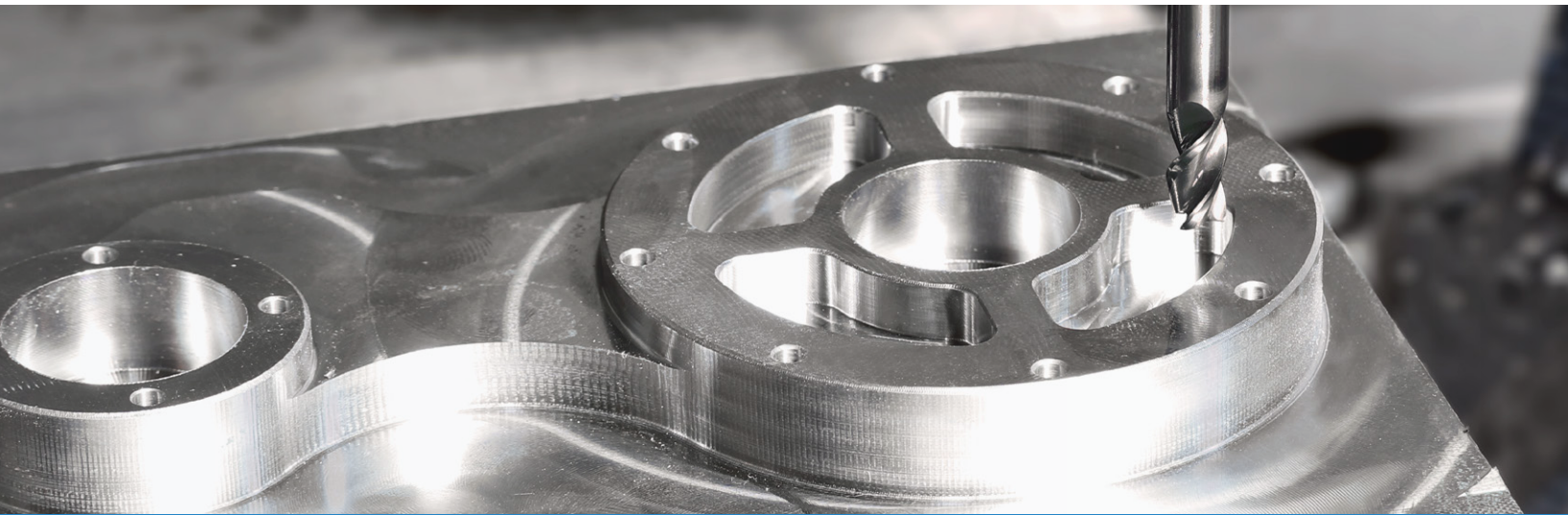




TITAN-AX

High Performance Miniature End Mills



Excellent Chip Evacuation, Long Tool Life, and High Quality Surface Finish

Smoother cutting with better chip evacuation

Deeper pocketing clearance

Ideal for trochoidal milling

Rigid shank diameter construction



TITAN-AX High Performance End Mills

Excellent Chip Evacuation, Long Tool Life, and High Quality Surface Finish
AX™ Performance Coating Technology Extends Tool Life

Kyocera has developed the TITAN-AX™ line of end mills for machining materials used in Medical, Microwave, Aerospace and other miniature component industries. Equipped with optimized flute geometries, 3 flutes, and increased shank diameters for maximum rigidity, these coated end mills are engineered for precision using aggressive machining parameters. Material applications for the TITAN-AX™ include Kovar®, Stainless Steel, Titanium, Carpenter 49 as well as other ferrous materials.

1 TITAN-AX Features

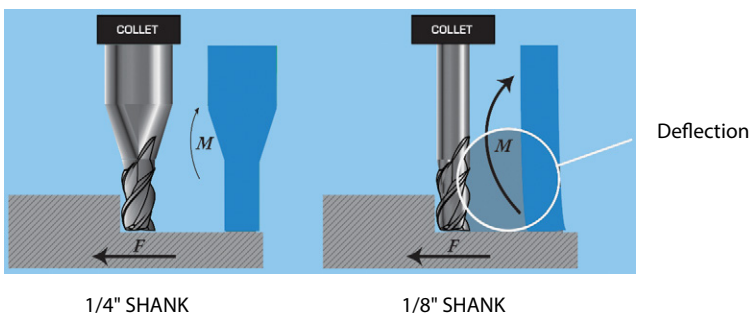
- 3 Flute Optimized Geometry
- Sharp & Corner Radius (Bull Nose)
- AX™ Coating Technology
- Diameter Tolerance $+0 / -.0008"$
- Increased Shank Diameters for Maximum Rigidity
- Long Reach Reduced Neck Design
- Variable Helix

