



# Triple-T

Cutting Tools, Inc.



135 EDGEWOOD AVE  
WEST BERLIN, NJ 08091  
PHONE: (800) 570-6929  
FAX: (856) 768-3773

Cutting Through the Competition

Triple-T Cutting Tools, Inc. was founded in 1995.

Our main goal is to accommodate our customers with superior quality cutting tools at a competitive price. Our services include the sharpening of all types of cutting tools and the manufacturing of blueprint specials. Supplying reliable cutting tools used by the ophthalmic, medical, and aerospace industries is a challenge Triple-T Cutting Tools, Inc conquers daily.

We also manufacture and stock a full line of solid carbide end mills many of which are application specific. All manufacturing and sharpening are processed in our modern ten thousand square foot facility on the latest state of the art 5 axis CNC grinders. Here at Triple-T Cutting Tools, Inc., we continue to educate our staff and bring in new technology to meet our customers requirements.

This assures the greatest quality, consistency, and performance of your cutting tools. Fast deliveries and superior quality are the pride of Triple-T Cutting Tools, Inc. We offer over 55 years of tool and cutter grinding experience to handle any of your cutting tool needs.

Sincerely,

Mike & Steve Thomas



Owners of Triple-T Cutting Tools Inc.

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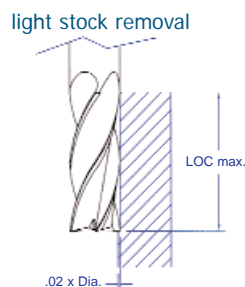
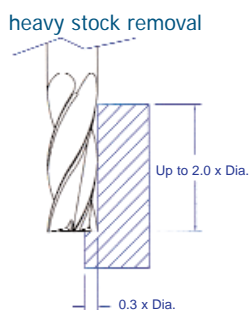
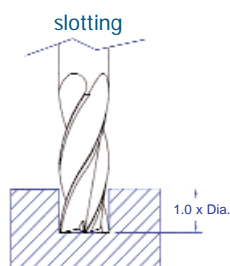
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## Standard End Mills

AC	4 Flute Square End, 30 Degree Helix -RHS/RHC, General Purpose, Made from Premium Micro Grain Carbide				
	Item	Diameter	Shank	LOC	OAL
	AC2	1/16	1/8	3/16	1-1/2
	AC2-5	5/64	1/8	1/4	1-1/2
	AC3	3/32	1/8	1/4	1-1/2
	AC3-5	7/64	1/8	1/4	1-1/2
	AC4	1/8	1/8	1/2	1-1/2
	AC4-5	9/64	3/16	9/16	2
	AC5	5/32	3/16	9/16	2
	AC5-5	11/64	3/16	9/16	2
	AC6	3/16	3/16	5/8	2
	AC6-5	13/64	1/4	5/8	2-1/2
	AC7	7/32	1/4	5/8	2-1/2
	AC7-5	15/64	1/4	3/4	2-1/2
	AC8	1/4	1/4	3/4	2-1/2
	AC8-5	17/64	5/16	3/4	2-1/2
	AC9	9/32	5/16	3/4	2-1/2
	AC9-5	19/64	5/16	7/8	2-1/2
	AC10	5/16	5/16	7/8	2-1/2
	AC10-5	21/64	3/8	7/8	2-1/2
	AC11	11/32	3/8	7/8	2-1/2
	AC11-5	23/64	3/8	7/8	2-1/2
	AC12	3/8	3/8	7/8	2-1/2
	AC12-5	25/64	7/16	7/8	2-3/4
	AC13	13/32	7/16	7/8	2-3/4
	AC13-5	27/64	7/16	7/8	2-3/4
	AC14	7/16	7/16	1	2-3/4
	AC14-5	29/64	1/2	1	3
	AC15	15/32	1/2	1	3
	AC15-5	31/64	1/2	1	3
	AC16	1/2	1/2	1	3
	AC18	9/16	9/16	1-1/4	3-1/2
	AC20	5/8	5/8	1-1/4	3-1/2
	AC24	3/4	3/4	1-1/2	4
AC32	1.0	1.0	1-1/2	4	




Reference Chart "D" on page 14


3

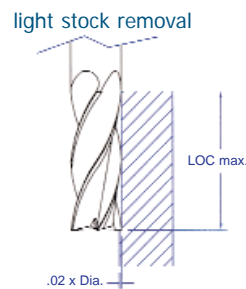
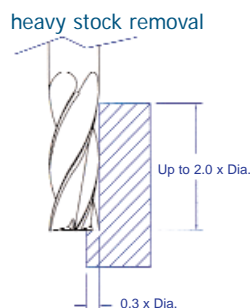
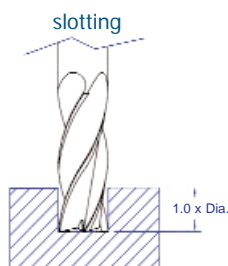
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## Standard End Mills

