



ARM Tooling Systems

**Double Edge and Specialty
Face Mills and Slotting Saws**





ARM Tooling Systems

ARM Tooling Systems specializes in the manufacturing and engineering of carbide and specialty tooling.

ARM Tooling Systems manufactures quality cutting tools and cutters to meet our customers ever changing requirements.

ARM Tooling Systems commitment to provide customers with the best price, quality, and service has allowed ATS to remain a dominant force throughout the global supply chain.



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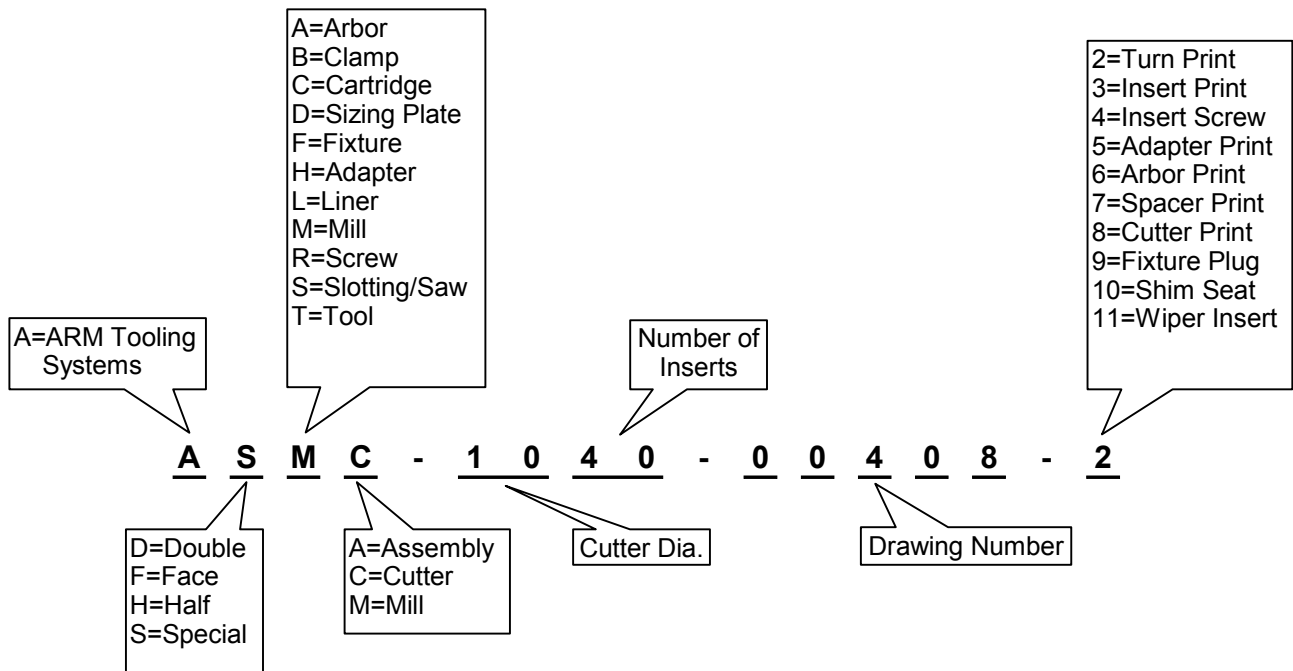
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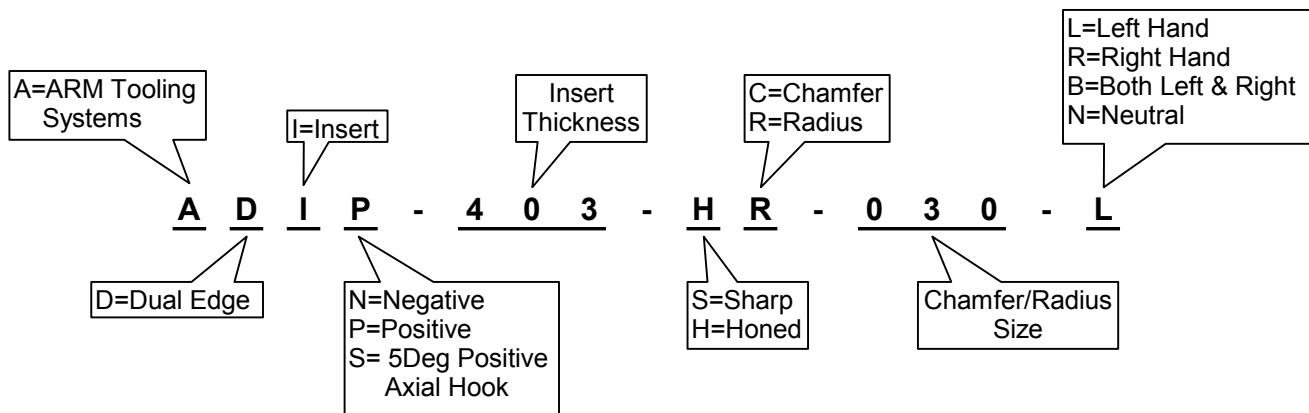
Customer Service:

To place an order or inquire about product availability & pricing, please call our offices at 1-586-759-5677 or copy the Request for Quotation data sheet on page 19 and FAX it to 1-586-754-1653.