2 TITAN-AX Benefits

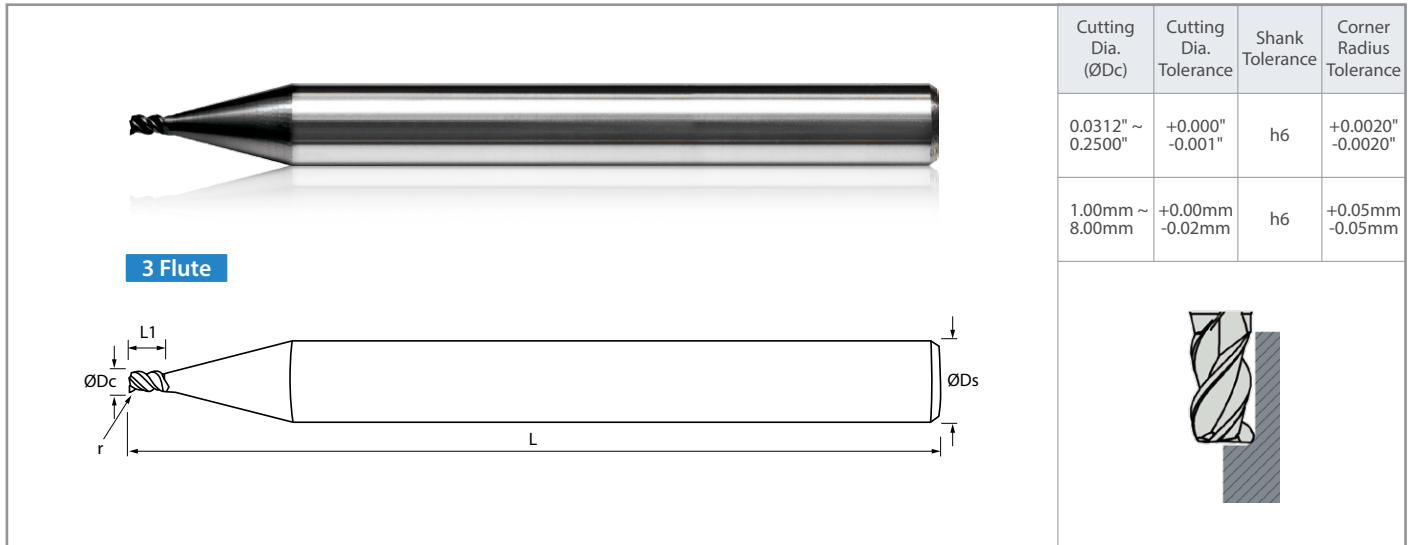
- Smoother Cutting with Better Chip Evacuation
- Corner Radii Programmable for 3D Surfacing
- Better Life and Finishes
- Consistent Part Size and Surface Finish
- Better Clamping Rigidity and T.I.R
- Clearance for Deeper Pocketing Applications
- Ideal for Trochoidal Milling Parts

AX™ Performance Coating Technology Extends Tool Life

3 Rigid Shank Diameter Construction



1/4" Diameter shank construction minimizes tool deflection compared to similar cutting diameter on 1/8" shanks. This reduction in deflection from the point of cutting to the collet is due to increased mass. Less deflection means better part consistency, reduced tool breakage, and improved tool life.