<b>ACS</b>		<b>4 Flute Square End, Stub Length, 30 Degree Helix -RHS/RHC, General Purpose, Made from Premium Micro Grain Carbide</b>				
	Item	Diameter	Shank	LOC	OAL	
	ACS2	1/16	1/8	1/8	1-1/2	
	ACS3	3/32	1/8	3/16	1-1/2	
	ACS4	1/8	1/8	1/4	1-1/2	
	ACS5	5/32	3/16	5/16	1-1/2	
	ACS6	3/16	3/16	5/16	1-1/2	
	ACS7	7/32	1/4	1/2	2	
	ACS8	1/4	1/4	1/2	2	
	ACS9	9/32	5/16	1/2	2	
	ACS10	5/16	5/16	1/2	2	
	ACS12	3/8	3/8	5/8	2	
	ACS14	7/16	7/16	5/8	2-1/2	
	ACS16	1/2	1/2	5/8	2-1/2	
	ACS18	9/16	9/16	3/4	3	
	ACS20	5/8	5/8	3/4	3	
	ACS24	3/4	3/4	1	3	
	ACS32	1.0	1.0	1.0	3.0	

<b>ACL</b>		<b>4 Flute Square End, Stub Length, 30 Degree Helix -RHS/RHC, General Purpose, Made from Premium Micro Grain Carbide</b>				
	Item	Diameter	Shank	LOC	OAL	
	ACL3	3/32	1/8	9/16	3	
	ACL4	1/8	1/8	3/4	3	
	ACL5	5/32	3/16	3/4	3	
	ACL6	3/16	3/16	3/4	3	
	ACL8	1/4	1/4	1-1/8	3	
	ACL10	5/16	5/16	1-1/8	3	
	ACL12	3/8	3/8	1-1/8	3	
	ACL14	7/16	7/16	2	4	
	ACL16	1/2	1/2	2	4	
	ACL20	5/8	5/8	2-1/4	5	
	ACL24	3/4	3/4	2-1/4	5	
	ACL32	1.0	1.0	2-1/4	5	





Reference Chart "D" on page 14

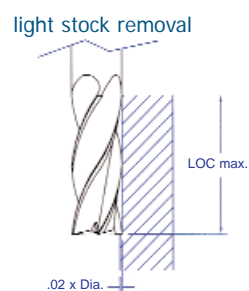
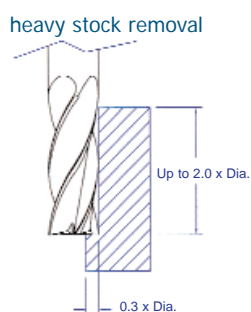
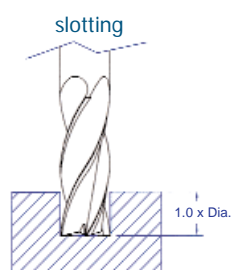
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## Standard End Mills


<b>DAC</b> Double End, 4 Flute Square End, 30 Degree Helix -RHS/RHC, General Purpose, Made from Premium Micro Grain Carbide					
	Item	Diameter	Shank	LOC	OAL
	DAC4	1/8	1/8	3/8	3
	DAC5	5/32	3/16	7/16	3
	DAC6	3/16	3/16	1/2	3
	DAC8	1/4	1/4	5/8	3
	DAC9	9/32	5/16	11/16	3
	DAC10	5/16	5/16	3/4	3
	DAC12	3/8	3/8	3/4	3-1/2
	DAC16	1/2	1/2	1	4

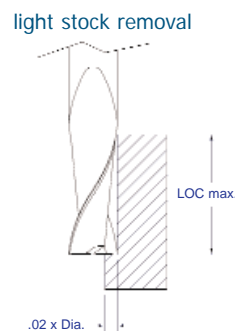
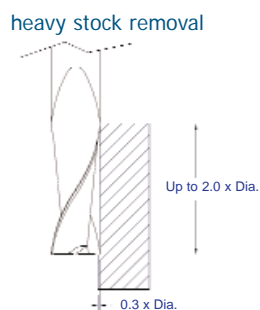
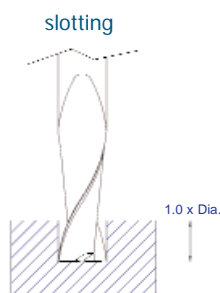
<b>AR</b> 4 Flute Ball End, 30 Degree Helix -RHS/RHC, General Purpose, Made from Premium Micro Grain Carbide					
	Item	Diameter	Shank	LOC	OAL
	AR4	1/8	1/8	1/2	1-1/2
	AR6	3/16	3/16	5/8	2
	AR8	1/4	1/4	3/4	2-1/2
	AR10	5/16	5/16	13/16	2-1/2
	AR12	3/8	3/8	7/8	2-1/2
	AR14	7/16	7/16	1	2-3/4
	AR16	1/2	1/2	1	3
	AR20	5/8	5/8	1-1/4	3-1/2
	AR24	3/4	3/4	1-1/2	4
	AR32	1.0	1.0	1-1/2	4