Cutter Body Identification System

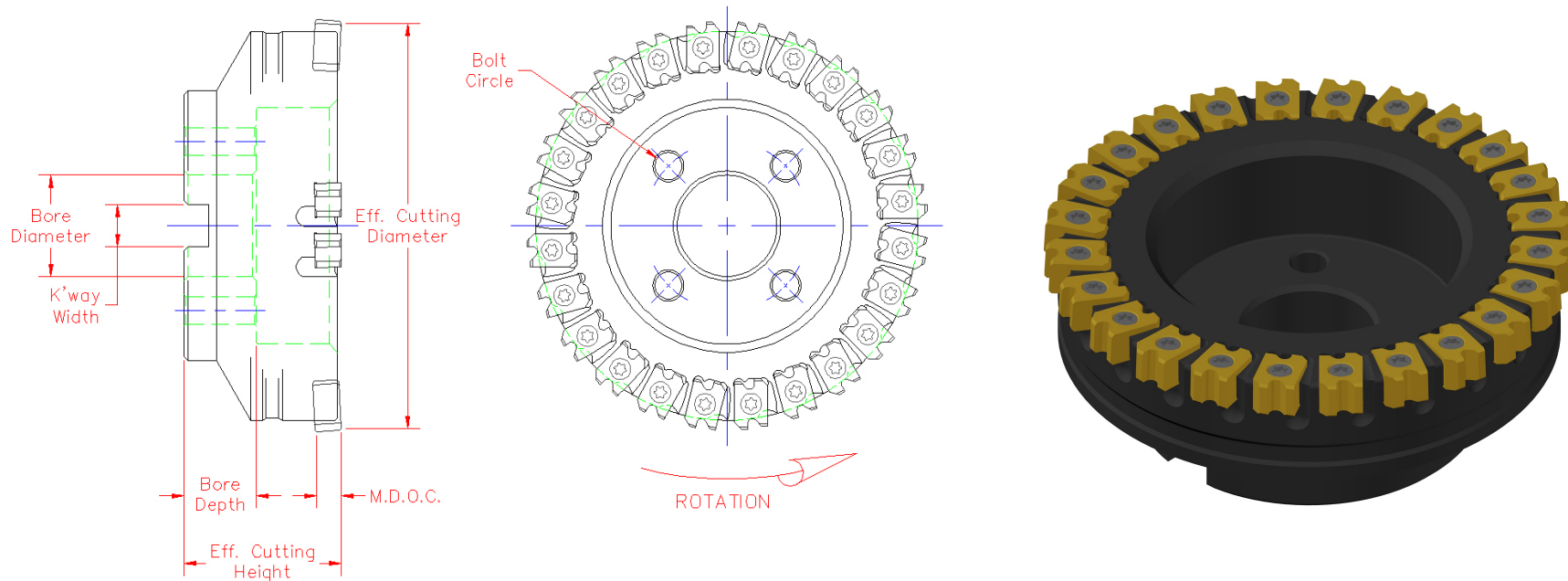


Insert Identification System



Standard Dual Edge Face Mills

U.S. Pat. #5,209,611



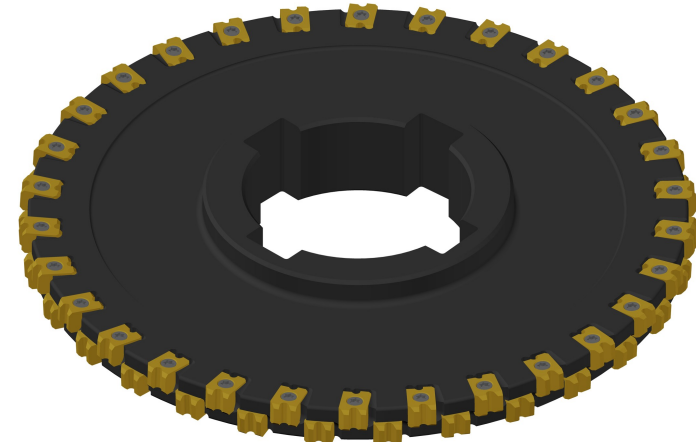
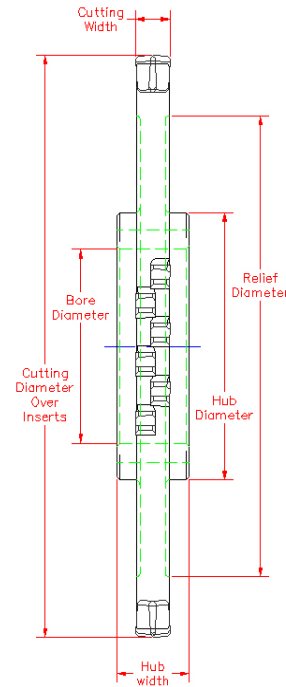
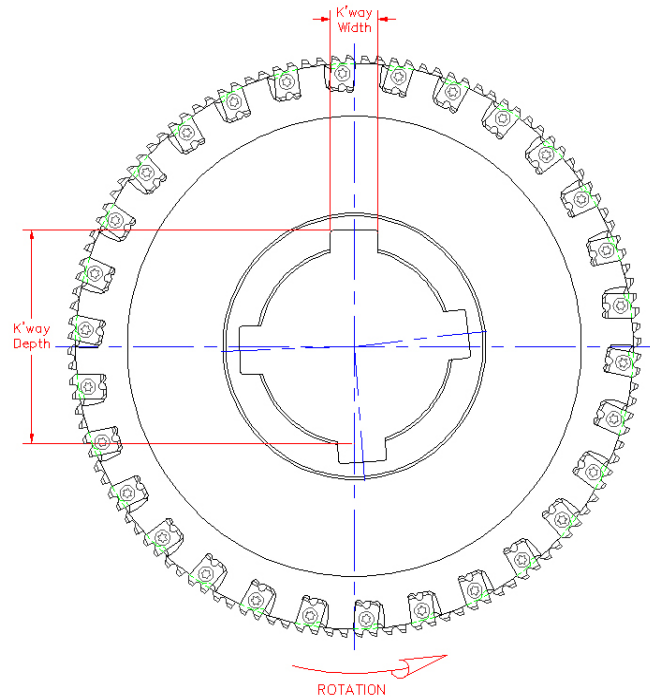
Part Number	Eff. Cutting Diameter	Eff. Cutting Height	M.D.O.C.	Number of		Bore Diameter	Bore Depth	K'way Width	K'way Length	Bolt Circle	Rotation
				Inserts	Teeth						
AFM 3009-00030	3.00	2.38	.370	9	18	1.00	1.00	3/8	thru	--	Right Hand Rotation
AFM 4012-00031	4.00			12	24	1.50	1.00	5/8	thru	--	
AFM 5016-00040	5.00			16	32	1.50	1.10	5/8	thru	--	
AFM 6024-00032	6.00			24	48	1.50	1.12	5/8	thru	--	
AFM 8032-00033	8.00			32	64	2.50	1.26	1	thru	4	
AFM 1040-00034	10.00			40	80	2.50	1.26	1	7.24	4	
AFM 1248-00035	12.00			48	96	2.50	1.26	1	9.56	4 & 7	
AFM 3009-00203	3.00	2.38	.370	9	18	1.00	1.00	3/8	thru	--	**Left Hand Rotation
AFM 4012-00204	4.00			12	24	1.50	1.00	5/8	thru	--	
AFM 5016-00205	5.00			16	32	1.50	1.10	5/8	thru	--	
AFM 6024-00206	6.00			24	48	1.50	1.12	5/8	thru	--	
AFM 8032-00207	8.00			32	64	2.50	1.26	1	thru	4	
AFM 1040-00208	10.00			40	80	2.50	1.26	1	7.24	4	
AFM 1248-00209	12.00			48	96	2.50	1.26	1	9.56	4 & 7	

* M.D.O.C. based on a .403" thick insert with a .030" chamfer. (For cutting depths past .370", please note on the Request for Quotation form.)

** Right Hand Rotation shown, Left Hand Rotation opposite.

*** Larger diameter dual edge face mills are available upon request.

Also available for finish applications, please note on Request for Quotation form.



ARM Tooling Systems Dual Edge slotting cutters are made to order products. Our experienced staff of application engineers will assist in producing the most efficient cutter for any application. To insure prompt response, please use the Request for Quotation form provided on page 19 and FAX it to our technical service group at 1-586-754-1653.

Each Dual Edge slotting cutter body manufactured from durable alloy steel to exacting tolerances. Each body holds patented Dual Edge indexable inserts which feature two cutting edges per index, double that of any other competitor. ARM Tooling Systems can produce any cutting diameter from 3 inches and up.

