keyway	Bore	Insert Pockets	HVC11 Chamfer Body Part Number	EDP Number	Body List Price USD
60°	1.278	1-3/4	3.23	2.10	.380	1"	3	HVC11-60	10220	\$451.00
90°	1.040	1-3/4	3.83	2.10	.380	1"	3	HVC11-90	10221	\$550.00
120°	.733	1-3/4	4.29	2.10	.380	1"	3	HVC11-120	10222	\$588.50

\*Please note that axial LOC will change based upon radius size

## Select an HV11 Insert

All HV11 inserts are parallelogram-shaped and measure 7/16" wide by 1.5" in length, with precision ground & polished SmoothGrind® and Mil-Tec's unique Super Shear geometry. All inserts have 2 indexes. Length varies by radius.

Note HV11 inserts are sold in packs of 6. List prices are for individual inserts. EDP#'s listed below.

UnCoated	\$31.00
Coated	\$35.00

HV11 Insert List Prices



**SS**  
Super Shear  
High Dish  
SmoothGrind®

High positive grind ideal for aluminum, non-ferrous, plastic, & non-metals.



20UC: UnCoated & no edge prep; Aluminum, non-ferrous, non-metals  
20A1: A1 (TiB2) coated for superior lubricity and reduced chip weld  
20D1: D1 Diamond coated for wear resistance in abrasive materials

Grade	Rad .032	Rad .062
20UC	81020UC	81120UC
20A1	81020A1	81120A1
20D1	81020D1	81120D1





# Mil-Tec HV3HD, HV5HD, HV10 & HV11 Speeds and Feeds

Speeds and Feeds for the most common material groups plus typical insert selection. Recommendations based on normal slotting & peripheral milling with DOC .100 or less. Speed in Surface Feet per Minute. Feed in Inches per Tooth. HV Series Specifications: Body Diameter +.000 / -.005, TIR with installed insert ±.001



Material	Alloy Grade	Speed SFPM	HV3HD feed per tooth	HV5HD feed per tooth	HV10 / HV11 feed per tooth	Mil-Tec Grade* (Class/Prep/Coating)	Coolant
Non-Ferrous	6061 Aluminum	1000 - 3000+	.003 - .010	.003 - .012	.003 - .024	20UC or 20A1	Wet
	Copper, Brass	800 - 1500	.003 - .008	.003 - .010	.003 - .018	20UC or 20A1	Wet
	Plastics	500 - 3000+	.003 - .015	.003 - .015	.003 - .015	20UC or 20A1	Dry
Steels	1018, 1020	800 - 1500	.002 - .006	.002 - .008	call factory	51TA	Dry
	4140, 4340, P20	600 - 1200	.002 - .005	.002 - .007	call factory	51TA	Dry
	A2, D2, H13	400 - 1000	.002 - .004	.002 - .006	call factory	51TA	Dry
Stainless Steel	13-8, 15-5, 17-4	500 - 1200	.001 - .004	.001 - .006	call factory	51TA or 11AT	Dry
	303, 304, 316	800 - 1500	.002 - .006	.002 - .006	call factory	51TA or 11AT	Dry
	420, 440C	800 - 1500	.002 - .005	.002 - .005	call factory	51TA or 11AT	Dry
High Temp	Inconel	100 - 300	.001 - .004	.001 - .004	call factory	11AT	Wet
	Titanium	70 - 250	.001 - .004	.001 - .004	call factory	11AT	Wet
Cast Iron	Gray Iron	500 - 1200	.002 - .004	.002 - .006	call factory	11TA	Dry
	Ductile Iron	600 - 1200	.002 - .004	.002 - .006	call factory	11TA	Dry

**Carbide Classification** designated as 1, 2, or 5

**ULTRA-Carb® 1**  
Toughest Grade  
All applications + Exotics

**ULTRA-Carb® 2**  
Hardest Grade  
Cast Iron, Stainless  
Low Carbon Steels

**ULTRA-Carb® 5**  
Tough + Hard  
Steels, Stainless  
Hard materials

**Edge Prep** designated as 0, 1, or 2

**SmoothEdge® 0**  
No Hone, Upsharp = 0  
Razor sharp for max shearing  
Plastics, Aluminum, Non-Ferrous

**SmoothEdge® 1**  
Light Hone = 1  
Added edge strength w/high shear  
General Purpose for most materials

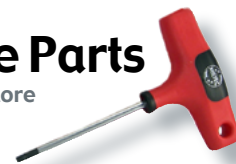
**SmoothEdge® 2**  
Heavy Hone = 2  
Strongest cutting edge  
Exotics, PH Stainless, Heat treated alloys

\*Please note that the combination of Carbide Class, Edge Prep & Coating constitute the insert **Grade** (i.e. "52AT" or 5-2-AT).

Part #	Description	Price USD	Package Q	EDP#
HVW-7T	Torx wrench for HV3HD	\$3.30	1	<a href="#">99110</a>
HVW-10T	Torx wrench for HV5(HD&R)	\$3.30	1	<a href="#">99111</a>
HVW-15T	Torx wrench for HV10 / HV11	\$3.30	1	<a href="#">99112</a>
HVS-440T	Torx insert screw / HV3HD	\$16.50	9	<a href="#">99113</a>
HVS-832T	Torx insert screw / HV5(HD&R)	\$16.50	9	<a href="#">99114</a>
HV10-1032T	Torx insert screw / HV10	\$33.00	9	<a href="#">99115</a>
HV11-1032T	Torx insert screw / HV11	\$39.60	6	<a href="#">99116</a>
MT-AS	Anti-Seize tube	\$1.10	1	<a href="#">99106</a>

## HV Series Spare Parts

Wrenches, Screws & More



- ← Tighten to 12 - 15 Inch Pounds
- ← Tighten to 16 - 20 Inch Pounds
- ← Tighten to 25 - 28 Inch Pounds
- ← Tighten to 25 - 28 Inch Pounds

## About the Mil-Tec HV End Mill Series:

The new Mil-Tec HV (High Velocity) successfully bridges the performance gap between solid carbide end mills and indexable carbide face mills. The combination of positive axial & radial rake geometries, precision & polished grinding, hardened cutter bodies, and SuperNitride PVD hard coatings makes the HV run like a solid carbide end mill, yet the inherent modular makeup allows for flexibility in design, application, and diameter. The HV can be made in special sizes & configurations, including coolant-thru. Call the factory today!

- Positive Axial Geometry = **Free cutting with maximized work piece engagement.**
- Positive Radial Geometry = **Superb chip formation transfers heat away from tool and work piece.**
- 100% Precision Ground Insert = **Sharp cutting edges, tight tolerances, and excellent coating adhesion.**

### Applications:



\*Note: The HV Series is not designed for plunge milling. Ramp milling or a starter hole is necessary for pocket milling.