Reference Chart "D" on page 14

## Standard End Mills

BC	2 Flute Square End, 30 Degree Helix -RHS/RHC, General Purpose, Made from Premium Micro Grain Carbide				
	Item	Diameter	Shank	LOC	OAL
	BC2	1/16	1/8	3/16	1-1/2
	BC2-5	5/64	1/8	1/4	1-1/2
	BC3	3/32	1/8	1/4	1-1/2
	BC3-5	7/64	1/8	1/4	1-1/2
	BC4	1/8	1/8	1/2	1-1/2
	BC4-5	9/64	3/16	9/16	2
	BC5	5/32	3/16	9/16	2
	BC5-5	11/64	3/16	9/16	2
	BC6	3/16	3/16	5/8	2
	BC6-5	13/64	1/4	5/8	2-1/2
	BC7	7/32	1/4	5/8	2-1/2
	BC7-5	15/64	1/4	3/4	2-1/2
	BC8	1/4	1/4	3/4	2-1/2
	BC8-5	17/64	5/16	3/4	2-1/2
	BC9	9/32	5/16	3/4	2-1/2
	BC9-5	19/64	5/16	7/8	2-1/2
	BC10	5/16	5/16	7/8	2-1/2
	BC10-5	21/64	3/8	7/8	2-1/2
	BC11	11/32	3/8	7/8	2-1/2
	BC11-5	23/64	3/8	7/8	2-1/2
	BC12	3/8	3/8	7/8	2-1/2
	BC12-5	25/64	7/16	7/8	2-3/4
	BC13	13/32	7/16	7/8	2-3/4
	BC13-5	27/64	7/16	7/8	2-3/4
	BC14	7/16	7/16	1	2-3/4
	BC14-5	29/64	1/2	1	3
	BC15	15/32	1/2	1	3
	BC15-5	31/64	1/2	1	3
	BC16	1/2	1/2	1	3
	BC18	9/16	9/16	1-1/4	3-1/2
	BC20	5/8	5/8	1-1/4	3-1/2
	BC24	3/4	3/4	1-1/2	4
	BC32	1.0	1.0	1-1/2	4



Reference Chart "D" on page 14

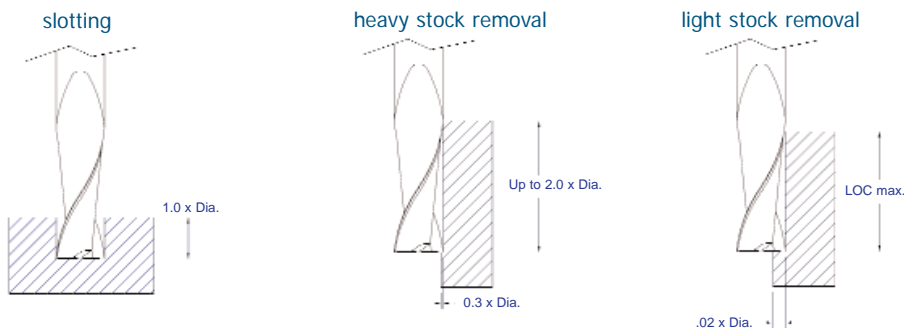
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## Standard End Mills


<b>BCS</b> 2 flute square end, Stub length, 30 degree helix -RHS/RHC, General purpose Made from premium micro grain carbide					
Item	Diameter	Shank	LOC	OAL	
BCS2	1/16	1/8	1/8	1-1/2	
BCS3	3/32	1/8	3/16	1-1/2	
BCS4	1/8	1/8	1/4	1-1/2	
BCS5	5/32	3/16	5/16	1-1/2	
BCS6	3/16	3/16	5/16	1-1/2	
BCS7	7/32	1/4	1/2	2	
BCS8	1/4	1/4	1/2	2	
BCS9	9/32	5/16	1/2	2	
BCS10	5/16	5/16	1/2	2	
BCS12	3/8	3/8	5/8	2	
BCS14	7/16	7/16	5/8	2-1/2	
BCS16	1/2	1/2	5/8	2-1/2	
BCS18	9/16	9/16	3/4	3	
BCS20	5/8	5/8	3/4	3	
BCS24	3/4	3/4	1	3	
BCS32	1.0	1.0	1.0	3.0	


<b>BCL</b> 2 flute square end, Long length, 30 degree helix -RHS/RHC, General purpose Made from premium micro grain carbide					
Item	Diameter	Shank	LOC	OAL	
BCL3	3/32	1/8	9/16	3	
BCL4	1/8	1/8	3/4	3	
BCL5	5/32	3/16	3/4	3	
BCL6	3/16	3/16	3/4	3	
BCL8	1/4	1/4	1-1/8	3	
BCL10	5/16	5/16	1-1/8	3	
BCL12	3/8	3/8	1-1/8	3	
BCL14	7/16	7/16	2	4	
BCL16	1/2	1/2	2	4	
BCL20	5/8	5/8	2-1/4	5	
BCL24	3/4	3/4	2-1/4	5	
BCL32	1.0	1.0	2-1/4	5	

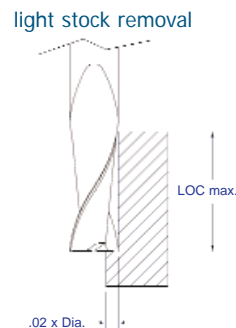
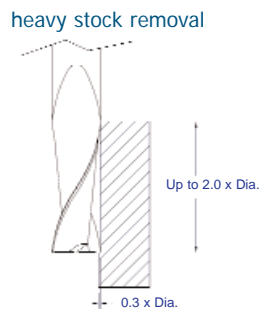
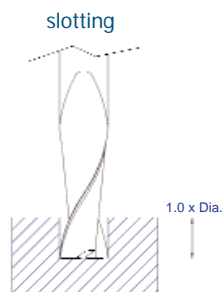