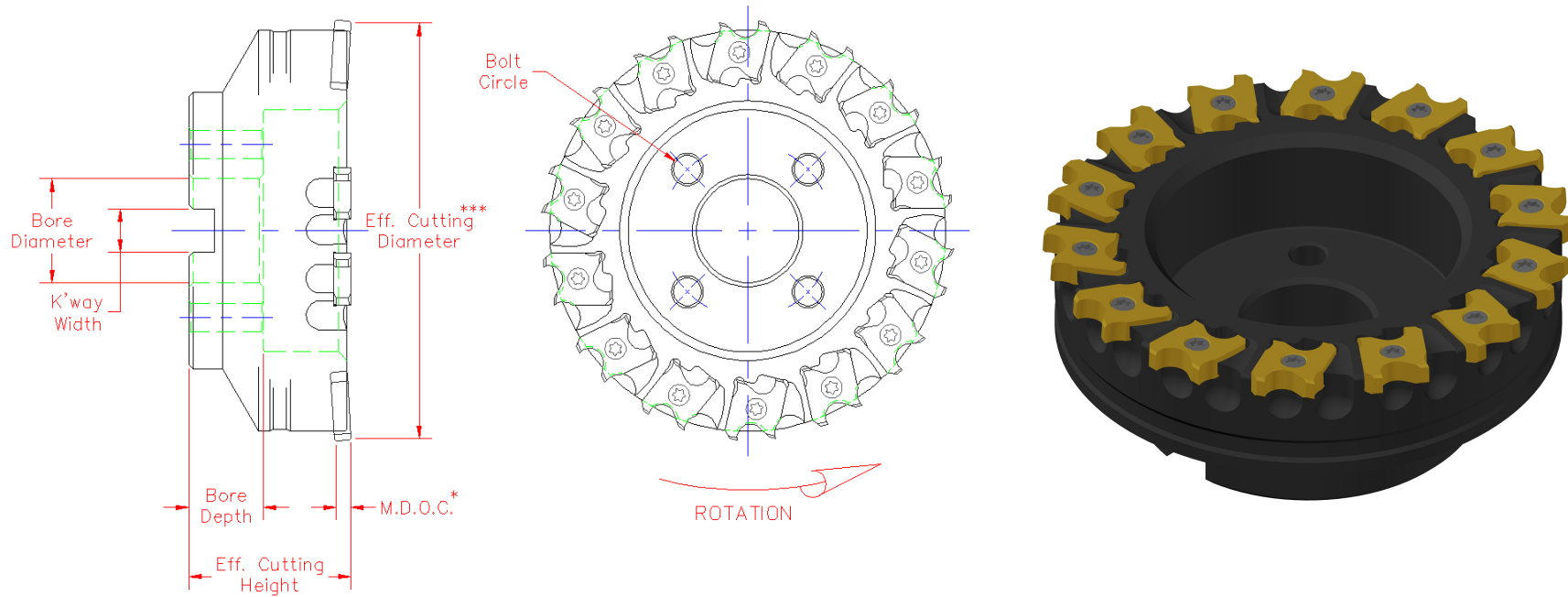
Our Dual Edge slotting cutters offer higher performance & increased productivity, with a 200% potential reduction in manufacturing costs versus conventional indexable slotting cutters in use today.

The Dual Edge insert pocket is designed so that the cutting edge locates one way - "the right way!". The fixed pocket design also eliminate time consuming tool room presetting further reducing setup costs. No setting fixture is required and repeatability is assured.

Only one slotting cutter body is required to machine virtually any material. Dual Edge can be set up for both negative or positive cutting rake. To customize for the material to be cut, merely change insert style or grade.

Standard Dual Edge Face Mills To Cut Aluminum

U.S. Pat. #5,209,611



Part Number	Eff. Cutting Diameter	Eff. Cutting Height	M.D.O.C.	Number of		Bore Diameter	Bore Depth	K'way Width	K'way Length	Bolt Circle	Rotation
				Inserts	Teeth						
AFM 4009-00760	4.00	2.38	.215	9	18	1.50	1.00	5/8	thru	--	Right Hand Rotation
AFM 5012-00761	5.00			12	24	1.50	1.10	5/8	thru	--	
AFM 6014-00762	6.00			14	28	1.50	1.12	5/8	thru	--	
AFM 8020-00763	8.00			20	40	2.50	1.26	1	thru	4	
AFM 1024-00764	10.00			24	48	2.50	1.26	1	7.24	4	
AFM 1230-00765	12.00			30	60	2.50	1.26	1	9.56	4 & 7	
AFM 4009-00766	4.00	2.38	.215	9	18	1.50	1.00	5/8	thru	--	**Left Hand Rotation
AFM 5012-00767	5.00			12	24	1.50	1.10	5/8	thru	--	
AFM 6014-00768	6.00			14	28	1.50	1.12	5/8	thru	--	
AFM 8020-00769	8.00			20	40	2.50	1.26	1	thru	4	
AFM 1024-00770	10.00			24	48	2.50	1.26	1	7.24	4	
AFM 1230-00771	12.00			30	60	2.50	1.26	1	9.56	4 & 7	

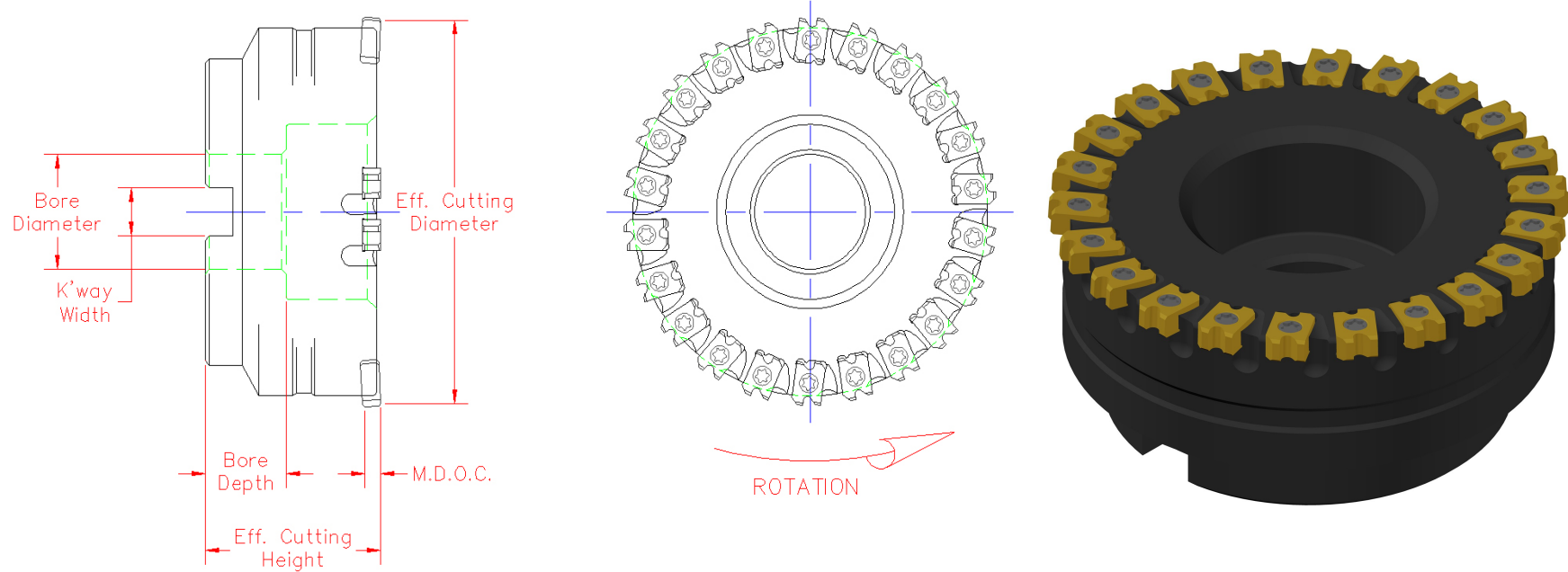
* M.D.O.C. based on a .250" thick insert with a .030" chamfer. (For cutting depths past .215", please note on the Request for Quotation form.)