# Mil-Tec HD5.1 & HFC High Feed Cutter Speeds and Feeds

Mil-Tec's High Feed Cutters allow for incredible feed rates. Listed Speeds and Feeds are for plus optimal insert selection. Speed in Surface Feet Per Minute. Feed in inches per tooth.



## Mil-Tec HD5.1 High Feed Cutter Speeds and Feeds

Material	Alloy Grade	Speed SFPM	HFC feed per tooth	Axial Depth of Cut	DRY Coolant
Steels	1018, 1020	900 - 1000	.020 - .030	.030	Dry
	4140, 4340, P20	700 - 800	.020 - .030	.030	Dry
	A2, D2, H13	600 - 700	.015 - .025	.030	Dry
Stainless Steel	13-8, 15-5, 17-4	600 - 800	.020 - .025	.030	Dry
	303, 304, 316	700 - 900	.020 - .030	.030	Dry
	420, 440C	700 - 900	.020 - .025	.030	Dry

OD = Max Cutter Diameter	Radial Depth of Cut
1"	.355
1-1/4"	.585
1-1/2"	.820

Recommended starting parameters.



Watch the Mil-Tec HD5.1 High Feed End Mill in action!

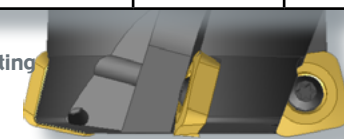
## Mil-Tec HFC High Feed Freedom Cutter Speeds and Feeds



Material	Alloy Grade	Speed SFPM	1-1/2 and 2" diameter feed per tooth	2-1/2 to 4" diameter feed per tooth	Axial Depth of Cut	Coolant
Steels	1018, 1020	900 - 1000	.020 - .040	.015 - .030	.050	Dry
	4140, 4340, P20	700 - 800	.020 - .040	.015 - .030	.050	Dry
	A2, D2, H13	600 - 700	.015 - .030	.010 - .0225	.050	Dry
Stainless Steel	13-8, 15-5, 17-4	600 - 800	.020 - .035	.015 - .0275	.050	Dry
	303, 304, 316	700 - 900	.020 - .035	.015 - .0275	.050	Dry
	420, 440C	700 - 900	.020 - .030	.015 - .0225	.050	Dry

OD = Max Cutter Diameter	Radial Depth of Cut
1-1/2"	.620
2"	1.070
2-1/2"	1.560
3"	2.050
4"	3.040

Recommended starting parameters.

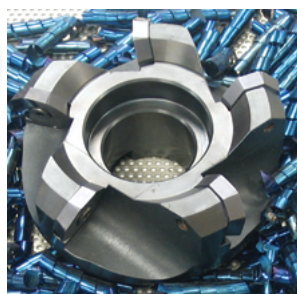


Watch the Mil-Tec HFC High Feed Freedom Cutter in action!



# The Mil-Tec HD Heavy Duty Series

- Large 1" Insert
- 1/4" Axial DOC
- 8 indexes for Value
- Positive Geometry / Free Cutting
- NP, PS and SS Geometry
- SmoothGrind® surfaces
- SmoothCoat® PVD hard coating availability
- From 2" to 10" diameter range



The Mil-Tec Heavy Duty Series features a huge 1" IC carbide insert for increased capacity and strength. The HD allows for heavier depth of cuts and higher feed rates for max stock removal. Mil-Tec's HD Series Inserts are available in our SS (Super Shear), PS (Power Shear), & NP (Negative/Positive) geometries. The HD Round machines a beautiful 1/2" radius in robust applications.

**new!**

**HD Round!**



## Select an HD Heavy Duty Cutter Body

All HD Heavy Duty Cutter Bodies are machined in our own modern CNC factory in Fort Myers, FL from special pre-hardened steel to exacting tolerances. We can manufacture specials such as Metric, Left-Hand, Extended Length, Coolant-Thru or other cutter bodies with lead times as quick as one week. Shank diameter is -.0002 / -.0005

Shell Style	Cutter Diameter	Bore	Keyway	Insert Pockets	Octagon HD		Round HD		Body List Price USD
					HD Shell Body Part Number	EDP Number	HD Shell Body Part Number	EDP Number	
	3"	1-1/4	1/2	4	HD-3-4	10090	RHD-3-4	10101	\$396.00
	4"	1-1/2	5/8	5	HD-4-5	10091	RHD-4-5	10102	\$495.00
	5"	1-1/2	5/8	5	HD-5-5	10092	RHD-5-5	10103	\$616.00
	6"	1-1/2	5/8	5	HD-6-5	10093	RHD-6-5	10104	\$682.00
	8"	2-1/2	1"	7	HD-8-7	10094	RHD-8-7	10105	\$968.00
	10"	2-1/2	1"	8	HD-10-8	10095	RHD-10-8	10106	\$1210.00
RPX Shell Style	Cutter Diameter	Bore	Keyway	Insert Pockets	HD RPX Shell Body Part Number	EDP Number			Body List Price USD
	3"	1-1/4	1/2	3	HDRPX-3-3	10096			\$374.00
	4"	1-1/2	5/8	4	HDRPX-4-4	10097			\$474.00
	4"	1-1/2	5/8	5	HDRPX-4-5	10098			\$495.00
RPX Shank Style	Cutter Diameter	OAL	Shank Diameter	Insert Pockets	HD RPX Shank Body Part Number	EDP Number			Body List Price USD
	2"	4"	1-1/4	2	HDRPX-2-2-10	10099			\$286.00
	2"	4"	1-1/4	3	HDRPX-2-3-10	10100			\$308.00

## Select an HD Heavy Duty Insert

All HD inserts measure 1" inscribed circle, with precision ground & polished SmoothGrind® and Mil-Tec's unique Negative-Positive, Super Shear or Power Shear geometry. All inserts have 8 indexes. Radius size for Octagon is .100, for Round (PS Geometry only) .500.

Note HD inserts are sold in packs of 5. List prices are for individual inserts. EDP#'s listed below.

UnCoated	\$27.00
Coated	\$30.00

HD Insert List Prices



High positive grind ideal for aluminum, non-ferrous, plastic, & non-metals. Available in Octagon shape only.



Grade	Octagon
UC 20UC	42100UC
A1 20A1	42100A1



Medium positive grind for steels, stainless, and other higher-hardness range applications in Octagon. For Round shape use 20UC for aluminum & non-ferrous, 12AT for titanium / exotics, and 52AT for steels and stainless.