Reference Chart "D" on page 14

## Standard End Mills

<b>DBC</b> Double end, 2 flute square end, 30 degree helix -RHS/RHC, General purpose Made from premium micro grain carbide					
	Item	Diameter	Shank	LOC	OAL
	DBC4	1/8	1/8	3/8	3
	DBC5	5/32	3/16	7/16	3
	DBC6	3/16	3/16	1/2	3
	DBC8	1/4	1/4	5/8	3
	DBC9	9/32	5/16	11/16	3
	DBC10	5/16	5/16	3/4	3
	DBC12	3/8	3/8	3/4	3-1/2
	DBC16	1/2	1/2	1	4

<b>BR</b> 2 flute ball end, 30 degree helix -RHS/RHC, General purpose Made from premium micro grain carbide					
	Item	Diameter	Shank	LOC	OAL
	BR4	1/8	1/8	1/2	1-1/2
	BR6	3/16	3/16	5/8	2
	BR8	1/4	1/4	3/4	2-1/2
	BR10	5/16	5/16	13/16	2-1/2
	BR12	3/8	3/8	7/8	2-1/2
	BR14	7/16	7/16	1	2-3/4
	BR16	1/2	1/2	1	3
	BR20	5/8	5/8	1-1/4	3-1/2
	BR24	3/4	3/4	1-1/2	4
	BR32	1.0	1.0	1-1/2	4



Reference Chart "D" on page 14

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## Special application specific end mills

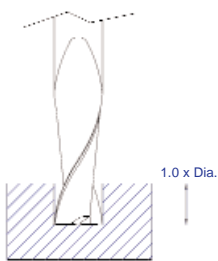
### 2H45AL

This end mill is used for cutting aluminum. Designed as a rougher finisher with high rake and clearance angles for aggressive stock removal with exceptional finishes. Geometrically superior eccentric relief and a cylindrical land further enhance the performance of these tools. These end mills are manufactured with extra fine grain carbide with exceptionally high transverse rupture strength.

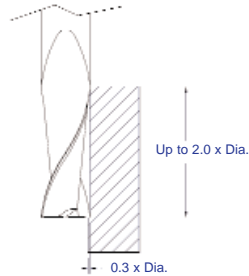


Item	Diameter	Shank	LOC	OAL
2H45R-01250AL	1/8	1/8	3/8	1-1/2
2H45R-01562AL	5/32	3/16	9/16	2
2H45R-01870AL	3/16	3/16	9/16	2
2H45R-02500AL	1/4	1/4	3/4	2-1/2
2H45R-03125AL	5/16	5/16	13/16	2-1/2
2H45R-03750AL	3/8	3/8	1	2-1/2
2H45R-05000AL	1/2	1/2	1-1/4	3
2H45R-06250AL	5/8	5/8	1-5/8	3-1/2
2H45R-07500AL	3/4	3/4	1-5/8	4
2H45R-10000AL	1.0	1.0	2.0	5

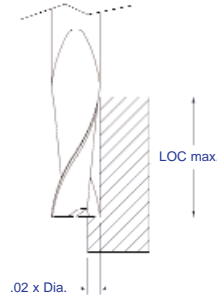
slotting



heavy stock removal



light stock removal



Reference Chart "A" on page 13

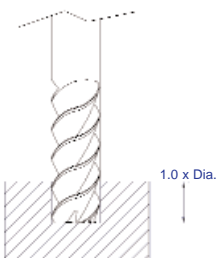
### 3H35AL

This end mill is used for finish cuts on aluminum and other non-ferrous materials. Fine finishes on the rake face and cylindrical OD generate these superior part finish. These end mills are manufactured with extra fine grain carbide with exceptionally high transverse rupture strength.

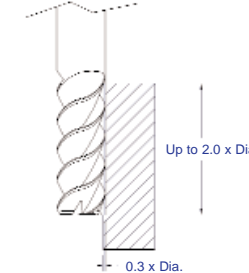


Item	Diameter	Shank	LOC	OAL
3H35R-01250AL	1/8	1/8	3/8	1-1/2
3H35R-01870AL	3/16	3/16	9/16	2
3H35R-02500AL	1/4	1/4	3/8	2-1/2
3H35R-03125AL	5/16	5/16	13/16	2-1/2
3H35R-03750AL	3/8	3/8	1	2-1/2
3H35R-05000AL	1/2	1/2	1-1/4	3
3H35R-06250AL	5/8	5/8	1-5/8	3-1/2
3H35R-07500AL	3/4	3/4	1-5/8	4
3H35R-10000AL	1.0	1.0	2.0	5