** Right Hand Rotation shown, Left Hand Rotation opposite.

*** Larger diameter dual edge face mills are available upon request.

Standard Dual Edge High Density Face Mills

U.S. Pat. #5,209,611



Part Number	Eff. Cutting Diameter	Eff. Cutting Height	M.D.O.C.	Number of		Bore Diameter	Bore Depth	K'way Width	K'way Length	Bolt Circle	Rotation
				Inserts	Teeth						
AFM 2007-00772	2.00	1.75	.215	7	14	.75	.75	5/16	thru	--	Right Hand Rotation
AFM 3012-00773	3.00	2.38		12	24	1.00	1.00	3/8	thru	--	
AFM 4018-00774	4.00			18	36	1.50	1.00	5/8	thru	--	
AFM 5022-00775	5.00			22	44	1.50	1.10	5/8	thru	--	
AFM 2007-00776	2.00	1.75	.215	7	14	.75	.75	5/16	thru	--	**Left Hand Rotation
AFM 3012-00777	3.00	2.38		12	24	1.00	1.00	3/8	thru	--	
AFM 4018-00778	4.00			18	36	1.50	1.00	5/8	thru	--	
AFM 5022-00779	5.00			22	44	1.50	1.10	5/8	thru	--	

* M.D.O.C. based on a .250" thick insert with a .030" chamfer. (For cutting depths past .215", please note on the Request for Quotation form.)

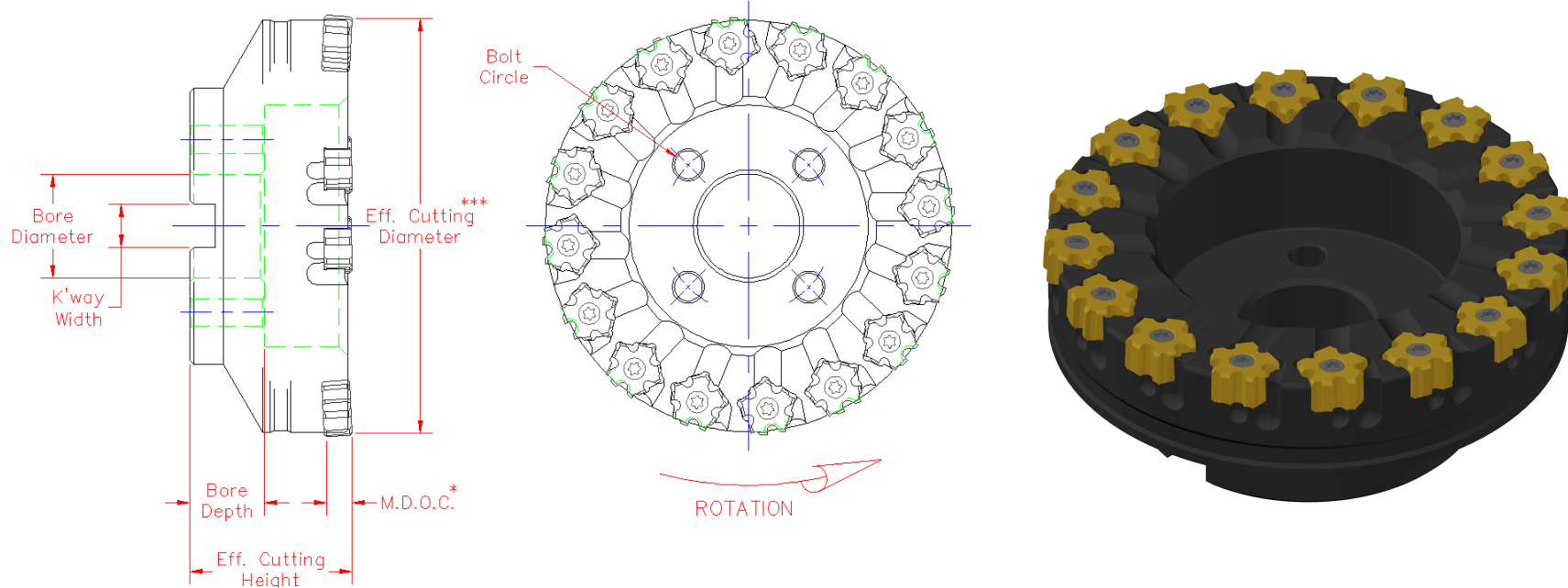
** Right Hand Rotation shown, Left Hand Rotation opposite.

*** Larger diameter dual edge face mills are available upon request.

Also available for finish applications, please note on Request for Quotation form.

Standard Dual Edge Face Mills w/ Pentagon Inserts

U.S. Pat. #5,209,611



Part Number	Eff. Cutting Diameter	Eff. Cutting Height	M.D.O.C.	Number of		Bore Diameter	Bore Depth	K'way Width	K'way Length	Bolt Circle	Rotation
				Inserts	Teeth						
AFM 4010-00780	4.00	2.38	.370	10	20	1.50	1.00	5/8	thru	--	Right Hand Rotation
AFM 5013-00781	5.00			13	26	1.50	1.10	5/8	thru	--	
AFM 6016-00782	6.00			16	32	1.50	1.12	5/8	thru	--	
AFM 8022-00783	8.00			22	44	2.50	1.26	1	thru	4	
AFM 1030-00784	10.00			30	60	2.50	1.26	1	7.24	4	
AFM 1236-00785	12.00			36	72	2.50	1.26	1	9.56	4 & 7	
AFM 4010-00786	4.00	2.38	.370	10	20	1.50	1.00	5/8	thru	--	**Left Hand Rotation
AFM 5013-00787	5.00			13	26	1.50	1.10	5/8	thru	--	
AFM 6016-00788	6.00			16	32	1.50	1.12	5/8	thru	--	
AFM 8022-00789	8.00			22	44	2.50	1.26	1	thru	4	
AFM 1030-00790	10.00			30	60	2.50	1.26	1	7.24	4	
AFM 1236-00791	12.00			36	72	2.50	1.26	1	9.56	4 & 7	

* M.D.O.C. based on a .403" thick insert with a .030" chamfer. (For cutting depths past .370", please note on the Request for Quotation form.)

