CONICAL™

TAPERED HIGH SPEED STEEL

AMERICAN MADE

GLOBALLY RENOWNED

SPECIALTY END MILLS

FOR MACHINING DRAFT ANGLES & CHAMFERS

CONICAL™ CUTTING TOOLS

CONICAL™

TAPERED HIGH SPEED STEEL

DRAFT ANGLE & CHAMFER MACHINING

IN EASY & MEDIUM MACHINABILITY MATERIALS

FEATURES & BENEFITS

Our Conical Tapered High Speed Steel end mills have many of the same characteristics of our carbide variety, but are available in significantly more configurations. They are the perfect choice for easy and medium to machine materials or applications with minor machining requirements. The Conical Tapered end mill was created by us in the 1940's to reduce significant fixturing time, combine multiple operations into one and create parts that were previously impossible to machine. These tools are a household name and our quality has been tested time and time again.

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E: quotes@conicaltool.com
W: conicalendmills.com/custom-tool-ordering

CONICAL™
CUTTING TOOLS

SERIES: THX

For rough and finish milling of draft angles / chamfers and slotting of tapered walls in most materials; wet or dry; from easy to medium machinability materials.

Standard square end to create sharp corners in finishing operations

Ball end option for high performance contour milling in finishing operations. Available in 24 to 48 hours

Variable lead helix provides increased tool engagement and rigidity

Variable Core Design maximizes chip evacuation and provides increased rigidity when the cutter is fully engaged

Corner radius option protects corners in roughing operations and difficult to machine materials by preventing corner chipping and tool failure. Available in 24 to 48 hours

Multi-flute, three and four flute design allows for proper chip evacuation through a variety of materials and applications while maximizing machine performance when possible

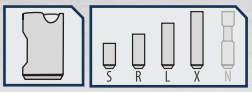
Premium high speed steel improves rigidity, hardness and wear resistance for milling of easy to medium machinability materials

Universal design allows for a multitude of applications, from slotting to finishing

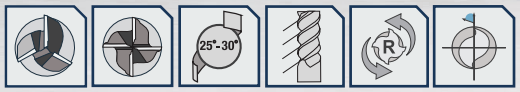
Uncoated for versatility. More than 16 available coatings can be added to increase tool life for your specific application and material

TIP & END

SHANK & LENGTH



FLUTE CONFIGURATION



MATERIAL

HSS
HIGH SPEED STEEL

COATING

UNC

RESULTS

Having the ability to cut setup time and eliminate costly programming, while maximizing production rates, may seem too good to be true. Our customers can testify to the fact that the Conical Tapered end mill does just that. A wide variety of configurations perform in finish milling of draft angles and slotting tapered walls, in most materials. Employing the three or four flute design facilitates chip disposal and maximizes feed rates, which brings your work closer to completion with every rotation of the tool.

Series THX: High Speed Steel, 3 & 4 Flute, 25 - 30° Variable Lead Helix
Subseries: TH0XD, TH01D, TH1XD, TH02D, TH03D, TH04D, TH05D, TH60D, TH07D, TH08D, TH10D, TH11D, TH12D, TH15D, TH20D, TH25D, TH30D, TH35D TH40D, TH45D
Configuration: Varying Angles; Varying Diameters; Stub, Regular, Long & Extra-Long Lengths; 25 - 30° Variable Lead Helix; Square End, Corner Radius & Ball End

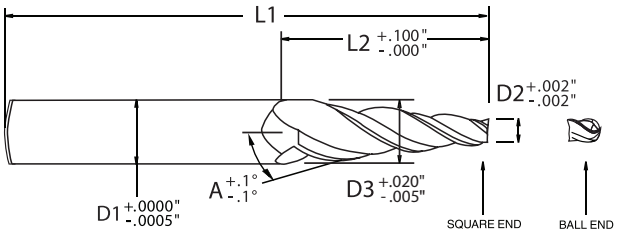
CONICAL TAPERED HSS

SERIES THX - *HIGH SPEED STEEL, 3 & 4 FLUTE, 25 - 30° VARIABLE LEAD HELIX*

99.8% IN STOCK STATUS

With the widest selection of high speed steel tapered end mills available and an average 99.8% in stock status, the Conical Tapered High Speed Steel end mill is the go-to tool for unique machining challenges.

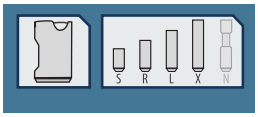
- Standard square end to create sharp corners in finishing operations
- Ball end option for high performance contour milling in finishing operations. Available in 24 to 48 hours
- Constant spiral helix provides increased tool engagement and rigidity
- Variable Core Design maximizes chip evacuation and provides increased rigidity when the cutter is fully engaged



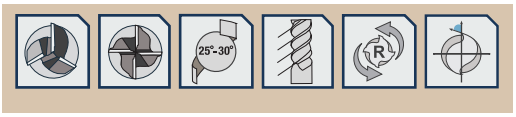
To order a corner radius, use code "CR" & actual radius in the part number. For example, a standard AX-203 would be ordered as AX-203-CR-015, with "015" being the radius.

TIP & END

SHANK & LENGTH



FLUTE CONFIGURATION



MATERIAL

COATING

SERIES TH0XD - *½ DEGREE, VARYING LENGTHS*

ANGLE PER SIDE (A)	TIP DIAMETER (D2)		LARGE DIAMETER (D3)	SHANK DIAMETER (D1)		FLUTE LENGTH (L2)		OVERALL LENGTH (L1)		# OF FLUTES	SQUARE END PART #	SQUARE END EDP #	BALL END PART #	BALL END EDP #
0.5°	1/16	0.0625	0.0756	3/8	0.375	3/4	0.750	2 7/8	2.875	3	AX-003	2Y01S	AX-003-BE	2Y01B
	3/32	0.0938	0.1025	3/8	0.375	1/2	0.500	2 5/8	2.625		AX-102	2Y02S	AX-102-BE	2Y02B
			0.1068	3/8	0.375	3/4	0.750	2 7/8	2.875		AX-103	2Y03S	AX-103-BE	2Y03B
			0.1156	3/8	0.375	1 1/4	1.250	3 1/4	3.250		AX-105	2Y04S	AX-105-BE	2Y04B
	1/8	0.1250	0.1294	3/8	0.375	1/4	0.250	2 5/8	2.625		AX-201	2Y05S	AX-201-BE	2Y05B
			0.1337	3/8	0.375	1/2	0.500	2 5/8	2.625		AX-202	2Y06S	AX-202-BE	2Y06B
			0.1381	3/8	0.375	3/4	0.750	2 7/8	2.875		AX-203	2Y07S	AX-203-BE	2Y07B
			0.1425	3/8	0.375	1	1.000	2 7/8	2.875		AX-204	2Y08S	AX-204-BE	2Y08B
			0.1468	3/8	0.375	1 1/4	1.250	3 1/4	3.250		AX-205	2Y09S	AX-205-BE	2Y09B
			0.1512	3/8	0.375	1 1/2	1.500	3 1/4	3.250		AX-206	2Y10S	AX-206-BE	2Y10B
	3/16	0.1875	0.2006	3/8	0.375	3/4	0.750	2 7/8	2.875		AX-303	2Y11S	AX-303-BE	2Y11B
			0.2093	3/8	0.375	1 1/4	1.250	3 1/4	3.250		AX-305	2Y12S	AX-305-BE	2Y12B
			0.2180	3/8	0.375	1 3/4	1.750	3 7/8	3.875		AX-307	2Y13S	AX-307-BE	2Y13B
	1/4	0.2500	0.2631	3/8	0.375	3/4	0.750	2 7/8	2.875		AX-403	2Y14S	AX-403-BE	2Y14B
			0.2718	3/8	0.375	1 1/4	1.250	3 1/4	3.250		AX-405	2Y15S	AX-405-BE	2Y15B
			0.2893	1/2	0.500	2 1/4	2.250	4 1/4	4.250		AX-409	2Y16S	AX-409-BE	2Y16B
			0.3067	1/2	0.500	3 1/4	3.250	5 1/2	5.500		AX-413	2Y17S	AX-413-BE	2Y17B
	3/8	0.3750	0.3968	1/2	0.500	1 1/4	1.250	3 1/4	3.250		AX-605	2Y18S	AX-605-BE	2Y18B
			0.4143	1/2	0.500	2 1/4	2.250	4 1/4	4.250		AX-609	2Y19S	AX-609-BE	2Y19B
			0.4317	1/2	0.500	3 1/4	3.250	5 1/2	5.500		AX-613	2Y20S	AX-613-BE	2Y20B
	1/2	0.5000	0.5218	1/2	0.500	1 1/4	1.250	3 1/4	3.250		AX-805	2Y21S	AX-805-BE	2Y21B
			0.5393	1/2	0.500	2 1/4	2.250	4 1/4	4.250		AX-809	2Y22S	AX-809-BE	2Y22B
			0.5567	1/2	0.500	3 1/4	3.250	5 3/8	5.375		AX-813	2Y23S	AX-813-BE	2Y23B
	5/8	0.6250	0.6643	5/8	0.625	2 1/4	2.250	4 1/2	4.500		AX-1009	2Y24S	AX-1009-BE	2Y24B
			0.6817	5/8	0.625	3 1/4	3.250	5 1/2	5.500		AX-1013	2Y25S	AX-1013-BE	2Y25B
			0.6992	5/8	0.625	4 1/4	4.250	6 1/2	6.500		AX-1017	2Y26S	AX-1017-BE	2Y26B
	3/4	0.7500	0.7893	3/4	0.750	2 1/4	2.250	4 1/2	4.500		AX-1209	2Y27S	AX-1209-BE	2Y27B
			0.8067	3/4	0.750	3 1/4	3.250	5 3/4	5.750		AX-1213	2Y28S	AX-1213-BE	2Y28B
			0.8155	3/4	0.750	3 3/4	3.750	6 1/2	6.500		AX-1217	2Y29S	AX-1217-BE	2Y29B
			0.8416	3/4	0.750	5 1/4	5.250	7 3/4	7.750		AX-1221	2Y30S	AX-1221-BE	2Y30B
	1	1.0000	1.1047	1	1.000	6	6.000	8 1/2	8.500	4	AX-1624	2Y31S	AX-1624-BE	2Y31B

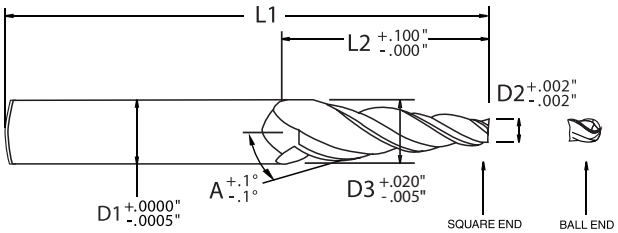
CONICAL TAPERED HSS

SERIES THX - *HIGH SPEED STEEL, 3 & 4 FLUTE, 25 - 30° VARIABLE LEAD HELIX*

MULTITUDE OF APPLICATIONS

Whether machining draft angles, or chamfers in easy and medium machinability materials, the universal design allows for a multitude of applications, which include slotting and finishing.

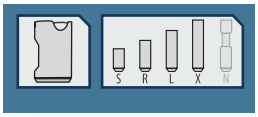
- Corner radius option protects corners in roughing operations and difficult to machine materials by preventing corner chipping and tool failure. Available in 24 to 48 hours
- Multi-flute, three and four flute design allows for proper chip evacuation through a variety of materials and applications while maximizing machine performance when possible
- Premium high speed steel improves rigidity, hardness and wear resistance for milling of easy to medium machinability materials



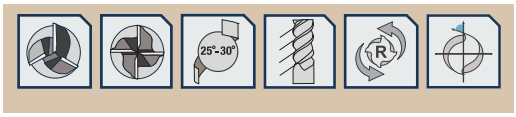
To order a corner radius, use code "CR" & actual radius in the part number. For example, a standard AX-203 would be ordered as AX-203-CR-015, with "015" being the radius.

TIP & END

SHANK & LENGTH



FLUTE CONFIGURATION



MATERIAL

COATING

SERIES TH01D - *1 DEGREE, VARYING LENGTHS*

ANGLE PER SIDE (A)	TIP DIAMETER (D2)		LARGE DIAMETER (D3)	SHANK DIAMETER (D1)		FLUTE LENGTH (L2)		OVERALL LENGTH (L1)		# OF FLUTES	SQUARE END PART #	SQUARE END EDP #	BALL END PART #	BALL END EDP #
1.0°	1/16	0.0625	0.0887	3/8	0.375	3/4	0.750	2 7/8	2.875	3	A-003	2A01S	A-003-BE	2A01B
	3/32	0.0938	0.1112	3/8	0.375	1/2	0.500	2 5/8	2.625		A-102	2A02S	A-102-BE	2A02B
			0.1199	3/8	0.375	3/4	0.750	2 7/8	2.875		A-103	2A03S	A-103-BE	2A03B
			0.1374	3/8	0.375	1 1/4	1.250	3 1/8	3.125		A-105	2A04S	A-105-BE	2A04B
			0.1461	3/8	0.375	1 1/2	1.500	3 3/8	3.375		A-106	2A05S	A-106-BE	2A05B
	1/8	0.1250	0.1337	3/8	0.375	1/4	0.250	2 5/8	2.625		A-201	2A06S	A-201-BE	2A06B
			0.1425	3/8	0.375	1/2	0.500	2 5/8	2.625		A-202	2A07S	A-202-BE	2A07B
			0.1512	3/8	0.375	3/4	0.750	2 7/8	2.875		A-203	2A08S	A-203-BE	2A08B
			0.1599	3/8	0.375	1	1.000	2 7/8	2.875		A-204	2A09S	A-204-BE	2A09B
			0.1686	3/8	0.375	1 1/4	1.250	3 1/4	3.250		A-205	2A10S	A-205-BE	2A10B
			0.1774	3/8	0.375	1 1/2	1.500	3 1/4	3.250		A-206	2A11S	A-206-BE	2A11B
			0.1948	3/8	0.375	2	2.000	4	4.000		A-208	2A12S	A-208-BE	2A12B
	3/16	0.1875	0.2137	3/8	0.375	3/4	0.750	2 7/8	2.875		A-303	2A13S	A-303-BE	2A13B
			0.2311	3/8	0.375	1 1/4	1.250	3 1/4	3.250		A-305	2A14S	A-305-BE	2A14B
			0.2573	3/8	0.375	2	2.000	7	4.000		A-308	2A15S	A-308-BE	2A15B
	1/4	0.2500	0.2762	3/8	0.375	3/4	0.750	2 7/8	2.875		A-403	2A16S	A-403-BE	2A16B
			0.2936	3/8	0.375	1 1/4	1.250	3 1/4	3.250		A-405	2A17S	A-405-BE	2A17B
			0.3285	1/2	0.500	2 1/4	2.250	4 1/8	4.125		A-409	2A18S	A-409-BE	2A18B
			0.3634	1/2	0.500	3 1/4	3.250	5 1/2	5.500		A-413	2A19S	A-413-BE	2A19B
	3/8	0.3750	0.4186	1/2	0.500	1 1/4	1.250	3 1/4	3.250		A-605	2A20S	A-605-BE	2A20B
			0.4535	1/2	0.500	2 1/4	2.250	4 1/4	4.250		A-609	2A21S	A-609-BE	2A21B
			0.4884	1/2	0.500	3 1/4	3.250	5 1/2	5.500		A-613	2A22S	A-613-BE	2A22B
	1/2	0.5000	0.5436	1/2	0.500	1 1/4	1.250	3 1/4	3.250		A-805	2A23S	A-805-BE	2A23B
			0.5785	1/2	0.500	2 1/4	2.250	4 1/4	4.250		A-809	2A24S	A-809-BE	2A24B
			0.6134	1/2	0.500	3 1/4	3.250	5 1/2	5.500		A-813	2A25S	A-813-BE	2A25B
	5/8	0.6250	0.7035	5/8	0.625	2 1/4	2.250	4 1/2	4.500		A-1009	2A26S	A-1009-BE	2A26B
			0.7384	5/8	0.625	3 1/4	3.250	5 1/2	5.500		A-1013	2A27S	A-1013-BE	2A27B
			0.7733	5/8	0.625	4 1/4	4.250	6 1/2	6.500		A-1017	2A28S	A-1017-BE	2A28B
	3/4	0.7500	0.8634	3/4	0.750	3 1/4	3.250	5 3/4	5.750		A-1213	2A29S	A-1213-BE	2A29B
			0.8984	3/4	0.750	4 1/4	4.250	6 7/8	6.875		A-1217	2A30S	A-1217-BE	2A30B
			0.9332	3/4	0.750	5 1/4	5.250	7 1/2	7.500		A-1221	2A31S	A-1221-BE	2A31B
	1	1.0000	1.2094	1	1.000	6	6.000	8 1/2	8.500	4	A-1624	2A32S	A-1624-BE	2A32B

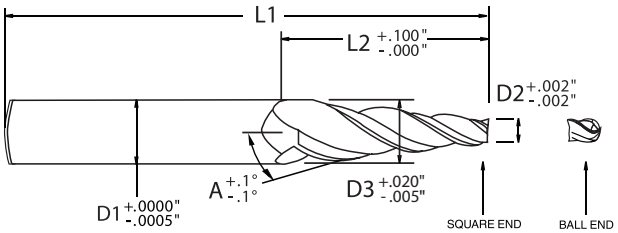
CONICAL TAPERED HSS

SERIES THX - *HIGH SPEED STEEL, 3 & 4 FLUTE, 25 - 30° VARIABLE LEAD HELIX*

CUSTOMER SUPPORT

The functionality of a tool determines its worth. It's a simple fact that a quality tool will provide better performance. When you add the experience and technical support Conical provides, there's no question which manufacturer to select.