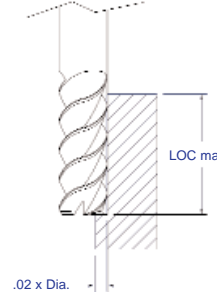
slotting



heavy stock removal



light stock removal



Reference Chart "A" on page 13

## Special application specific end mills

### 5H45SS

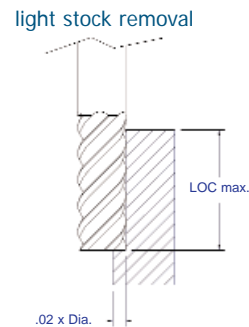
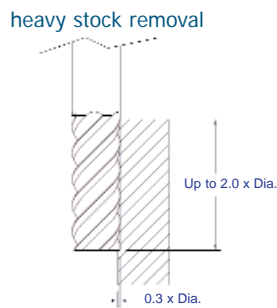
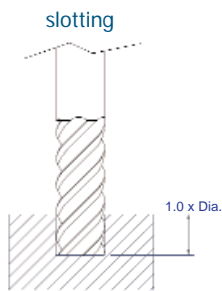
This end mill is for materials such as stainless steel, 4140, titanium, inconels and others. Designed with an increased core cross section and medium helix allows for high production rates and superior finishes. These end mills are manufactured with extra fine grain carbide with exceptionally high transverse rupture strength.



REGULAR LENGTH					
Item	Diameter	Shank	LOC	OAL	
5H45R-01250SSTC	1/8	1/8	1/2	1-1/2	
5H45R-01562SSTC	5/32	3/16	9/16	2	
5H45R-01875SSTC	3/16	3/16	9/16	2	
5H45R-02500SSTC	1/4	1/4	3/4	2-1/2	
5H45R-03125SSTC	5/16	5/16	13/16	2-1/2	
5H45R-03750SSTC	3/8	3/8	1	2-1/2	
5H45R-05000SSTC	1/2	1/2	1-1/4	3	
5H45R-06250SSTC	5/8	5/8	1-5/8	3-1/2	
5H45R-07500SSTC	3/4	3/4	1-5/8	4	
5H45R-10000SSTC	1.0	1.0	2	4	

STUB LENGTH					
Item	Diameter	Shank	LOC	OAL	
5H45S-01250SSTC	1/8	1/8	1/4	1-1/2	
5H45S-01562SSTC	5/32	3/16	9/16	2	
5H45S-01875SSTC	3/16	3/16	5/16	2	
5H45S-02500SSTC	1/4	1/4	3/8	2	
5H45S-03125SSTC	5/16	5/16	7/16	2	
5H45S-03750SSTC	3/8	3/8	1/2	2	
5H45S-05000SSTC	1/2	1/2	5/8	2-1/2	
5H45S-06250SSTC	5/8	5/8	3/4	3	
5H45S-07500SSTC	3/4	3/4	1	3	
5H45S-10000SSTC	1.0	1.0	1-1/4	3	



Reference Chart "C" on page 13

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## Special application specific end mills

### 3H35SS

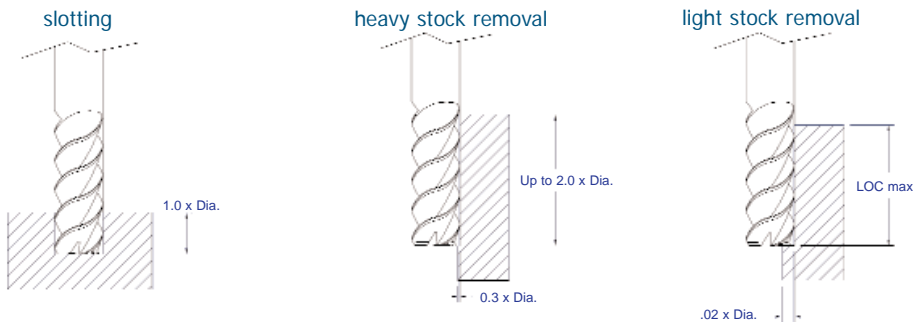
This end mill is designed with less radial rake and clearance resulting in a high strength cutting edge ideal for Stainless steel and other tough to machine materials. This design also allows for higher chip loads for increased productivity. These end mills are manufactured with extra fine grain carbide with exceptionally high transverse rupture strength.



REGULAR LENGTH						
Item	Diameter	Shank	LOC	OAL	C/R	
3H35R-01250SS	1/8	1/8	1/2	1-1/2	.010	
3H35R-01870SS	3/16	3/16	9/16	2	.010	
3H35R-02500SS	1/4	1/4	3/4	2-1/2	.020	
3H35R-03125SS	5/16	5/16	13/16	2-1/2	.020	
3H35R-03750SS	3/8	3/8	1	2-1/2	.020	
3H35R-05000SS	1/2	1/2	1-1/4	3	.035	
3H35R-06250SS	5/8	5/8	1-5/8	3-1/2	.035	
3H35R-07500SS	3/4	3/4	1-5/8	4	.035	
3H35R-10000SS	1.0	1.0	2.0	4	.035	


  


STUB LENGTH						
Item	Diameter	Shank	LOC	OAL	C/R	
3H35S-01250SS	1/8	1/8	1/2	1-1/2	.010	
3H35S-01870SS	3/16	3/16	9/16	2	.010	
3H35S-02500SS	1/4	1/4	3/4	2-1/2	.020	
3H35S-03125SS	5/16	5/16	13/16	2-1/2	.020	
3H35S-03750SS	3/8	3/8	1	2-1/2	.020	
3H35S-05000SS	1/2	1/2	1-1/4	3	.035	
3H35S-06250SS	5/8	5/8	1-5/8	3-1/2	.035	
3H35S-07500SS	3/4	3/4	1-5/8	4	.035	
3H35S-10000SS	1.0	1.0	2.0	4	.035	



Reference Chart "B" on page 13

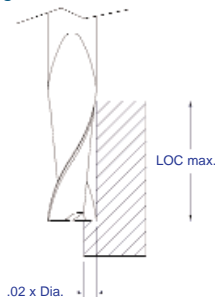
## Special application specific end mills

2H30 HM	This end mill is designed for High Speed milling of hard materials. Design features include a large core cross-section and stub length for higher strength. Shank diameter tolerances held to shrink fit specifications. These end mills are manufactured with extra fine grain carbide with exceptionally high transverse rupture strength.				
	Item	Diameter	Shank	LOC	OAL
	2H30-00937HM	3/32	1/4	3/32	2-1/2
	2H30-01250HM	1/8	1/4	1/8	2-1/2
	2H30-01875HM	3/16	1/4	3/16	2-1/2
	2H30-02500HM	1/4	1/4	1/4	2-1/2
	2H30-03125HM	5/16	5/16	5/16	2-1/2
	2H30-03750HM	3/8	3/8	3/8	2-1/2
	2H30-04375HM	7/16	7/16	7/16	2-3/4
	2H30-05000HM	1/2	1/2	1/2	3

2H30 HMB	This ball end mill is designed for High Speed milling of hard materials. Design features include a large core cross-section and stub length for higher strength. Shank diameter tolerances held to shrink fit specifications. These end mills are manufactured with extra fine grain carbide with exceptionally high transverse rupture strength.				
	Item	Diameter	Shank	LOC	OAL
	2H30-00937HMB	3/32	1/4	3/32	2-1/2
	2H30-01250HMB	1/8	1/4	1/8	2-1/2
	2H30-01875HMB	3/16	1/4	3/16	2-1/2
	2H30-02500HMB	1/4	1/4	1/4	2-1/2
	2H30-03125HMB	5/16	5/16	5/16	2-1/2
	2H30-03750HMB	3/8	3/8	3/8	2-1/2
	2H30-04375HMB	7/16	7/16	7/16	2-3/4
	2H30-05000HMB	1/2	1/2	1/2	3

Reference Chart "E" on page 14

light stock removal



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## Special application specific end mills

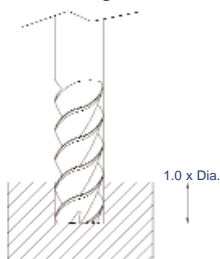
### 3H60HT

This end mill is designed with a three flute, high helix geometry for aggressive sheering action. Also, finely polished rake face and eccentric OD relief provide ideal cutters for high temperature alloys such as inconels, hastalloy, waspalloys, titanium, and hardened stainless steel. High chip loads allow the tools to stay ahead of the heat before work hardening occurs. These end mills are manufactured with extra fine grain carbide with exceptionally high transverse rupture strength.

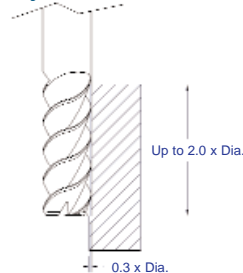
Item	Diameter	Shank	LOC	OAL
3H60R-02500HT	1/4	1/4	3/4	2-1/2
3H60R-03125HT	5/16	5/16	13/16	2-1/2
3H60R-03750HT	3/8	3/8	1	2-1/2
3H60R-04375HT	7/16	7/16	1	2-3/4
3H60R-05000HT	1/2	1/2	1	3
3H60R-06250HT	5/8	5/8	1-1/4	3-1/2
3H60R-07500HT	3/4	3/4	1-1/2	4
3H60R-01000HT	1.0	1.0	1-1/2	4.0



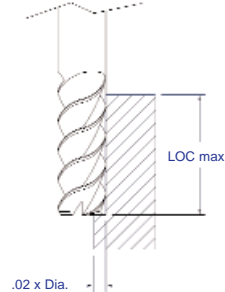
slotting



heavy stock removal



light stock removal



Reference Chart "C" on page 13

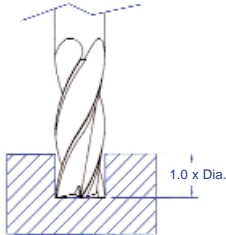
### 4HU - Harmonizer

This end mill was developed to machine Steel, stainless steel, Titanium, inconel, cast iron, and high temp alloys. The variable helix design aids in reducing harmonics from developing during the machining process. These end mills are manufactured with extra fine grain carbide with exceptionally high transverse rupture strength.