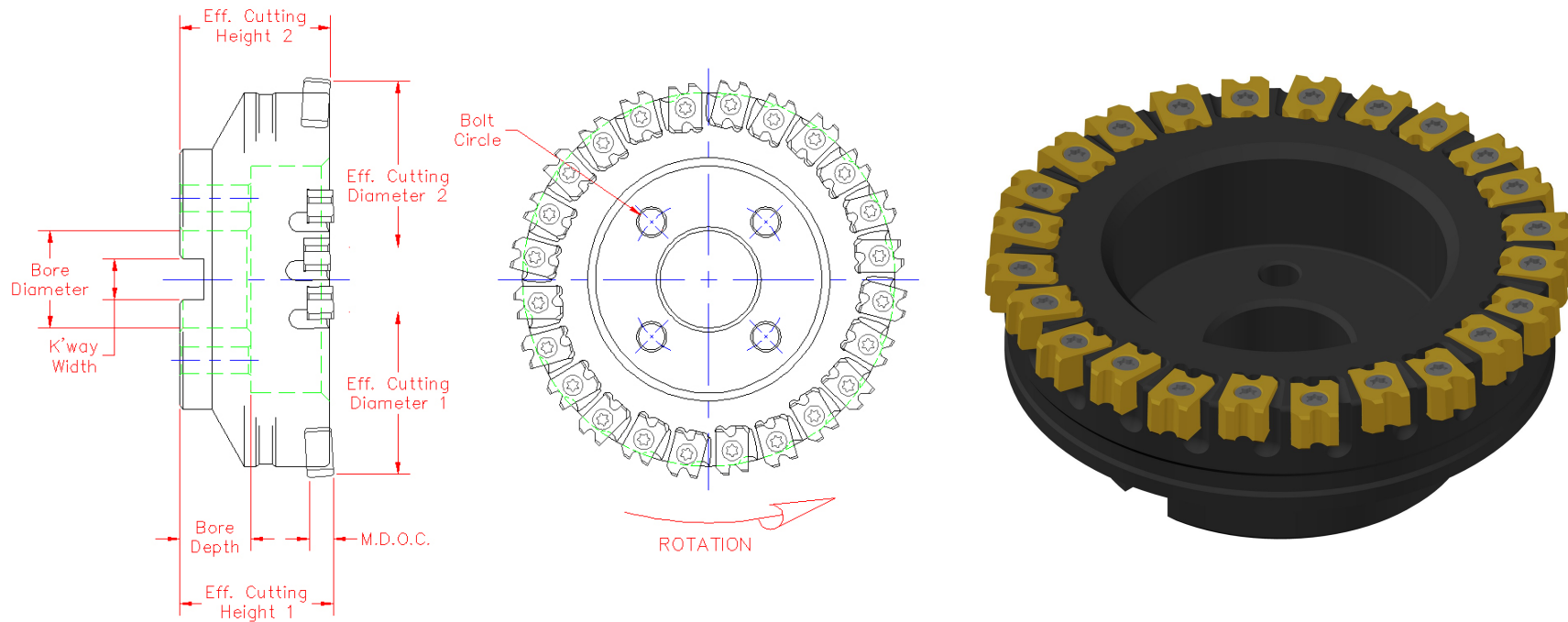
** Right Hand Rotation shown, Left Hand Rotation opposite.

*** Larger diameter dual edge face mills are available upon request.

Also available for finish applications, please note on Request for Quotation form.

Dual Edge Step Mills

U.S. Pat. #5,209,611

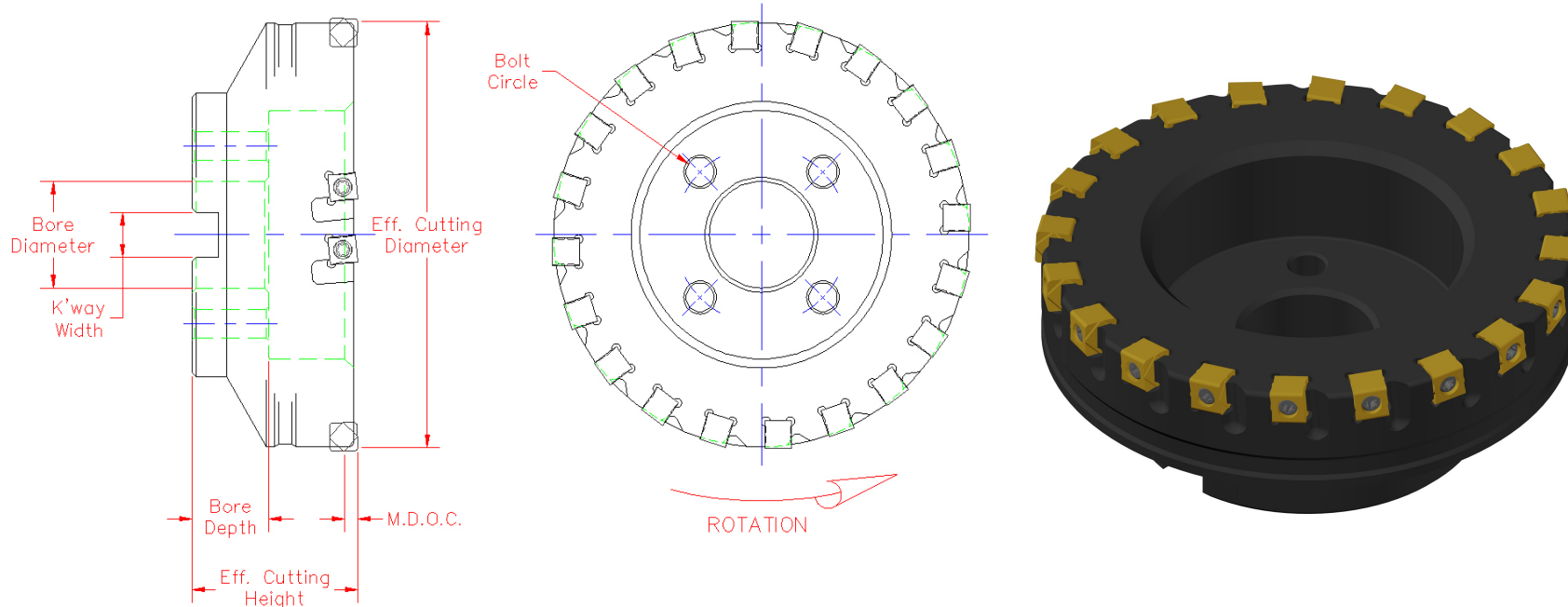


ARM Tooling Systems Dual Edge Step Mills are engineered for smooth cutting action and high machining efficiency on applications where lack of rigidity causes deflection or vibration.

Radial and axial stepping reduce the effective number of inserts and the depth of engagement of each insert in the workpiece. Step mills take short, thick chips rather than long chips. This design reduces cutting forces while maintaining the advance per insert, depth of cut, and width of cut.

These mills have a lesser number of effective inserts, that is, it takes more than one insert to generate a full chip. But, since the chip is not as wide, the chip load can be increased to compensate. This cutter can generally be run without reducing the feed rate.