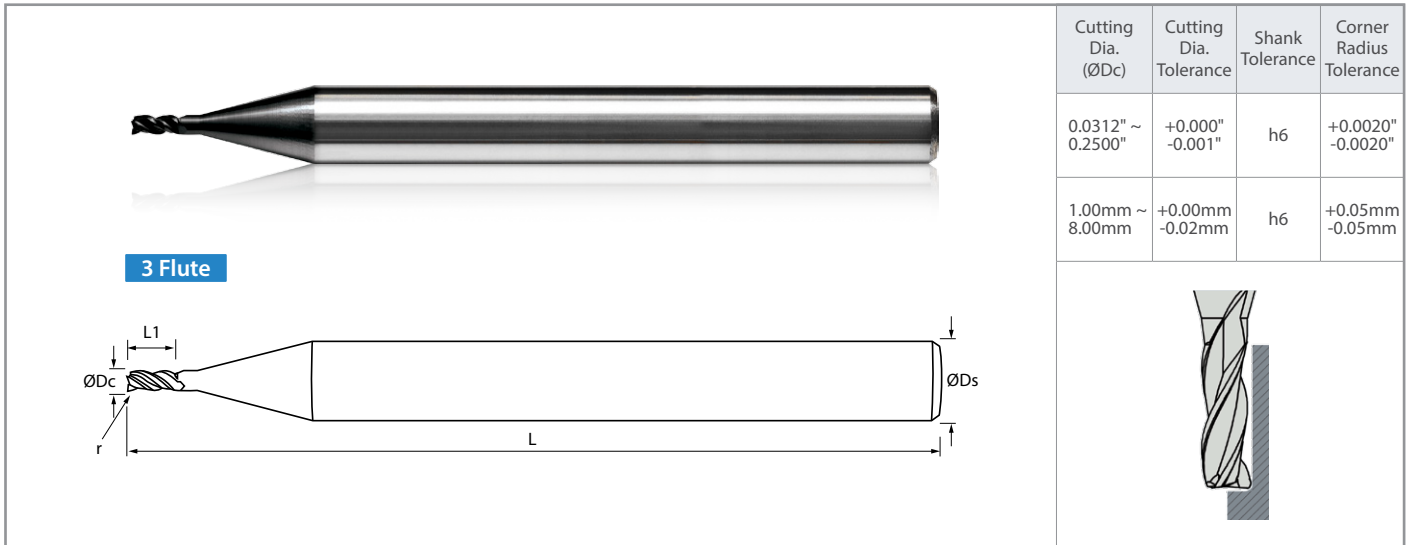
Inch Size Dimensions

Part Number	Stock	Dimensions (in)				
		ØDc	ØDs	L	L1	r
T0312O063CR	●	0.0312 (1/32)	1/4	2 1/2	0.063	0.006
T0469O094CR	●	0.0469 (3/64)			0.094	0.010
T0625O140CR	●	0.0625 (1/16)			0.140	0.010
T0781O140CR	●	0.0781 (5/64)			0.140	0.010
T0938O188CR	●	0.0938 (3/32)			0.188	0.010
T1094O188CR	●	0.1094 (7/64)			0.188	0.010
T1250O250CR	●	0.1250 (1/8)			0.250	0.015
T1562O375CR	●	0.1562 (5/32)			0.375	0.015
T1875O375CR	●	0.1875 (3/16)			0.375	0.015
T2188O375CR	●	0.2188 (7/32)			0.375	0.015
T2500O500CR	●	0.2500 (1/4)			0.500	0.015

Metric Size Dimensions

Part Number	Stock	Dimensions (mm)				
		ØDc	ØDs	L	L1	r
T0394O059CR1	●	1.00	6	63.5	1.5	0.10
T0394O059CR2	●	1.00			1.5	0.20
T0394O059CR3	●	1.00			1.5	0.30
T0591O098CR1	●	1.50			2.5	0.10
T0591O098CR2	●	1.50			2.5	0.20
T0591O098CR3	●	1.50			2.5	0.30
T0591O098CR4	●	1.50			2.5	0.50
T0787O118CR1	●	2.00			3.0	0.20
T0787O118CR2	●	2.00			3.0	0.30
T0787O118CR3	●	2.00			3.0	0.50
T0984O157CR1	●	2.50			4.0	0.20
T0984O157CR2	●	2.50			4.0	0.30
T0984O157CR3	●	2.50			4.0	0.50
T1181O197CR1	●	3.00			5.0	0.20
T1181O197CR2	●	3.00			5.0	0.30
T1181O197CR3	●	3.00			5.0	0.50
T1181O197CR4	●	3.00			5.0	1.00
T1575O236CR1	●	4.00			6.0	0.20
T1575O236CR2	●	4.00			6.0	0.30
T1575O236CR3	●	4.00			6.0	0.50
T1575O236CR4	●	4.00			6.0	1.00
T1969O315CR1	●	5.00			8.0	0.20
T1969O315CR2	●	5.00			8.0	0.30
T1969O315CR3	●	5.00			8.0	0.50
T1969O315CR4	●	5.00			8.0	1.00
T1969O315CR5	●	5.00			8.0	1.50
T2362O354CR1	●	6.00			9.0	0.20
T2362O354CR2	●	6.00			9.0	0.30
T2362O354CR3	●	6.00			9.0	0.50
T2362O354CR4	●	6.00			9.0	1.00
T2362O354CR5	●	6.00	9.0	1.50		
T2362O354CR6	●	6.00	9.0	2.00		
T3150O472CR1	●	8.00	8	63.5	12.0	0.20
T3150O472CR2	●	8.00			12.0	0.30
T3150O472CR3	●	8.00			12.0	0.50
T3150O472CR4	●	8.00			12.0	1.00
T3150O472CR5	●	8.00			12.0	1.50
T3150O472CR6	●	8.00			12.0	2.00

● : U.S. Stock



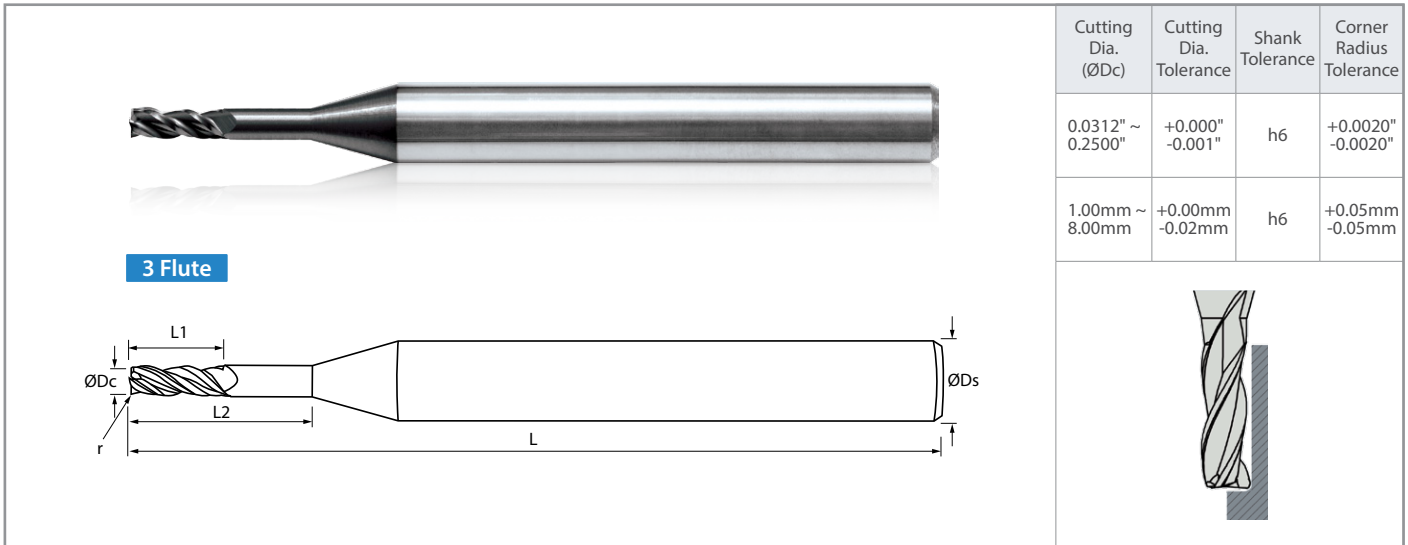
Inch Size Dimensions

Part Number	Stock	Dimensions (in)				
		ØDc	ØDs	L	L1	r
T0312O094CR	●	0.0312 (1/32)	1/4	2 1/2	0.094	0.006
T0469O141CR	●	0.0469 (3/64)			0.141	0.010
T0625O188CR	●	0.0625 (1/16)			0.188	0.010
T0781O234CR	●	0.0781 (5/64)			0.234	0.010
T0938O375CR	●	0.0938 (3/32)			0.375	0.010
T1094O438CR	●	0.1094 (7/64)			0.438	0.010
T1250O500CR	●	0.1250 (1/8)			0.500	0.015
T1562O563CR	●	0.1562 (5/32)			0.563	0.015
T1875O625CR	●	0.1875 (3/16)			0.625	0.015
T2188O625CR	●	0.2188 (7/32)			0.625	0.015
T2500O750CR	●	0.2500 (1/4)			0.750	0.015

Metric Size Dimensions

Part Number	Stock	Dimensions (mm)				
		ØDc	ØDs	L	L1	r
T0394O118CR1	●	1.00	6	63.5	3.0	0.10
T0394O118CR2	●	1.00			3.0	0.20
T0394O118CR3	●	1.00			3.0	0.30
T0591O177CR1	●	1.50			4.5	0.10
T0591O177CR2	●	1.50			4.5	0.20
T0591O177CR3	●	1.50			4.5	0.30
T0591O177CR4	●	1.50			4.5	0.50
T0787O236CR1	●	2.00			6.0	0.20
T0787O236CR2	●	2.00			6.0	0.30
T0787O236CR3	●	2.00			6.0	0.50
T0984O295CR1	●	2.50			7.5	0.20
T0984O295CR2	●	2.50			7.5	0.30
T0984O295CR3	●	2.50			7.5	0.50
T1181O354CR1	●	3.00			9.0	0.20
T1181O354CR2	●	3.00			9.0	0.30
T1181O354CR3	●	3.00			9.0	0.50
T1181O354CR4	●	3.00			9.0	1.00
T1575O472CR1	●	4.00			12.0	0.20
T1575O472CR2	●	4.00			12.0	0.30
T1575O472CR3	●	4.00			12.0	0.50
T1575O472CR4	●	4.00			12.0	1.00
T1969O591CR1	●	5.00			15.0	0.20
T1969O591CR2	●	5.00			15.0	0.30
T1969O591CR3	●	5.00			15.0	0.50
T1969O591CR4	●	5.00			15.0	1.00
T1969O591CR5	●	5.00			15.0	1.50
T2362O709CR1	●	6.00			18.0	0.20
T2362O709CR2	●	6.00			18.0	0.30
T2362O709CR3	●	6.00			18.0	0.50
T2362O709CR4	●	6.00			18.0	1.00
T2362O709CR5	●	6.00	18.0	1.50		
T2362O709CR6	●	6.00	18.0	2.00		
T3150O945CR1	●	8.00	8	63.5	24.0	0.20
T3150O945CR2	●	8.00			24.0	0.30
T3150O945CR3	●	8.00			24.0	0.50
T3150O945CR4	●	8.00			24.0	1.00
T3150O945CR5	●	8.00			24.0	1.50
T3150O945CR6	●	8.00			24.0	2.00