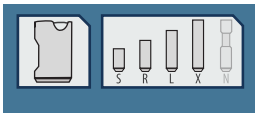
- Universal design allows for a multitude of applications, from slotting to finishing
- Uncoated for versatility. More than 16 available coatings can be added to increase tool life for your specific application and material
- Ball end option for high performance contour milling in finishing operations. Available in 24 to 48 hours



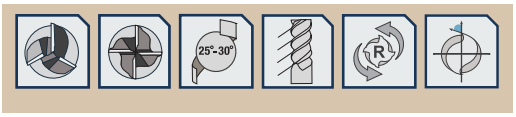
To order a corner radius, use code "CR" & actual radius in the part number. For example, a standard AX-203 would be ordered as AX-203-CR-015, with "015" being the radius.

TIP & END

SHANK & LENGTH



FLUTE CONFIGURATION



MATERIAL

COATING

SERIES TH1XD - *1 ½ DEGREE, VARYING LENGTHS*

ANGLE PER SIDE (A)	TIP DIAMETER (D2)		LARGE DIAMETER (D3)	SHANK DIAMETER (D1)		FLUTE LENGTH (L2)		OVERALL LENGTH (L1)		# OF FLUTES	SQUARE END PART #	SQUARE END EDP #	BALL END PART #	BALL END EDP #
1.5°	1/16	0.0625	0.1018	3/8	0.375	3/4	0.750	2 7/8	2.875	3	AAX-003	2Z01S	AAX-003-BE	2Z01B
	3/32	0.0938	0.1199	3/8	0.375	1/2	0.500	2 5/8	2.625		AAX-102	2Z02S	AAX-102-BE	2Z02B
			0.1330	3/8	0.375	3/4	0.750	2 7/8	2.875		AAX-103	2Z03S	AAX-103-BE	2Z03B
			0.1461	3/8	0.375	1	1.000	2 7/8	2.875		AAX-104	2Z04S	AAX-104-BE	2Z04B
			0.1592	3/8	0.375	1 1/4	1.250	3 1/4	3.250		AAX-105	2Z05S	AAX-105-BE	2Z05B
			0.1723	3/8	0.375	1 1/2	1.500	3 1/4	3.250		AAX-106	2Z06S	AAX-106-BE	2Z06B
	7/64	0.1094	0.1617	3/8	0.375	1	1.000	2 7/8	2.875		AAX-154	2Z07S	AAX-154-BE	2Z07B
			0.1879	3/8	0.375	1 1/2	1.500	3 1/4	3.250		AAX-156	2Z08S	AAX-156-BE	2Z08B
	1/8	0.1250	0.1512	3/8	0.375	1/2	0.500	2 5/8	2.625		AAX-202	2Z09S	AAX-202-BE	2Z09B
			0.1643	3/8	0.375	3/4	0.750	2 7/8	2.875		AAX-203	2Z10S	AAX-203-BE	2Z10B
			0.1774	3/8	0.375	1	1.000	2 7/8	2.875		AAX-204	2Z11S	AAX-204-BE	2Z11B
			0.1905	3/8	0.375	1 1/4	1.250	3 1/4	3.250		AAX-205	2Z12S	AAX-205-BE	2Z12B
			0.2035	3/8	0.375	1 1/2	1.500	3 1/4	3.250		AAX-206	2Z13S	AAX-206-BE	2Z13B
			0.2297	3/8	0.375	2	2.000	3 7/8	3.875		AAX-208	2Z14S	AAX-208-BE	2Z14B
	5/32	0.1563	0.2086	3/8	0.375	1	1.000	2 7/8	2.875		AAX-254	2Z15S	AAX-254-BE	2Z15B
			0.2217	3/8	0.375	1 1/4	1.250	3 1/4	3.250		AAX-255	2Z16S	AAX-255-BE	2Z16B
			0.2348	3/8	0.375	1 1/2	1.500	3 1/4	3.250		AAX-256	2Z17S	AAX-256-BE	2Z17B
	3/16	0.1875	0.2268	3/8	0.375	3/4	0.750	2 7/8	2.875		AAX-303	2Z18S	AAX-303-BE	2Z18B
			0.2530	3/8	0.375	1 1/4	1.250	3 1/4	3.250		AAX-305	2Z19S	AAX-305-BE	2Z19B
			0.2922	3/8	0.375	2	2.000	3 7/8	3.875		AAX-308	2Z20S	AAX-308-BE	2Z20B
			0.3053	3/8	0.375	2 1/4	2.250	4 1/4	4.250		AAX-309	2Z21S	AAX-309-BE	2Z21B
	1/4	0.2500	0.2893	3/8	0.375	3/4	0.750	2 7/8	2.875		AAX-403	2Z22S	AAX-403-BE	2Z22B
			0.3155	3/8	0.375	1 1/4	1.250	3 1/4	3.250		AAX-405	2Z23S	AAX-405-BE	2Z23B
			0.3678	1/2	0.500	2 1/4	2.250	4 1/4	4.250		AAX-409	2Z24S	AAX-409-BE	2Z24B
			0.4202	1/2	0.500	3 1/4	3.250	5 1/2	5.500		AAX-413	2Z25S	AAX-413-BE	2Z25B
	3/8	0.3750	0.4405	1/2	0.500	1 1/4	1.250	3 1/4	3.250		AAX-605	2Z26S	AAX-605-BE	2Z26B
			0.4928	1/2	0.500	2 1/4	2.250	4 1/4	4.250		AAX-609	2Z27S	AAX-609-BE	2Z27B
			0.5452	5/8	0.625	3 1/4	3.250	5 1/2	5.500		AAX-613	2Z28S	AAX-613-BE	2Z28B
	1/2	0.5000	0.5655	1/2	0.500	1 1/4	1.250	3 1/4	3.250		AAX-805	2Z29S	AAX-805-BE	2Z29B
			0.6178	1/2	0.500	2 1/4	2.250	4 1/4	4.250		AAX-809	2Z30S	AAX-809-BE	2Z30B
			0.6702	5/8	0.625	3 1/4	3.250	5 1/2	5.500		AAX-813	2Z31S	AAX-813-BE	2Z31B
	5/8	0.6250	0.7428	3/4	0.750	2 1/4	2.250	4 1/2	4.500		AAX-1009	2Z32S	AAX-1009-BE	2Z32B
			0.7952	3/4	0.750	3 1/4	3.250	5 1/2	5.500		AAX-1013	2Z33S	AAX-1013-BE	2Z33B
			0.8475	3/4	0.750	4 1/4	4.250	6 1/2	6.500		AAX-1017	2Z34S	AAX-1017-BE	2Z34B
	3/4	0.7500	0.8678	3/4	0.750	2 1/4	2.250	4 1/2	4.500		AAX-1209	2Z35S	AAX-1209-BE	2Z35B
			1.0249	1	1.000	5 1/4	5.250	8	8.000		AAX-1221	2Z36S	AAX-1221-BE	2Z36B
	1	1.0000	1.3142	1 1/4	1.250	6	6.000	8 3/4	8.750	4	AAX-1624	2Z37S	AAX-1624-BE	2Z37B

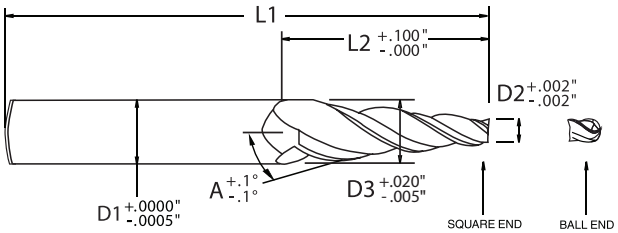
CONICAL TAPERED HSS

SERIES THX - *HIGH SPEED STEEL, 3 & 4 FLUTE, 25 - 30° VARIABLE LEAD HELIX*

A RELIABLE PARTNER

Experience counts when you make your investment in a cutting tool manufacturer. We all need reliable partners and Conical pledges to be just that.

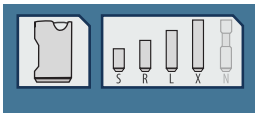
- Standard square end to create sharp corners in finishing operations
- Ball end option for high performance contour milling in finishing operations. Available in 24 to 48 hours
- Constant spiral helix provides increased tool engagement and rigidity
- Variable Core Design maximizes chip evacuation and provides increased rigidity when the cutter is fully engaged



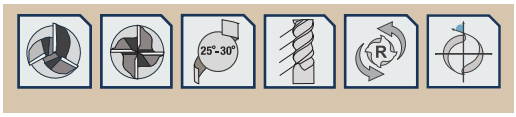
To order a corner radius, use code "CR" & actual radius in the part number. For example, a standard AX-203 would be ordered as AX-203-CR-015, with "015" being the radius.

TIP & END

SHANK & LENGTH



FLUTE CONFIGURATION



MATERIAL

COATING

SERIES TH02D - *2 DEGREE, VARYING LENGTHS*

ANGLE PER SIDE (A)	TIP DIAMETER (D2)		LARGE DIAMETER (D3)	SHANK DIAMETER (D1)		FLUTE LENGTH (L2)		OVERALL LENGTH (L1)		# OF FLUTES	SQUARE END PART #	SQUARE END EDP #	BALL END PART #	BALL END EDP #
2.0°	1/32	0.0313	0.0662	3/8	0.375	1/2	0.500	2 5/8	2.625	3	B-0002	2B01S	B-0002-BE	2B01B
			0.0836	3/8	0.375	3/4	0.750	2 7/8	2.875		B-0003	2B02S	B-0003-BE	2B02B
	1/16	0.0625	0.0974	3/8	0.375	1/2	0.500	2 5/8	2.625		B-002	2B03S	B-002-BE	2B03B
			0.1323	3/8	0.375	1	1.000	2 7/8	2.875		B-004	2B04S	B-004-BE	2B04B
			0.1498	3/8	0.375	1 1/4	1.250	3 1/4	3.250		B-005	2B05S	B-005-BE	2B05B
	3/32	0.0938	0.1287	3/8	0.375	1/2	0.500	2 5/8	2.625		B-102	2B06S	B-102-BE	2B06B
			0.1461	3/8	0.375	3/4	0.750	2 7/8	2.875		B-103	2B07S	B-103-BE	2B07B
			0.1636	3/8	0.375	1	1.000	2 7/8	2.875		B-104	2B08S	B-104-BE	2B08B
			0.1811	3/8	0.375	1 1/4	1.250	3 1/4	3.250		B-105	2B09S	B-105-BE	2B09B
			0.1985	3/8	0.375	1 1/2	1.500	3 1/2	3.500		B-106	2B10S	B-106-BE	2B10B
	1/8	0.1250	0.1599	3/8	0.375	1/2	0.500	2 5/8	2.625		B-202	2B11S	B-202-BE	2B11B
			0.1774	3/8	0.375	3/4	0.750	2 7/8	2.875		B-203	2B12S	B-203-BE	2B12B
			0.1948	3/8	0.375	1	1.000	2 7/8	2.875		B-204	2B13S	B-204-BE	2B13B
			0.2123	3/8	0.375	1 1/4	1.250	3	3.000		B-205	2B14S	B-205-BE	2B14B
			0.2298	3/8	0.375	1 1/2	1.500	3 1/4	3.250		B-206	2B15S	B-206-BE	2B15B
			0.2647	3/8	0.375	2	2.000	3 7/8	3.875		B-208	2B16S	B-208-BE	2B16B
			0.2996	1/2	0.500	2 1/2	2.500	4 3/4	4.750		B-210	2B17S	B-210-BE	2B17B
			0.1774	3/8	0.375	3/4	0.750	2 7/8	2.875		B-303	2B18S	B-303-BE	2B18B
	3/16	0.1875	0.2748	3/8	0.375	1 1/4	1.250	3 1/4	3.250		B-305	2B19S	B-305-BE	2B19B
			0.3272	3/8	0.375	2	2.000	3 7/8	3.875		B-308	2B20S	B-308-BE	2B20B
			0.2399	3/8	0.375	3/4	0.750	2 7/8	2.875		B-403	2B21S	B-403-BE	2B21B
	1/4	0.2500	0.3373	3/8	0.375	1 1/4	1.250	3 1/4	3.250		B-405	2B22S	B-405-BE	2B22B
			0.4071	1/2	0.500	2 1/4	2.250	4 1/4	4.250		B-409	2B23S	B-409-BE	2B23B
			0.4770	1/2	0.500	3 1/4	3.250	5 1/2	5.500		B-413	2B24S	B-413-BE	2B24B
	3/8	0.3750	0.4623	1/2	0.500	1 1/4	1.250	3 1/4	3.250		B-605	2B25S	B-605-BE	2B25B
			0.5321	1/2	0.500	2 1/4	2.250	4 1/4	4.250		B-609	2B26S	B-609-BE	2B26B
			0.6020	5/8	0.625	3 1/4	3.250	5 1/2	5.500		B-613	2B27S	B-613-BE	2B27B
	1/2	0.5000	0.5873	1/2	0.500	1 1/4	1.250	3 1/4	3.250		B-805	2B28S	B-805-BE	2B28B
			0.6571	1/2	0.500	2 1/4	2.250	4 1/4	4.250		B-809	2B29S	B-809-BE	2B29B
			0.7270	5/8	0.625	3 1/4	3.250	5 1/2	5.500		B-813	2B30S	B-813-BE	2B30B
	5/8	0.6250	0.7821	3/4	0.750	2 1/4	2.250	4 1/2	4.500		B-1009	2B31S	B-1009-BE	2B31B
			0.8520	3/4	0.750	3 1/4	3.250	5 1/2	5.500		B-1013	2B32S	B-1013-BE	2B32B
			0.9218	3/4	0.750	4 1/4	4.250	6 1/4	6.250		B-1017	2B33S	B-1017-BE	2B33B
	3/4	0.7500	0.9071	3/4	0.750	2 1/4	2.250	4 1/2	4.500		B-1209	2B34S	B-1209-BE	2B34B
			0.9770	1	1.000	3 1/4	3.250	6	6.000		B-1213	2B35S	B-1213-BE	2B35B
			1.1167	1	1.000	5 1/4	5.250	7 3/4	7.750		B-1221	2B36S	B-1221-BE	2B36B
	1	1.0000	1.4190	1 1/4	1.250	6	6.000	8 1/2	8.500	4	B-1624	2B37S	B-1624-BE	2B37B

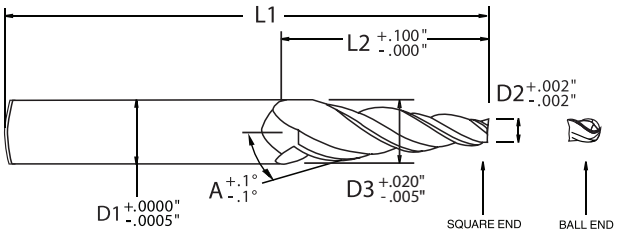
CONICAL TAPERED HSS

SERIES THX - *HIGH SPEED STEEL, 3 & 4 FLUTE, 25 - 30° VARIABLE LEAD HELIX*

COMBINES MULTIPLE OPERATIONS

The perfect choice for easy and medium to machine materials or applications with minor machining requirements. Reduces significant fixturing time, combines multiple operations into one and creates parts that were previously impossible to machine.

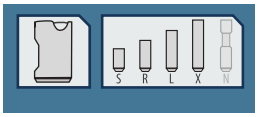
- Corner radius option protects corners in roughing operations and difficult to machine materials by preventing corner chipping and tool failure. Available in 24 to 48 hours
- Multi-flute, three and four flute design allows for proper chip evacuation through a variety of materials and applications while maximizing machine performance when possible
- Premium high speed steel improves rigidity, hardness and wear resistance for milling of easy to medium machinability materials



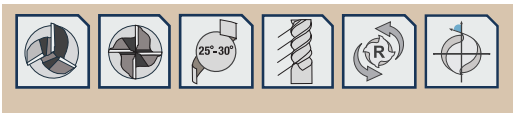
To order a corner radius, use code "CR" & actual radius in the part number. For example, a standard AX-203 would be ordered as AX-203-CR-015, with "015" being the radius.

TIP & END

SHANK & LENGTH



FLUTE CONFIGURATION



MATERIAL

COATING

SERIES TH03D - *3 DEGREE, VARYING LENGTHS*

ANGLE PER SIDE (A)	TIP DIAMETER (D2)		LARGE DIAMETER (D3)	SHANK DIAMETER (D1)		FLUTE LENGTH (L2)		OVERALL LENGTH (L1)		# OF FLUTES	SQUARE END PART #	SQUARE END EDP #	BALL END PART #	BALL END EDP #
3.0°	1/4	0.2500	0.3286	3/8	0.375	3/4	0.750	2 7/8	2.875	3	C-403	2C32S	C-403-BE	2C32B
			0.3810	3/8	0.375	1 1/4	1.250	3 1/4	3.250		C-405	2C33S	C-405-BE	2C33B
			0.4858	1/2	0.500	2 1/4	2.250	4 1/4	4.250		C-409	2C34S	C-409-BE	2C34B
			0.5907	5/8	0.625	3 1/4	3.250	5 1/2	5.500		C-413	2C35S	C-413-BE	2C35B
			0.6693	5/8	0.625	4	4.000	6 1/2	6.500		C-416	2C36S	C-416-BE	2C36B
			0.7741	3/4	0.750	5	5.000	7 1/4	7.250		C-420	2C37S	C-420-BE	2C37B
	3/8	0.3750	0.5060	1/2	0.500	1 1/4	1.250	3 1/4	3.250		C-605	2C38S	C-605-BE	2C38B
			0.6108	5/8	0.625	2 1/4	2.250	4 1/4	4.250		C-609	2C39S	C-609-BE	2C39B
			0.7157	3/4	0.750	3 1/4	3.250	5 1/2	5.500		C-613	2C40S	C-613-BE	2C40B
			0.7943	3/4	0.750	4	4.000	6 1/2	6.500		C-616	2C41S	C-616-BE	2C41B
			0.8991	3/4	0.750	5	5.000	7 1/2	7.500		C-620	2C42S	C-620-BE	2C42B
			1.0039	1	1.000	6	6.000	8 1/2	8.500		C-624	2C43S	C-624-BE	2C43B
	1/2	0.5000	0.6310	1/2	0.500	1 1/4	1.250	3 1/4	3.250		C-805	2C44S	C-805-BE	2C44B
			0.7358	5/8	0.625	2 1/4	2.250	4 3/8	4.375		C-809	2C45S	C-809-BE	2C45B
			0.8407	3/4	0.750	3 1/4	3.250	5 1/2	5.500		C-813	2C46S	C-813-BE	2C46B
			0.9193	3/4	0.750	4	4.000	6 1/2	6.500		C-816	2C47S	C-816-BE	2C47B
			1.0241	1	1.000	5	5.000	7 1/2	7.500		C-820	2C48S	C-820-BE	2C48B
			1.1289	1	1.000	6	6.000	8 1/2	8.500		C-824	2C49S	C-824-BE	2C49B
	5/8	0.6250	0.6905	1	1.000	5/8	0.625	4 1/2	4.500		C-1009	2C50S	C-1009-BE	2C50B
			0.9657	1	1.000	3 1/4	3.250	5 1/2	5.500		C-1013	2C51S	C-1013-BE	2C51B
			1.0443	1	1.000	4	4.000	6 1/2	6.500		C-1016	2C52S	C-1016-BE	2C52B
			1.1491	1	1.000	5	5.000	7 1/2	7.500		C-1020	2C53S	C-1020-BE	2C53B
	3/4	0.7500	0.9858	1	1.000	2 1/4	2.250	4 3/4	4.750		C-1209	2C54S	C-1209-BE	2C54B
			1.0907	1	1.000	3 1/4	3.250	5 3/4	5.750		C-1213	2C55S	C-1213-BE	2C55B
			1.1693	1	1.000	4	4.000	6 1/2	6.500	4	C-1216	2C56S	C-1216-BE	2C56B
			1.2741	1	1.000	5	5.000	7 1/2	7.500		C-1220	2C57S	C-1220-BE	2C57B
			1.3789	1 1/4	1.250	6	6.000	8 1/2	8.500		C-1224	2C58S	C-1224-BE	2C58B
	1	1.0000	1.6289	1 1/4	1.250	6	6.000	8 1/2	8.500		C-1624	2C59S	C-1624-BE	2C59B

(continued on next page)

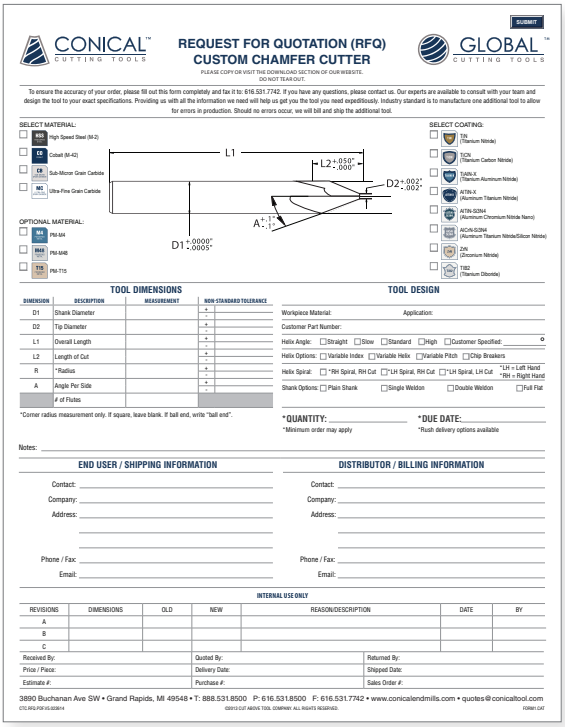
CUSTOM TOOL ORDERING

TO SOLVE MACHINING CHALLENGES

"JUST IN TIME" AVAILABILITY

WE'LL HELP YOU FIND THE SOLUTION

Along with our standard tool offerings, Conical Tool Company manufactures custom carbide and high speed steel end mills and cutters. Whether a variation of a standard tool or specialized tool meant to combine multiple processes into one pass, our custom tools improve performance and reduce cycle time at the best value in the industry.



SUBMIT

CONICAL™ CUTTING TOOLS

REQUEST FOR QUOTATION (RFQ)
CUSTOM CHAMFER CUTTER

PLEASE COPY OR VISIT THE DOWNLOAD SECTION OF OUR WEBSITE.
DO NOT TEAR OUT.

GLOBAL™ CUTTING TOOLS

To ensure the accuracy of your order, please fill out this form completely and fax it to: 616.531.7742. If you have any questions, please contact us. Our experts are available to consult with your team and design the tool to your exact specifications. Providing us with all the information we need will help us get you the tool you need expeditiously. Industry standard is to manufacture one additional tool to allow for errors in production. Should no errors occur, we will bill and ship the additional tool.

SELECT MATERIAL:
- ☐ HSS High Speed Steel (M-2)
- ☐ CO Cobalt (M-42)
- ☐ CR Sub-Micron Grain Carbide
- ☐ MG Ultra-Fine Grain Carbide

OPTIONAL MATERIAL:
- ☐ M4 PM-M4
- ☐ M48 PM-M48
- ☐ T15 PM-T15

L1
L2 +.050" -.000"
D2 +.002" -.002"
A -.1°
D1 +.0000" -.0005"

SELECT COATING:
- ☐ TiN (Titanium Nitride)
- ☐ TiCN (Titanium Carbon Nitride)
- ☐ TiAlN-X (Titanium Aluminum Nitride)
- ☐ AlTiN-X (Aluminum Titanium Nitride)
- ☐ AlTiN-SUN4 (Aluminum Chromium Nitride Nano)
- ☐ AlCrN-SUN4 (Aluminum Titanium Nitride/Silicon Nitride)
- ☐ ZrN (Zirconium Nitride)
- ☐ TiB2 (Titanium Diboride)

TOOL DIMENSIONS

DIMENSION	DESCRIPTION	MEASUREMENT	NON-STANDARD TOLERANCE
D1	Shank Diameter		+ / -
D2	Tip Diameter		+ / -
L1	Overall Length		+ / -
L2	Length of Cut		+ / -
R	*Radius		+ / -
A	Angle Per Side		+ / -
	# of Flutes		

*Corner radius measurement only. If square, leave blank. If ball end, write "ball end".

TOOL DESIGN

Workpiece Material: Application:
Customer Part Number:
Helix Angle: ☐ Straight ☐ Slow ☐ Standard ☐ High ☐ Customer Specified: °
Helix Options: ☐ Variable Index ☐ Variable Helix ☐ Variable Pitch ☐ Chip Breakers
Helix Spiral: ☐ *RH Spiral, RH Cut ☐ *LH Spiral, RH Cut ☐ *LH Spiral, LH Cut *LH = Left Hand *RH = Right Hand
Shank Options: ☐ Plain Shank ☐ Single Weldon ☐ Double Weldon ☐ Full Flat

*QUANTITY: _____ *DUE DATE: _____
*Minimum order may apply *Rush delivery options available

Notes: _____

END USER / SHIPPING INFORMATION

Contact: _____
Company: _____
Address: _____
Phone / Fax: _____
Email: _____

DISTRIBUTOR / BILLING INFORMATION

Contact: _____
Company: _____
Address: _____
Phone / Fax: _____
Email: _____

INTERNAL USE ONLY

REVISIONS	DIMENSIONS	OLD	NEW	REASON/DESCRIPTION	DATE	BY
A						
B						
C						

Received By:	Quoted By:	Returned By:
Price / Piece:	Delivery Date:	Shipped Date:
Estimate #:	Purchase #:	Sales Order #:

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FORM CAT

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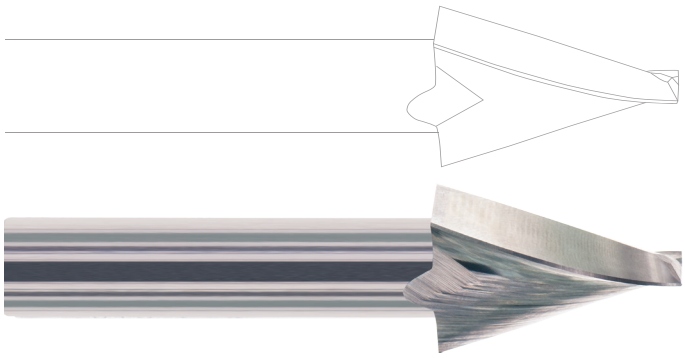
DECREASED PART CYCLE TIME

REDUCED COST PER PIECE

INCREASED PROFIT PER JOB

IMPROVED CUTTING TOOL PERFORMANCE

MANUFACTURED TO YOUR SPECIFICATIONS



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CONICAL™ CUTTING TOOLS

GLOBAL™ CUTTING TOOLS

We can modify our standard tools or manufacture a highly specialized tool to your exact specifications. Request for Quote documents for custom tools are on the following pages. We cannot process your quote without this form. RFQ's are typically returned within 24 hours. A full list of definitions and acronyms can be found on pages 80-81. If you need assistance with your custom tool design or have any questions, please contact us.

CONICAL TOOL COMPANY 70 YEARS IN BUSINESS 1944 - 2014

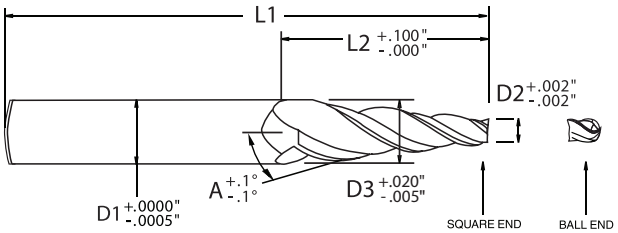
CONICAL TAPERED HSS

SERIES THX - *HIGH SPEED STEEL, 3 & 4 FLUTE, 25 - 30° VARIABLE LEAD HELIX*

WIDE VARIETY OF CONFIGURATIONS

A wide variety of configurations perform in finish milling of draft angles and slotting tapered walls, in most materials. Average 99.8% in stock status.

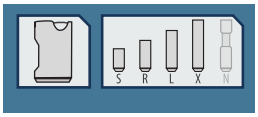
- Standard square end to create sharp corners in finishing operations
- Ball end option for high performance contour milling in finishing operations. Available in 24 to 48 hours
- Constant spiral helix provides increased tool engagement and rigidity
- Variable Core Design maximizes chip evacuation and provides increased rigidity when the cutter is fully engaged



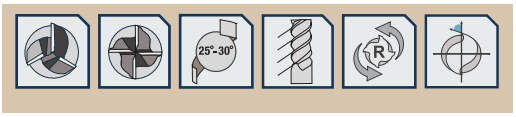
To order a corner radius, use code "CR" & actual radius in the part number. For example, a standard AX-203 would be ordered as AX-203-CR-015, with "015" being the radius.

TIP & END

SHANK & LENGTH



FLUTE CONFIGURATION



MATERIAL

COATING

SERIES TH04D - *4 DEGREE, VARYING LENGTHS*

ANGLE PER SIDE (A)	TIP DIAMETER (D2)		LARGE DIAMETER (D3)	SHANK DIAMETER (D1)		FLUTE LENGTH (L2)		OVERALL LENGTH (L1)		# OF FLUTES	SQUARE END PART #	SQUARE END EDP #	BALL END PART #	BALL END EDP #
4.0°	1/32	0.0313	0.1711	3/8	0.375	1	1.000	2 7/8	2.875	3	D-0004	2D01S	D-0004-BE	2D01B
	1/16	0.0625	0.2024	3/8	0.375	1	1.000	2 7/8	2.875		D-004	2D02S	D-004-BE	2D02B
			0.2723	3/8	0.375	1 1/2	1.500	3 1/4	3.250		D-006	2D03S	D-006-BE	2D03B
	3/32	0.0938	0.2336	3/8	0.375	1	1.000	2 7/8	2.875		D-104	2D04S	D-104-BE	2D04B
	1/8	0.1250	0.2299	3/8	0.375	3/4	0.750	2 7/8	2.875		D-203	2D05S	D-203-BE	2D05B
			0.2649	3/8	0.375	1	1.000	2 7/8	2.875		D-204	2D06S	D-204-BE	2D06B
			0.3348	3/8	0.375	1 1/2	1.500	3 1/4	3.250		D-206	2D07S	D-206-BE	2D07B
			0.4047	1/2	0.500	2	2.000	3 7/8	3.875		D-208	2D08S	D-208-BE	2D08B
			0.4747	1/2	0.500	2 1/2	2.500	4 1/2	4.500		D-210	2D09S	D-210-BE	2D09B
	3/16	0.1875	0.2924	3/8	0.375	3/4	0.750	2 7/8	2.875		D-303	2D10S	D-303-BE	2D10B
			0.3623	3/8	0.375	1 1/4	1.250	3 1/4	3.250		D-305	2D11S	D-305-BE	2D11B
			0.5372	1/2	0.500	2 1/2	2.500	4 1/2	4.500		D-310	2D12S	D-310-BE	2D12B
			0.6420	5/8	0.625	3 1/4	3.250	5 1/2	5.500		D-313	2D13S	D-313-BE	2D13B
			0.7469	3/4	0.750	4	4.000	6 1/2	6.500		D-316	2D14S	D-316-BE	2D14B
	1/4	0.2500	0.3549	3/8	0.375	3/4	0.750	2 7/8	2.875		D-403	2D15S	D-403-BE	2D15B
			0.4248	1/2	0.500	1 1/4	1.250	3 1/4	3.250		D-405	2D16S	D-405-BE	2D16B
			0.5647	5/8	0.625	2 1/4	2.250	4 1/2	4.500		D-409	2D17S	D-409-BE	2D17B
			0.7045	3/4	0.750	3 1/4	3.250	5 5/8	5.625		D-413	2D18S	D-413-BE	2D18B
			0.8094	3/4	0.750	4	4.000	6 1/2	6.500		D-416	2D19S	D-416-BE	2D19B
	3/8	0.3750	0.5498	1/2	0.500	1 1/4	1.250	3 1/4	3.250		D-605	2D20S	D-605-BE	2D20B
			0.6897	5/8	0.625	2 1/4	2.250	4 1/4	4.250		D-609	2D21S	D-609-BE	2D21B
			0.8295	3/4	0.750	3 1/4	3.250	5 1/2	5.500		D-613	2D22S	D-613-BE	2D22B
			0.9344	3/4	0.750	4	4.000	6 1/2	6.500		D-616	2D23S	D-616-BE	2D23B
	1/2	0.5000	0.6748	1/2	0.500	1 1/4	1.250	3 1/4	3.250		D-805	2D24S	D-805-BE	2D24B
			0.8147	3/4	0.750	2 1/4	2.250	4 1/2	4.500		D-809	2D25S	D-809-BE	2D25B
			1.0594	1	1.000	4	4.000	6 1/2	6.500		D-816	2D26S	D-816-BE	2D26B
			1.1993	1	1.000	5	5.000	7 1/2	7.500		D-820	2D27S	D-820-BE	2D27B

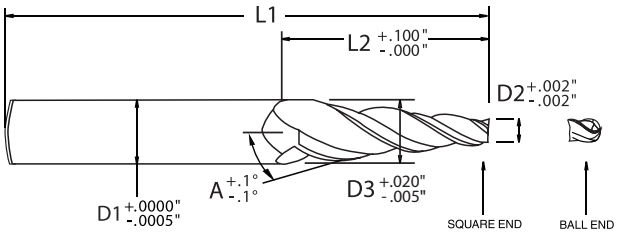
CONICAL TAPERED HSS

SERIES THX - *HIGH SPEED STEEL, 3 & 4 FLUTE, 25 - 30° VARIABLE LEAD HELIX*

MAXIMIZE FEED RATES

Employing the three or four flute design facilitates chip disposal and maximizes feed rates, which brings your work closer to completion with every rotation of the tool.

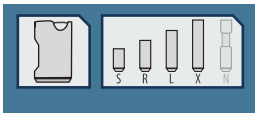
- Corner radius option protects corners in roughing operations and difficult to machine materials by preventing corner chipping and tool failure. Available in 24 to 48 hours
- Multi-flute, three and four flute design allows for proper chip evacuation through a variety of materials and applications while maximizing machine performance when possible
- Premium high speed steel improves rigidity, hardness and wear resistance for milling of easy to medium machinability materials



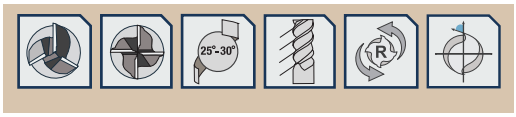
To order a corner radius, use code "CR" & actual radius in the part number. For example, a standard AX-203 would be ordered as AX-203-CR-015, with "015" being the radius.

TIP & END

SHANK & LENGTH



FLUTE CONFIGURATION



MATERIAL

COATING

SERIES TH05D - *5 DEGREE, VARYING LENGTHS*

ANGLE PER SIDE (A)	TIP DIAMETER (D2)		LARGE DIAMETER (D3)	SHANK DIAMETER (D1)		FLUTE LENGTH (L2)		OVERALL LENGTH (L1)		# OF FLUTES	SQUARE END PART #	SQUARE END EDP #	BALL END PART #	BALL END EDP #
5.0°	1/32	0.0313	0.1187	3/8	0.375	1/2	0.500	2 5/8	2.625	3	E-0002	2E01S	E-0002-BE	2E01B
			0.1625	3/8	0.375	3/4	0.750	2 7/8	2.875		E-0003	2E02S	E-0003-BE	2E02B
	1/16	0.0625	0.1500	3/8	0.375	1/2	0.500	2 5/8	2.625		E-002	2E03S	E-002-BE	2E03B
			0.1937	3/8	0.375	3/4	0.750	2 7/8	2.875		E-003	2E04S	E-003-BE	2E04B
			0.2375	3/8	0.375	1	1.000	2 7/8	2.875		E-004	2E05S	E-004-BE	2E05B
			0.3250	3/8	0.375	1 1/2	1.500	3 1/4	3.250		E-006	2E06S	E-006-BE	2E06B
	3/32	0.0938	0.1812	3/8	0.375	1/2	0.500	2 5/8	2.625		E-102	2E07S	E-102-BE	2E07B
			0.2250	3/8	0.375	3/4	0.750	2 7/8	2.875		E-103	2E08S	E-103-BE	2E08B
			0.2687	3/8	0.375	1	1.000	2 7/8	2.875		E-104	2E09S	E-104-BE	2E09B
			0.3125	3/8	0.375	1 1/4	1.250	3 1/4	3.250		E-105	2E10S	E-105-BE	2E10B
			0.3562	3/8	0.375	1 1/2	1.500	3 1/4	3.250		E-106	2E11S	E-106-BE	2E11B
			0.4437	1/2	0.500	2	2.000	3 7/8	3.875		E-108	2E12S	E-108-BE	2E12B
			0.5312	1/2	0.500	2 1/2	2.500	4 1/2	4.500		E-110	2E13S	E-110-BE	2E13B
	7/64	0.1094	0.2844	3/8	0.375	1	1.000	2 7/8	2.875		E-154	2E14S	E-154-BE	2E14B
			0.3718	3/8	0.375	1 1/2	1.500	3 1/4	3.250		E-156	2E15S	E-156-BE	2E15B
			0.4593	1/2	0.500	2	2.000	3 7/8	3.875		E-158	2E16S	E-158-BE	2E16B
	1/8	0.1250	0.2562	3/8	0.375	3/4	0.750	2 7/8	2.875		E-203	2E17S	E-203-BE	2E17B
			0.3000	3/8	0.375	1	1.000	2 7/8	2.875		E-204	2E18S	E-204-BE	2E18B
			0.3437	3/8	0.375	1 1/4	1.250	3 1/4	3.250		E-205	2E19S	E-205-BE	2E19B
			0.3875	3/8	0.375	1 1/2	1.500	3 1/4	3.250		E-206	2E20S	E-206-BE	2E20B
			0.4750	1/2	0.500	2	2.000	3 7/8	3.875		E-208	2E21S	E-208-BE	2E21B
			0.5625	1/2	0.500	2 1/2	2.500	4 1/2	4.500		E-210B	2E22S	E-210B-BE	2E22B
			0.5625	5/8	0.625	2 1/2	2.500	4 3/4	4.750		E-210A	2E23S	E-210A-BE	2E23B
	5/32	0.1563	0.3312	3/8	0.375	1	1.000	2 7/8	2.875		E-254	2E24S	E-254-BE	2E24B
			0.3750	3/8	0.375	1 1/4	1.250	3 1/4	3.250		E-255	2E25S	E-255-BE	2E25B
			0.4187	1/2	0.500	1 1/2	1.500	3 5/8	3.625		E-256	2E26S	E-256-BE	2E26B
			0.5062	1/2	0.500	2	2.000	3 7/8	3.875		E-258	2E27S	E-258-BE	2E27B
	3/16	0.1875	0.3187	3/8	0.375	3/4	0.750	2 7/8	2.875		E-303	2E28S	E-303-BE	2E28B
			0.4062	1/2	0.500	1 1/4	1.250	3 1/4	3.250		E-305	2E29S	E-305-BE	2E29B
			0.5375	1/2	0.500	2	2.000	4 1/8	4.125		E-308	2E30S	E-308-BE	2E30B
			0.6250	1/2	0.500	2 1/2	2.500	4 1/2	4.500		E-310B	2E31S	E-310B-BE	2E31B
			0.6250	5/8	0.625	2 1/2	2.500	4 3/4	4.750		E-310A	2E32S	E-310A-BE	2E32B
			0.7562	3/4	0.750	3 1/4	3.250	5 1/2	5.500		E-313	2E33S	E-313-BE	2E33B
			1.0624	3/4	0.750	4	4.000	6 1/2	6.500		E-316	2E34S	E-316-BE	2E34B
			1.0624	1	1.000	5	5.000	7 1/2	7.500		E-320	2E35S	E-320-BE	2E35B
			1.2374	1	1.000	6	6.000	8 1/2	8.500		E-324	2E36S	E-324-BE	2E36B

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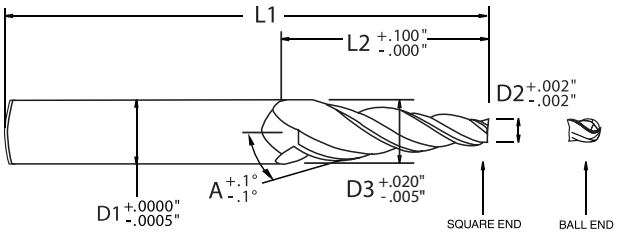
CONICAL TAPERED HSS

SERIES THX - *HIGH SPEED STEEL, 3 & 4 FLUTE, 25 - 30° VARIABLE LEAD HELIX*

THE GO-TO TOOL

With the widest selection of high speed steel tapered end mills available and an average 99.8% in stock status, the Conical Tapered High Speed Steel end mill is the go-to tool for unique machining challenges.

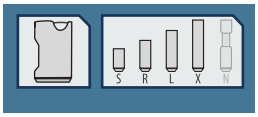
- Universal design allows for a multitude of applications, from slotting to finishing
- Uncoated for versatility. More than 16 available coatings can be added to increase tool life for your specific application and material
- Ball end option for high performance contour milling in finishing operations. Available in 24 to 48 hours



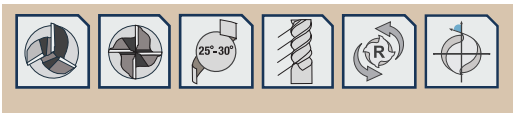
To order a corner radius, use code "CR" & actual radius in the part number. For example, a standard AX-203 would be ordered as AX-203-CR-015, with "015" being the radius.

TIP & END

SHANK & LENGTH



FLUTE CONFIGURATION



MATERIAL

COATING

SERIES TH05D - *5 DEGREE, VARYING LENGTHS*

ANGLE PER SIDE (A)	TIP DIAMETER (D2)		LARGE DIAMETER (D3)	SHANK DIAMETER (D1)		FLUTE LENGTH (L2)		OVERALL LENGTH (L1)		# OF FLUTES	SQUARE END PART #	SQUARE END EDP #	BALL END PART #	BALL END EDP #
5.0°	1/4	0.2500	0.3812	3/8	0.375	3/4	0.750	2 7/8	2.875	3	E-403	2E37S	E-403-BE	2E37B
			0.4687	1/2	0.500	1 1/4	1.250	3 1/4	3.250		E-405	2E38S	E-405-BE	2E38B
			0.6437	1/2	0.500	2 1/4	2.250	4 1/4	4.250		E-409B	2E39S	E-409B-BE	2E39B
			0.6437	5/8	0.625	2 1/4	2.250	4 1/2	4.500		E-409A	2E40S	E-409A-BE	2E40B
			0.8187	3/4	0.750	3 1/4	3.250	5 1/2	5.500		E-413	2E41S	E-413-BE	2E41B
			0.9499	3/4	0.750	4	4.000	6 1/2	6.500		E-416	2E42S	E-416-BE	2E42B
			1.2999	1	1.000	6	6.000	8 1/2	8.500		E-424	2E43S	E-424-BE	2E43B
	3/8	0.3750	0.5937	1/2	0.500	1 1/4	1.250	3 1/4	3.250		E-605	2E44S	E-605-BE	2E44B
			0.7687	3/4	0.750	2 1/4	2.250	4 3/4	4.750		E-609	2E45S	E-609-BE	2E45B
			0.9437	3/4	0.750	3 1/4	3.250	5 1/2	5.500		E-613	2E46S	E-613-BE	2E46B
			1.0749	1	1.000	4	4.000	6 1/2	6.500		E-616	2E47S	E-616-BE	2E47B
			1.2499	1 1/4	1.250	5	5.000	7 1/4	7.250		E-620	2E48S	E-620-BE	2E48B
			1.4249	1 1/4	1.250	6	6.000	8 1/2	8.500		E-624	2E49S	E-624-BE	2E49B
	1/2	0.5000	0.7187	1/2	0.500	1 1/4	1.250	3 1/4	3.250		E-805	2E50S	E-805-BE	2E50B
			0.8937	3/4	0.750	2 1/4	2.250	4 1/2	4.500		E-809	2E51S	E-809-BE	2E51B
			1.0687	1	1.000	3 1/4	3.250	6	6.000		E-813	2E52S	E-813-BE	2E52B
			1.1999	1	1.000	4	4.000	6 1/2	6.500		E-816	2E53S	E-816-BE	2E53B
			1.3749	1 1/4	1.250	5	5.000	7 1/2	7.500		E-820	2E54S	E-820-BE	2E54B
			1.5499	1 1/4	1.250	6	6.000	8 1/2	8.500		E-824	2E55S	E-824-BE	2E55B
	5/8	0.6250	1.0187	3/4	0.750	2 1/4	2.250	4 1/2	4.500		E-1009	2E56S	E-1009-BE	2E56B
			1.4999	1 1/4	1.250	5	5.000	7 1/2	7.500	4	E-1020	2E57S	E-1020-BE	2E57B
	3/4	0.7500	1.1437	3/4	0.750	2 1/4	2.250	4 3/4	4.750	3	E-1209	2E58S	E-1209-BE	2E58B
			1.4499	1 1/4	1.250	4	4.000	6 1/2	6.500	4	E-1216	2E59S	E-1216-BE	2E59B
			1.6249	1 1/4	1.250	5	5.000	7 3/4	7.750		E-1220	2E60S	E-1220-BE	2E60B
			1.7999	1 1/4	1.250	6	6.000	8 3/4	8.750		E-1224	2E61S	E-1224-BE	2E61B
	1	1.0000	1.8749	1 1/4	1.250	5	5.000	7 3/4	7.750		E-1620	2E62S	E-1620-BE	2E62B
			2.0499	2	2.000	6	6.000	9 1/2	9.500		E-1624	2E63S	E-1624-BE	2E63B
	1 1/2	1.5000	2.5499	2	2.000	6	6.000	9 1/2	9.500		E-2424	2E64S	E-2424-BE	2E64B

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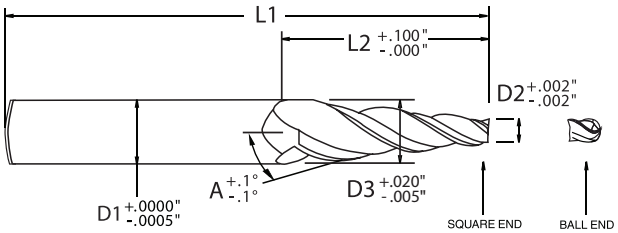
CONICAL TAPERED HSS

SERIES THX - *HIGH SPEED STEEL, 3 & 4 FLUTE, 25 - 30° VARIABLE LEAD HELIX*

UNIVERSAL DESIGN

Whether machining draft angles, or chamfers in easy and medium machinability materials, the universal design allows for a multitude of applications, which include slotting and finishing.

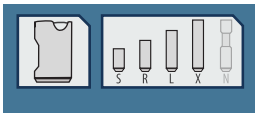
- Standard square end to create sharp corners in finishing operations
- Ball end option for high performance contour milling in finishing operations. Available in 24 to 48 hours
- Constant spiral helix provides increased tool engagement and rigidity
- Variable Core Design maximizes chip evacuation and provides increased rigidity when the cutter is fully engaged



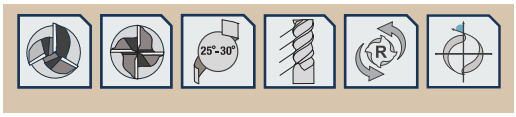
To order a corner radius, use code "CR" & actual radius in the part number. For example, a standard AX-203 would be ordered as AX-203-CR-015, with "015" being the radius.

TIP & END

SHANK & LENGTH



FLUTE CONFIGURATION



MATERIAL

COATING

SERIES TH06D - *6 DEGREE, VARYING LENGTHS*

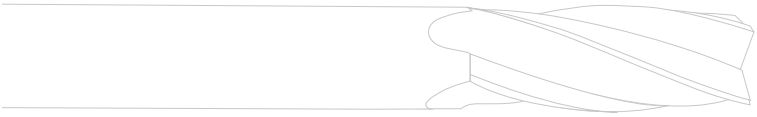
ANGLE PER SIDE (A)	TIP DIAMETER (D2)		LARGE DIAMETER (D3)	SHANK DIAMETER (D1)		FLUTE LENGTH (L2)		OVERALL LENGTH (L1)		# OF FLUTES	SQUARE END PART #	SQUARE END EDP #	BALL END PART #	BALL END EDP #
6.0°	1/16	0.0625	0.2727	3/8	0.375	1	1.000	2 7/8	2.875	3	F-004	2F01S	F-004-BE	2F01B
	3/32	0.0938	0.3040	3/8	0.375	1	1.000	2 7/8	2.875		F-104	2F02S	F-104-BE	2F02B
	1/8	0.1250	0.3352	3/8	0.375	1	1.000	2 7/8	2.875		F-204	2F03S	F-204-BE	2F03B
			0.4403	3/8	0.375	1 1/2	1.500	3 1/2	3.500		F-206	2F04S	F-206-BE	2F04B
	1/4	0.2500	0.5653	1/2	0.500	1 1/2	1.500	3 1/2	3.500		F-406	2F05S	F-406-BE	2F05B
	3/8	0.3750	0.6378	1/2	0.500	1 1/4	1.250	3 1/4	3.250		F-605	2F06S	F-605-BE	2F06B
	1/2	0.5000	0.7628	5/8	0.625	1 1/4	1.250	3 1/4	3.250		F-805	2F07S	F-805-BE	2F07B

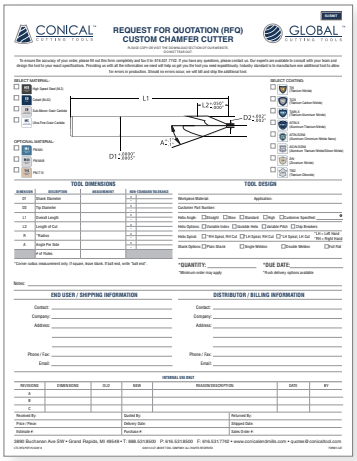
CUSTOM TOOL ORDERING

TO SOLVE MACHINING CHALLENGES

WE'LL HELP YOU FIND THE SOLUTION

Along with our standard tool offerings, Conical Tool Company manufactures custom carbide and high speed steel end mills and cutters. Whether a variation of a standard tool or specialized tool meant to combine multiple processes into one pass, our custom tools improve performance and reduce cycle time at the best value in the industry.





SEE PAGES 27-36 FOR DETAILS, VISIT CONICALENDMILLS.COM, OR CALL (888) 531-8500

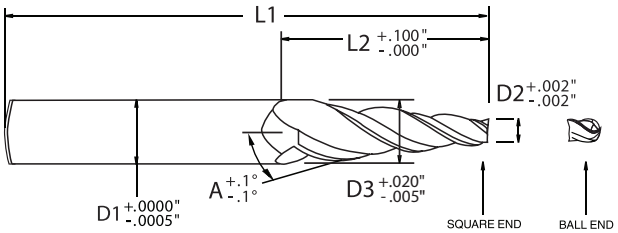
CONICAL TAPERED HSS

SERIES THX - *HIGH SPEED STEEL, 3 & 4 FLUTE, 25 - 30° VARIABLE LEAD HELIX*

BETTER PERFORMANCE

The functionality of a tool determines its worth. It's a simple fact that a quality tool will provide better performance. When you add the experience and technical support Conical provides, there's no question which manufacturer to select.

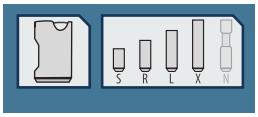
- Corner radius option protects corners in roughing operations and difficult to machine materials by preventing corner chipping and tool failure. Available in 24 to 48 hours
- Multi-flute, three and four flute design allows for proper chip evacuation through a variety of materials and applications while maximizing machine performance when possible
- Premium high speed steel improves rigidity, hardness and wear resistance for milling of easy to medium machinability materials



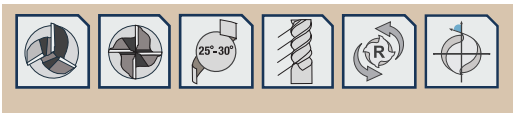
To order a corner radius, use code "CR" & actual radius in the part number. For example, a standard AX-203 would be ordered as AX-203-CR-015, with "015" being the radius.

TIP & END

SHANK & LENGTH



FLUTE CONFIGURATION



MATERIAL

COATING

SERIES TH07D - *7 DEGREE, VARYING LENGTHS*

ANGLE PER SIDE (A)	TIP DIAMETER (D2)		LARGE DIAMETER (D3)	SHANK DIAMETER (D1)		FLUTE LENGTH (L2)		OVERALL LENGTH (L1)		# OF FLUTES	SQUARE END PART #	SQUARE END EDP #	BALL END PART #	BALL END EDP #
7.0°	1/32	0.0313	0.2154	3/8	0.375	3/4	0.750	2 7/8	2.875	3	G-0003	2G01S	G-0003-BE	2G01B
	1/16	0.0625	0.3081	3/8	0.375	1	1.000	2 7/8	2.875		G-004	2G02S	G-004-BE	2G02B
			0.4308	1/2	0.500	1 1/2	1.500	3 3/8	3.375		G-006	2G03S	G-006-BE	2G03B
	3/32	0.0938	0.3393	3/8	0.375	1	1.000	2 7/8	2.875		G-104	2G04S	G-104-BE	2G04B
			0.4621	1/2	0.500	1 1/2	1.500	3 3/8	3.375		G-106	2G05S	G-106-BE	2G05B
	1/8	0.1250	0.3092	3/8	0.375	3/4	0.750	2 7/8	2.875		G-203	2G06S	G-203-BE	2G06B
			0.3706	3/8	0.375	1	1.000	2 7/8	2.875		G-204	2G07S	G-204-BE	2G07B
			0.4933	1/2	0.500	1 1/2	1.500	3 1/4	3.250		G-206	2G08S	G-206-BE	2G08B
			0.6161	5/8	0.625	2	2.000	4 1/8	4.125		G-208	2G09S	G-208-BE	2G09B
			0.8617	3/4	0.750	3	3.000	5 1/2	5.500		G-212	2G10S	G-212-BE	2G10B
	3/16	0.1875	0.4945	1/2	0.500	1 1/4	1.250	3 1/8	3.125		G-305	2G11S	G-305-BE	2G11B
			0.9242	3/4	0.750	3	3.000	5 1/4	5.250		G-312	2G12S	G-312-BE	2G12B
	1/4	0.2500	0.4342	1/2	0.500	3/4	0.750	3	3.000		G-403	2G13S	G-403-BE	2G13B
			0.5570	1/2	0.500	1 1/4	1.250	3 1/4	3.250		G-405	2G14S	G-405-BE	2G14B
			0.8025	3/4	0.750	2 1/4	2.250	4 1/2	4.500		G-409	2G15S	G-409-BE	2G15B
			1.0481	1	1.000	3 1/4	3.250	5 3/4	5.750		G-413	2G16S	G-413-BE	2G16B
			1.2322	1	1.000	4	4.000	6 1/2	6.500		G-416	2G17S	G-416-BE	2G17B
	5/16	0.3125	1.1106	1	1.000	3 1/4	3.250	5 3/4	5.750		G-513	2G18S	G-513-BE	2G18B
	3/8	0.3750	0.6820	5/8	0.625	1 1/4	1.250	3 1/2	3.500		G-605	2G19S	G-605-BE	2G19B
			0.9275	3/4	0.750	2 1/4	2.250	4 1/2	4.500		G-609	2G20S	G-609-BE	2G20B
			1.1731	1	1.000	3 1/4	3.250	5 3/4	5.750		G-613	2G21S	G-613-BE	2G21B
			1.3572	1	1.000	4	4.000	6 1/2	6.500		G-616	2G22S	G-616-BE	2G22B
			1.8484	1 1/4	1.250	6	6.000	8 1/2	8.500		G-624	2G23S	G-624-BE	2G23B
	1/2	0.5000	0.8070	5/8	0.625	1 1/4	1.250	3 3/8	3.375		G-805	2G24S	G-805-BE	2G24B
			1.0525	1	1.000	2 1/4	2.250	4 3/4	4.750		G-809	2G25S	G-809-BE	2G25B
			1.2981	1 1/4	1.250	3 1/4	3.250	5 3/4	5.750		G-813	2G26S	G-813-BE	2G26B
			1.4822	1 1/4	1.250	4	4.000	6 1/2	6.500		G-816	2G27S	G-816-BE	2G27B
			1.9734	1 1/4	1.250	6	6.000	8 1/2	8.500		G-824	2G28S	G-824-BE	2G28B
	5/8	0.6250	1.6072	1 1/4	1.250	4	4.000	6 1/2	6.500	4	G-1016	2G29S	G-1016-BE	2G29B
			1.8528	1 1/4	1.250	5	5.000	7 1/2	7.500		G-1020	2G30S	G-1020-BE	2G30B
	3/4	0.7500	1.5481	1 1/4	1.250	3 1/4	3.250	5 3/4	5.750		G-1213	2G31S	G-1213-BE	2G31B
			1.7322	1 1/4	1.250	4	4.000	6 3/4	6.750		G-1216	2G32S	G-1216-BE	2G32B
			2.2234	2	2.000	6	6.000	9 1/2	9.500		G-1224	2G33S	G-1224-BE	2G33B
	1	1.0000	2.4734	2	2.000	6	6.000	9 1/2	9.500		G-1624	2G34S	G-1624-BE	2G34B
	1 1/2	1.5000	2.9734	2	2.000	6	6.000	9 1/2	9.500		G-2424	2G35S	G-2424-BE	2G35B

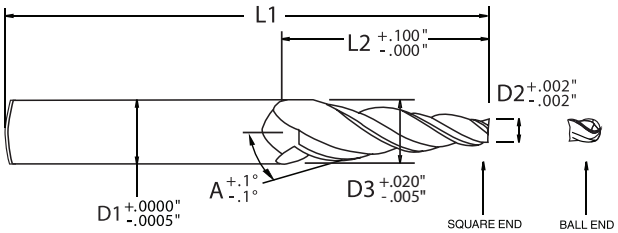
CONICAL TAPERED HSS

SERIES THX - *HIGH SPEED STEEL, 3 & 4 FLUTE, 25 - 30° VARIABLE LEAD HELIX*

EXPERIENCE COUNTS

Experience counts when you make your investment in a cutting tool manufacturer. We all need reliable partners and Conical pledges to be just that.

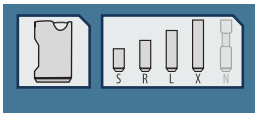
- Universal design allows for a multitude of applications, from slotting to finishing
- Uncoated for versatility. More than 16 available coatings can be added to increase tool life for your specific application and material
- Ball end option for high performance contour milling in finishing operations. Available in 24 to 48 hours



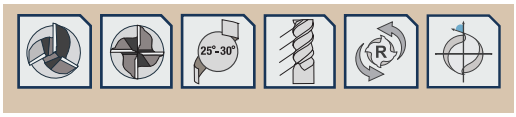
To order a corner radius, use code "CR" & actual radius in the part number. For example, a standard AX-203 would be ordered as AX-203-CR-015, with "015" being the radius.

TIP & END

SHANK & LENGTH



FLUTE CONFIGURATION



MATERIAL

COATING

SERIES TH08D - *8 DEGREE, VARYING LENGTHS*

ANGLE PER SIDE (A)	TIP DIAMETER (D2)		LARGE DIAMETER (D3)	SHANK DIAMETER (D1)		FLUTE LENGTH (L2)		OVERALL LENGTH (L1)		# OF FLUTES	SQUARE END PART #	SQUARE END EDP #	BALL END PART #	BALL END EDP #
8.0°	1/32	0.0313	0.1718	3/8	0.375	1/2	0.500	2 5/8	2.625	3	H-0002	2H01S	H-0002-BE	2H01B
	1/16	0.0625	0.2733	3/8	0.375	3/4	0.750	2 7/8	2.875		H-003	2H02S	H-003-BE	2H02B
			0.3436	3/8	0.375	1	1.000	2 7/8	2.875		H-004	2H03S	H-004-BE	2H03B
			0.4139	3/8	0.375	1 1/4	1.250	3 1/8	3.125		H-005	2H04S	H-005-BE	2H04B
			0.4841	3/8	0.375	1 1/2	1.500	3 1/2	3.500		H-006	2H05S	H-006-BE	2H05B
	3/32	0.0938	0.3046	3/8	0.375	3/4	0.750	2 5/8	2.625		H-103	2H06S	H-103-BE	2H06B
			0.3748	3/8	0.375	1	1.000	2 7/8	2.875		H-104	2H07S	H-104-BE	2H07B
	1/8	0.1250	0.3358	3/8	0.375	3/4	0.750	3	3.000		H-203	2H08S	H-203-BE	2H08B
			0.4061	3/8	0.375	1	1.000	3	3.000		H-204	2H09S	H-204-BE	2H09B
			0.6872	5/8	0.625	2	2.000	4	4.000		H-208	2H10S	H-208-BE	2H10B
	1/4	0.2500	0.4608	1/2	0.500	3/4	0.750	2 7/8	2.875		H-403	2H11S	H-403-BE	2H11B
			0.8122	3/4	0.750	2	2.000	4 1/8	4.125		H-408	2H12S	H-408-BE	2H12B
	3/8	0.3750	0.5858	1/2	0.500	3/4	0.750	2 3/4	2.750		H-603	2H13S	H-603-BE	2H13B
	1/2	0.5000	0.7108	5/8	0.625	3/4	0.750	2 7/8	2.875		H-803	2H14S	H-803-BE	2H14B

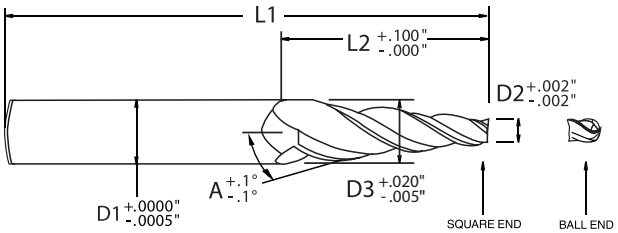
CONICAL TAPERED HSS

SERIES THX - *HIGH SPEED STEEL, 3 & 4 FLUTE, 25 - 30° VARIABLE LEAD HELIX*

THE PERFECT CHOICE

The perfect choice for easy and medium to machine materials or applications with minor machining requirements. Reduces significant fixturing time, combines multiple operations into one and creates parts that were previously impossible to machine.

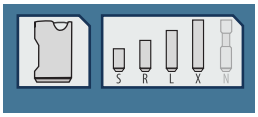
- Standard square end to create sharp corners in finishing operations
- Ball end option for high performance contour milling in finishing operations. Available in 24 to 48 hours
- Constant spiral helix provides increased tool engagement and rigidity
- Variable Core Design maximizes chip evacuation and provides increased rigidity when the cutter is fully engaged



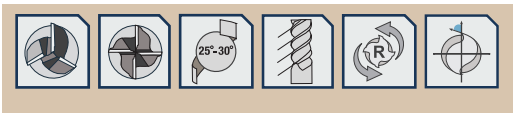
To order a corner radius, use code "CR" & actual radius in the part number. For example, a standard AX-203 would be ordered as AX-203-CR-015, with "015" being the radius.

TIP & END

SHANK & LENGTH



FLUTE CONFIGURATION



MATERIAL

COATING

SERIES TH10D - *10 DEGREE, VARYING LENGTHS*

ANGLE PER SIDE (A)	TIP DIAMETER (D2)		LARGE DIAMETER (D3)	SHANK DIAMETER (D1)		FLUTE LENGTH (L2)		OVERALL LENGTH (L1)		# OF FLUTES	SQUARE END PART #	SQUARE END EDP #	BALL END PART #	BALL END EDP #
10.0°	1/32	0.0313	0.2957	3/8	0.375	3/4	0.750	2 7/8	2.875	3	J-0003	2J01S	J-0003-BE	2J01B
	1/16	0.0625	0.4152	3/8	0.375	1	1.000	2 7/8	2.875	3	J-004	2J02S	J-004-BE	2J02B
	3/32	0.0938	0.2701	3/8	0.375	1/2	0.500	2 5/8	2.625	3	J-102	2J03S	J-102-BE	2J03B
			0.3582	3/8	0.375	3/4	0.750	2 7/8	2.875	3	J-103	2J04S	J-103-BE	2J04B
			0.6227	1/2	0.500	1 1/2	1.500	3 1/2	3.500	3	J-106	2J05S	J-106-BE	2J05B
	1/8	0.1250	0.3895	3/8	0.375	3/4	0.750	2 7/8	2.875	3	J-203	2J06S	J-203-BE	2J06B
			0.5658	1/2	0.500	1 1/4	1.250	3 1/4	3.250	3	J-205	2J07S	J-205-BE	2J07B
			0.6540	1/2	0.500	1 1/2	1.500	3 5/8	3.625	3	J-206	2J08S	J-206-BE	2J08B
	3/16	0.1875	0.6283	1/2	0.500	1 1/4	1.250	3 1/4	3.250	3	J-305	2J09S	J-305-BE	2J09B
			0.9810	3/4	0.750	2 1/4	2.250	4 1/2	4.500	3	J-309	2J10S	J-309-BE	2J10B
	1/4	0.2500	0.5145	1/2	0.500	3/4	0.750	2 7/8	2.875	3	J-403	2J11S	J-403-BE	2J11B
			0.6908	1/2	0.500	1 1/4	1.250	3 1/4	3.250	3	J-405	2J12S	J-405-BE	2J12B
			1.0435	3/4	0.750	2 1/4	2.250	4 1/2	4.500	4	J-409	2J13S	J-409-BE	2J13B
			1.3961	1	1.000	3 1/4	3.250	5 3/4	5.750	4	J-413	2J14S	J-413-BE	2J14B
	3/8	0.3750	0.8158	5/8	0.625	1 1/4	1.250	3 1/2	3.500	3	J-605	2J15S	J-605-BE	2J15B
			1.1685	1	1.000	2 1/4	2.250	4 5/8	4.625	3	J-609	2J16S	J-609-BE	2J16B
			1.5211	1 1/4	1.250	3 1/4	3.250	5 3/4	5.750	4	J-613	2J17S	J-613-BE	2J17B
	1/2	0.5000	0.9408	3/4	0.750	1 1/4	1.250	3 1/2	3.500	3	J-805	2J18S	J-805-BE	2J18B
			1.2935	1	1.000	2 1/4	2.250	4 3/4	4.750	3	J-809	2J19S	J-809-BE	2J19B
			1.6461	1 1/4	1.250	3 1/4	3.250	6	6.000	4	J-813	2J20S	J-813-BE	2J20B
			1.9106	1 1/4	1.250	4	4.000	6 1/2	6.500	4	J-816	2J21S	J-816-BE	2J21B

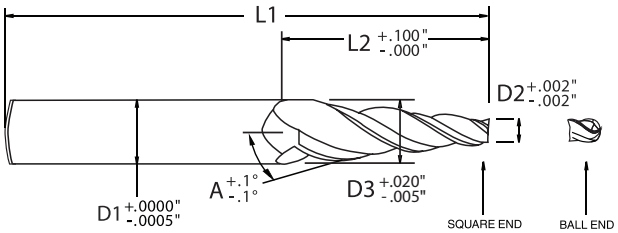
CONICAL TAPERED HSS

SERIES THX - *HIGH SPEED STEEL, 3 & 4 FLUTE, 25 - 30° VARIABLE LEAD HELIX*

ELIMINATE COSTLY PROGRAMMING

Having the ability to cut setup time and eliminate costly programming, while maximizing production rates, may seem too good to be true. Our customers can testify to the fact that the Conical Tapered end mill does just that.

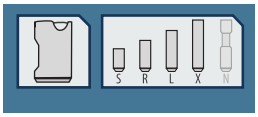
- Corner radius option protects corners in roughing operations and difficult to machine materials by preventing corner chipping and tool failure. Available in 24 to 48 hours
- Multi-flute, three and four flute design allows for proper chip evacuation through a variety of materials and applications while maximizing machine performance when possible
- Premium high speed steel improves rigidity, hardness and wear resistance for milling of easy to medium machinability materials



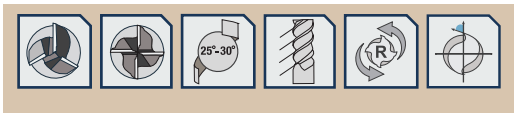
To order a corner radius, use code "CR" & actual radius in the part number. For example, a standard AX-203 would be ordered as AX-203-CR-015, with "015" being the radius.

TIP & END

SHANK & LENGTH



FLUTE CONFIGURATION



MATERIAL

COATING

SERIES TH11D - *11 DEGREE, VARYING LENGTHS*

ANGLE PER SIDE (A)	TIP DIAMETER (D2)		LARGE DIAMETER (D3)	SHANK DIAMETER (D1)		FLUTE LENGTH (L2)		OVERALL LENGTH (L1)		# OF FLUTES	SQUARE END PART #	SQUARE END EDP #	BALL END PART #	BALL END EDP #
11.0°	1/32	0.0313	0.3228	3/8	0.375	3/4	0.750	2 7/8	2.875	3	K-0003	2K01S	K-0003-BE	2K01B
	1/16	0.0625	0.3541	3/8	0.375	3/4	0.750	2 7/8	2.875		K-003	2K02S	K-003-BE	2K02B
			0.4513	3/8	0.375	1	1.000	2 7/8	2.875		K-004	2K03S	K-004-BE	2K03B
	3/32	0.0938	0.3367	3/8	0.375	5/8	0.625	2 7/8	2.875		K-103	2K04S	K-103-BE	2K04B

SERIES TH12D - *12 DEGREE, VARYING LENGTHS*

ANGLE PER SIDE (A)	TIP DIAMETER (D2)		LARGE DIAMETER (D3)	SHANK DIAMETER (D1)		FLUTE LENGTH (L2)		OVERALL LENGTH (L1)		# OF FLUTES	SQUARE END PART #	SQUARE END EDP #	BALL END PART #	BALL END EDP #
12.0°	3/32	0.0938	0.4126	3/8	0.375	3/4	0.750	2 7/8	2.875	3	L-103	2L01S	L-103-BE	2L01B
	1/8	0.1250	0.6564	1/2	0.500	1 1/4	1.250	3 1/8	3.125		L-205	2L02S	L-205-BE	2L02B
	1/4	0.2500	0.8877	5/8	0.625	1 1/2	1.500	3 5/8	3.625		L-406	2L03S	L-406-BE	2L03B
			1.2065	1	1.000	2 1/4	2.250	4 1/2	4.500	4	L-409	2L04S	L-409-BE	2L04B

SERIES TH13D - *13 DEGREE, VARYING LENGTHS*

ANGLE PER SIDE (A)	TIP DIAMETER (D2)		LARGE DIAMETER (D3)	SHANK DIAMETER (D1)		FLUTE LENGTH (L2)		OVERALL LENGTH (L1)		# OF FLUTES	SQUARE END PART #	SQUARE END EDP #	BALL END PART #	BALL END EDP #
13.0°	1/4	0.2500	1.7506	1 1/4	1.250	3 1/4	3.250	5 3/4	5.750	4	M-413	2M01S	M-413-BE	2M01B

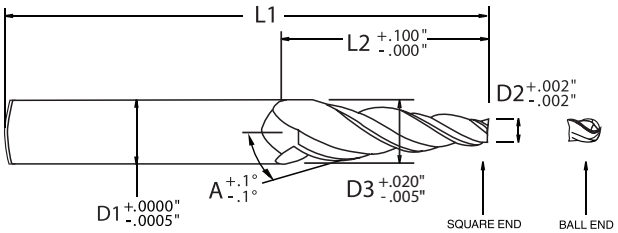
CONICAL TAPERED HSS

SERIES THX - *HIGH SPEED STEEL, 3 & 4 FLUTE, 25 - 30° VARIABLE LEAD HELIX*

99.8% IN STOCK STATUS

A wide variety of configurations perform in finish milling of draft angles and slotting tapered walls, in most materials. Average 99.8% in stock status.

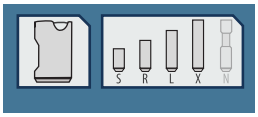
- Universal design allows for a multitude of applications, from slotting to finishing
- Uncoated for versatility. More than 16 available coatings can be added to increase tool life for your specific application and material
- Ball end option for high performance contour milling in finishing operations. Available in 24 to 48 hours



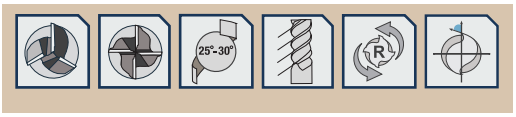
To order a corner radius, use code "CR" & actual radius in the part number. For example, a standard AX-203 would be ordered as AX-203-CR-015, with "015" being the radius.

TIP & END

SHANK & LENGTH



FLUTE CONFIGURATION



MATERIAL

COATING

SERIES TH15D - *15 DEGREE, VARYING LENGTHS*

ANGLE PER SIDE (A)	TIP DIAMETER (D2)		LARGE DIAMETER (D3)	SHANK DIAMETER (D1)		FLUTE LENGTH (L2)		OVERALL LENGTH (L1)		# OF FLUTES	SQUARE END PART #	SQUARE END EDP #	BALL END PART #	BALL END EDP #
15.0°	1/32	0.0313	0.4332	1/2	0.500	3/4	0.750	2 3/4	2.750	3	P-0003	2P01S	P-0003-BE	2P01B
	1/16	0.0625	0.4644	1/2	0.500	3/4	0.750	2 3/4	2.750		P-003	2P02S	P-003-BE	2P02B
	3/32	0.0938	0.4957	1/2	0.500	3/4	0.750	2 3/4	2.750		P-103	2P03S	P-103-BE	2P03B
			0.8976	3/4	0.750	1 1/2	1.500	3 3/4	3.750		P-106	2P04S	P-106-BE	2P04B
	1/8	0.1250	0.3930	3/8	0.375	1/2	0.500	2 7/8	2.875		P-202	2P05S	P-202-BE	2P05B
			0.6609	1/2	0.500	1	1.000	3	3.000		P-204	2P06S	P-204-BE	2P06B
	3/16	0.1875	0.7234	1/2	0.500	1	1.000	3	3.000		P-304	2P07S	P-304-BE	2P07B
			0.8574	3/4	0.750	1 1/4	1.250	3 1/2	3.500	4	P-305	2P08S	P-305-BE	2P08B
			1.2593	1	1.000	2	2.000	4 1/2	4.500	3	P-308	2P09S	P-308-BE	2P09B
	1/4	0.2500	0.7859	1/2	0.500	1	1.000	3	3.000	4	P-404	2P10S	P-404-BE	2P10B
			1.0539	3/4	0.750	1 1/2	1.500	3 3/4	3.750		P-406	2P11S	P-406-BE	2P11B
			1.4558	1	1.000	2 1/4	2.250	4 3/4	4.750		P-409	2P12S	P-409-BE	2P12B
			1.9917	1 1/4	1.250	3 1/4	3.250	5 3/4	5.750		P-413	2P13S	P-413-BE	2P13B
	5/16	0.3125	0.8484	3/4	0.750	1	1.000	3 1/4	3.250		P-504	2P14S	P-504-BE	2P14B
			1.1164	3/4	0.750	1 1/2	1.500	3 3/4	3.750		P-506	2P15S	P-506-BE	2P15B
	3/8	0.3750	1.0449	3/4	0.750	1 1/4	1.250	3 5/8	3.625		P-605	2P16S	P-605-BE	2P16B
			1.5808	1 1/4	1.250	2 1/4	2.250	4 3/4	4.750		P-609	2P17S	P-609-BE	2P17B
	1/2	0.5000	1.1699	3/4	0.750	1 1/4	1.250	3 1/2	3.500		P-805	2P18S	P-805-BE	2P18B
			1.4378	1	1.000	1 3/4	1.750	4 1/4	4.250		P-807	2P19S	P-807-BE	2P19B
			1.7058	1 1/4	1.250	2 1/4	2.250	4 3/4	4.750		P-809	2P20S	P-809-BE	2P20B
			2.2417	1 1/4	1.250	3 1/4	3.250	6	6.000		P-813	2P21S	P-813-BE	2P21B

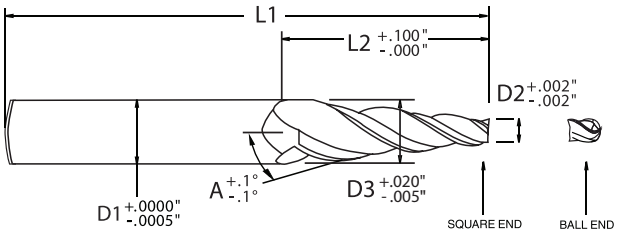
CONICAL TAPERED HSS

SERIES THX - *HIGH SPEED STEEL, 3 & 4 FLUTE, 25 - 30° VARIABLE LEAD HELIX*

FACILITATING CHIP DISPOSAL

Employing the three or four flute design facilitates chip disposal and maximizes feed rates, which brings your work closer to completion with every rotation of the tool.

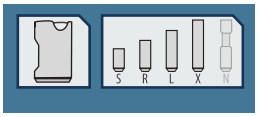
- Standard square end to create sharp corners in finishing operations
- Ball end option for high performance contour milling in finishing operations. Available in 24 to 48 hours
- Constant spiral helix provides increased tool engagement and rigidity
- Variable Core Design maximizes chip evacuation and provides increased rigidity when the cutter is fully engaged



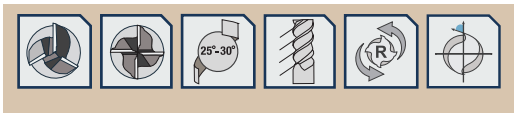
To order a corner radius, use code "CR" & actual radius in the part number. For example, a standard AX-203 would be ordered as AX-203-CR-015, with "015" being the radius.

TIP & END

SHANK & LENGTH



FLUTE CONFIGURATION



MATERIAL

COATING

SERIES TH20D - *20 DEGREE, VARYING LENGTHS*

ANGLE PER SIDE (A)	TIP DIAMETER (D2)		LARGE DIAMETER (D3)	SHANK DIAMETER (D1)		FLUTE LENGTH (L2)		OVERALL LENGTH (L1)		# OF FLUTES	SQUARE END PART #	SQUARE END EDP #	BALL END PART #	BALL END EDP #
20.0°	1/32	0.0313	0.3952	3/8	0.375	1/2	0.500	2 1/2	2.500	3	T-0002	2T01S	T-0002-BE	2T01B
	1/16	0.0625	0.4265	3/8	0.375	1/2	0.500	2 1/2	2.500		T-002	2T02S	T-002-BE	2T02B
	3/32	0.0938	0.6397	1/2	0.500	3/4	0.750	2 3/4	2.750		T-103	2T03S	T-103-BE	2T03B
	1/8	0.1250	0.4890	3/8	0.375	1/2	0.500	2 1/2	2.500		T-202	2T04S	T-202-BE	2T04B
			0.8529	1/2	0.500	1	1.000	3	3.000	4	T-204	2T05S	T-204-BE	2T05B
	3/16	0.1875	0.9154	1/2	0.500	1	1.000	3	3.000		T-304	2T06S	T-304-BE	2T06B
	1/4	0.2500	0.9779	1/2	0.500	1	1.000	3	3.000		T-404	2T07S	T-404-BE	2T07B
			1.3419	3/4	0.750	1 1/2	1.500	4	4.000		T-406	2T08S	T-406-BE	2T08B
	5/16	0.3125	1.0404	3/4	0.750	1	1.000	3 3/8	3.375		T-504	2T09S	T-504-BE	2T09B
			1.4044	3/4	0.750	1 1/2	1.500	3 1/2	3.500		T-506	2T10S	T-506-BE	2T10B
	3/8	0.3750	1.4669	3/4	0.750	1 1/2	1.500	4	4.000		T-606	2T11S	T-606-BE	2T11B
			1.8309	1	1.000	2	2.000	4 1/2	4.500		T-608	2T12S	T-608-BE	2T12B
	1/2	0.5000	2.1379	1 1/4	1.250	2 1/4	2.250	4 3/4	4.750		T-809	2T13S	T-809-BE	2T13B

SURFACE TREATMENTS & COATINGS

SELECT ADVANCED SPECIALTY COATING

SELECTING YOUR COATING

Certain applications, materials or performances simply require the enhancement of a specialty coating and knowledge of the properties of the coatings available. Temperature, friction resistance, hardness, lubricity, toughness and cohesion of the resulting process must be examined prior to the selection.

UNC	TiN	TiCN	TiAlN-X	AlTiN-X	AlTiN Si3N4	AlCrN Si3N4	ZrN	TiB2	DIA
UNCOATED	TITANIUM NITRIDE	TITANIUM CARBON NITRIDE	TITANIUM ALUMINUM NITRIDE NANO	ALUMINUM TITANIUM NITRIDE NANO	ALUMINUM TITANIUM NITRIDE/ SILICON NITRIDE	ALUMINUM CHROMIUM NITRIDE NANO	ZIRCONIUM NITRIDE	TITANIUM DIBORIDE	AMORPHOUS DIAMOND & CVD

SEE PAGES 42 - 44 FOR DETAILS

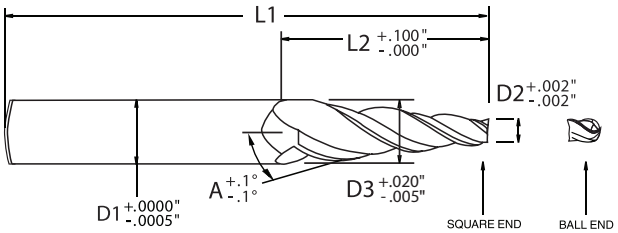
CONICAL TAPERED HSS

SERIES THX - *HIGH SPEED STEEL, 3 & 4 FLUTE, 25 - 30° VARIABLE LEAD HELIX*

UNIQUE MACHINING CHALLENGES

With the widest selection of high speed steel tapered end mills available and an average 99.8% in stock status, the Conical Tapered High Speed Steel end mill is the go-to tool for unique machining challenges.

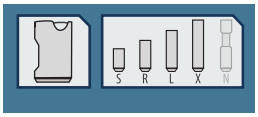
- Corner radius option protects corners in roughing operations and difficult to machine materials by preventing corner chipping and tool failure. Available in 24 to 48 hours
- Multi-flute, three and four flute design allows for proper chip evacuation through a variety of materials and applications while maximizing machine performance when possible
- Premium high speed steel improves rigidity, hardness and wear resistance for milling of easy to medium machinability materials



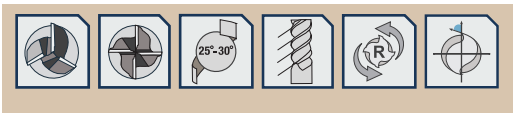
To order a corner radius, use code "CR" & actual radius in the part number. For example, a standard AX-203 would be ordered as AX-203-CR-015, with "015" being the radius.

TIP & END

SHANK & LENGTH



FLUTE CONFIGURATION



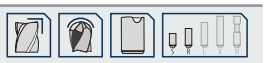
MATERIAL

COATING

SERIES TH25D - *25 DEGREE, VARYING LENGTHS*

ANGLE PER SIDE (A)	TIP DIAMETER (D2)		LARGE DIAMETER (D3)	SHANK DIAMETER (D1)		FLUTE LENGTH (L2)		OVERALL LENGTH (L1)		# OF FLUTES	SQUARE END PART #	SQUARE END EDP #	BALL END PART #	BALL END EDP #
25.0°	3/32	0.0938	0.7932	1/2	0.500	3/4	0.750	3	3.000	3	R-103	2R01S	R-103-BE	2R01B
	1/8	0.1250	0.5913	1/2	0.500	1/2	0.500	2 1/2	2.500		R-202	2R02S	R-202-BE	2R02B
			1.0576	5/8	0.625	1	1.000	3	3.000	4	R-204	2R03S	R-204-BE	2R03B
	1/4	0.2500	1.1826	5/8	0.625	1	1.000	3 1/4	3.250		R-404	2R04S	R-404-BE	2R04B
			1.6489	3/4	0.750	1 1/2	1.500	3 3/4	3.750		R-406	2R05S	R-406-BE	2R05B
	5/16	0.3125	1.0120	5/8	0.625	3/4	0.750	3	3.000		R-503	2R06S	R-503-BE	2R06B
			1.2451	3/4	0.750	1	1.000	3 1/2	3.500		R-504	2R07S	R-504-BE	2R07B
			1.7114	1	1.000	1 1/2	1.500	4	4.000		R-506	2R08S	R-506-BE	2R08B
	3/8	0.3750	1.0745	5/8	0.625	3/4	0.750	3	3.000		R-603	2R09S	R-603-BE	2R09B
			1.3076	3/4	0.750	1	1.000	3 1/4	3.250		R-604	2R10S	R-604-BE	2R10B
			1.7739	1	1.000	1 1/2	1.500	4	4.000		R-606	2R11S	R-606-BE	2R11B
	1/2	0.5000	1.6658	1	1.000	1 1/4	1.250	3 3/4	3.750		R-805	2R12S	R-805-BE	2R12B

SERIES TH30D - *30 DEGREE, VARYING LENGTHS*



ANGLE PER SIDE (A)	TIP DIAMETER (D2)		LARGE DIAMETER (D3)	SHANK DIAMETER (D1)		FLUTE LENGTH (L2)		OVERALL LENGTH (L1)		# OF FLUTES	SQUARE END PART #	SQUARE END EDP #	BALL END PART #	BALL END EDP #
30.0°	1/16	0.0625	0.6399	1/2	0.500	1/2	0.500	2 1/2	2.500	3	U-002A	2U01S	U-002A-BE	2U01B
			0.6399	3/8	0.375	1/2	0.500	2 1/2	2.500		U-002B	2U02S	U-002B-BE	2U02B
	3/32	0.0938	0.9598	1/2	0.500	3/4	0.750	2 3/4	2.750		U-103	2U03S	U-103-BE	2U03B
	1/8	0.1250	0.7024	1/2	0.500	1/2	0.500	2 1/2	2.500	4	U-202	2U04S	U-202-BE	2U04B
			1.2797	5/8	0.625	1	1.000	3 1/8	3.125		U-204A	2U05S	U-204A-BE	2U05B
			1.2797	1/2	0.500	1	1.000	3 1/8	3.125		U-204B	2U06S	U-204B-BE	2U06B
	1/4	0.2500	1.4047	3/4	0.750	1	1.000	3 1/2	3.500		U-404	2U07S	U-404-BE	2U07B
			1.9821	1	1.000	1 1/2	1.500	4 1/8	4.125		U-406	2U08S	U-406-BE	2U08B
	3/8	0.3750	1.8184	1	1.000	1 1/4	1.250	4	4.000		U-605	2U09S	U-605-BE	2U09B
			2.1071	1	1.000	1 1/2	1.500	4 1/4	4.250		U-606	2U10S	U-606-BE	2U10B
	1/2	0.5000	1.9434	1	1.000	1 1/4	1.250	4	4.000		U-805	2U11S	U-805-BE	2U11B
			2.2321	1	1.000	1 1/2	1.500	4 1/4	4.250		U-806	2U12S	U-806-BE	2U12B

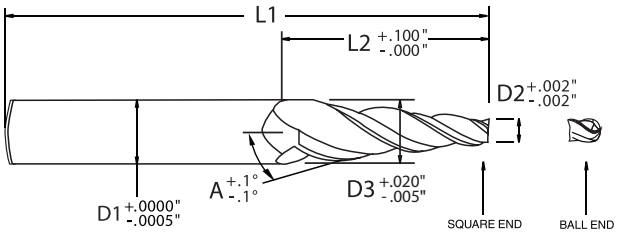
CONICAL TAPERED HSS

SERIES THX - *HIGH SPEED STEEL, 3 & 4 FLUTE, 25 - 30° VARIABLE LEAD HELIX*

EASY AND MEDIUM MACHINABILITY MATERIALS

Whether machining draft angles, or chamfers in easy and medium machinability materials, the universal design allows for a multitude of applications, which include slotting and finishing.

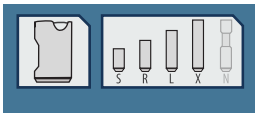
- Universal design allows for a multitude of applications, from slotting to finishing
- Uncoated for versatility. More than 16 available coatings can be added to increase tool life for your specific application and material
- Ball end option for high performance contour milling in finishing operations. Available in 24 to 48 hours



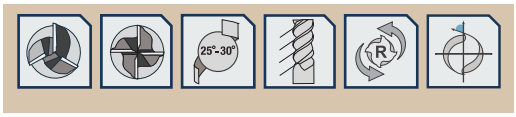
To order a corner radius, use code "CR" & actual radius in the part number. For example, a standard AX-203 would be ordered as AX-203-CR-015, with "015" being the radius.

TIP & END

SHANK & LENGTH



FLUTE CONFIGURATION



MATERIAL

COATING

SERIES TH35D - *35 DEGREE, VARYING LENGTHS*

ANGLE PER SIDE (A)	TIP DIAMETER (D2)		LARGE DIAMETER (D3)	SHANK DIAMETER (D1)		FLUTE LENGTH (L2)		OVERALL LENGTH (L1)		# OF FLUTES	SQUARE END PART #	SQUARE END EDP #	BALL END PART #	BALL END EDP #
35.0°	1/8	0.1250	1.1753	1/2	0.500	3/4	0.750	3	3.000	4	V-203	2V01S	V-203-BE	2V01B
	1/4	0.2500	1.6504	1	1.000	1	1.000	3 1/4	3.250		V-404	2V02S	V-404-BE	2V02B

SERIES TH40D - *40 DEGREE, VARYING LENGTHS*

ANGLE PER SIDE (A)	TIP DIAMETER (D2)		LARGE DIAMETER (D3)	SHANK DIAMETER (D1)		FLUTE LENGTH (L2)		OVERALL LENGTH (L1)		# OF FLUTES	SQUARE END PART #	SQUARE END EDP #	BALL END PART #	BALL END EDP #
40.0°	1/8	0.1250	1.8030	1	1.000	1	1.000	3 5/8	3.625	4	X-204	2X01S	X-204-BE	2X01B
	1/4	0.2500	1.9280	1	1.000	1	1.000	3 5/8	3.625		X-404	2X02S	X-404-BE	2X02B

SERIES TH45D - *45 DEGREE, VARYING LENGTHS*

ANGLE PER SIDE (A)	TIP DIAMETER (D2)		LARGE DIAMETER (D3)	SHANK DIAMETER (D1)		FLUTE LENGTH (L2)		OVERALL LENGTH (L1)		# OF FLUTES	SQUARE END PART #	SQUARE END EDP #	BALL END PART #	BALL END EDP #
45.0°	1/8	0.1250	0.7500	1/2	0.500	5/16	0.313	2 5/8	2.625	4	WA-215	2W01S	WA-215-BE	2W01B
			0.7500	1/2	0.500	5/16	0.313	2 5/8	2.625		WA-215SP	2W02S	WA-215SP-BE	2W02B
			1.6250	5/8	0.625	3/4	0.750	3 1/4	3.250		WA-203	2W03S	WA-203-BE	2W03B
			1.6250	5/8	0.625	3/4	0.750	3 1/4	3.250		WA-203SP	2W04S	WA-203SP-BE	2W04B
			2.1250	3/4	0.750	1	1.000	3 3/4	3.750		WA-204B	2W05S	WA-204B-BE	2W05B
			2.1250	3/4	0.750	1	1.000	3 3/4	3.750		WA-204BSP	2W06S	WA-204BSP-BE	2W06B
			2.1250	1	1.000	1	1.000	3 3/4	3.750		WA-204A	2W07S	WA-204A-BE	2W07B
			2.1250	1	1.000	1	1.000	3 3/4	3.750		WA-204ASP	2W08S	WA-204ASP-BE	2W08B

THX APPLICATION GUIDE • SPEED & FEED

	WORK MATERIAL	TYPE OF CUT	AXIAL DOC	RADIAL DOC	FLUTES	SPEED (SFM)	FEED (INCHES PER TOOTH) 1/8" (3 & 4 FL)	1/4" (3 & 4 FL)	3/8" (3 & 4 FL)	1/2" (3 & 4 FL)	5/8" (3 & 4 FL)	3/4" (3 & 4 FL)	1" (3 & 4 FL)
CARBON STEEL	LOW CARBON STEELS ≤ 38 HRc 10xx; 11xx; 12xx; 12Lxx, 15xx	Slotting	.5 x D	1 x D	3 / 4	85 - 115	0.0003 - 0.0005	0.0004 - 0.0008	0.0007 - 0.0013	0.0008 - 0.0016	0.0010 - 0.0020	0.0013 - 0.0025	0.0017 - 0.0033
		Roughing	1.5 x D	.3 x D	3 / 4	110 - 145	0.0004 - 0.0008	0.0007 - 0.0012	0.0010 - 0.0018	0.0014 - 0.0024	0.0017 - 0.0030	0.0021 - 0.0036	0.0027 - 0.0048
		Finishing	1.5 x D	.01 x D	3 / 4	140 - 180	0.0005 - 0.0009	0.0009 - 0.0014	0.0014 - 0.0021	0.0018 - 0.0027	0.0023 - 0.0034	0.0027 - 0.0041	0.0036 - 0.0055
	MEDIUM CARBON STEELS ≤ 38 HRc 13xx; 41xx; 43xx; 86xx, 92xx; 93xx; Chromoly	Slotting	.5 x D	1 x D	3 / 4	35 - 45	0.0002 - 0.0004	0.0003 - 0.0007	0.0005 - 0.0011	0.0006 - 0.0014	0.0006 - 0.0016	0.0009 - 0.0021	0.0012 - 0.0028
		Roughing	1.5 x D	.3 x D	3 / 4	45 - 60	0.0003 - 0.0007	0.0005 - 0.0010	0.0007 - 0.0015	0.0010 - 0.0020	0.0012 - 0.0025	0.0015 - 0.0030	0.0019 - 0.0040
		Finishing	1.5 x D	.01 x D	3 / 4	55 - 75	0.0004 - 0.0008	0.0006 - 0.0011	0.0010 - 0.0017	0.0013 - 0.0022	0.0016 - 0.0027	0.0020 - 0.0034	0.0026 - 0.0045
TOOL STEEL	TOOL & DIE STEELS ≤ 38 HRc A2; A3; D2; H11; H13; M1; O-1; S-7; NAK 55	Slotting	.5 x D	1 x D	3 / 4	50 - 65	0.0001 - 0.0003	0.0002 - 0.0006	0.0003 - 0.0009	0.0003 - 0.0011	0.0003 - 0.0013	0.0005 - 0.0017	0.0006 - 0.0022
		Roughing	1.5 x D	.3 x D	3 / 4	60 - 80	0.0002 - 0.0006	0.0003 - 0.0008	0.0004 - 0.0012	0.0006 - 0.0016	0.0007 - 0.0020	0.0009 - 0.0024	0.0011 - 0.0032
		Finishing	1.5 x D	.01 x D	3 / 4	80 - 100	0.0003 - 0.0007	0.0004 - 0.0009	0.0006 - 0.0013	0.0008 - 0.0017	0.0010 - 0.0021	0.0012 - 0.0026	0.0016 - 0.0035
	TOOL & DIE STEELS 39 to 48 HRc P20; P21; S-136; PX-5; NAK 80	Slotting	.5 x D	1 x D	3 / 4	45 - 55	0.0001 - 0.0003	0.0002 - 0.0006	0.0003 - 0.0009	0.0003 - 0.0011	0.0003 - 0.0013	0.0005 - 0.0017	0.0006 - 0.0022
		Roughing	1.5 x D	.3 x D	3 / 4	55 - 70	0.0002 - 0.0006	0.0003 - 0.0008	0.0004 - 0.0012	0.0006 - 0.0016	0.0007 - 0.0020	0.0009 - 0.0024	0.0011 - 0.0032
		Finishing	1.5 x D	.01 x D	3 / 4	70 - 90	0.0003 - 0.0007	0.0004 - 0.0009	0.0006 - 0.0013	0.0008 - 0.0017	0.0010 - 0.0021	0.0012 - 0.0026	0.0016 - 0.0035
HARDENED STEEL	HARDENED STEELS 48 to 57 HRc	Slotting	.5 x D	1 x D	3 / 4	40 - 50	0.0001 - 0.0003	0.0002 - 0.0006	0.0003 - 0.0009	0.0003 - 0.0011	0.0003 - 0.0013	0.0005 - 0.0017	0.0006 - 0.0022
		Roughing	1.5 x D	.25 x D	3 / 4	50 - 65	0.0002 - 0.0006	0.0003 - 0.0008	0.0004 - 0.0012	0.0006 - 0.0016	0.0007 - 0.0020	0.0009 - 0.0024	0.0011 - 0.0032
		Finishing	1.5 x D	.01 x D	3 / 4	60 - 80	0.0003 - 0.0007	0.0004 - 0.0009	0.0006 - 0.0013	0.0008 - 0.0017	0.0010 - 0.0021	0.0012 - 0.0026	0.0016 - 0.0035
	HARDENED STEELS 58 to 65HRc	Slotting	.5 x D	1 x D	3 / 4	35 - 45	0.0001 - 0.0003	0.0002 - 0.0006	0.0003 - 0.0009	0.0003 - 0.0011	0.0003 - 0.0013	0.0005 - 0.0017	0.0006 - 0.0022
		Roughing	1.5 x D	.25 x D	3 / 4	40 - 55	0.0002 - 0.0006	0.0003 - 0.0008	0.0004 - 0.0012	0.0006 - 0.0016	0.0007 - 0.0020	0.0009 - 0.0024	0.0011 - 0.0032
		Finishing	1.5 x D	.01 x D	3 / 4	55 - 70	0.0003 - 0.0007	0.0004 - 0.0009	0.0006 - 0.0013	0.0008 - 0.0017	0.0010 - 0.0021	0.0012 - 0.0026	0.0016 - 0.0035
STAINLESS STEEL	EASY TO MACHINE 72 - 85 HRb 410; 416; 420; 430F; 440C; 302; 303	Slotting	.5 x D	1 x D	3 / 4	65 - 80	0.0003 - 0.0005	0.0005 - 0.0009	0.0008 - 0.0014	0.0010 - 0.0018	0.0011 - 0.0021	0.0015 - 0.0027	0.0019 - 0.0035
		Roughing	1.25 x D	.3 x D	3 / 4	80 - 105	0.0005 - 0.0009	0.0008 - 0.0013	0.0012 - 0.0020	0.0016 - 0.0026	0.0019 - 0.0032	0.0024 - 0.0039	0.0031 - 0.0052
		Finishing	1.5 x D	.01 x D	3 / 4	100 - 130	0.0006 - 0.0010	0.0010 - 0.0015	0.0015 - 0.0022	0.0020 - 0.0029	0.0026 - 0.0037	0.0031 - 0.0045	0.0041 - 0.0060
	MODERATELY DIFFICULT 79 - 85 HRb; 25 - 41 HRc 304; 304L; 316; 316L; 320; 321; 347; Invar 36; Kovar	Slotting	.5 x D	1 x D	3 / 4	55 - 75	0.0003 - 0.0005	0.0004 - 0.0008	0.0007 - 0.0013	0.0008 - 0.0016	0.0010 - 0.0020	0.0013 - 0.0025	0.0017 - 0.0033
		Roughing	1.25 x D	.25 x D	3 / 4	70 - 95	0.0004 - 0.0008	0.0007 - 0.0012	0.0010 - 0.0018	0.0014 - 0.0024	0.0017 - 0.0030	0.0021 - 0.0036	0.0027 - 0.0048
		Finishing	1.5 x D	.01 x D	3 / 4	90 - 120	0.0005 - 0.0009	0.0009 - 0.0014	0.0014 - 0.0021	0.0018 - 0.0027	0.0023 - 0.0034	0.0027 - 0.0041	0.0036 - 0.0055
	DIFFICULT TO MACHINE 31 - 50 HRc 13-8 PH; 15-5 PH; 17-4 PH; Carpenter; Custo 465; Invar	Slotting	.5 x D	1 x D	3 / 4	40 - 55	0.0001 - 0.0003	0.0002 - 0.0006	0.0003 - 0.0009	0.0003 - 0.0011	0.0003 - 0.0013	0.0005 - 0.0017	0.0006 - 0.0022
		Roughing	1.25 x D	.25 x D	3 / 4	50 - 70	0.0002 - 0.0006	0.0003 - 0.0008	0.0004 - 0.0012	0.0006 - 0.0016	0.0007 - 0.0020	0.0009 - 0.0024	0.0011 - 0.0032
		Finishing	1.5 x D	.01 x D	3 / 4	65 - 85	0.0003 - 0.0007	0.0004 - 0.0009	0.0006 - 0.0013	0.0008 - 0.0017	0.0010 - 0.0021	0.0012 - 0.0026	0.0016 - 0.0035
CAST IRON	GRAY 100 - 200 HRb	Slotting	.5 x D	1 x D	3 / 4	65 - 85	0.0003 - 0.0005	0.0006 - 0.0010	0.0009 - 0.0015	0.0011 - 0.0019	0.0013 - 0.0023	0.0017 - 0.0029	0.0022 - 0.0038
		Roughing	1.5 x D	.3 x D	3 / 4	85 - 110	0.0005 - 0.0009	0.0009 - 0.0014	0.0013 - 0.0021	0.0018 - 0.0028	0.0022 - 0.0035	0.0027 - 0.0042	0.0035 - 0.0056
		Finishing	1.5 x D	.01 x D	3 / 4	105 - 135	0.0006 - 0.0010	0.0011 - 0.0016	0.0017 - 0.0024	0.0023 - 0.0032	0.0029 - 0.0040	0.0035 - 0.0049	0.0046 - 0.0065
	DUCTILE 150 - 300 HRb	Slotting	.5 x D	1 x D	3 / 4	65 - 85	0.0003 - 0.0005	0.0006 - 0.0010	0.0009 - 0.0015	0.0011 - 0.0019	0.0013 - 0.0023	0.0017 - 0.0029	0.0022 - 0.0038
		Roughing	1.5 x D	.3 x D	3 / 4	85 - 110	0.0005 - 0.0009	0.0009 - 0.0014	0.0013 - 0.0021	0.0018 - 0.0028	0.0022 - 0.0035	0.0027 - 0.0042	0.0035 - 0.0056
		Finishing	1.5 x D	.01 x D	3 / 4	105 - 135	0.0006 - 0.0010	0.0011 - 0.0016	0.0017 - 0.0024	0.0023 - 0.0032	0.0029 - 0.0040	0.0035 - 0.0049	0.0046 - 0.0065
	MALLEABLE 150 - 310 HRb	Slotting	.5 x D	1 x D	3 / 4	55 - 75	0.0002 - 0.0004	0.0003 - 0.0007	0.0005 - 0.0011	0.0006 - 0.0014	0.0006 - 0.0016	0.0009 - 0.0021	0.0012 - 0.0028
		Roughing	1.5 x D	.3 x D	3 / 4	70 - 95	0.0003 - 0.0007	0.0005 - 0.0010	0.0007 - 0.0015	0.0010 - 0.0020	0.0012 - 0.0025	0.0015 - 0.0030	0.0019 - 0.0040
		Finishing	1.5 x D	.01 x D	3 / 4	90 - 120	0.0004 - 0.0008	0.0006 - 0.0011	0.0010 - 0.0017	0.0013 - 0.0022	0.0016 - 0.0027	0.0020 - 0.0034	0.0026 - 0.0045
ALLOYS	TITANIUM ALLOYS 70 - 100 HRb; 25 - 36 HRc Ti61AL4V; Grades 5-38	Slotting	.5 x D	1 x D	3 / 4	45 - 60	0.0001 - 0.0003	0.0002 - 0.0006	0.0003 - 0.0009	0.0003 - 0.0011	0.0003 - 0.0013	0.0005 - 0.0017	0.0006 - 0.0022
		Roughing	1.25 x D	.25 x D	3 / 4	60 - 75	0.0002 - 0.0006	0.0003 - 0.0008	0.0004 - 0.0012	0.0006 - 0.0016	0.0007 - 0.0020	0.0009 - 0.0024	0.0011 - 0.0032
		Finishing	1.5 x D	.01 x D	3 / 4	75 - 95	0.0003 - 0.0007	0.0004 - 0.0009	0.0006 - 0.0013	0.0008 - 0.0017	0.0010 - 0.0021	0.0012 - 0.0026	0.0016 - 0.0035
	HIGH TEMP ALLOYS 83 - 99 HRb; 30 - 52 HRc Inconel; Monel; A286; Rene; Stelite; Haynes; Waspalloy; Hastalloy; etc	Slotting	.25 x D	1 x D	3 / 4	10 - 15	0.0001 - 0.0003	0.0002 - 0.0006	0.0003 - 0.0009	0.0003 - 0.0011	0.0003 - 0.0013	0.0005 - 0.0017	0.0006 - 0.0022
		Roughing	1.25 x D	.25 x D	3 / 4	15 - 20	0.0002 - 0.0006	0.0003 - 0.0008	0.0004 - 0.0012	0.0006 - 0.0016	0.0007 - 0.0020	0.0009 - 0.0024	0.0011 - 0.0032
		Finishing	1.5 x D	.01 x D	3 / 4	20 - 25	0.0003 - 0.0007	0.0004 - 0.0009	0.0006 - 0.0013	0.0008 - 0.0017	0.0010 - 0.0021	0.0012 - 0.0026	0.0016 - 0.0035
ALUMINUM	ALUMINUM ALLOYS Low Silicon Content 20xx; 50xx; 60xx; 70xx	Slotting	1 x D	1 x D	3 / 4	380 - 490	0.0004 - 0.0006	0.0007 - 0.0011	0.0011 - 0.0017	0.0014 - 0.0022	0.0016 - 0.0026	0.0020 - 0.0032	0.0027 - 0.0043
		Roughing	1 x D	.3 x D	3 / 4	475 - 615	0.0006 - 0.0010	0.0011 - 0.0016	0.0016 - 0.0024	0.0022 - 0.0032	0.0027 - 0.0040	0.0033 - 0.0048	0.0043 - 0.0064
		Finishing	1.5 x D	.01 x D	3 / 4	595 - 770	0.0008 - 0.0012	0.0014 - 0.0019	0.0021 - 0.0028	0.0028 - 0.0037	0.0035 - 0.0046	0.0042 - 0.0056	0.0056 - 0.0075
	ALUMINUM DIE CAST ALLOY High Silicon Content A-38x; A-39x; B39x	Slotting	.75 x D	1 x D	3 / 4	270 - 350	0.0003 - 0.0005	0.0006 - 0.0010	0.0009 - 0.0015	0.0011 - 0.0019	0.0013 - 0.0023	0.0017 - 0.0029	0.0022 - 0.0038
		Roughing	1 x D	.3 x D	3 / 4	340 - 440	0.0005 - 0.0009	0.0009 - 0.0014	0.0013 - 0.0021	0.0018 - 0.0028	0.0022 - 0.0035	0.0027 - 0.0042	0.0035 - 0.0056
		Finishing	1.5 x D	.01 x D	3 / 4	425 - 550	0.0006 - 0.0010	0.0011 - 0.0016	0.0017 - 0.0024	0.0023 - 0.0032	0.0029 - 0.0040	0.0035 - 0.0049	0.0046 - 0.0065
NONFERROUS	MAGNESIUM ALLOYS ≤ 38 HRc	Slotting	1 x D	1 x D	3 / 4	325 - 420	0.0005 - 0.0007	0.0008 - 0.0012	0.0013 - 0.0019	0.0016 - 0.0024	0.0019 - 0.0029	0.0024 - 0.0036	0.0032 - 0.0048
		Roughing	1 x D	.3 x D	3 / 4	405 - 525	0.0007 - 0.0011	0.0013 - 0.0018	0.0019 - 0.0027	0.0026 - 0.0036	0.0032 - 0.0045	0.0039 - 0.0054	0.0051 - 0.0072
		Finishing	1.5 x D	.01 x D	3 / 4	510 - 660	0.0009 - 0.0013	0.0016 - 0.0021	0.0025 - 0.0032	0.0033 - 0.0042	0.0041 - 0.0052	0.0050 - 0.0064	0.0066 - 0.0085
	COPPER ALLOYS, BRASS & BRONZE 39 to 48 HRc Manganese Bronze, Tin Bronze, Beryllium Copper	Slotting	1 x D	1 x D	3 / 4	270 - 350	0.0003 - 0.0005	0.0005 - 0.0009	0.0008 - 0.0014	0.0010 - 0.0018	0.0011 - 0.0021	0.0015 - 0.0027	0.0019 - 0.0035
		Roughing	1 x D	.3 x D	3 / 4	340 - 440	0.0005 - 0.0009	0.0008 - 0.0013	0.0012 - 0.0020	0.0016 - 0.0026	0.0019 - 0.0032	0.0024 - 0.0039	0.0031 - 0.0052
		Finishing	1.5 x D	.01 x D	3 / 4	425 - 550	0.0006 - 0.0010	0.0010 - 0.0015	0.0015 - 0.0022	0.0020 - 0.0029	0.0026 - 0.0037	0.0031 - 0.0045	0.0041 - 0.0060
	COMPOSITES, PLASTICS & FIBER-GLASS48 to 57 HRc ABS, Polycarbonate, PVC, Polypropylene	Slotting	1 x D	1 x D	3 / 4	270 - 350	0.0003 - 0.0005	0.0005 - 0.0009	0.0008 - 0.0014	0.0010 - 0.0018	0.0011 - 0.0021	0.0015 - 0.0027	0.0019 - 0.0035
		Roughing	1 x D	.3 x D	3 / 4	340 - 440	0.0005 - 0.0009	0.0008 - 0.0013	0.0012 - 0.0020	0.0016 - 0.0026	0.0019 - 0.0032	0.0024 - 0.0039	0.0031 - 0.0052
		Finishing	1.5 x D	.01 x D	3 / 4	425 - 550	0.0006 - 0.0010	0.0010 - 0.0015	0.0015 - 0.0022	0.0020 - 0.0029	0.0026 - 0.0037	0.0031 - 0.0045	0.0041 - 0.0060