Ex-Celler-8 Face Mills



Part Number	Eff. Cutting Diameter	Eff. Cutting Height	M.D.O.C.	Number of Inserts	Bore Diameter	Bore Depth	K'way Width	K'way Length	Bolt Circle	Rotation
AFM 2006-01294	2.00	1.75	.187	6	.75	.75	5/16	thru	--	Right Hand Rotation
AFM 3010-01295	3.00	2.38		10	1.00	1.00	3/8	thru	--	
AFM 4014-01296	4.00			14	1.50	1.00	5/8	thru	--	
AFM 5018-01297	5.00			18	1.50	1.10	5/8	thru	--	
AFM 6020-01298	6.00			20	1.50	1.12	5/8	thru	--	
AFM 8028-01299	8.00			28	2.50	1.26	1	thru	4	
AFM 1034-01300	10.00			34	2.50	1.26	1	7.25	4	
AFM 1242-01301	12.00			42	2.50	1.26	1	9.50	4 & 7	
AFM 2006-01302	2.00	1.75	.187	6	.75	.75	5/16	thru	--	**Left Hand Rotation
AFM 3010-01303	3.00	2.38		10	1.00	1.00	3/8	thru	--	
AFM 4014-01304	4.00			14	1.50	1.00	5/8	thru	--	
AFM 5018-01305	5.00			18	1.50	1.10	5/8	thru	--	
AFM 6020-01306	6.00			20	1.50	1.12	5/8	thru	--	
AFM 8028-01307	8.00			28	2.50	1.26	1	thru	4	
AFM 1034-01308	10.00			34	2.50	1.26	1	7.25	4	
AFM 1242-01309	12.00			42	2.50	1.26	1	9.50	4 & 7	

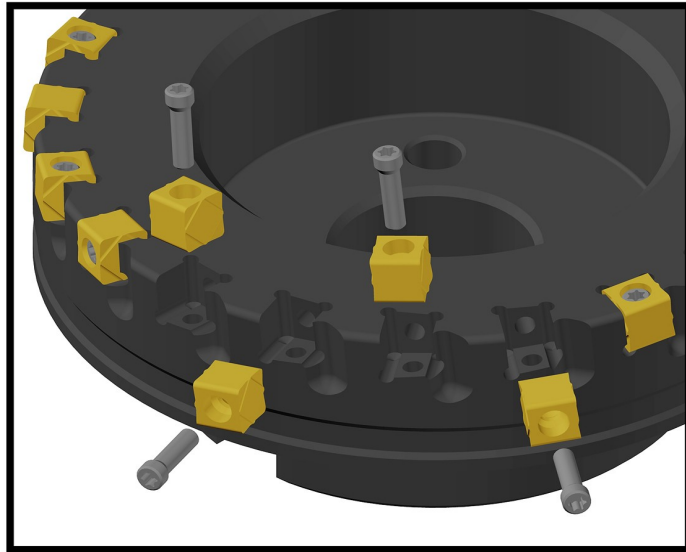
* M.D.O.C. based on a 10mm insert with a .039" radius. (For cutting depths past .187", please note on the Request for Quotation form.)

** Right Hand Rotation shown, Left Hand Rotation opposite.

*** Larger diameter dual edge face mills are available upon request.

Also available for finish applications, please note on Request for Quotation form.

Ex-Celler-8 Description

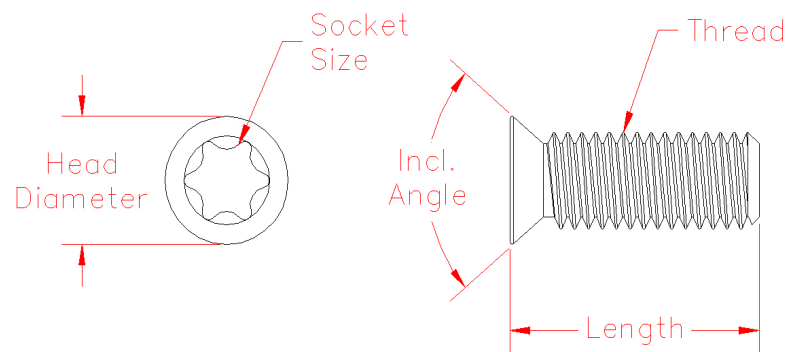


Insert and Pocket Detail

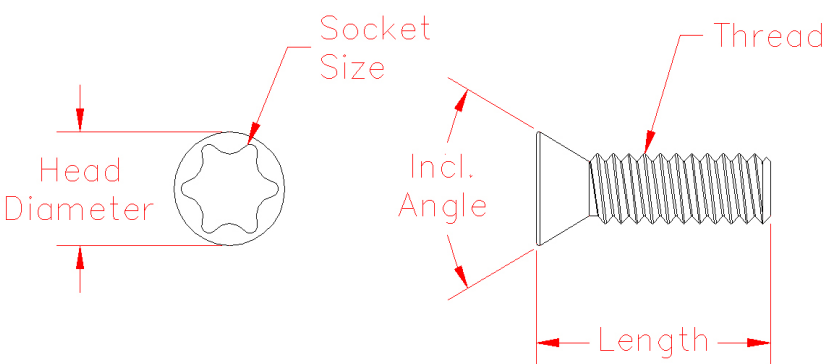
Key Features of Ex-Celler-8

- Simple and easy clamping with screw.
- 2 Differed direction of insert clamping.
- 8 indexes per insert.
- Fixed pocket design eliminates presetting, reducing set up costs.
- Able to machine at higher SFM and feed rates.
- Helps reduce burrs and tool pressure due to the excellent cutting performance of the positive chip breaker.
- Wiper inserts can be added to cutters for a smoother finish.

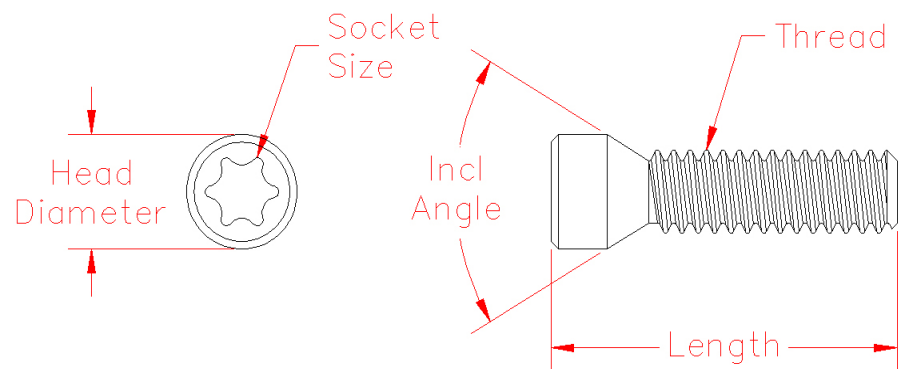
Insert Screws



Part No.	Head Diameter	Length	Thread	Included Angle	Socket Size	Torque Spec.
ASR 00190	.270	.360	#10-32	82 Deg.	Torx-15	45 in/lbs
ASR 00191		.460				
ASR 00192		.562				
ASR 00193		.625				
ASR 00194		.750				



Part No.	Head Diameter	Length	Thread	Included Angle	Socket Size	Torque Spec.
ASR 01202	.220	.345	#6-32	60 Deg.	Torx-15	35 in/lbs
ASR 01203		.465				
ASR 01204		.565				