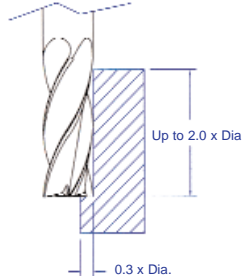
Item	Diameter	Shank	LOC	OAL
4HUR-02500TA	1/4	1/4	3/4	2-1/2
4HUR-03125TA	5/16	5/16	13/16	2-1/2
4HUR-03750TA	3/8	3/8	7/8	2-1/2
4HUR-05000TA	1/2	1/2	1	3
4HUR-06250TA	5/8	5/8	1-1/4	3-1/2
4HUR-07500TA	3/4	3/4	1-5/8	4
4HUR-10000TA	1.0	1.0	1-3/4	5.0



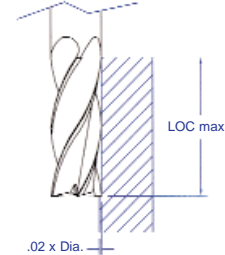
slotting



heavy stock removal



light stock removal



Reference Chart "B" on page 13

## REFERENCE GUIDE

Specifically designed for machining Aluminum, Stainless Steel, Titanium and Exotic Alloy Materials.

### Special application specific Product identification

3	H35	R	01250	SS	TC
# of flutes	Helix angle	Length	Size	Material	Coating
Application					
2 - 2 flute	35 - 35 degree helix	S - Stub	0125 = 0.125		TC-Titanium Carbon Nitride (TiCN)
3 - 3 flute	45 - 45 degree helix	R - Regular		AL - Aluminum	TA-Titanium Aluminum Nitride (TiAlN)
4 - 4 flute	60 - 60 degree helix	L - Long		SS - Stainless Steel	TI-Titanium Nitride (TiN)
5 - 5 flute	U - Uneven index	X - Extra long		HMB - High speed	-Machining (Ball)

### Standard end mill product identification

TC	AC	L	8
Coating	Type	Length	Size
TC - Titanium Carbon Nitride (TiCN)	AC - 4 flute	S - Stub	AC8 = $8/32 = .2500 \text{ } \emptyset = \frac{1}{4} \text{ } \emptyset$
TA - Titanium Aluminum Nitride (TiAlN)	BC - 2 flute	L - Long	AC8-5 = $8.5-32 = .2656 \text{ } \emptyset = 17/64 \text{ } \emptyset$
TI - Titanium Nitride (TiN)	AR - 4 flute ball	X - Extra long	
TL - Aluminum Titanium Nitride (AlTiN)	BR - 2 flute ball	No alpha character is standard length	
	DAC - Double End 4 flute		
	DBC - Double End 2 flute		

## COATINGS

### TiN

Titanium Nitride (TiN) is where it all started, and it remains a proven and versatile standard coating. TiN has shown good results in low carbon steels and many iron-based applications. It is a very popular coating used in the industry today.

### TiCN

Titanium Carbonitride (TiCN) is a multi-layer coating. Because of the multi-layer composition, the TiCN is tougher than TiN, even though TiCN is harder. The added toughness of the TiCN coating makes it a good choice of mechanically stressed edges like in end mill applications. The higher hardness makes TiCN a good choice for abrasive applications where higher wear resistance is required.

### TiAlN

Titanium Aluminum Nitride (TiAlN) is a coating offering the ability to run at even higher temperatures. In drilling applications, this coating has produced excellent results in stainless steel, nickel based alloys, high temperature alloys and titanium alloys. In milling, TiAlN has shown superior results in hardened steel materials. This coating has the potential to work well without coolants because of its elevated temperature resistant characteristics.

### AlTiN

An extremely hard coating very similar to TiAlN with outstanding wear resistance. AlTiN has a higher aluminum content which makes it harder and smoother than TiAlN. Very effective in the same materials as TiAlN. Excellent for small depths of cut and excels in high speed and dry machining applications.

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## SPEED & FEED REFERENCE GUIDE

### CHART A

End mill types: 2H45...AL, 3H35...AL

	Aluminum alloys	Cast Aluminum	High Silicon Based Aluminum	Copper	Brass	Magnesium
Speed(SFM)	800 +	250 - 600	600 - 1000	700 - 1000	500 - 900	500 - 900
1/4	0.0042	0.0042	0.0037	0.0037	0.0037	0.0037
5/16	0.0055	0.0055	0.0043	0.0043	0.0043	0.0043
3/8	0.0065	0.0065	0.0059	0.0059	0.0059	0.0059
1/2	0.0101	0.0101	0.0091	0.0091	0.0091	0.0091
5/8	0.0108	0.0108	0.0097	0.0097	0.0097	0.0097
3/4	0.0123	0.0123	0.0110	0.0110	0.0110	0.0110
1	0.0181	0.0181	0.0163	0.0163	0.0163	0.0163