Grade	Octagon
TA 52TA	42110TA
AT 12AT	42120AT



Strongest insert and designed for heavy feed rates. Ideal for steel, stainless, & heat-treated alloys. Available in Octagon only.



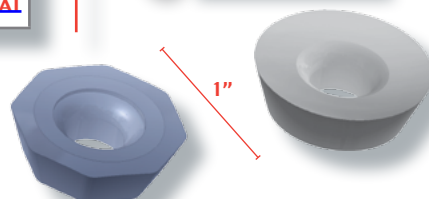
Grade	Octagon
TA 52TA	42130TA
AT 12AT	42140AT
TA 22TA	42150TA

## About our Geometry

Mil-Tec's Power Shear (PS) has higher edge strength than the Super Shear (SS). The PS is engineered for use in steels, stainless, titanium & inconel, while the SS is ideal for aluminum and other non-ferrous material groups. The Negative/Positive (NP) is a workhorse design for a wide range of applications. All geometries are 100% precision ground and feature Tool Alliance's proprietary SmoothGrind® technology for superior cutting edge properties and increased chip lubricity.

Part #	Description	Price USD	Package Q	EDP#
HDS-28	Insert screw, HD Heavy Duty	\$18.20	6	99120
MT-AS	Anti-Seize Tube	\$1.10	1	99106

HD Series Spare Parts





**Metric Sizes** All the power and high-performance of Mil-Tec available in metric sizing. The Metric Freedom Cutters on this page use our standard FC inserts displayed on pages #10 to #17.

Select a **METRIC Freedom Cutter Plus+ Face Mill Style Body**

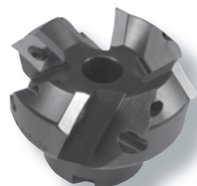
All Freedom Cutter Bodies are machined in our own modern CNC factory in Fort Myers, FL from special pre-hardened steel to exacting tolerances. We manufacture standards & specials such as Fractional, Coolant-Thru, Cartridge style, aluminum, or other cutter bodies with lead times as quick as one week.



Cutter Diameter	Bore	Keyway	Height	Insert Pockets	FC Plus+ Body Part Number	EDP Number	Body List Price USD
50.0 mm	22 mm	10 mm	43.8 mm	4	FC-50-4-22	05004	\$242.00
63.0 mm	22 mm	10 mm	47.6 mm	4	FC-63-4-22	05005	\$302.50
80.0 mm	27 mm	12 mm	47.6 mm	5	FC-80-5-27	05006	\$379.50
80.0 mm	27 mm	12 mm	47.6 mm	7	FC-80-7-27	05007	\$401.50
100.0 mm	32 mm	14 mm	47.6 mm	6	FC-100-6-32	05008	\$495.00
100.0 mm	32 mm	14 mm	47.6 mm	8	FC-100-8-32	05009	\$528.00
125.0 mm	40 mm	16 mm	53.6 mm	6	FC-125-6-40	05010	\$616.00
125.0 mm	40 mm	16 mm	53.6 mm	9	FC-125-9-40	05011	\$649.00
160.0 mm	40 mm	16 mm	53.6 mm	8	FC-160-8-40	05012	\$682.00
160.0 mm	40 mm	16 mm	53.6 mm	10	FC-160-10-40	05013	\$726.00

Select a **METRIC Freedom Cutter Plus+45 Face Mill Style Body**

All Freedom Cutter Plus+45 Bodies are machined in our own modern CNC factory in Fort Myers, FL from special pre-hardened steel to exacting tolerances. We manufacture standards & specials such as Fractional, Coolant-Thru, Cartridge style, aluminum, or other cutter bodies with lead times as quick as one week.



Cutter Diameter	Bore	Keyway	Height	Insert Pockets	FC Plus+45 Body Part Number	EDP Number	Body List Price USD
50.0 mm	22 mm	10 mm	52 mm	4	FC45-50-4-2	05101	\$242.00
80.0 mm	27 mm	12 mm	52 mm	6	FC45-80-6-2	05102	\$385.00
100.0 mm	32 mm	14 mm	52 mm	8	FC45-100-8-2	05103	\$528.00
125.0 mm	40 mm	16 mm	52 mm	9	FC45-125-9-2	05104	\$649.00
160.0 mm	40 mm	16 mm	52 mm	10	FC45-160-10-2	05105	\$726.00

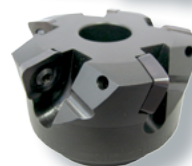
Select a **METRIC High Feed Freedom Cutter Shank or Face Mill Style Body**

The new Mil-Tec High Feed Freedom Cutter brings incredible metalworking performance to smaller CNC's & 40-taper spindles milling Steels & Stainless (up to 7,500 mm/min) and Titanium & Exotics (up to 152 SMPM @ 1,270 mm/min). High Feed inserts are listed below.

**new!**



Cutter Diameter	Shank Diameter	OAL	Insert Pockets	HFC Shank Body Part Number	EDP Number	Body List Price USD
40.0 mm	32 mm	100 mm	2	HFC-40-2-32	05022	\$231.00
50.0 mm	32 mm	100 mm	2	HFC-50-2-32	05023	\$341.00



Cutter Diameter	Bore	Keyway	Height	Insert Pockets	HFC Shell Body Part Number	EDP Number	Body List Price USD
50.0 mm	22 mm	10 mm	40 mm	4	HFC-50-4-22	05024	\$275.00
63.0 mm	22 mm	10 mm	50 mm	4	HFC-63-4-22	05025	\$357.50
80.0 mm	27 mm	12 mm	50 mm	5	HFC-80-5-27	05026	\$418.00

Select a **High Feed Insert:**

This insert is ideal for roughing steel, Stainless, and cast iron.



EDP#	Shape	Radius	# indexes	Price
72752AT	Square	.125	4	\$15.50

This insert is ideal for roughing Stainless, Titanium, Inconel, and high-temp alloys.



EDP#	Shape	Radius	# indexes	Price
63712AT	Square 90	.125	2	\$15.50



Select a **METRIC Freedom Cutter with Extended Reach Shank Style Body**

All Freedom Cutter Bodies are machined in our own modern CNC factory in Fort Myers, FL from special pre-hardened steel to exacting tolerances. We manufacture standards & specials such as Fractional, Coolant-Thru, Extended Length, integrated R8 shank, or other cutter bodies with lead times as quick as one week.

Cutter Diameter	Shank	Reach	OAL	Insert Pockets	FC Shank Body Part Number	EDP Number	Body List Price USD
32.0 mm	32 mm	45.6 mm	100 mm	2	FCR-32-2-32	05001	\$165.00
40.0 mm	32 mm	43.5 mm	100 mm	3	FCR-40-3-32	05002	\$209.00
50.0 mm	32 mm	43.5 mm	100 mm	4	FCR-50-4-32	05003	\$308.00



### Select a METRIC HV3HD Cutter Body

All HV3HD Cutter Bodies are machined in our own modern CNC factory in Fort Myers, FL from special pre-hardened steel to exacting tolerances. We can manufacture specials such as Fractional, Left-Hand, Extended Length, Coolant-Thru or other cutter bodies with lead times as quick as one week.



Cutter Diameter	LOC	LOR	OAL	Shank Diameter	Insert Pockets	HV3HD Body Part Number	EDP Number	Body List Price USD
16.0 mm	9.15 mm	34 mm	90 mm	16.0 mm	2	HV3HD-16-2	<a href="#">05201</a>	\$107.20
16.0 mm	9.15 mm	69 mm	125 mm	16.0 mm	2	HV3HD-16-2L	<a href="#">05202</a>	\$126.50
20.0 mm	9.15 mm	34 mm	90 mm	20.0 mm	2	HV3HD-20-2	<a href="#">05203</a>	\$107.20
20.0 mm	9.15 mm	94 mm	150 mm	20.0 mm	2	HV3HD-20-2L	<a href="#">05204</a>	\$126.50
25.0 mm	9.15 mm	54 mm	110 mm	25.0 mm	3	HV3HD-25-3	<a href="#">05205</a>	\$112.80
25.0 mm	9.15 mm	144 mm	200 mm	25.0 mm	3	HV3HD-25-3L	<a href="#">05206</a>	\$159.50

### Select a Radius & Geometry

All HV3HD inserts are parallelogram-shaped and measure 6.35mm wide by 9.15mm in length, with precision ground & polished SmoothGrind® and Mil-Tec's unique Power Shear or Super Shear geometry.

#### HV3HD Insert List Prices

UnCoated	\$12.50
Coated	\$13.50

Note HV3HD inserts are sold in packs of 10. List prices are for individual inserts. EDP#'s listed below.



### Select an Insert Grade

Our proprietary carbide substrates and in-house SmoothCoat® PVD SuperNitride hard coatings are scientifically mated for Application-Specific usage. EDP numbers are listed below.



**SS**

Super Shear  
High Dish  
SmoothGrind®

High positive grind ideal for aluminum, non-ferrous, plastic, & non-metals.

Grade	Rad			
	0.5mm	1.0mm	2.0mm	3.0mm
20UC	<a href="#">05214UC</a>	<a href="#">05215UC</a>	<a href="#">05216UC</a>	<a href="#">05217UC</a>
20A1	<a href="#">05224A1</a>	<a href="#">05225A1</a>	<a href="#">05226A1</a>	<a href="#">05227A1</a>
51TA	<a href="#">05244TA</a>	<a href="#">05245TA</a>	<a href="#">05246TA</a>	<a href="#">05247TA</a>
11AT	<a href="#">05254AT</a>	<a href="#">05255AT</a>	<a href="#">05256AT</a>	<a href="#">05257AT</a>



**PS**

Power Shear  
Medium Dish  
SmoothGrind®

Medium positive grind for steels, stainless, and other higher-hardness range applications.

Grade	Rad			
	0.5mm	1.0mm	2.0mm	3.0mm
20UC	<a href="#">05210UC</a>	<a href="#">05211UC</a>	<a href="#">05212UC</a>	<a href="#">05213UC</a>
20A1	<a href="#">05220A1</a>	<a href="#">05221A1</a>	<a href="#">05222A1</a>	<a href="#">05223A1</a>
51TA	<a href="#">05240TA</a>	<a href="#">05241TA</a>	<a href="#">05242TA</a>	<a href="#">05243TA</a>
11AT	<a href="#">05250AT</a>	<a href="#">05251AT</a>	<a href="#">05252AT</a>	<a href="#">05253AT</a>



## Metric Sizes

Please note that the combination of Carbide Class, Edge Prep & Coating constitute the insert Grade (i.e. "51AT" or 5-1-AT). These metric inserts are compatible with the fractional HV Series cutter bodies, allowing for the ability to utilize metric radii sizes.



### Select a METRIC HV5HD Cutter Body

All HV5HD Cutter Bodies are machined in our own modern CNC factory in Fort Myers, FL from special pre-hardened steel to exacting tolerances. We can manufacture specials such as Fractional, Left-Hand, Extended Length, Coolant-Thru or other cutter bodies with lead times as quick as one week.



Cutter Diameter	LOC	LOR	OAL	Shank Diameter	Insert Pockets	HV5HD Body Part Number	EDP Number	Body List Price USD
25.0 mm	15.25 mm	54 mm	110 mm	25.0 mm	2	HV5HD-25-2	<a href="#">05301</a>	\$112.80
25.0 mm	15.25 mm	94 mm	150 mm	25.0 mm	2	HV5HD-25-2L	<a href="#">05302</a>	\$165.00
32.0 mm	15.25 mm	54 mm	110 mm	32.0 mm	3	HV5HD-32-3	<a href="#">05303</a>	\$145.80
32.0 mm	15.25 mm	144 mm	200 mm	32.0 mm	3	HV5HD-32-3L	<a href="#">05304</a>	\$192.50
40.0 mm	15.25 mm	59 mm	115 mm	40.0 mm	4	HV5HD-40-4	<a href="#">05305</a>	\$159.50
40.0 mm	15.25 mm	144 mm	200 mm	40.0 mm	4	HV5HD-40-4L	<a href="#">05306</a>	\$215.60

### Select a Radius & Geometry

All HV5HD inserts are parallelogram-shaped and measure 9.5mm wide by 15.25mm in length, with precision ground & polished SmoothGrind® and Mil-Tec's unique Power Shear or Super Shear geometry.

#### HV5HD Insert List Prices

UnCoated	\$13.50
Coated	\$14.50

Note HV5HD inserts are sold in packs of 10. List prices are for individual inserts. EDP#'s listed below.



### Select an Insert Grade

Our proprietary carbide substrates and in-house SmoothCoat® PVD SuperNitride hard coatings are scientifically mated for Application-Specific usage. EDP numbers are listed below.



**SS**

Super Shear  
High Dish  
SmoothGrind®

High positive grind ideal for aluminum, non-ferrous, plastic, & non-metals.

Grade	Rad					
	0.5mm	1.0mm	2.0mm	3.0mm	4.0mm	5.0mm
20UC	<a href="#">05316UC</a>	<a href="#">05317UC</a>	<a href="#">05318UC</a>	<a href="#">05319UC</a>	<a href="#">05320UC</a>	<a href="#">05321UC</a>
20A1	<a href="#">05328A1</a>	<a href="#">05329A1</a>	<a href="#">05330A1</a>	<a href="#">05331A1</a>	<a href="#">05332A1</a>	<a href="#">05333A1</a>
51TA	<a href="#">05352TA</a>	<a href="#">05353TA</a>	<a href="#">05354TA</a>	<a href="#">05355TA</a>	<a href="#">05356TA</a>	<a href="#">05357TA</a>
11AT	<a href="#">05364AT</a>	<a href="#">05365AT</a>	<a href="#">05366AT</a>	<a href="#">05367AT</a>	<a href="#">05368AT</a>	<a href="#">05369AT</a>



**PS**

Power Shear  
Medium Dish  
SmoothGrind®

Medium positive grind for steels, stainless, and other higher-hardness range applications.

Grade	Rad					
	0.5mm	1.0mm	2.0mm	3.0mm	4.0mm	5.0mm
20UC	<a href="#">05310UC</a>	<a href="#">05311UC</a>	<a href="#">05312UC</a>	<a href="#">05313UC</a>	<a href="#">05314UC</a>	<a href="#">05315UC</a>
20A1	<a href="#">05322A1</a>	<a href="#">05323A1</a>	<a href="#">05324A1</a>	<a href="#">05325A1</a>	<a href="#">05326A1</a>	<a href="#">05327A1</a>
51TA	<a href="#">05346TA</a>	<a href="#">05347TA</a>	<a href="#">05348TA</a>	<a href="#">05349TA</a>	<a href="#">05350TA</a>	<a href="#">05351TA</a>
11AT	<a href="#">05358AT</a>	<a href="#">05359AT</a>	<a href="#">05360AT</a>	<a href="#">05361AT</a>	<a href="#">05362AT</a>	<a href="#">05363AT</a>

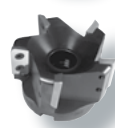




Select a **METRIC HV10** Cutter Body (Shank & Shell Mill Styles)  
 All HV10 Cutter Bodies are machined in our own modern CNC factory in Fort Myers, FL from special pre-hardened steel to exacting tolerances. We can manufacture specials such as Fractional, Left-Hand, Extended Length, Coolant-Thru or other cutter bodies with lead times as quick as one week.



Cutter Diameter	LOC	LOR	OAL	Shank Diameter	Insert Pockets	HV10 Shank Body Part Number	EDP Number	Body List Price USD
32.0 mm	25.0 mm	50 mm	115 mm	20.0 mm	2	HV10-32-2-20	05401	\$173.20
32.0 mm	25.0 mm	50 mm	115 mm	25.0 mm	2	HV10-32-2-25	05402	\$173.20
32.0 mm	25.0 mm	50 mm	115 mm	32.0 mm	2	HV10-32-2-32	05403	\$173.20
40.0 mm	25.0 mm	50 mm	115 mm	25.0 mm	3	HV10-40-3-25	05404	\$198.00
40.0 mm	25.0 mm	50 mm	115 mm	32.0 mm	3	HV10-40-3-32	05405	\$198.00
50.0 mm	25.0 mm	50 mm	115 mm	32.0 mm	3	HV10-50-3-32	05406	\$269.50



Cutter Diameter	LOC	Height	Keyway	Bore	Insert Pockets	HV10 Shell Body Part Number	EDP Number	Body List Price USD
50.0 mm	25.0 mm	54.6 mm	10 mm	22.0 mm	3	HV10-50-3-22	05407	\$269.50
63.0 mm	25.0 mm	54.6 mm	10 mm	22.0 mm	4	HV10-63-4-22	05408	\$412.50
80.0 mm	25.0 mm	54.6 mm	12 mm	27.0 mm	5	HV10-80-5-27	05409	\$412.50
100.0 mm	25.0 mm	54.6 mm	14 mm	32.0 mm	5	HV10-100-5-32	05410	\$539.00

Select a Radius & Geometry  
 All HV10 inserts are parallelogram-shaped and measure 11mm wide by 25mm in length, with 2 precision ground & polished indexes featuring Mil-Tec's unique SmoothGrind® & Super Shear geometry.

HV10 Insert List Prices

UnCoated	\$25.00
Coated	\$28.00

Note HV10 inserts are sold in packs of 5. List prices are for individual inserts. EDP#'s listed below.

Select an Insert Grade  
 Our proprietary carbide substrates and in-house SmoothCoat® PVD SuperNitride hard coatings are scientifically mated for Application-Specific usage. EDP numbers are listed below.



High positive grind ideal for aluminum, non-ferrous, plastic, & non-metals.

Grade	1.0mm	2.0mm	3.0mm	4.0mm	5.0mm*
20UC	05411UC	05412UC	05413UC	05423UC	05414UC
20A1	05415A1	05416A1	05417A1	05427A1	05418A1

\*Large 5.0 mm radius may require additional body clearance.

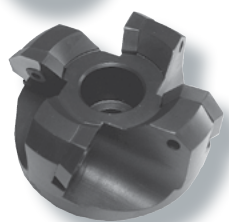


Metric Sizes

Please note that the combination of Carbide Class, Edge Prep & Coating constitute the insert Grade (i.e. "20UC" or 2-0-UC). These metric inserts are compatible with the fractional HV10 or HD Series cutter bodies, allowing for the ability to utilize metric radii sizes.



Select a **METRIC Heavy Duty (HD)** Face Mill Cutter Body  
 All HD (Heavy Duty) Cutter Bodies are machined in our own modern CNC factory in Fort Myers, FL from special pre-hardened steel to exacting tolerances. We can manufacture specials such as Fractional, Left-Hand, Extended Length, Coolant-Thru or other cutter bodies with lead times as quick as one week.



Cutter Diameter	Bore	Keyway	Insert Pockets	Heavy Duty Body Part Number	EDP Number	Body List Price USD
80.0 mm	32 mm	12 mm	4	HDFC-80-4-32	05151	\$396.00
100.0 mm	32 mm	14 mm	5	HDFC-100-5-32	05152	\$539.00
125.0 mm	40 mm	16 mm	5	HDFC-125-5-40	05153	\$616.00
160.0 mm	40 mm	16 mm	5	HDFC-160-5-40	05154	\$682.00
200.0 mm	60 mm	25 mm	7	HDFC-200-7-60	05155	\$1078.00
250.0 mm	60 mm	25 mm	8	HDFC-250-8-60	05156	\$1320.00

Select a Radius & Geometry  
 All HD inserts are Octagon-shaped and measure 25mm inscribed circle, with precision ground & polished SmoothGrind® and Mil-Tec's unique NP, PS or SS geometry. Each insert has 8 indexes and share a 2.5mm radius.

HD Insert List Prices

UnCoated	\$27.00
Coated	\$30.00

Note HD inserts are sold in packs of 6. List prices are for individual inserts. EDP#'s listed below.

Select an Insert Grade  
 Our proprietary carbide substrates and in-house SmoothCoat® PVD SuperNitride hard coatings are scientifically mated for Application-Specific usage. EDP numbers are listed below.

**SS**  
 Super Shear High Dish SmoothGrind®  
 Rad 2.5mm  
 Grade 20UC 05161UC  
 Grade 20A1 05162A1

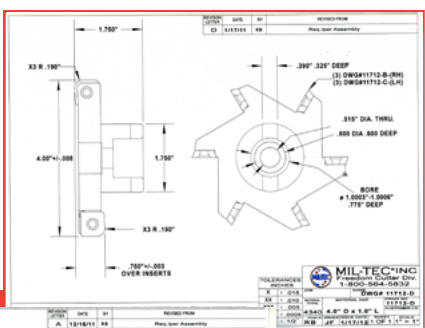
**NP**  
 Negative / Positive Frustricoconical Land SmoothGrind®  
 Rad 2.5mm  
 Grade 22TA 05157TA  
 Grade 52TA 05158TA  
 Grade 12AT 05159AT

**PS**  
 Power Shear Medium Dish SmoothGrind®  
 Rad 2.5mm  
 Grade 52TA 05160TA

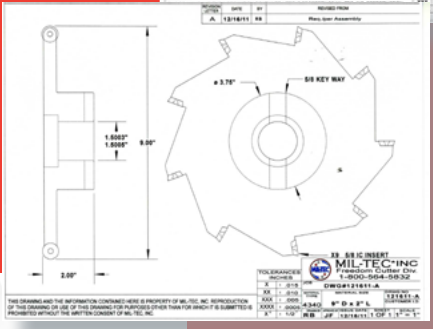
# Mil-Tec Specials Capabilities



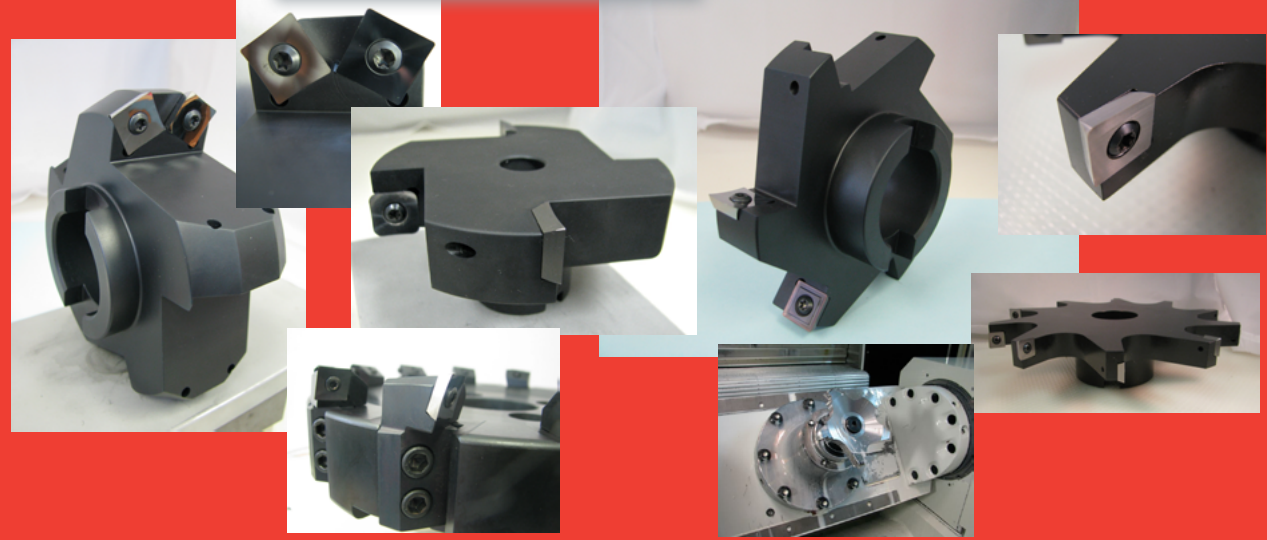
- Precision 5-axis machining
- CAD design / development
- Fast quotations
- Fast deliveries
- Tight pocket tolerances
- Slotters, Reach, Chamfers, Cartridge, & more



When you need special indexable milling solutions, and need them fast, Mil-Tec is the answer. We can deliver special cutters incorporating our Freedom Cutter, High Velocity, or Heavy Duty family of inserts in the time it takes the large global firms to return a quotation. We can handle apps for slotting, reach, chamfering, undercuts, coolant-thru, and more, quickly and efficiently, all with traditional Mil-Tec quality.

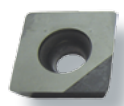


For quotations, technical support, and application information contact us at (800) 564-5832 or sales@miltecusa.com

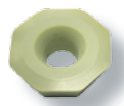


## Mil-Tec Special Apps

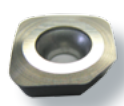
Unique apps utilizing specialty Freedom Cutter and HV Series inserts  
Please see Pages # 16 & 17 to individually select these Freedom Cutter insert styles



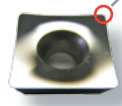
• **Diamond**  
Mil-Tec offers a full range of inserts with PCD tips and diamond coatings. These inserts provide maximum wear resistance and lubricity when used in non-ferrous and non-metal applications. Our D1 (PVD Diamond) offers great value and can be applied to any of our inserts. For maximum wear with a coating, select our D2 (CVD Diamond). Lastly, our PCD product offers extremely high wear with mirror finishes.



• **Silicon Nitride & Cermet**  
Mil-Tec's silicon nitride and cermet grades offer a higher level of wear resistance and heat stability than cemented carbide. While still lacking the toughness of carbide, new technology has dramatically increased the durability of these grades. Our silicon nitride is ideal for cast & ductile iron applications, while cermet is targeted for steels and stainless. Please note ground insert geometry selection is limited.



• **Wipers**  
Mil-Tec's wiper inserts can produce smooth workpiece finishes in a wide range of materials. We carry designs in all three Freedom Cutter shapes (square, round, and octagon). A single wiper insert is used in a cutter body array, and each has a single index. Depths of cut range from .005 to .025".



• **Aluminum Wipers**  
Mil-Tec offers a dedicated aluminum wiper designed to provide excellent finishes while performing either roughing or finishing operations. This unique geometry is ground on our square Freedom Cutter insert and features a .032" radius on each index. A .047" wiper flat is blended to the radius and provides surface finishes as low as 15 Ra.



# Mil-Tec for Titanium, Inconel, Stainless, Exotics

Mil-Tec's high Positive Geometry and Precision Ground inserts are ideal for milling exotic materials such as Titanium, Inconel, Stainless Steel, and other High-Temp alloys. And with the huge family of Freedom Cutters and HV Series indexable end mills to select from, your specialized solution awaits. Reprogram your Milling Expectations!



- High Positive Geometry
- Shearing cutting action
- Sharp, strong cutting edge
- Chip retains heat, not work piece
- Reduces "work hardening"
- Highly efficient on 40 taper CNC's

## SHEAR DISBELIEF



**OURS** Shears material with positive ground geometry **Carries heat off with the chip** Leaves the workpiece cool to the touch



**THEIRS** Pushes material with pressed geometry **Punishes the workpiece** Punishes the entire machine tool assembly

"REPROGRAM YOUR MILLING EXPECTATIONS"



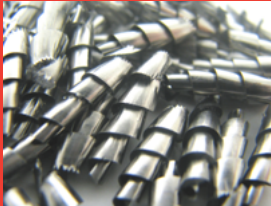
The Freedom Cutter Plus+ with the Mag-Na-Shear (MS) precision ground insert with chipbreaker.

These 6Al-4V Titanium chips tell the story...



This picture indicates poor chip formation. Dull, torn, and undefined shape indicates poor cutting conditions.

**POOR**



These chips were sheared with Mil-Tec's Power Shear (PS) insert geometry. Smooth & shiny with a tight curl, this picture indicates a chip formation under ideal cutting conditions.

**IDEAL**



Precision ground inserts + Positive geometry = Efficient High Speed Machining.

Outstanding qualitative insert characteristics combined with specialized cutters:

### SmoothCoat®

Milling exotics requires a world-class PVD hardcoating, and Mil-Tec offers just that with our exclusive SmoothCoat formulations.



Our TiAlN is superb for all applications including wet or dry milling.

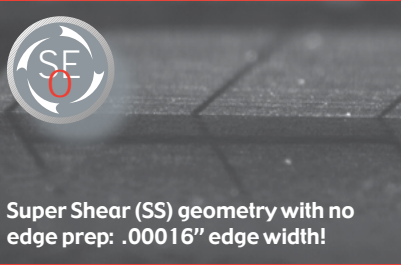


Our AlTiN is thicker, has a higher thermal resistance, and is ideal for dry milling.

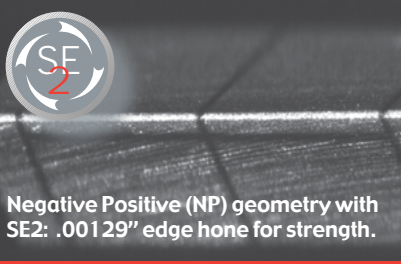


Our Titanium DiBoride (TiB2) has excellent lubricity and retains edge sharpness; great for Titanium.

### SmoothEdge®



Super Shear (SS) geometry with no edge prep: .00016" edge width!



Negative Positive (NP) geometry with SE2: .00129" edge hone for strength.



The Freedom Cutter RPX is the freest cutting design that Mil-Tec offers, with ramp and plunge capability.

The all new Mil-Tec Freedom Cutter Dedicated Round (FCDR) was engineered specifically for milling titanium and high-temp alloys.



The Mil-Tec High Feed cutter is designed for maximum feed rates using our PS90 insert geometry.





# Tool Alliance®: Ready, Set, Cut!™

## About the brands of Tool Alliance® For more info contact sales@toolalliance.com

We obsess over details that create the finest cutting tools available. Our reward is customer satisfaction via increased factory productivity. We cannot be the best without thinking differently, so over a 45 year operating history we've developed proprietary technologies and brands that yield significant characteristics and designs of cutting tools unlike any you'll find elsewhere:



The world's first web-based design, blueprint, quotation, and ordering system for solid carbide specials brings real time information to cutting tool consumers everywhere on a 24/7/365 virtual basis.

Customize Yourself.™  
tungstentoolworks.com



Celebrating 45 years of providing the industry's highest value in solid carbide standards and blueprint specials.

The Total Value Carbide Solution.™  
ultra-tool.com



Precision ground and polished carbide insert geometries utilized within a family of advanced end mill & face mill cutter bodies.

Reprogram your milling expectations.™  
miltecusa.com



High-performance solid carbide round tools for die & mold, medical, consumer electronic, aerospace, composite, and micro machining.

Not just where machining is, but where machining will be.™  
roundtool.com



Bringing the Tool Alliance principles of Performance & Value to the woodworking and plastics industry.

Proven daily by the linear foot.™  
routco.com

## About the technology partners of Tool Alliance®

Our technology partners are second to none. We find premier firms, the technological leaders in their respective industries, throughout the world and work with them in progressive, win-win relationships to bring our customers the very finest components and characteristics that we build into our products. Constant reinvestment into our company-owned factories promise long-term stability & consistency in delivering Performance & Solutions to carbide rotary tooling consumers everywhere.



5-axis VMC control



Substrate, abrasive, coolants & workholding



Grinding centers



Coating systems



Robotics



CNC grinder control



# Mil-Tec® Terms & Conditions

**Ordering Information:** All Mil-Tec® products have an EDP number and a Part number. One or both may be used when entering orders via eMail or fax (preferred methods), phone, or postal mail communications. If the product is coated, be sure to include the coating suffix.

**Availability:** Mil-Tec® products are available through select Industrial Distributors, catalog houses, and our website. Locally, your Industrial Distributor can provide communication, technical assistance, and inventory support. Standard products are subject to prior sale.

**Pricing:** All prices shown are effective January 1, 2020, supersede and cancel all previous listed prices, and subject to change without notice. The amount of any present or future sales tax, value-added tax, or similar tax applicable to the products listed herein shall be added to the purchase price and paid by the customer. All sales made at list price less standard applicable distributor discount. Contract pricing must be obtained in writing via current quotation, with stated pricing, effective date, and expiration date, to be valid.

**Shipping:** Preferred carriers are UPS ground services, Federal Express Express Saver (Guaranteed 3-Day), and Federal Express premium services. Prices quoted herein are F.O.B. our shipping warehouses in Fort Myers, Florida, or Huntington Beach, California, U.S.A.

**Terms:** Domestic and Export Net 30 Days.

**Minimum Charge:** \$50.00 Net.

**Returned Items:** Current catalog items are returnable subject to a 25% handling charge and approval by the Mil-Tec® Inspection Department. Credit cannot be issued for any product that has in any way been modified, machined, altered, coated, marked, or displaying other characteristics that render it in a "used" condition. Additionally, as our tolerances, substrate, and grinding methods are continually improved, products purchased two-years or longer prior to return may not be acceptable for credit. A Returned Goods Authorization (RGA) number must be obtained from the Tool Alliance® Sales Department prior to return. Returned product must be sent to the Factory for credit; consignment locations are not capable of issuing either RGA's or credit memos. Special tools are not returnable.

**Specials Policy:** We reserve the right to overship or undership and invoice special tools up to a 10% variance per item. Quantities under 10 are subject to a one-piece variance. Any variations to this policy must be stated in advance as it will effect pricing upon quotation. Special orders cannot be cancelled without prior approval and proper consideration.

**Product Warranty:** Mil-Tec® warrants that products sold by it shall be free from defects in materials and workmanship. Mil-Tec will replace, repair, or grant credit for any product which does not comply with this warranty. This warranty does not apply to any products which have been in any way modified, machined, misused, subjected to accident, or used beyond normal life. Warranty claims should be made through the distributor from whom the product was purchased. There are no other warranties, expressed or implied, made by us except as expressed above, and we neither assume nor authorize any other firm or person to assume for it any other obligation or liability in connection with our products.

**Cooperative Advertising:** Mil-Tec® does not participate in any cooperative advertising programs with either industrial distributors or manufacturer's representatives. This policy allows us to avoid any possible favoritism or conflicts of interest, and keeps costs and sales prices as low as possible.



is friendly to the environment. All paper products are separated for reuse and shredded for packaging materials. Shipping boxes are reused when possible. Conservation programs are in place for reduced energy use (additionally, our coastal locations eliminate the need for artificial heating or cooling on many days). All displaced materials during the manufacturing process are collected, separated, and returned to a materials recycler. Coolants are recycled when appropriate. Mop water is evaporated and resultant sediment is properly disposed. Skylights provide natural lighting and reduce electricity usage.

**Visit our factories** on your next trip to the greater Los Angeles / San Diego, CA or Fort Myers / Naples, FL areas. View our automated facilities, meet our Associates, and tell us how we can better grow our relationship together. Huntington Beach is officially "Surf City" with miles of open beach on the Pacific Ocean, and we're minutes away from attractions such as Disneyland, Knott's, Universal Studios, Reagan and Nixon Presidential Libraries, Getty Museum, Dodger Stadium, Staples Center, Angel Stadium, Honda Center, The Tool Alliance Club, and the list goes on. The closest airport is Orange County (SNA), followed by Long Beach (LGB), Los Angeles (LAX), and then Ontario (ONT). Fort Myers (airport code RSW) is on the beautiful Gulf of Mexico coast, a recreational haven, home to Major League Baseball spring training, and within a 3-hour drive to Orlando, Tampa Bay, Sarasota, Miami, Fort Lauderdale, the Everglades, and more.



Fort Myers, Florida



Huntington Beach, California



Huntington Beach, California



Huntington Beach, California

Tool Alliance / Florida  
Mil-Tec, Incorporated  
5578 6th Street West  
Lehigh Acres, FL 33971  
(800) 564-5832 • fax (866) 244-0298

Tool Alliance / California  
Ultra-Tool Int'l, Inc.  
5451 McFadden Avenue  
Huntington Beach, CA 92649  
(800) 854-2431 • fax (714) 891-7816



See us on the web at:  
[toolalliance.com](http://toolalliance.com)  
Contact:  
[sales@toolalliance.com](mailto:sales@toolalliance.com)  
Mil-Tec Catalog Version 2020  
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## Mil-Tec® sales features:

- The Company created and patented the Freedom Cutter, allowing square, octagon, and round inserts to seat in the same cutter body.
- Our precision ground carbide inserts provide incredible shearing via positive geometries & work excellent within a wide machine tool spectrum.
- Mil-Tec is dedicated solely to the indexable carbide tooling industry.
- We are privately held, operate with long-term focus and goals, and manufacture 100% of our products within factory buildings that we own exclusively within the USA.
- Our substrate, geometry, and coating are specially selected for each application and Series.
- Our cutting tools have extremely accurate diameter, radius, and concentricity characteristics.
- Our edge prep process provides toughness and strength.
- Our grinding method & coating technology yields an extremely sharp & long-lasting cutting edge.
- We perform in-house, 5-axis cutter body machining and testing.
- We offer proprietary coatings such as A1 (TiB2) and AT (HSN<sup>2</sup>), all performed in-house for quick delivery.
- Our inserts are also completely proprietary / Non-ISO.
- We can stock firm blanket orders.
- We are able to quickly quote and manufacture print specials.
- Both fractional and metric size ranges are offered.
- We have sales offices in both coastal time zones (Florida and California).
- We have large standard inventories and excellent service levels.
- We strongly support traditional Industrial Distribution.



Always made in the USA.  
Learn more at [milteccusa.com](http://milteccusa.com)



## About the technology of Mil-Tec® and Tool Alliance®:

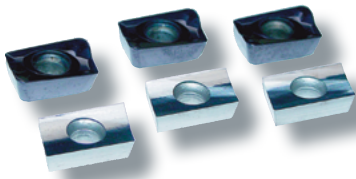
We obsess over details that create the finest cutting tools available. Our reward is customer satisfaction via increasing their factory productivity. We cannot be the best without thinking differently, so over a forty-year operating history we've developed proprietary technologies that yield significant characteristics of cutting tools unlike any you'll find elsewhere:

- SmoothGrind® = Polished cutting edges for extreme sharpness and lubricity.
- SmoothContricity® = Precision grinding, tool holding, and tolerances for minimized TIR.
- SmoothCoat® = Sputter-based SuperNitride PVD coating for superior surface hardness & uniformity.
- SmoothEdge® = Surface and edge preparation for lubricity and minimized break-in.



**Sharpness & Lubricity.**  
No wonder it works better.

Sintered APKT geometry (top) versus  
Mil-Tec precision ground (bottom).



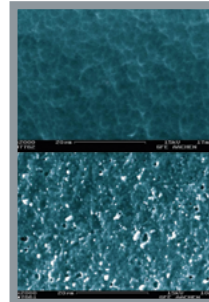
**SmoothGrind®**

**Tight tolerances.**  
Minimized run-out.



**SmoothContricity®**

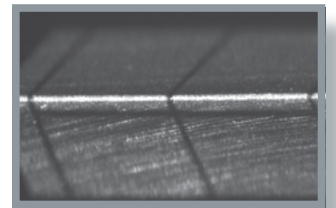
**Our coating @ 2,000X (top).**  
Everybody else's (bottom).



**SmoothCoat®**

**Edge Integrity.**  
Runs great on the first pass.

Mil-Tec Freedom Cutter insert cutting edge  
magnified to display SE2 hone.



**SmoothEdge®**



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