Part No.	Head Diameter	Length	Thread	Included Angle	Socket Size	Torque Spec.
AEFT-045C	.218	.670	M4 x .7	62 Deg.	Torx-15	45 in/lbs
AEET-500	0.26	.790	M5 x .8	42 Deg.	Torx-20	45 in/lbs

Dual Edge Insert Grades for Steel

Steel	P	P05	P10	P15	P20	P25	P30	P35	P40	P45	P50
		C8	C7 (Light Finishing)			C6 (Semi-Finishing)		C5 (General)			
		BK19									
BK65											

Grade	ISO	Machining Condition/Application
BK19	P10 ~ P15	- Excellent combination of toughness and hardness. - Micro-grained tungsten carbide and special processing enable this grade to exhibit high edge strength and wear properties. - Excellent choice for low speeds and feeds when machining steel, high temperature alloys, nodular iron and cast iron.
BK65	P30	General purpose, turning, boring and grooving on steel and alloyed cast iron at moderate cutting speeds.

Dual Edge Insert Grades for Cast Iron

Cast Iron	K	K05	K10	K15	K20	K25	K30	K35	K40	K45	K50
		C4	C3 (Semi-Finishing)			C2 (General)		C1 (Roughing)			
		BK26									
		BK20									
BK19											

Grade	ISO	Machining Condition/Application
BK26	K15 ~ K30	Excellent combination of impact and wear properties for moderate to heavy milling at high speeds and feeds on low alloyed cast irons.
BK20	K20	- Roughing and general purpose machining of cast iron high temperature alloys and non-ferrous materials. - Also utilized in wear applications.
BK19	K20 ~ K30	- Excellent combination of toughness and hardness. - Micro-grained tungsten carbide and special processing enable this grade to exhibit high edge strength and wear properties. - Excellent choice for low speeds and feeds when machining steel, high temperature alloys, nodular iron and cast iron.

Ex-Celler-8 Insert Grades for Steel

Steel	P	P05	P10	P15	P20	P25	P30	P35	P40	P45	P50	
		C8	C7 (Light Finishing)			C6 (Semi-Finishing)		C5 (General)				
							BK21					
					BK60							

Grade	ISO	Coating	Machining Condition/Application
BK21	P20	Multi-Layered ALTiN	Is suitable for milling nodular and also milling of steel at high speeds.
BK60	P20	Tin/TiALN	High speed steel milling grade have superior wear resistance.

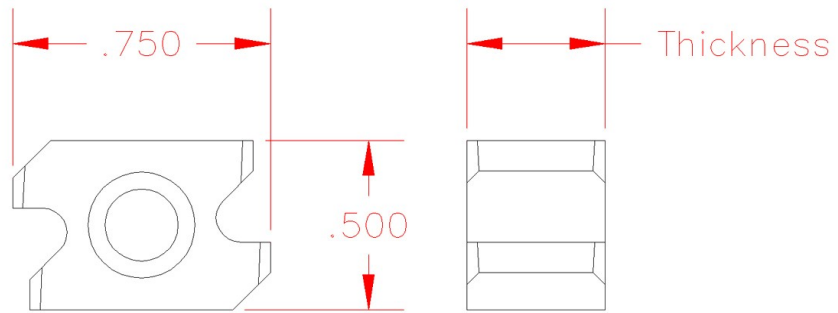
Ex-Celler-8 Insert Grades for Cast Iron

Cast Iron	K	K05	K10	K15	K20	K25	K30	K35	K40	K45	K50
		C4	C3 (Semi-Finishing)			C2 (General)		C1 (Roughing)			
		BK26									

Grade	ISO	Coating	Machining Condition/Application
BK26	K40	Multi-Layered ALTiN	- Excellent wear resistance and tough substrate. - Is suitable for milling nodular and also milling of steel at high speeds.