● : U.S. Stock



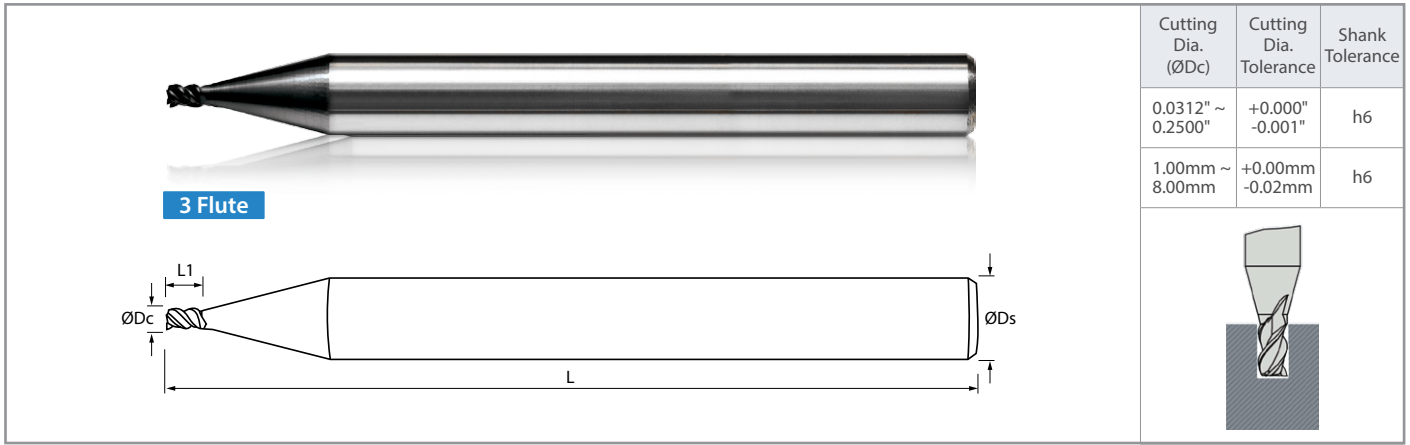
Inch Size Dimensions

Part Number	Stock	Dimensions (in)					
		ØDc	ØDs	L	L1	L2	r
T0312O094ERC	●	0.0312 (1/32)	1/4	2 1/2	0.094	0.155	0.006
T0469O141ERC	●	0.0469 (3/64)			0.141	0.230	0.010
T0625O188ERC	●	0.0625 (1/16)			0.188	0.312	0.010
T0781O234ERC	●	0.0781 (5/64)			0.234	0.390	0.010
T0938O375ERC	●	0.0938 (3/32)			0.375	0.465	0.010
T1094O438ERC	●	0.1094 (7/64)			0.438	0.545	0.010
T1250O500ERC	●	0.1250 (1/8)			0.500	0.625	0.015
T1562O563ERC	●	0.1562 (5/32)			0.563	0.781	0.015
T1875O625ERC	●	0.1875 (3/16)			0.625	0.938	0.015
T2188O625ERC	●	0.2188 (7/32)			0.625	1.093	0.015
T2500O750ERC	●	0.2500 (1/4)			0.750	1.250	0.015

Metric Size Dimensions

Part Number	Stock	Dimensions (mm)					
		ØDc	ØDs	L	L1	L2	r
T0394O118ECR1	●	1.00	6	75	3.0	10	0.10
T0394O118ECR2	●	1.00			3.0	10	0.20
T0394O118ECR3	●	1.00			3.0	10	0.30
T0591O177ECR1	●	1.50			4.5	15	0.10
T0591O177ECR2	●	1.50			4.5	15	0.20
T0591O177ECR3	●	1.50			4.5	15	0.30
T0591O177ECR4	●	1.50			4.5	15	0.50
T0787O236ECR1	●	2.00			6.0	20	0.20
T0787O236ECR2	●	2.00			6.0	20	0.30
T0787O236ECR3	●	2.00			6.0	20	0.50
T0984O295ECR1	●	2.50			7.5	25	0.20
T0984O295ECR2	●	2.50			7.5	25	0.30
T0984O295ECR3	●	2.50			7.5	25	0.50
T1181O354ECR1	●	3.00			9.0	30	0.20
T1181O354ECR2	●	3.00			9.0	30	0.30
T1181O354ECR3	●	3.00			9.0	30	0.50
T1181O354ECR4	●	3.00			9.0	30	1.00
T1575O472ECR1	●	4.00			12.0	30	0.20
T1575O472ECR2	●	4.00			12.0	30	0.30
T1575O472ECR3	●	4.00			12.0	30	0.50
T1575O472ECR4	●	4.00			12.0	30	1.00
T1969O591ECR1	●	5.00			15.0	40	0.20
T1969O591ECR2	●	5.00			15.0	40	0.30
T1969O591ECR3	●	5.00			15.0	40	0.50
T1969O591ECR4	●	5.00			15.0	40	1.00
T1969O591ECR5	●	5.00			15.0	40	1.50
T2362O709ECR1	●	6.00			18.0	45	0.20
T2362O709ECR2	●	6.00			18.0	45	0.30
T2362O709ECR3	●	6.00			18.0	45	0.50
T2362O709ECR4	●	6.00			18.0	45	1.00
T2362O709ECR5	●	6.00	18.0	45	1.50		
T2362O709ECR6	●	6.00	18.0	45	2.00		
T3150O945ECR1	●	8.00	8	100	24.0	50	0.20
T3150O945ECR2	●	8.00			24.0	50	0.30
T3150O945ECR3	●	8.00			24.0	50	0.50
T3150O945ECR4	●	8.00			24.0	50	1.00
T3150O945ECR5	●	8.00			24.0	50	1.50
T3150O945ECR6	●	8.00			24.0	50	2.00

● : U.S. Stock

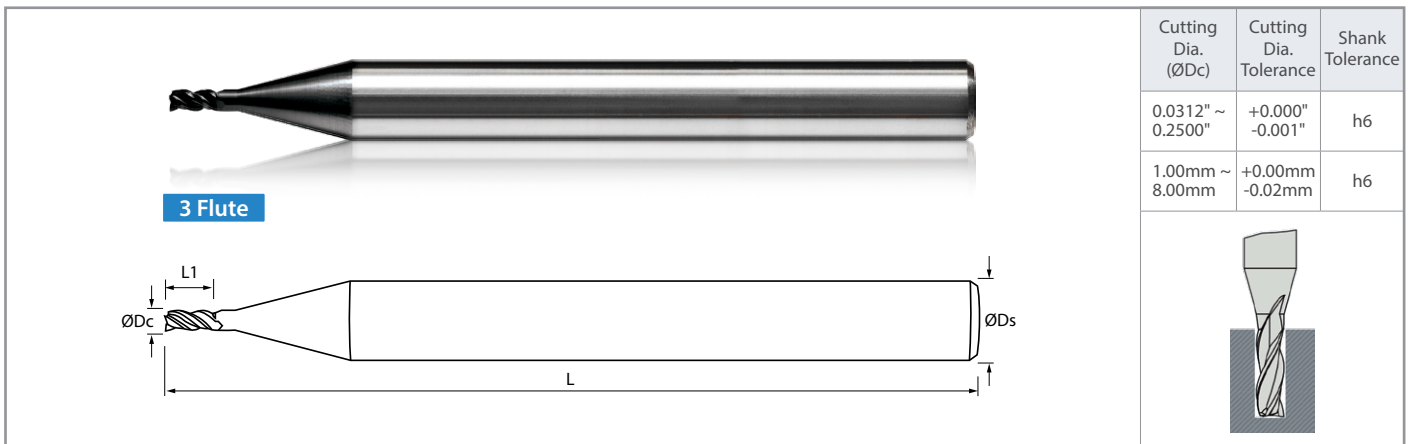


Inch Size Dimensions

Part Number	Stock	Dimensions (in)			
		ØDc	ØDs	L	L1
T03120063	●	0.0312 (1/32)	1/4	2 1/2	0.063
T04690094	●	0.0469 (3/64)			0.094
T06250140	●	0.0625 (1/16)			0.140
T07810140	●	0.0781 (5/64)			0.140
T09380188	●	0.0938 (3/32)			0.188
T10940188	●	0.1094 (7/64)			0.188
T12500250	●	0.1250 (1/8)			0.250
T15620375	●	0.1562 (5/32)			0.375
T18750375	●	0.1875 (3/16)			0.375
T21880375	●	0.2188 (7/32)			0.375
T25000500	●	0.2500 (1/4)			0.500

Metric Size Dimensions

Part Number	Stock	Dimensions (mm)			
		ØDc	ØDs	L	L1
T03940059	●	1.00	6	63.5	1.5
T05910098	●	1.50			2.5
T07870118	●	2.00			3.0
T09840157	●	2.50			4.0
T11810197	●	3.00			5.0
T15750236	●	4.00			6.0
T19690315	●	5.00			8.0
T23620354	●	6.00			9.0
T31500472	●	8.00			12.0



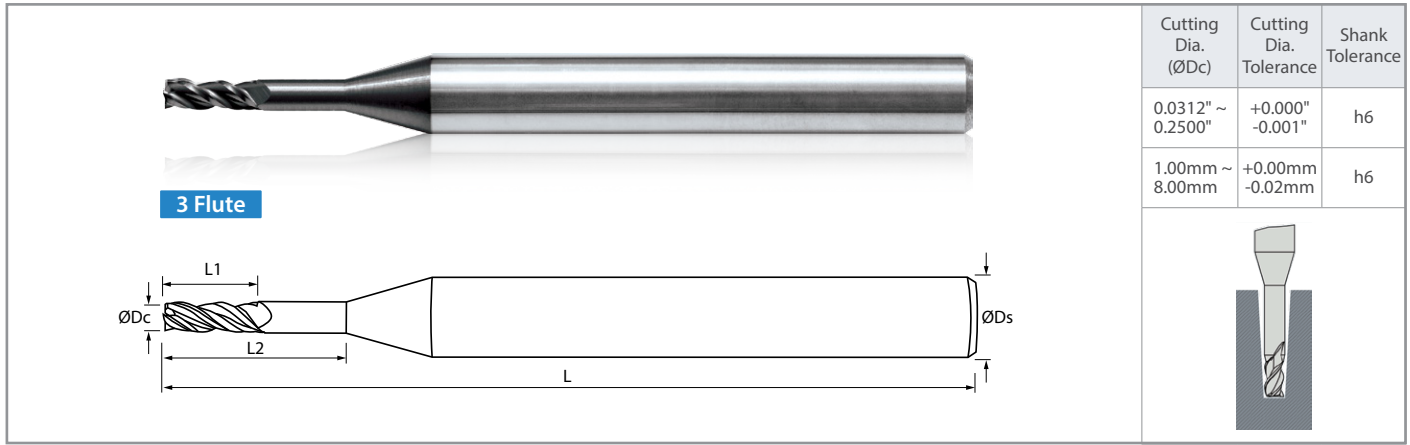
Inch Size Dimensions

Part Number	Stock	Dimensions (in)			
		ØDc	ØDs	L	L1
T03120094	●	0.0312 (1/32)	1/4	2 1/2	0.094
T04690141	●	0.0469 (3/64)			0.141
T06250188	●	0.0625 (1/16)			0.188
T07810234	●	0.0781 (5/64)			0.234
T09380375	●	0.0938 (3/32)			0.375
T10940438	●	0.1094 (7/64)			0.438
T12500500	●	0.1250 (1/8)			0.500
T15620563	●	0.1562 (5/32)			0.563
T18750625	●	0.1875 (3/16)			0.625
T21880625	●	0.2188 (7/32)			0.625
T25000750	●	0.2500 (1/4)			0.750

Metric Size Dimensions

Part Number	Stock	Dimensions (mm)			
		ØDc	ØDs	L	L1
T03940118	●	1.00	6	63.5	3.0
T05910177	●	1.50			4.5
T07870236	●	2.00			6.0
T09840295	●	2.50			7.5
T11810354	●	3.00			9.0
T15750472	●	4.00			12.0
T19690591	●	5.00			15.0
T23620709	●	6.00			18.0
T31500945	●	8.00			24.0

● : U.S. Stock



Cutting Dia. (ØDc)	Cutting Dia. Tolerance	Shank Tolerance
0.0312" ~ 0.2500"	+0.000" -0.001"	h6
1.00mm ~ 8.00mm	+0.00mm -0.02mm	h6

Inch Size Dimensions

Metric Size Dimensions

Part Number	Stock	Dimensions (in)				
		ØDc	ØDs	L	L1	L2
T03120063ER	●	0.0312 (1/32)	1/4	2 1/2	0.063	0.155
T04690094ER	●	0.0469 (3/64)			0.094	0.230
T06250140ER	●	0.0625 (1/16)			0.140	0.312
T07810140ER	●	0.0781 (5/64)			0.140	0.390
T09380188ER	●	0.0938 (3/32)			0.188	0.465
T10940188ER	●	0.1094 (7/64)			0.188	0.545
T12500250ER	●	0.1250 (1/8)			0.250	0.625
T15620375ER	●	0.1562 (5/32)			0.375	0.781
T18750375ER	●	0.1875 (3/16)			0.375	0.938
T21880375ER	●	0.2188 (7/32)			0.375	1.093
T25000500ER	●	0.2500 (1/4)			0.500	1.250

Part Number	Stock	Dimensions (mm)				
		ØDc	ØDs	L	L1	L2
T03940118ER	●	1.00	6	75	3.0	10
T05910177ER	●	1.50			4.5	15
T07870236ER	●	2.00			6.0	20
T09840295ER	●	2.50			7.5	25
T11810354ER	●	3.00			9.0	30
T15750472ER	●	4.00			12.0	30
T19690591ER	●	5.00			15.0	40
T23620709ER	●	6.00			18.0	45
T31500945ER	●	8.00			24.0	50

● : U.S. Stock

Case Study

Guide Rail
HRC58-60 Alloy Steel

Vc = 50 m/min
Vf = 0.04 mm/rev
D.O.C. = 2.15mm
Ø2.00mm
Dry (Air)
T0787O118 (3-Flute Stub Length Square End Mill)

Tool Life

TITAN-AX
Ø2.00mm

25-30 pcs



Competitor A
Ø2.00mm

12-16 pcs

The TITAN-AX doubled the tool life of Competitor A.
Length of slot machined was 82mm.

(User Evaluation)



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