### CHART B

End mill types: 4HU, 3H35...SS

	carbon steels	alloy steel	SS 300 series	SS 400 series	hardened SS	Gray cast iron	Ductile cast iron	High temp alloys	Titanium pure	Titanium cast
Spd<32Rc	200-450	150-300	150-350	200-450	80-250	250-450	120-350	70-120	140-220	140-200
Spd>32Rc	100-250	80-200	80-200	100-250	90-125	130-300	80-140	40-90	90-160	90-160
1/8	0.0007	0.0006	0.0007	0.0007	0.0006	0.0006	0.0006	0.0005	0.0007	0.0006
1/4	0.0016	0.0013	0.0016	0.0016	0.0013	0.0013	0.0013	0.0011	0.0016	0.0013
5/16	0.0020	0.0017	0.0020	0.0020	0.0017	0.0017	0.0017	0.0014	0.0020	0.0017
3/8	0.0026	0.0022	0.0026	0.0026	0.0022	0.0022	0.0022	0.0019	0.0026	0.0022
1/2	0.0036	0.0031	0.0036	0.0036	0.0031	0.0031	0.0031	0.0026	0.0036	0.0031
5/8	0.0045	0.0039	0.0045	0.0045	0.0039	0.0039	0.0039	0.0032	0.0045	0.0039
3/4	0.0054	0.0046	0.0054	0.0054	0.0046	0.0046	0.0046	0.0039	0.0054	0.0046
1	0.0071	0.0061	0.0071	0.0071	0.0061	0.0061	0.0061	0.0051	0.0071	0.0061

### CHART C

End mill types: 5H45...SS, 3H60...SS

	carbon steels	alloy steel	SS 300 series	SS 400 series	hardened SS	Gray cast iron	Ductile cast iron	High temp alloys	Titanium pure	Titanium cast
Spd<32Rc	200-450	150-300	150-350	200-450	80-250	250-450	120-350	70-120	140-220	140-200
Spd>32Rc	100-250	80-200	80-200	100-250	90-125	130-300	80-140	40-90	90-160	90-160
1/8	0.0010	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009	0.0006	0.0009	0.0009
1/4	0.0020	0.0018	0.0018	0.0018	0.0018	0.0018	0.0018	0.0013	0.0018	0.0018
5/16	0.0025	0.0023	0.0023	0.0023	0.0023	0.0023	0.0023	0.0023	0.0023	0.0023
3/8	0.0033	0.0030	0.0030	0.0030	0.0030	0.0030	0.0030	0.0022	0.0030	0.0030
1/2	0.0046	0.0041	0.0041	0.0041	0.0041	0.0041	0.0041	0.0031	0.0041	0.0041
5/8	0.0054	0.0049	0.0049	0.0049	0.0049	0.0049	0.0049	0.0037	0.0049	0.0049
3/4	0.0065	0.0058	0.0058	0.0058	0.0058	0.0058	0.0058	0.0044	0.0058	0.0058
1	0.0091	0.0081	0.0081	0.0081	0.0081	0.0081	0.0081	0.0061	0.0081	0.0081

## SPEED & FEED REFERENCE GUIDE

CHART D										
End mill types: AR, BR, BC, 3H30, AC										
	carbon steels	alloy steel	SS 300 series	SS 400 series	hardened SS	Gray cast iron	Ductile cast iron	High temp alloys	Titanium pure	Titanium cast
Spd<32Rc	200-450	150-300	150-350	200-450	80-250	250-450	120-350	70-120	140-220	140-200
Spd>32Rc	100-250	80-200	80-200	100-250	90-125	130-300	80-140	40-90	90-160	90-160
1/8	0.0009	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0005	0.0008	0.0008
1/4	0.0018	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0011	0.0016	0.0016
5/16	0.0021	0.0019	0.0019	0.0019	0.0019	0.0019	0.0019	0.0019	0.0019	0.0019
3/8	0.0028	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0017	0.0025	0.0025
1/2	0.0040	0.0035	0.0035	0.0035	0.0035	0.0035	0.0035	0.0025	0.0035	0.0035
5/8	0.0048	0.0043	0.0043	0.0043	0.0043	0.0043	0.0043	0.0031	0.0043	0.0043
3/4	0.0058	0.0051	0.0051	0.0051	0.0051	0.0051	0.0051	0.0037	0.0051	0.0051
1	0.0081	0.0071	0.0071	0.0071	0.0071	0.0071	0.0071	0.0051	0.0071	0.0071

CHART E						
End mill types: 2H30 HMB						
Diameter	Steel 30-40 Rc Speed (RPM)	Steel 30-40 Rc Chip load per tooth	Steel 40-50 Rc Speed (RPM)	Steel 40-50 Rc Chip load per tooth	Steel 50-60 Rc Speed (RPM)	Steel 50-60 Rc Chip load per tooth
1/8	15,000 to 24,000	0.0025	18,000 to 24,000	0.0020	12,000 to 18,000	0.0015
3/16	10,000 to 16,000	0.0038	12,000 to 16,000	0.0030	8,100 to 12,000	0.0023
1/4	7,600 to 12,000	0.0050	9,100 to 12,000	0.0040	6,100 to 9,100	0.0030
5/16	6,000 to 9,700	0.0063	7,300 to 9,700	0.0050	4,800 to 7,300	0.0038
3/8	5,000 to 8,100	0.0075	6,100 to 8,100	0.0060	4,000 to 6,100	0.0045
7/16	4,300 to 6,900	0.0088	5,200 to 6,900	0.0070	3,400 to 5,200	0.0053
1/2	3,800 to 6,100	0.0100	4,500 to 6,100	0.0080	3,000 to 4,500	0.0060

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PHONE: (800) 570-6929

FAX: (856) 768-3773