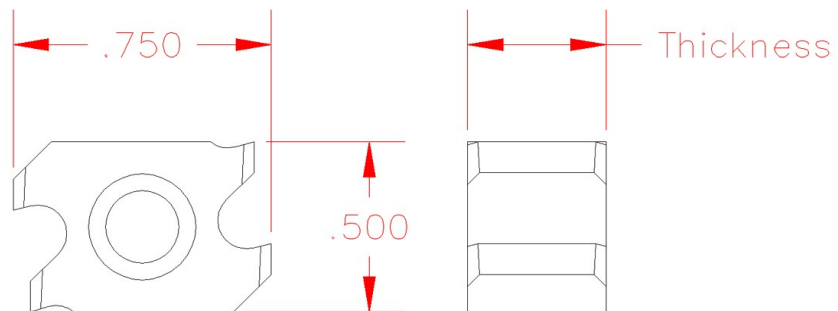
ADIN

Dual Edge
Negative Top Rake



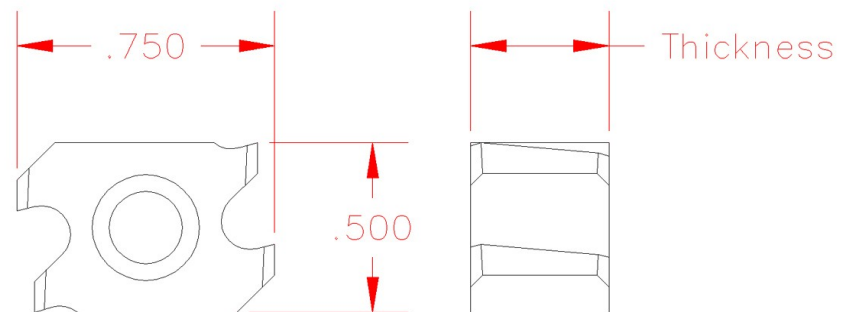
ADIP

Dual Edge
Positive Top Rake



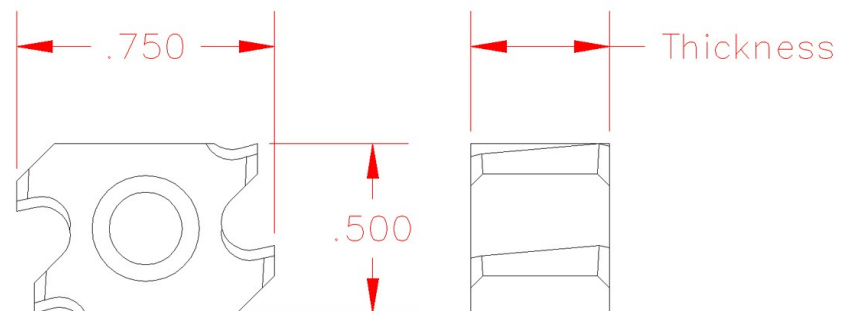
ADIS

Dual Edge
Positive Top Rake
5Deg Positive Axial Rake
Right Hand

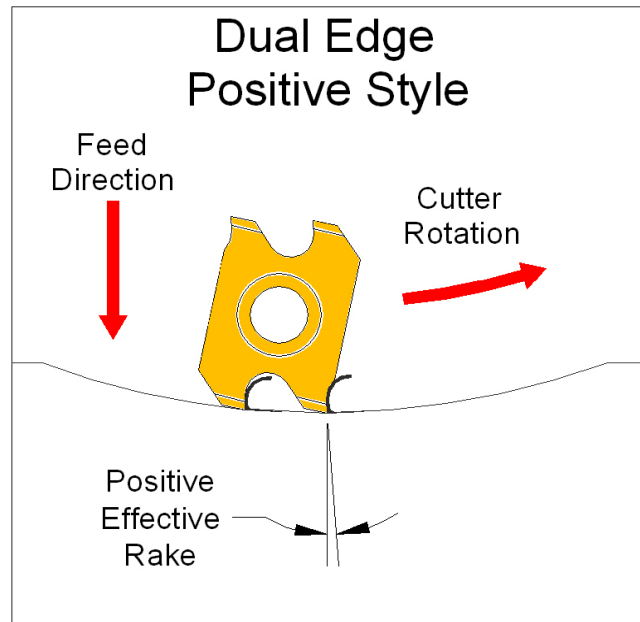
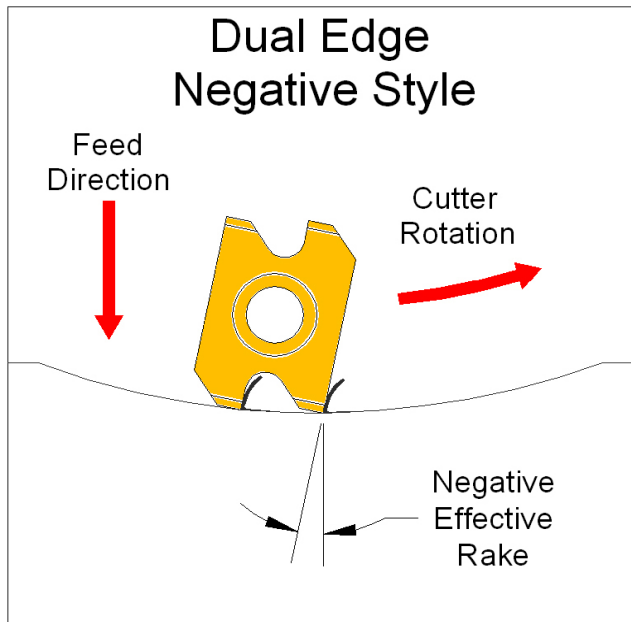


ADIS

Dual Edge
Positive Top Rake
5Deg Positive Axial Rake
Left Hand

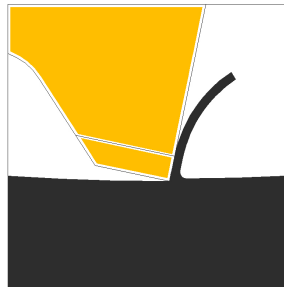


Dual Edge Insert Rake Geometry



Negative Rake Insert Styles

ARM Tooling Dual Edge inserts are available with a neutral top rake geometry. When locked in the pocket, the cutting face of the insert produces an effective negative rake cutting angle pocket orientation to the centerline of the milling cutter body. Depending upon the material specified and the rotational diameter of the cutter body, the effective negative rake angle will be from 5 degrees to 10 degrees.

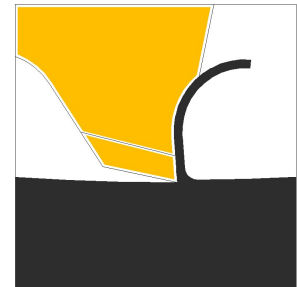


ARM Tooling recommends the use of negative rake Dual Edge inserts for heavy roughing of forgings, interrupted cuts where irregular shapes and slots are encountered.

The material to be milled will dictate the use of negative rake geometry. Cast Iron, Medium to Hard Alloy Steels as well as Tool Steels are best machined with negative rake geometry. Negative rake cutting edges are stronger and allow for heavier feed rates which generally produces shorter cycle times.

Positive Rake Insert Styles

ARM Tooling Dual Edge inserts are available with a dual positive top rake geometry. Both cutting edges have positive ground top rakes. The first cutting edge produces a higher positive cutting action while the second trailing edge has a less positive rake face. This dual positive format reduces chip loading between the part and the cutter body interface and can produce high quality finishes similar to grinding. Depending upon the material specified and the rotational diameter of the cutter body, the effective positive rake angle will be from 5 degrees to 10 degrees.



ARM Tooling recommends the use of positive rake Dual Edge inserts for producing extremely fine finishes when machining softer materials using medium to light feed rates.

Materials to be machined with the positive style Dual Edge insert; most nonferrous metals, low to high carbon steels under 300 BHN as well as all stainless steels and nickel based alloys.

Milling Formulas

Symbol Chart

D = Depth of Cut

d = Diameter of Cutter

T = Number of Teeth in Cutter

W = Width of Cut (in inches)

K = Constant (cubic inches per minute per HPc)

R.P.M. = Revolutions per Minute

S.F.M. = Surface Foot per Minute

F.P.R = Feed per Revolution (in inches)

I.P.M. = Feed (travel in inches per minute)

F.P.T. = Feed per Tooth (in inches)

HPc = Horsepower at the Cutter

How to Calculate R.P.M.

$$\text{R.P.M.} = (12 \times \text{S.F.M.}) / (3.1416 \times d)$$

or

$$\text{R.P.M.} = (3.82 \times \text{S.F.M.}) / d$$

How to Calculate S.F.M.

$$\text{S.F.M.} = (3.1416 \times d \times \text{R.P.M.}) / 12$$

or

$$\text{S.F.M.} = .262 \times d \times \text{R.P.M.}$$

How to Calculate F.P.R.

$$\text{F.P.R.} = \text{I.P.M.} / \text{R.P.M.}$$

How to Calculate I.P.M.

$$\text{I.P.M.} = \text{F.P.T.} \times T \times \text{R.P.M.}$$

How to Calculate F.P.T.

$$\text{F.P.T.} = \text{I.P.M.} / (T \times \text{R.P.M.})$$

How to Calculate HPc

$$\text{HPc} = (D \times W \times \text{I.P.M.}) / K$$

How to Calculate Number of Teeth

$$T = \text{I.P.M.} / (\text{F.P.T.} \times \text{R.P.M.})$$

How to Calculate Maximum Number of Teeth

$$T = (K \times \text{HPc}) / (D \times \text{F.P.T.} \times W \times \text{R.P.M.})$$

Company Name:			Date Faxed:
Contact:			Phone: ()
Address:			Extension Number:
City:	State:	Zip:	Fax:

R.P.M. Range: _____
 I.P.M. / Feed Range: _____
 S.F.M.: _____
 D.O.C.: _____
 Tilt (Incline) Deg.: _____

☐ Manual Clamping ☐ Table Mounted Parts
☐ Hydraulic Clamping ☐ Tombstone Mounted Parts

Cutting Diameter:
No. of Cutters:
No. of Cuts:
No. of Teeth / Cutter:
Effective Cutting Width:
Bore Diameter:
Hub Diameter:
Hub Width:
Keyway Height:
Keyway Width: