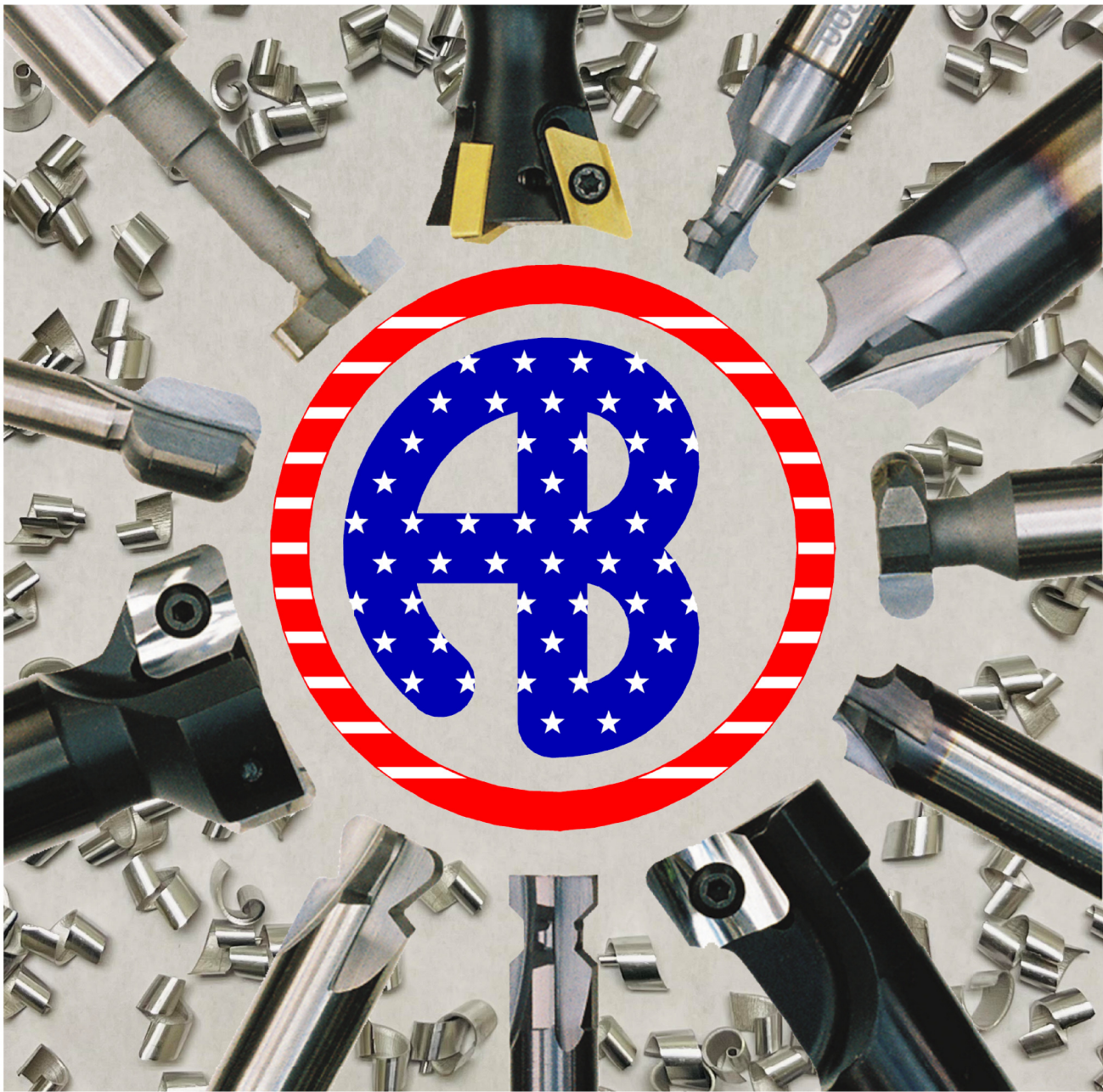


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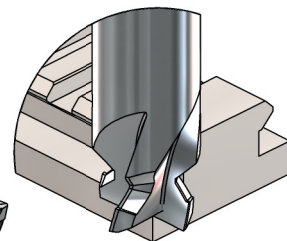
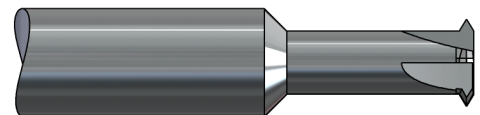
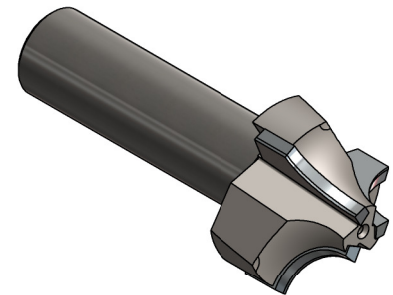
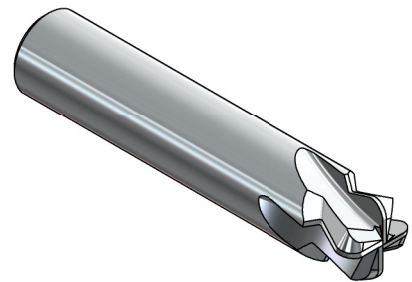
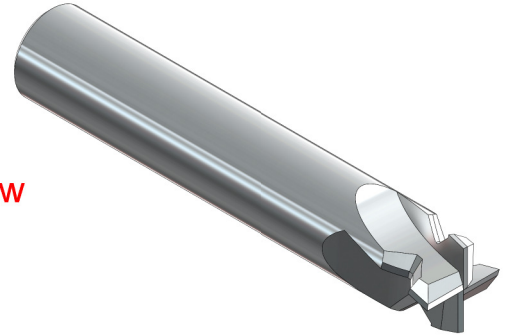
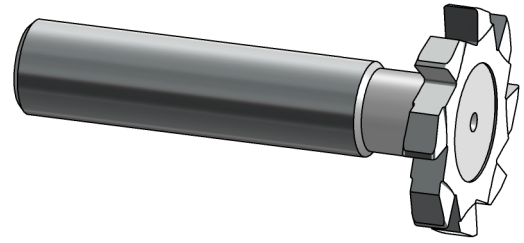


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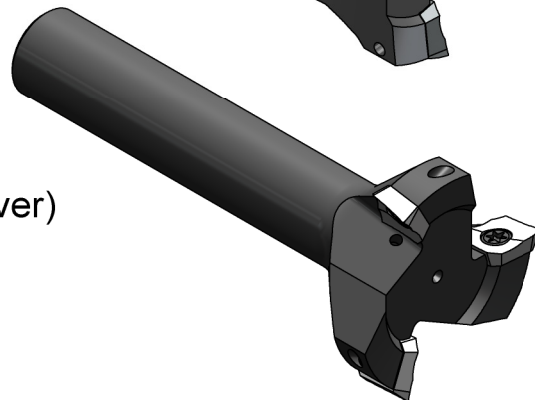
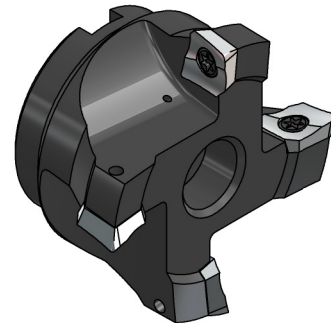
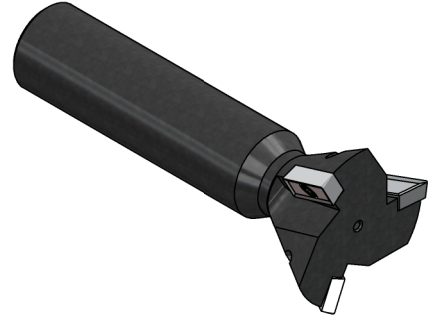
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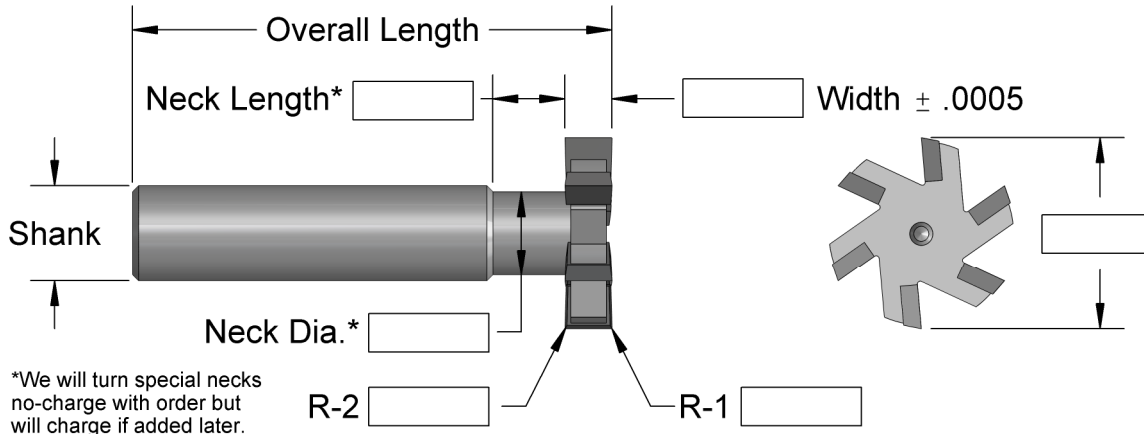
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Carbide Tipped Keyseat Cutters with your decimal width in 4-6 working days

Machining what part material, please? _____



Diameters to plus .015 unless you request otherwise

*We will turn special necks no-charge with order but will charge if added later.

| Diameter Plus .015 Minus Zero | Width Range | Basic Cutter Prices | | | | Shank & Overall Length |
|-------------------------------|-------------|---------------------|--------|-------------|--------|------------------------|
| | | For Aluminum | | For Ferrous | | |
| | | Flutes | Price | Flutes | Price | |
| 5/8 | .065/.190 | 2 | \$90. | 5 | \$115. | 1/2 Shank 2.5 OAL |
| 3/4 | .065/.220 | 2 | \$95. | 5 | \$115. | |
| 7/8 | .075/.255 | 2 | \$105. | 6 | \$120. | |
| 1 | .085/.315 | 2 | \$110. | 6 | \$125. | |
| 1-1/8 | .110/.315 | 2 | \$115. | 6 | \$145. | |
| 1-1/4 | .110/.350 | 3 | \$120. | 8 | \$160. | |
| 1-3/8 | .110/.380 | 3 | \$130. | 8 | \$165. | |

For Minor Modifications add to your basic price:

1 CHAMFER \$35.
2 CHAMFERS \$50.

1 RADIUS \$40.
2 RADII \$60.
FULL RADIUS \$60.

| | | | | | | |
|-------|-----------|---|--------|----|--------|----------------------|
| 1-1/2 | .110/.374 | 3 | \$150. | 8 | \$190. | 3/4 Shank 3.5 OAL |
| 1-1/2 | .375/.505 | 3 | \$185. | 8 | \$225. | |
| 1-3/4 | .120/.374 | 4 | \$175. | 10 | \$220. | |
| 1-3/4 | .375/.505 | 4 | \$200. | 10 | \$245. | |
| 2 | .120/.374 | 4 | \$205. | 12 | \$260. | |
| 2 | .375/.505 | 4 | \$245. | 12 | \$295. | |
| 2-1/4 | .120/.374 | 4 | \$225. | 12 | \$295. | |
| 2-1/4 | .375/.505 | 4 | \$260. | 12 | \$325. | |
| 2-1/2 | .120/.374 | 6 | \$245. | 12 | \$320. | |
| 2-1/2 | .375/.505 | 6 | \$285. | 12 | \$365. | |

Staggered tooth cutters add 30% to basic price
(2) piece minimum

Slot plus top Chamfers Upon Request

Suggested Starting Data:
Ferrous 150-250 SFM; .001/.003 IPT, Non-Ferrous 1K-3K SFM; .002/.006 IPT



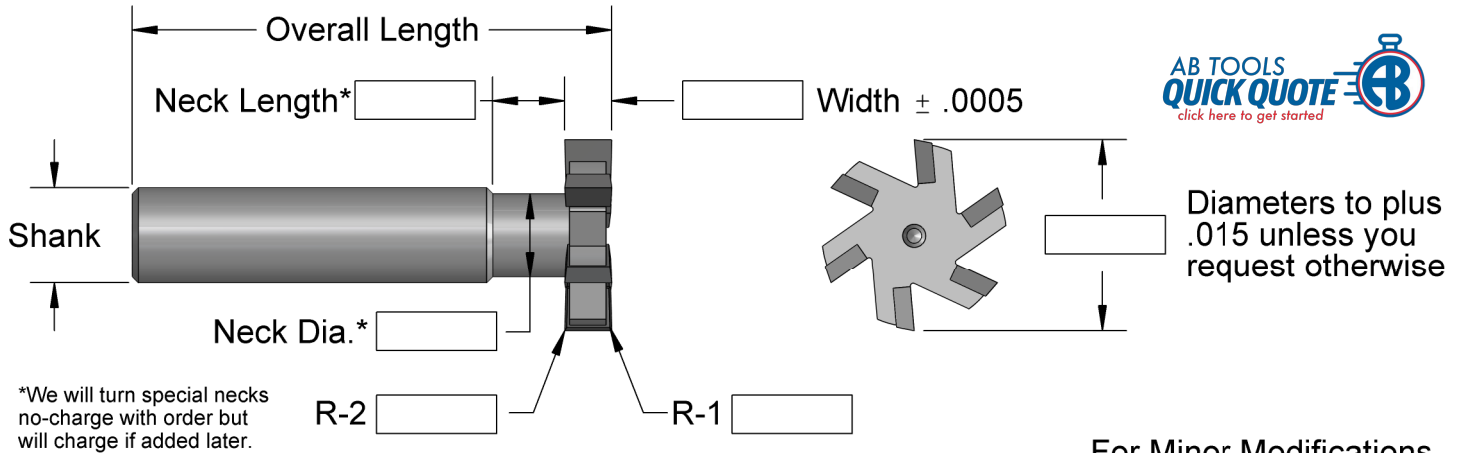
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Extra Long Carbide Tipped Keyseat Cutters with your decimal width in 4-6 working days

Machining what part material, please? _____



*We will turn special necks no-charge with order but will charge if added later.

For Minor Modifications add to your basic price.

| Diameter Plus .015 Minus Zero | Width Range | Basic Cutter Prices | | | | Shank & Overall Length |
|-------------------------------|-------------|---------------------|--------|-------------|--------|-------------------------|
| | | For Aluminum | | For Ferrous | | |
| | | Flutes | Price | Flutes | Price | |
| 5/8 | .065/.190 | 2 | \$145. | 5 | \$160. | 1/2 Shank 4.5 OAL |
| 3/4 | .065/.220 | 2 | \$145. | 5 | \$160. | |
| 7/8 | .075/.255 | 2 | \$155. | 6 | \$165. | |
| 1 | .085/.315 | 2 | \$160. | 6 | \$175. | |
| 1-1/8 | .110/.315 | 2 | \$165. | 6 | \$195. | |
| 1-1/4 | .110/.350 | 3 | \$175. | 8 | \$210. | |
| 1-3/8 | .110/.380 | 3 | \$185. | 8 | \$220. | |

1 CHAMFER \$35.
2 CHAMFERS \$50.

1 RADIUS \$40.
2 RADII \$60.
FULL RADIUS \$60.

| | | | | | | |
|-------|-----------|---|--------|----|--------|-------------------------|
| 1-1/2 | .110/.374 | 3 | \$210. | 8 | \$250. | 3/4 Shank 6.0 OAL |
| 1-1/2 | .375/.505 | 3 | \$245. | 8 | \$290. | |
| 1-3/4 | .120/.374 | 4 | \$230. | 10 | \$285. | |
| 1-3/4 | .375/.505 | 4 | \$265. | 10 | \$315. | |
| 2 | .120/.374 | 4 | \$275. | 12 | \$325. | |
| 2 | .375/.505 | 4 | \$305. | 12 | \$375. | |
| 2-1/4 | .120/.374 | 4 | \$295. | 12 | \$375. | |
| 2-1/4 | .375/.505 | 4 | \$335. | 12 | \$430. | |
| 2-1/2 | .120/.374 | 6 | \$325. | 12 | \$415. | |
| 2-1/2 | .375/.505 | 6 | \$340. | 12 | \$450. | |

Staggered tooth Cutters add 30% to basic price
(2) piece minimum

Slot plus top Chamfers Upon Request

Suggested Starting Data:
Ferrous 150-250 SFM; .001/.003 IPT, Non-Ferrous 1K-3K SFM; .002/.006 IPT



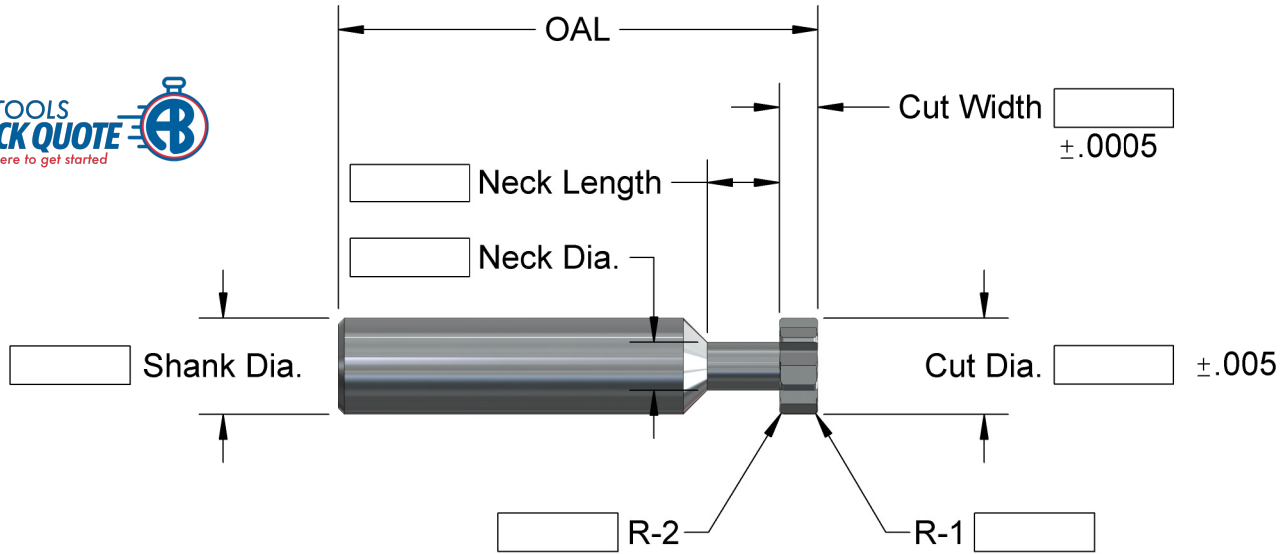
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Solid Carbide Slotting (Keyseat) Cutters .625 diameter and smaller your decimal width in 4-6 working days

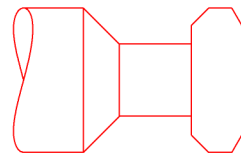
Machining what part material, please? _____



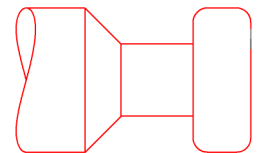
Suggested starting data:
 Ferrous 150 to 300 SFM; .001/.003 IPT
 Non-Ferrous 1K-3K SFM; .002/.006 IPT
 For thin or weak necked cutters, .0005 IPT

Number of flutes is your choice based on feasibility. We suggest coarse for non-ferrous, medium for titanium/stainless & maximum for cast iron and tough materials.

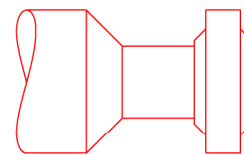
| Cut Diameter | Shank & OAL | Basic Price |
|--------------|-------------|-------------|
| .030/.060 | 3/16 X 2 | \$105. |
| .062/.186 | 3/16 X 2 | \$90. |
| .188/.248 | 1/4 X 2 | \$95. |
| .250/.390 | 3/8 X 2.5 | \$105. |
| .400/.515 | 1/2 X 2.5 | \$115. |
| .515/.625 | 5/8 X 3 | \$135. |



One Chamfer \$35.
 Two Chamfers \$50.



One Radius \$40.
 Two Radii \$60.
 Full Radius \$60.



Slot plus top Chamfers
 Upon Request

Add above prices to the basic price for minor modifications.



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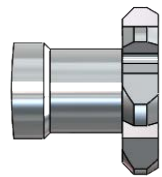
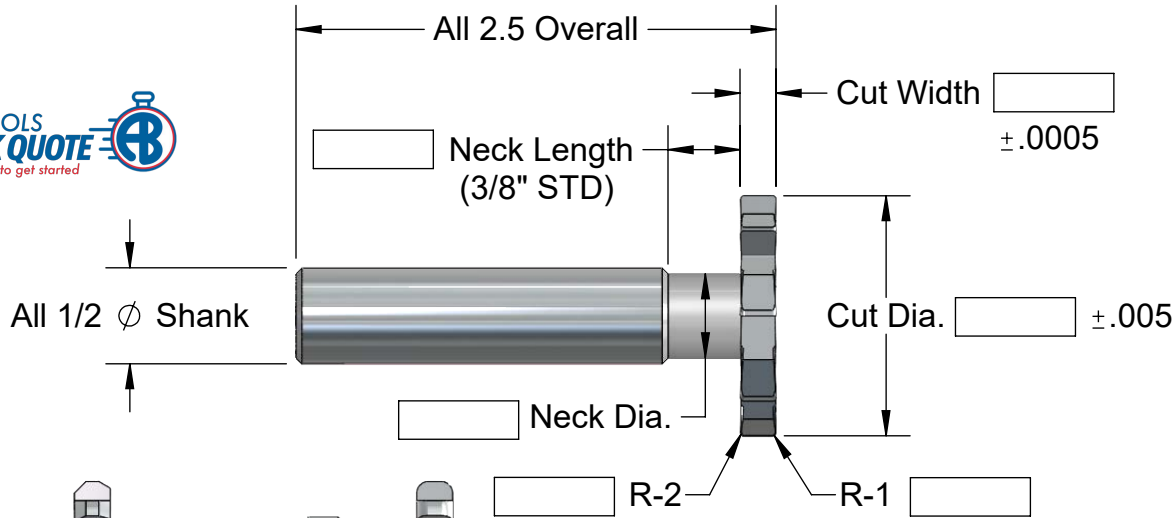
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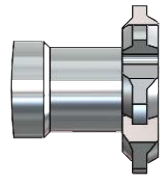
Solid Carbide Slotting (Keyseat) Cutters from .530 to 2.0 diameters

your decimal width in 4-6 working days

Machining what part material, please? _____



One Chamfer **\$35.**
Two Chamfers **\$50.**



One Radius **\$40.**
Two Radii **\$60.**
Full Radius **\$60.**

Necks can be modified at no extra charge if feasible.

Suggested starting data:
Ferrous 150 to 300 SFM; .001/.003 IPT
Non-Ferrous 1K-3K SFM; .002/.006 IPT
For thin or weak necked cutters, .0005 IPT

Slot plus top Chamfers
Upon Request

Number of flutes is your choice based on feasibility. We suggest coarse for non-ferrous, medium for titanium/stainless & maximum for cast iron and tough materials.

| Cut Dia. | Max. no. of Flutes | As-Cast Neck Dia. | Basic Prices for .020 thru .135 Widths* | Basic Prices for .136 thru .260 Widths | Basic Prices for .261 thru .374 Widths | Basic Prices for .375 thru .440 Widths |
|----------|--------------------|-------------------|---|--|--|--|
| .625 | 8 | 3/8 | \$160. | \$170. | \$175. | |
| .750 | 10 | 7/16 | \$165. | \$175. | \$180. | |
| 1.00 | 12 | 7/16 | \$175. | \$185. | \$190. | |
| 1.25 | 14 | 7/16 | \$185. | \$195. | \$220. | \$280. |
| 1.50 | 16 | 7/16 | \$200. | \$220. | \$260. | \$295. |
| 1.75 | 18 | 15/32 | \$230. | \$250. | \$290. | \$345. |
| 2.00 | 20 | 15/32 | \$260. | \$275. | \$310. | \$365. |

*1.50 Cut Dia. Minimum width .050, 1.75 - 2.00 Cut Dia. Minimum width .060



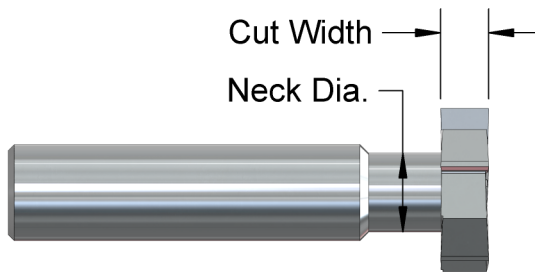
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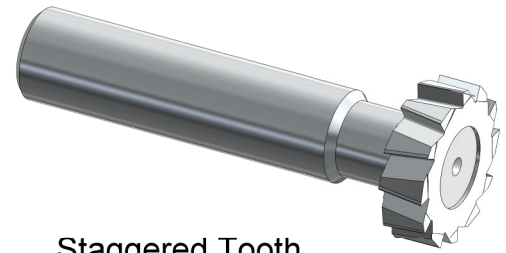
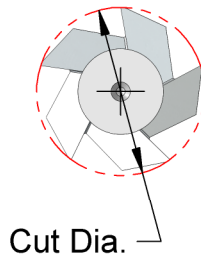
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Standard Keyway Cutters Solid Carbide

**Specials in 4-6
Working Days**



Straight Tooth
Shown Full Size
(#807 Keyway Cutter)



Staggered Tooth
Shown Full Size
(#807 Keyway Cutter)

All shanks are 1/2" Dia. and 2-1/2" overall

| Ind. Std. # | Cut Dia. | Cut Width | Neck Dia. | Neck Length | No. of Flutes Aluminum | No. of Flutes Steel | No. of Flutes Staggered | Price | |
|-------------|----------|-----------|-----------|-------------|------------------------|---------------------|-------------------------|----------------|-----------------|
| | | | | | | | | Straight Tooth | Staggered Tooth |
| 202 | 1/4 | 1/16 | .064 | .090 | 3 | 6 | 6 | \$85. | \$100. |
| 202.5 | 5/16 | 1/16 | .065 | .090 | 3 | 6 | 6 | \$85. | \$100. |
| 302.5 | 5/16 | 3/32 | .096 | .150 | 3 | 6 | 6 | \$85. | \$100. |
| 203 | 3/8 | 1/16 | .209 | .125 | 3 | 6 | 6 | \$95. | \$110. |
| 303 | 3/8 | 3/32 | .146 | .180 | 3 | 6 | 6 | \$95. | \$110. |
| 403 | 3/8 | 1/8 | .090 | .180 | 3 | 6 | 6 | \$95. | \$110. |
| 204 | 1/2 | 1/16 | .140 | .090 | 3 | 8 | 8 | \$105. | \$120. |
| 304 | 1/2 | 3/32 | .160 | .180 | 3 | 8 | 8 | \$105. | \$120. |
| 404 | 1/2 | 1/8 | .190 | .250 | 3 | 8 | 8 | \$105. | \$120. |
| 305 | 5/8 | 3/32 | .190 | .150 | 4 | 8 | 8 | \$160. | \$176. |
| 405 | 5/8 | 1/8 | .220 | .250 | 4 | 8 | 8 | \$160. | \$176. |
| 505 | 5/8 | 5/32 | .250 | .250 | 4 | 8 | 8 | \$160. | \$176. |
| 605 | 5/8 | 3/16 | .280 | .280 | 4 | 8 | 8 | \$160. | \$176. |
| 406 | 3/4 | 1/8 | .220 | .250 | 4 | 10 | 10 | \$165. | \$182. |
| 506 | 3/4 | 5/32 | .250 | .250 | 4 | 10 | 10 | \$165. | \$182. |
| 606 | 3/4 | 3/16 | .280 | .280 | 4 | 10 | 10 | \$165. | \$182. |
| 806 | 3/4 | 1/4 | .340 | .250 | 4 | 10 | 10 | \$165. | \$182. |
| 507 | 7/8 | 3/16 | .250 | .280 | 5 | 12 | 12 | \$170. | \$187. |
| 707 | 7/8 | 7/32 | .310 | .250 | 5 | 12 | 12 | \$170. | \$187. |
| 807 | 7/8 | 1/4 | .340 | .250 | 5 | 12 | 12 | \$170. | \$187. |



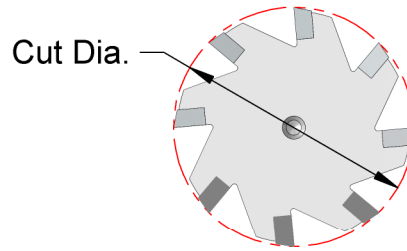
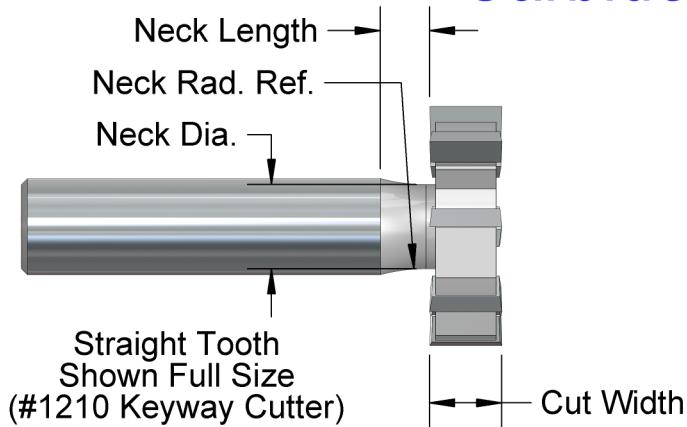
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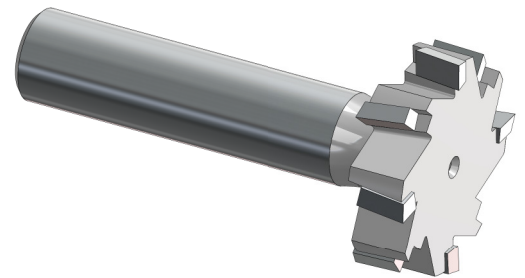
Standard Keyway Cutters Carbide Tipped

**Specials in 4-6
Working Days**

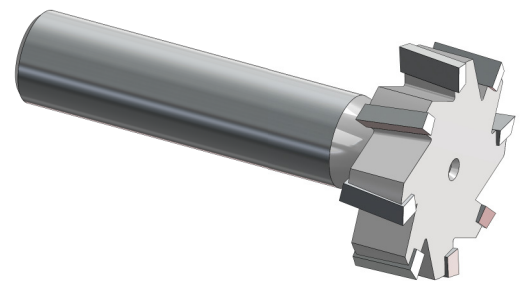


All shanks are 1/2" Dia. and 2-1/2" overall

| Ind. Std. # | Cut Dia. | Cut Width | Neck Dia. | Neck Length | Neck Rad. Ref. | No. of Flts. | Price | |
|-------------|----------|-----------|-----------|-------------|----------------|--------------|----------------|-----------------|
| | | | | | | | Straight Tooth | Staggered Tooth |
| 608 | 1 | 3/16 | .280 | .440 | .85 | 6 | \$115. | \$150. |
| 708 | 1 | 7/32 | .310 | .415 | .865 | | | |
| 808 | 1 | 1/4 | .340 | .385 | .880 | | | |
| 1008 | 1 | 5/16 | .375 | .219 | N/A | | | |
| 1208 | 1 | 3/8 | .410 | .219 | N/A | | | |
| 609 | 1-1/8 | 3/16 | .310 | .410 | .855 | 6 | \$130. | \$165. |
| 709 | 1-1/8 | 7/32 | .340 | .380 | .875 | | | |
| 809 | 1-1/8 | 1/4 | .380 | .346 | .895 | | | |
| 1009 | 1-1/8 | 5/16 | .435 | .250 | N/A | | | |
| 610 | 1-1/4 | 3/16 | .310 | .410 | .855 | 8 | \$145. | \$185. |
| 710 | 1-1/4 | 7/32 | .340 | .380 | .875 | | | |
| 810 | 1-1/4 | 1/4 | .375 | .350 | .895 | | | |
| 1010 | 1-1/4 | 5/16 | .485 | .250 | N/A | | | |
| 1210 | 1-1/4 | 3/8 | .485 | .250 | N/A | | | |
| 811 | 1-3/8 | 1/4 | .400 | .310 | .930 | 8 | \$150. | \$190. |
| 1011 | 1-3/8 | 5/16 | .485 | .313 | N/A | | | |
| 1211 | 1-3/8 | 3/8 | .485 | .313 | N/A | | | |
| 812 | 1-1/2 | 1/4 | .430 | .310 | N/A | 8 | \$170. | \$210. |
| 1012 | 1-1/2 | 5/16 | .490 | .250 | N/A | | | |
| 1212 | 1-1/2 | 3/8 | .490 | .250 | N/A | | | |



Staggered Tooth
Shown Full Size
(#1210 Keyway Cutter)



Staggered Tooth
All Ends Cut
Shown Full Size
(#1210 Keyway Cutter)

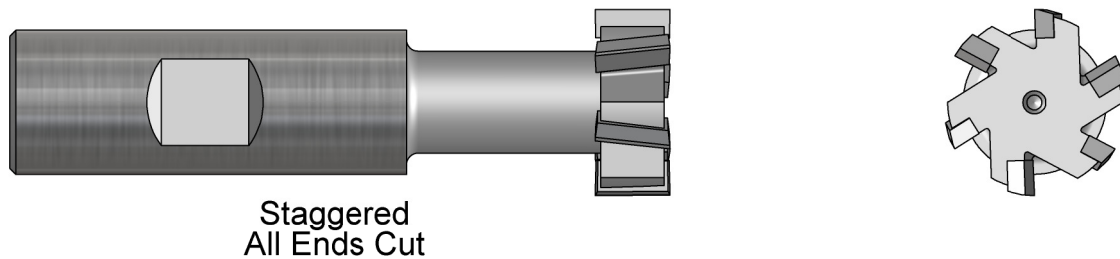
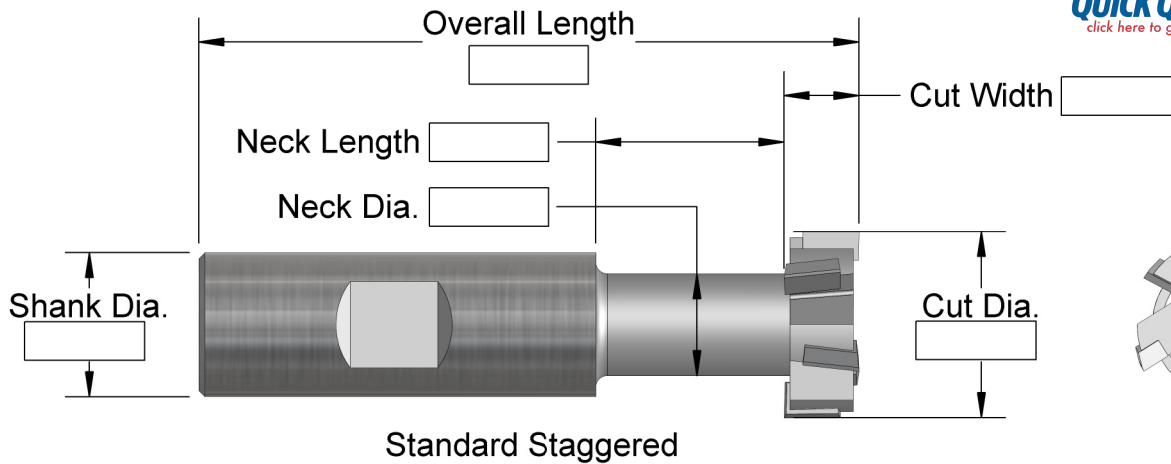


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NEW ! Carbide Tipped T-Slot cutters Industry Standard Stagger Tooth NEW !



| Number | Bolt Size | Cut Dia | Cut Width | Neck Dia. | Neck Length | Shank Dia. | OAL | No. of Flutes | Price | |
|------------|-----------|---------|-----------|-----------|-------------|------------|-------|---------------|----------|--------------|
| | | | | | | | | | Standard | All Ends Cut |
| TSKS-1/4* | 1/4" | .531 | .234 | .256 | .55 | 1/2" | 2-1/2 | 6 | \$150. | \$157. |
| TSKT-5/16 | 5/16" | .656 | .265 | .330 | .61 | 1/2" | 2.69 | 6 | \$135. | \$142. |
| TSKT-3/8 | 3/8" | .781 | .328 | .410 | .86 | 3/4" | 3.25 | 6 | \$165. | \$173. |
| TSKT-1/2 | 1/2" | .968 | .390 | .530 | .98 | 3/4" | 3.44 | 6 | \$175. | \$184. |
| TSKT-5/8 | 5/8" | 1.250 | .484 | .660 | 1.14 | 1" | 3.94 | 6 | \$215. | \$226. |
| TSKT-3/4 | 3/4" | 1.468 | .625 | .780 | 1.50 | 1" | 4.44 | 8 | \$245. | \$257. |
| TSKT-1.0 | 1" | 1.844 | .828 | 1.030 | 1.67 | 1-1/4" | 4.81 | 8 | \$315. | \$330. |
| TSKT-1-1/4 | 1-1/4" | 2.219 | 1.094 | 1.218 | 1.97 | 1-1/4" | 5.38 | 8 | \$395. | \$415. |
| TSKT-1-1/2 | 1-1/2" | 2.656 | 1.344 | - | - | 1-1/4" | 5.91 | 8 | \$445. | \$467. |

* Noted cutter is solid carbide



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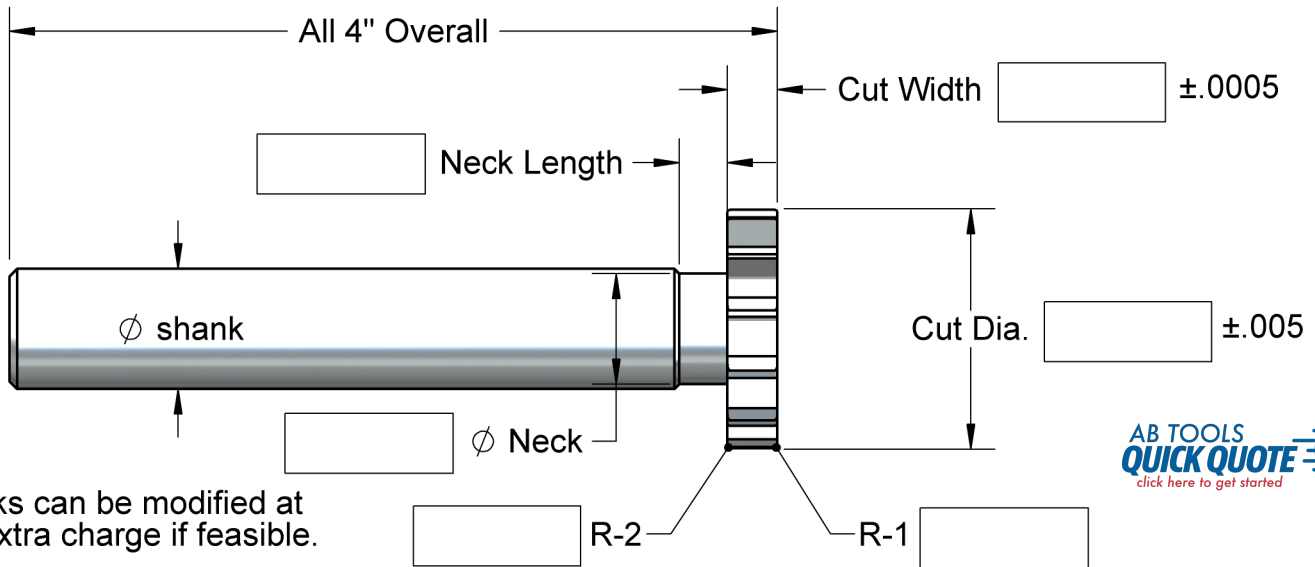
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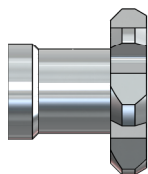
Extra Long Solid Carbide Keyseat Cutters

NEW !!! from .530 to 2.0 diameters **NEW !!!**
with your decimal width in 4-6 working days

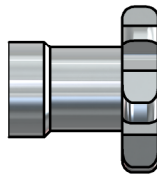
Machining what part material, please? _____



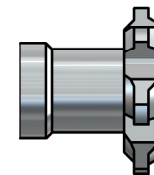
Necks can be modified at no extra charge if feasible.



One Chamfer \$35.
Two Chamfers \$50.



One Radius \$40.
Two Radii \$60.
Full Radius \$60.



Slot plus top Chamfers Upon Request

Number of flutes is your choice based on feasibility. We suggest coarse for non-ferrous, medium for titanium/stainless & maximum for cast iron and tough materials.

Suggested starting data:
Ferrous 150 to 300 SFM; .001/.003 IPT
Non-Ferrous 1K-3K SFM; .002/.006 IPT
For thin or weak necked cutters, .0005 IPT

| Cut Diameter | Max. # of Flutes | Shank Diameter | Basic Prices for .020 thru .135 Widths | Basic Prices for .136 thru .260 Widths | Basic Prices for .261 thru .374 Widths |
|--------------|------------------|----------------|--|--|--|
| .625 | 8 | 1/2" | \$245. | \$260. | \$275. |
| .750 | 10 | 1/2" | \$260. | \$275. | \$300. |
| 1.00 | 12 | 1/2" | \$275. | \$305. | \$330. |
| 1.125 | 12 | 5/8" | \$305. | \$340. | \$365. |
| 1.25 | 14 | 5/8" | \$325. | \$365. | \$385. |
| 1.375 | 14 | 3/4" | \$370. | \$415. | \$435. |
| 1.50 | 16 | 3/4" | \$415. | \$445. | \$480. |
| 1.75 | 18 | 3/4" | \$470. | \$485. | \$525. |
| 2.00 | 20 | 3/4" | \$500. | \$530. | \$560. |



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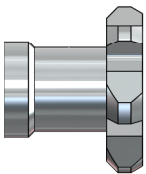
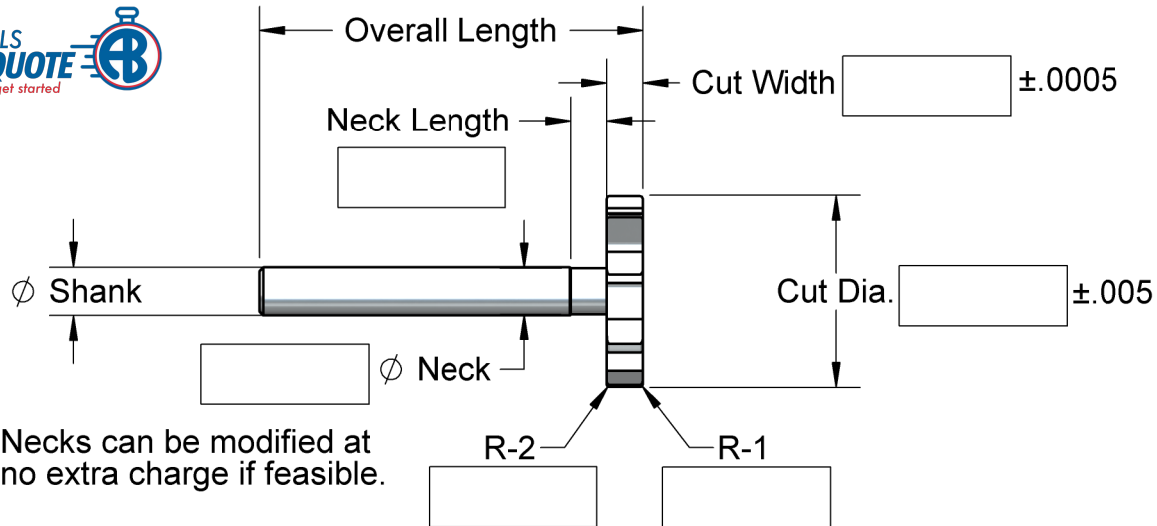
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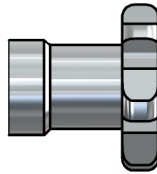
Reduced Shank Solid Carbide Slotting Tools

NEW !!! from .140 to 1.510 diameters **NEW !!!**
with your decimal width in 4-6 working days

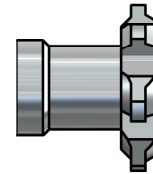
Machining what part material, please? _____



One Chamfer \$35.
Two Chamfers \$50.



One Radius \$40.
Two Radii \$60.
Full Radius \$60.



Slot plus top Chamfers Upon Request

Number of flutes is your choice based on feasibility. We suggest coarse for non-ferrous, medium for titanium/stainless & maximum for cast iron and tough materials.

Suggested starting data:
Ferrous 150 to 300 SFM; .001/.003 IPT
Non-Ferrous 1K-3K SFM; .002/.006 IPT
For thin or weak necked cutters, .0005 IPT

| Shank & OAL | Cut Diameter | Width Range | Basic Prices |
|---------------|--------------|-------------|--------------|
| 1/8" x 1-1/2" | .140 - .510 | .020 - .188 | \$125. |
| 1/4" x 2" | .375 - 1.010 | .020 - .250 | \$165. |
| 1/4" x 2" | .375 - 1.010 | .251 - .440 | \$180. |
| 3/8" x 2" | .500 - 1.510 | .030 - .375 | \$195. |
| 3/8" x 2-1/2" | .500 - 1.510 | .376 - .440 | \$220. |



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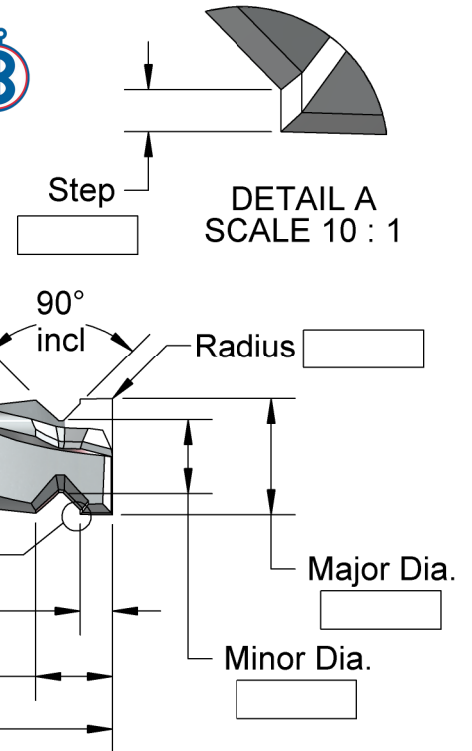
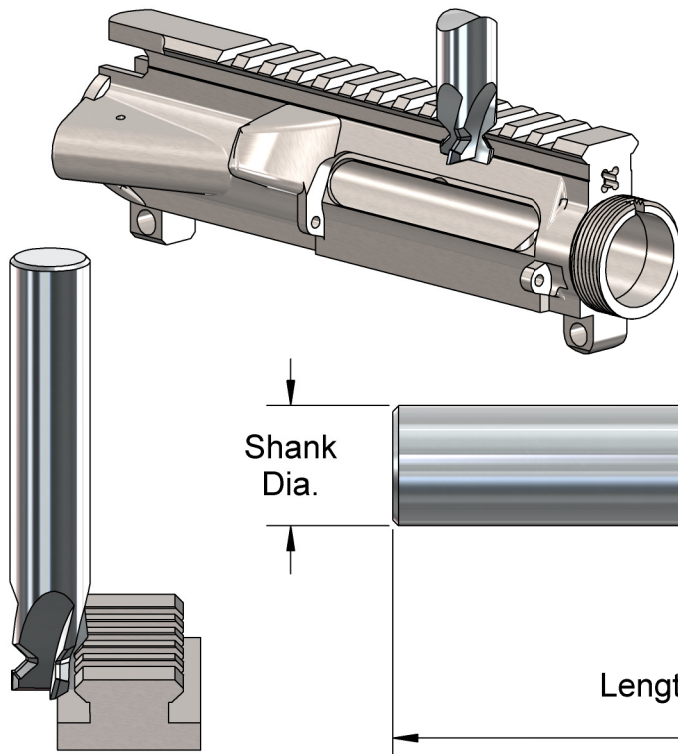
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NEW !!!

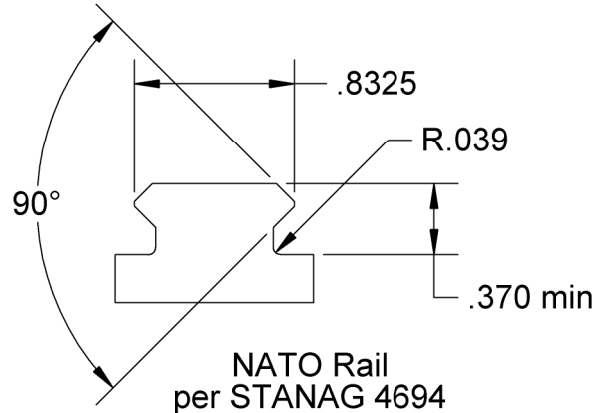
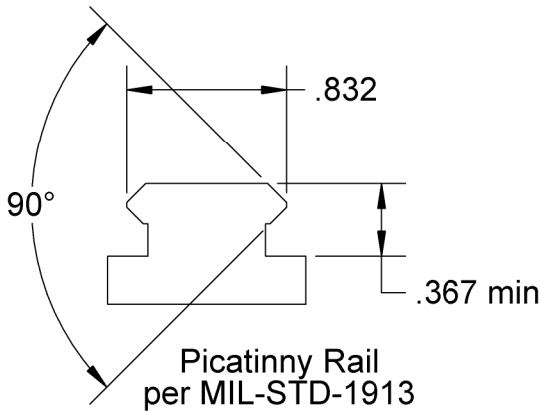
Picatinny/NATO Rail Cutters

NEW !!!



| Number | Major Dia. | Minor Dia. | Length of Cut | Flat | Radius | Shank Dia. | OAL | No. of Flutes | Price |
|---------------|------------|------------|---------------|------|--------|------------|-----|---------------|----------|
| PT605-90H-3 | .605 | .385 | .399 | .167 | None | 5/8" | 3.5 | 3 | \$140.00 |
| PT605-90H-4 | .605 | .385 | .399 | .167 | None | 5/8" | 3.5 | 4 | \$147.50 |
| PT480-90H-2 | .480 | .260 | .399 | .167 | None | 1/2" | 2.5 | 2 | \$130.00 |
| PT480-90H-3 | .480 | .260 | .399 | .167 | None | 1/2" | 2.5 | 3 | \$137.50 |
| PTN625-90H-3* | .625 | .405 | .387 | .143 | .039 | 5/8" | 3.5 | 3 | \$150.00 |
| PTN625-90H-4* | .625 | .405 | .387 | .143 | .039 | 5/8" | 3.5 | 4 | \$157.50 |
| PTN500-90H-2* | .500 | .280 | .387 | .143 | .039 | 1/2" | 2.5 | 2 | \$135.00 |
| PTN500-90H-3* | .500 | .280 | .387 | .143 | .039 | 1/2" | 2.5 | 3 | \$142.50 |

* Cutter produces NATO rail

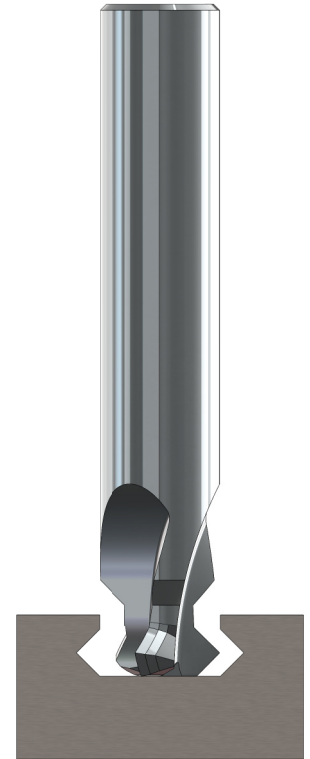
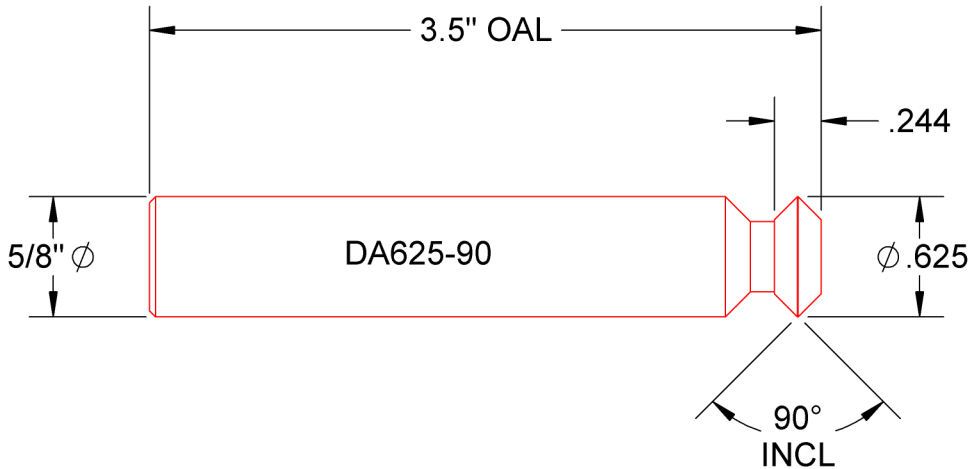


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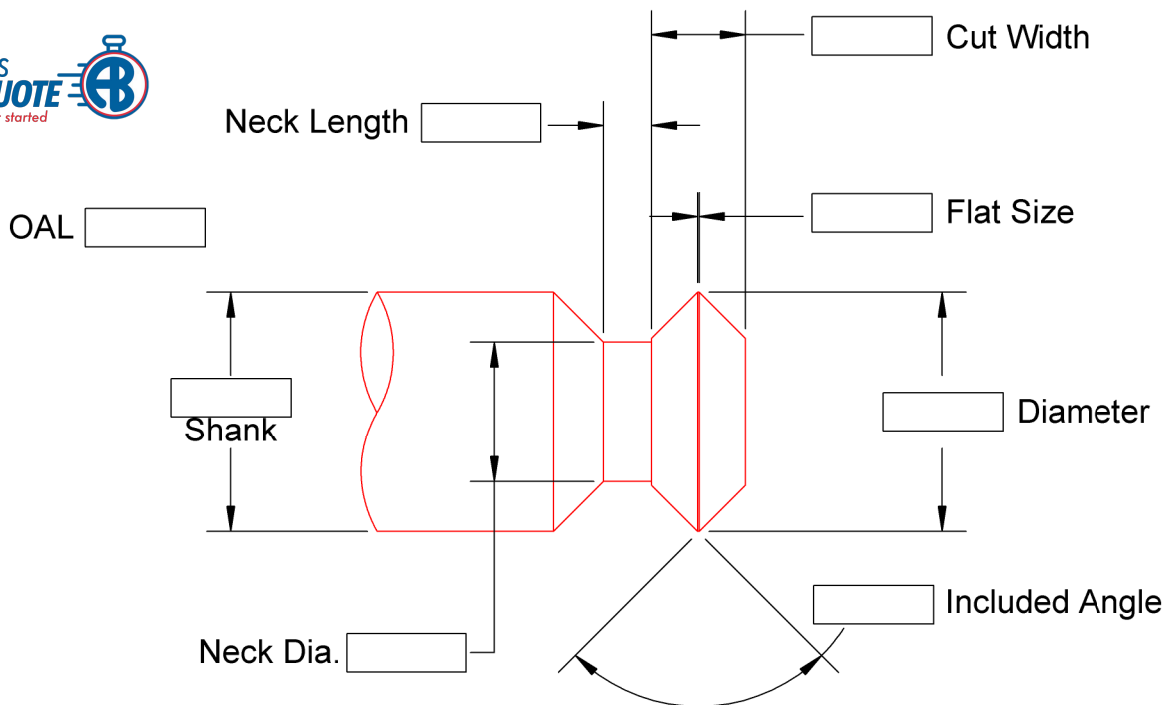
Solid Carbide Male Picatinny (Fixture) Cutter



| Number | Flutes | Price | |
|------------|--------|----------|----------|
| | | No-Coat | AITiN |
| DA625-90-3 | 3 | \$175. | \$197. |
| DA625-90-4 | 4 | \$182.50 | \$194.50 |

Special Male Picatinny (Fixture) Cutters in 4-6 Working Days

Machining what part material, please? _____

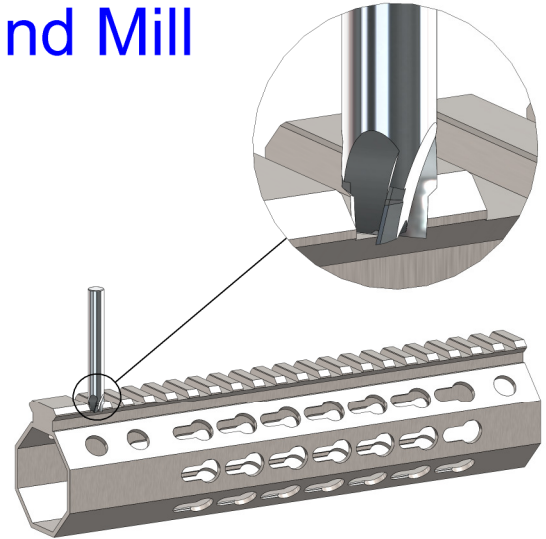
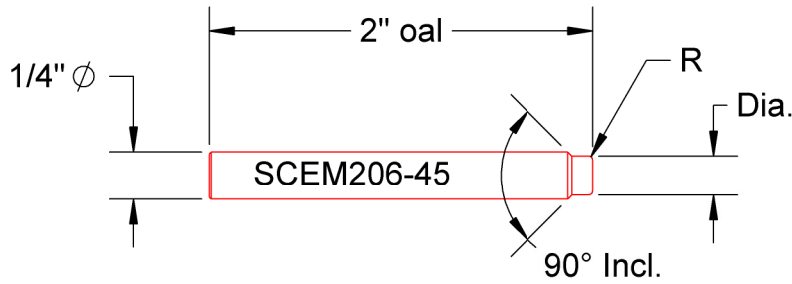


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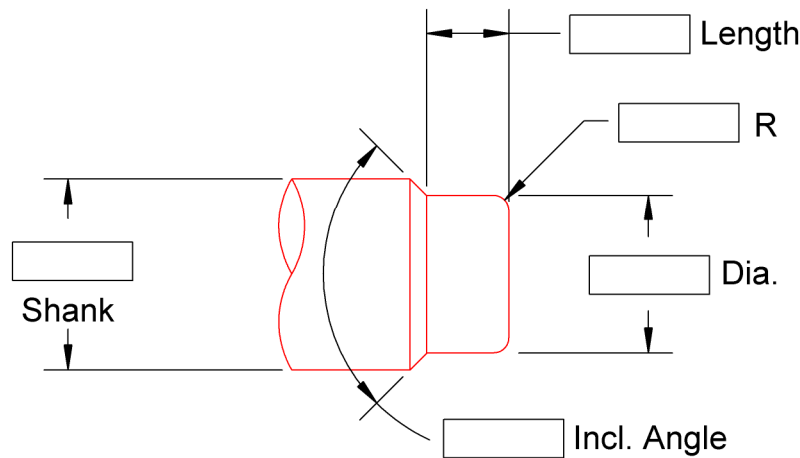
Solid Carbide Slot & Chamfer Picatinny Rail End Mill



| Number | Dia. | Radius | Price | | | AlTiN add |
|----------------|------|--------|----------|----------|----------|-----------|
| | | | 3 flutes | 4 flutes | 5 flutes | |
| SCEM206-45 | .206 | None | \$60. | \$70. | \$81. | \$4. |
| SCEM206-45-10R | .206 | .010 | \$70. | \$81. | \$91. | \$4. |
| SCEM206-45-20R | .206 | .020 | \$70. | \$81. | \$91. | \$4. |
| SCEM210-45 | .210 | None | \$60. | \$70. | \$81. | \$4. |
| SCEM210-45-10R | .210 | .010 | \$70. | \$81. | \$91. | \$4. |
| SCEM210-45-20R | .210 | .020 | \$70. | \$81. | \$91. | \$4. |

Special Slot & Chamfer End Mills in 4-6 Working Days

Machining what part material, please? _____



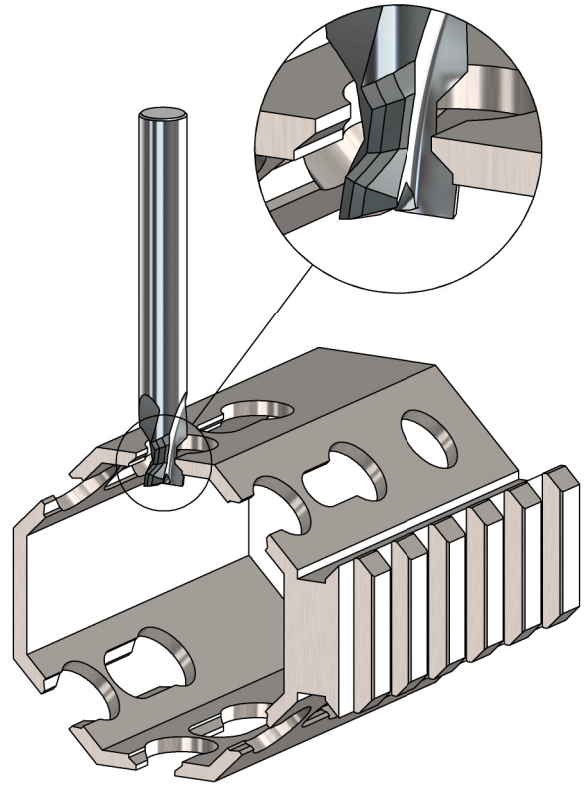
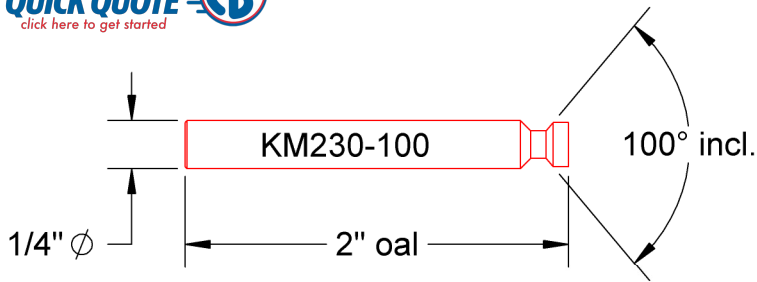
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Solid Carbide Keymod Cutter

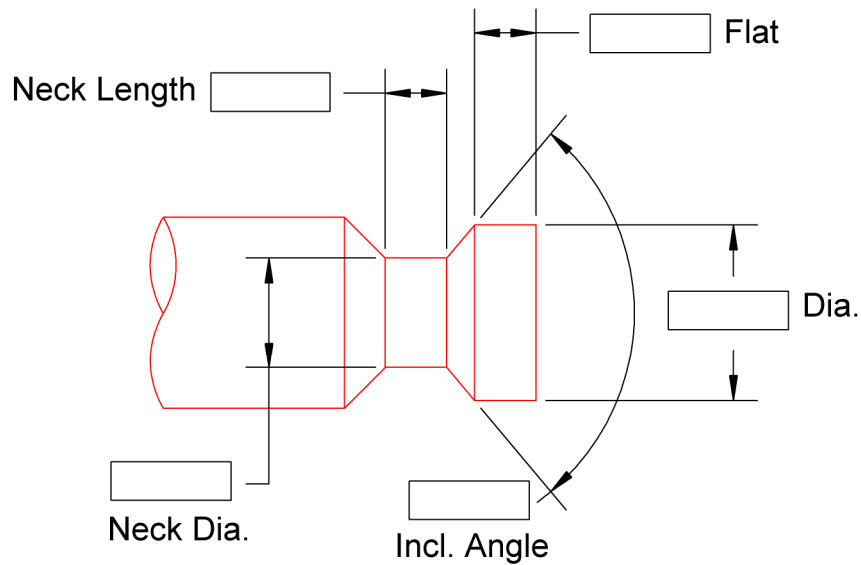
(3) flutes



| Number | Price | |
|-----------|---------|-------|
| | No-Coat | AlTiN |
| KM230-100 | \$90. | \$94. |

Special Keymod Cutters in 4-6 Working Days

Machining what part material, please? _____

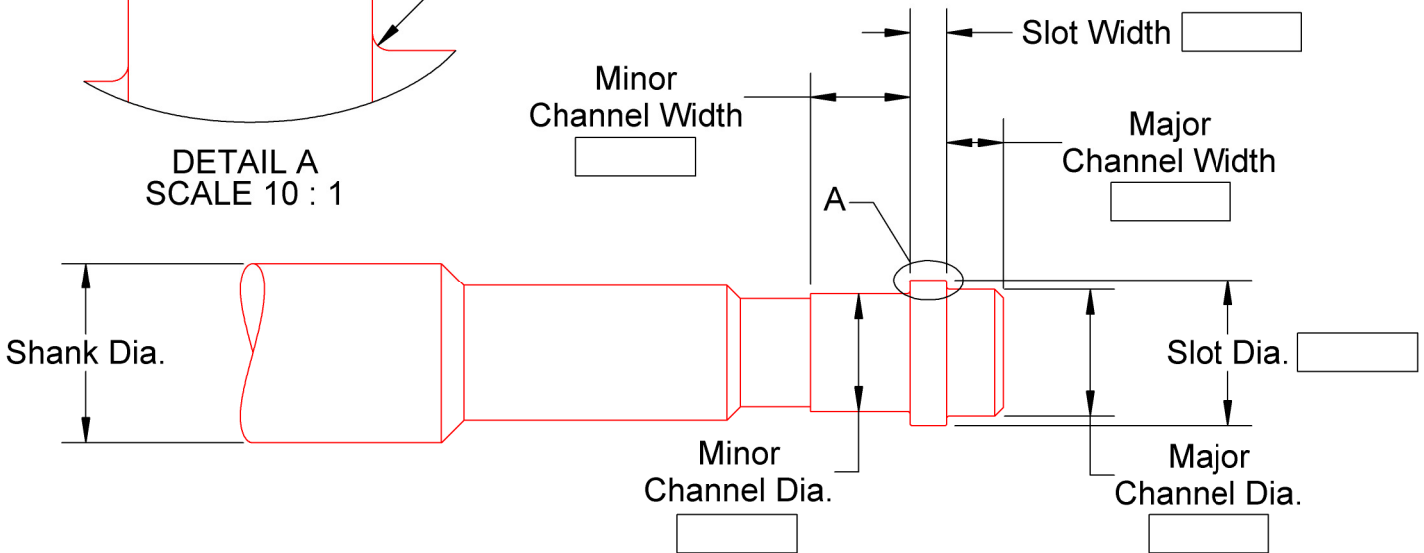
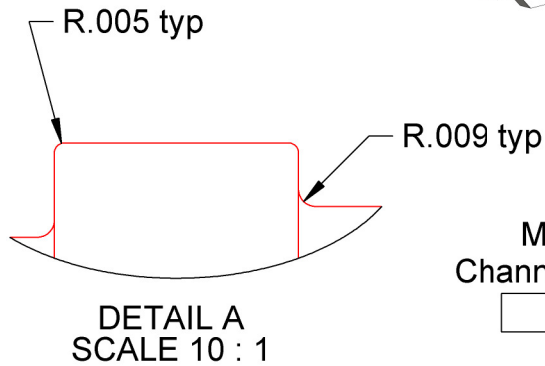
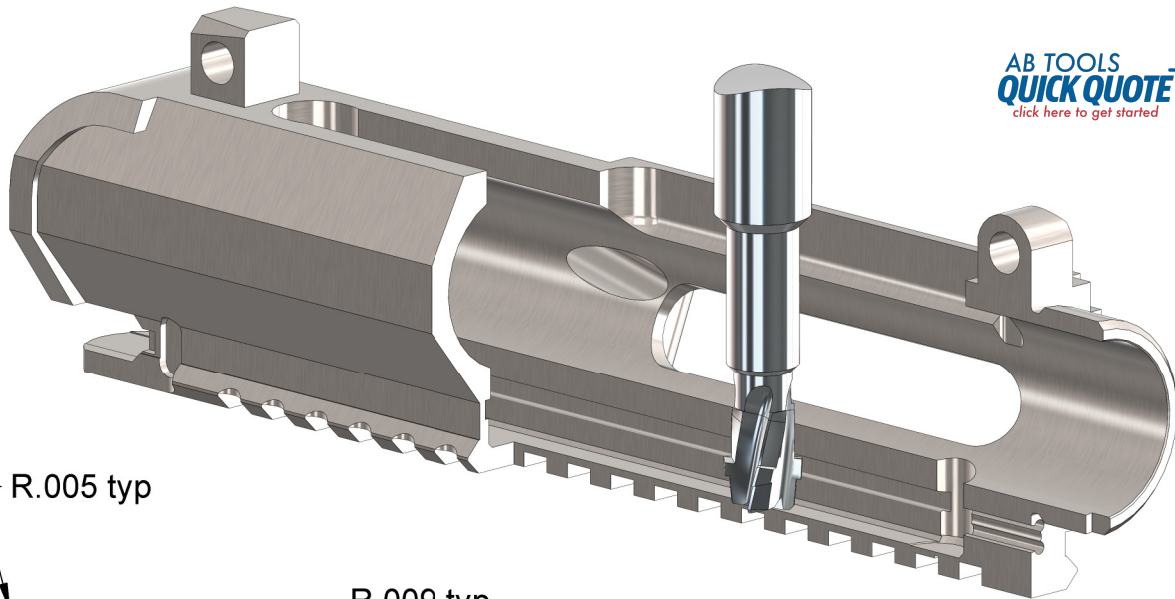


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Charging Handle Slot Cutter



Special Charging Handle Slot Cutters in 4-6 working days

Machining what part material, please? _____

| Number | Slot Dia. | Slot Width | Helix | Shank Dia. & OAL | No. of Flutes | Price | |
|----------|-----------|------------|-------|------------------|---------------|---------|--------|
| | | | | | | No-Coat | AlTiN |
| CHSC-R15 | .486 | .127 | 15° | 5/8 X 5 | 3 | \$240. | \$255. |
| CHSC-R30 | .486 | .127 | 30° | 5/8 X 5 | 3 | \$240. | \$255. |
| CHSC-F15 | .506 | .127 | 15° | 5/8 X 5 | 4 | \$240. | \$255. |
| CHSC-F30 | .506 | .127 | 30° | 5/8 X 5 | 4 | \$240. | \$255. |



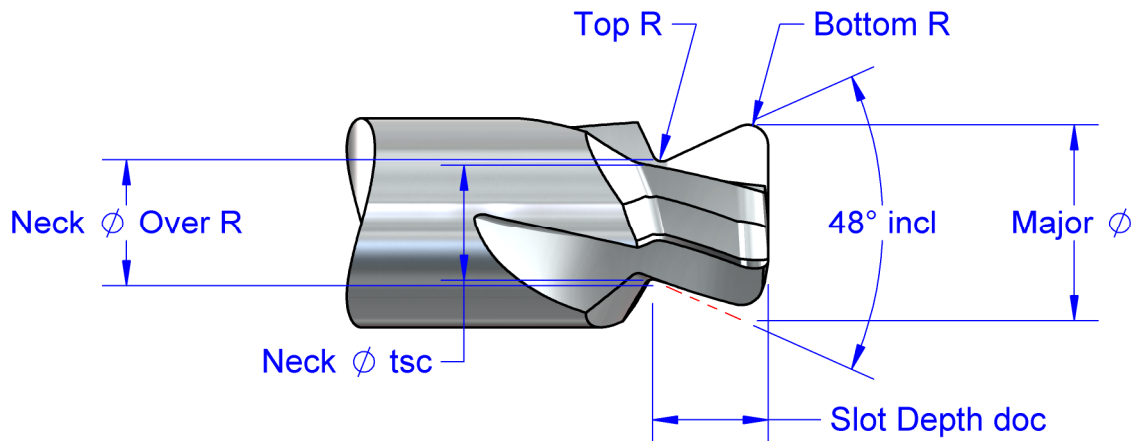
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Solid Carbide Dovetail Cutters for O-Ring Grooves

| NUMBER | O-RING SIZE | NECK Ø TSC | NECK Ø OVER R | SLOT DEPTH | TOP RAD. | BOTTOM RAD. | MAJOR Ø | PRICE | AITiN |
|---------------------|-------------|--------------|----------------|------------|----------|-------------|----------------|--------|--------|
| DT1/16 DT1/16-5 | .070 | .057 .052 | .0624 .0574 | .051 | .005 | .015 | .0862 .0812 | \$68. | \$72. |
| DT1/16-054 | .070 | .059 | .064 | .054 | .005 | .016 | .090 | \$68. | \$72. |
| DT3/32 DT3/32-8 | .103 | .085 .077 | .0958 .0878 | .082 | .010 | .015 | .1418 .1338 | \$68. | \$72. |
| DT1/8 DT1/8-10 | .139 | .115 .105 | .1258 .1158 | .112 | .010 | .031 | .1812 .1712 | \$75. | \$79. |
| DT3/16 DT3/16-12 | .210 | .173 .161 | .1892 .1772 | .172 | .015 | .031 | .2927 .2807 | \$85. | \$92. |
| DT1/4 DT1/4-15 | .275 | .233 .218 | .2492 .2342 | .232 | .015 | .062 | .3726 .3576 | \$100. | \$107. |
| DT3/8 DT3/8-15 | .375 | .317 .302 | .3386 .3236 | .317 | .020 | .094 | .4978 .4828 | \$130. | \$139. |



Reference Chart

| NUMBER | NO. OF FLUTES | SHANK Ø | OAL |
|---------------------|---------------|---------|-----|
| DT1/16 DT1/16-5 | 1 | 3/16 | 2 |
| DT1/16-054 | 2 | 3/16 | 2 |
| DT3/32 DT3/32-8 | 2 | 3/16 | 2 |
| DT1/8 DT1/8-10 | 2 | 1/4 | 2 |
| DT3/16 DT3/16-12 | 3 | 5/16 | 2.5 |
| DT1/4 DT1/4-15 | 3 | 3/8 | 2.5 |
| DT3/8 DT3/8-15 | 4 | 1/2 | 2.5 |

**Specials in 4-6
Working Days
(See Page 18)**



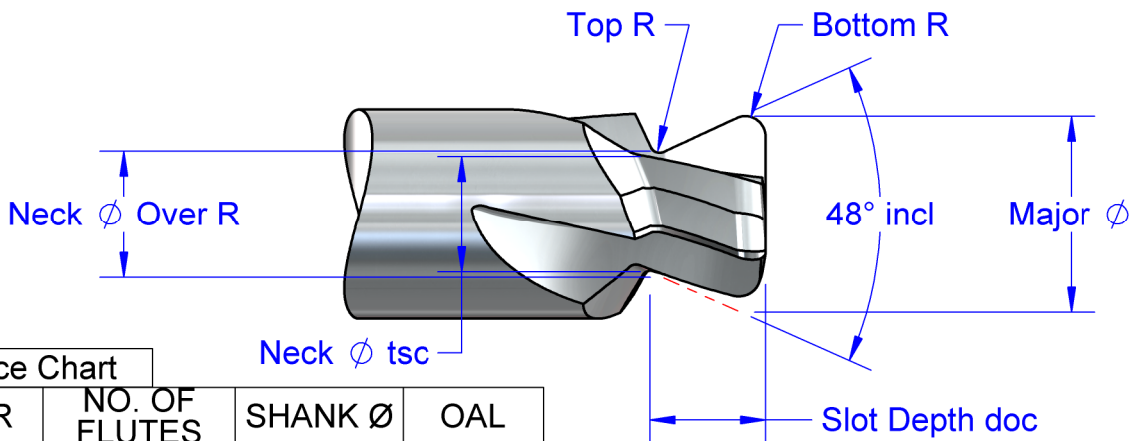
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Solid Carbide Dovetail for O-Ring Grooves (Metric)

| NUMBER | O-RING SIZE | NECK Ø TSC | NECK Ø OVER R | SLOT DEPTH | TOP RAD. | BOTTOM RAD. | MAJOR Ø | PRICE | AITiN |
|---------|-------------|------------|---------------|------------|----------|-------------|---------|--------|--------|
| DT3MM | 3MM | .096 | .102 | .094 | .010 | .016 | .162 | \$68. | \$72. |
| DT3.5MM | 3.5MM | .110 | .121 | .110 | .010 | .031 | .1745 | \$68. | \$72. |
| DT4MM | 4MM | .122 | .133 | .126 | .010 | .031 | .201 | \$72. | \$76. |
| DT4.5MM | 4.5MM | .138 | .149 | .144 | .010 | .031 | .232 | \$72. | \$76. |
| DT5MM | 5MM | .152 | .162 | .163 | .010 | .031 | .264 | \$85. | \$92. |
| DT5.5MM | 5.5MM | .165 | .183 | .181 | .016 | .031 | .293 | \$85. | \$92. |
| DT6MM | 6MM | .179 | .196 | .199 | .016 | .031 | .323 | \$100. | \$107. |
| DT6.5MM | 6.5MM | .193 | .210 | .2165 | .016 | .031 | .352 | \$100. | \$107. |
| DT7MM | 7MM | .207 | .224 | .234 | .016 | .059 | .352 | \$100. | \$107. |
| DT7.5MM | 7.5MM | .2205 | .238 | .252 | .016 | .059 | .381 | \$130. | \$139. |
| DT8MM | 8MM | .236 | .258 | .270 | .020 | .059 | .413 | \$130. | \$139. |
| DT8.5MM | 8.5MM | .250 | .272 | .289 | .020 | .059 | .444 | \$130. | \$139. |
| DT9MM | 9MM | .264 | .285 | .307 | .020 | .059 | .473 | \$130. | \$139. |
| DT9.5MM | 9.5MM | .278 | .299 | .323 | .020 | .059 | .501 | \$130. | \$139. |
| DT10MM | 10MM | .291 | .313 | .3425 | .020 | .059 | .533 | \$165. | \$178. |



| NUMBER | NO. OF FLUTES | SHANK Ø | OAL |
|---------|---------------|---------|-----|
| DT3MM | 2 | 3/16 | 2 |
| DT3.5MM | 2 | 3/16 | 2 |
| DT4MM | 2 | 1/4 | 2 |
| DT4.5MM | 2 | 1/4 | 2 |
| DT5MM | 3 | 5/16 | 2.5 |
| DT5.5MM | 3 | 5/16 | 2.5 |
| DT6MM | 3 | 3/8 | 2.5 |
| DT6.5MM | 3 | 3/8 | 2.5 |
| DT7MM | 3 | 3/8 | 2.5 |
| DT7.5MM | 3 | 1/2 | 2.5 |
| DT8MM | 3 | 1/2 | 2.5 |
| DT8.5MM | 3 | 1/2 | 2.5 |
| DT9MM | 3 | 1/2 | 2.5 |
| DT9.5MM | 3 | 1/2 | 2.5 |
| DT10MM | 3 | 5/8 | 3.5 |

Specials in 4-6 Working Days (See Page 18)



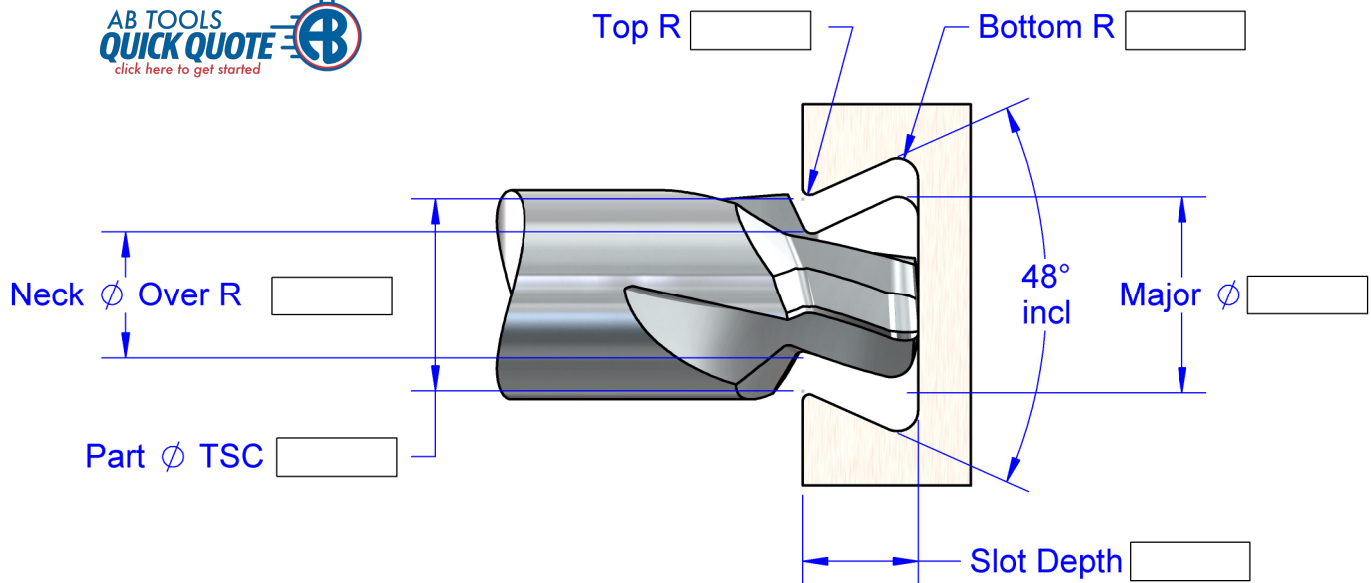
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Solid Carbide Dovetail Cutters for O-Ring Grooves WITHOUT Drop Hole Provision

| NUMBER | O-RING SIZE | PART Ø TSC | NECK Ø OVER R | SLOT DEPTH | TOP RAD. | BOTTOM RAD. | NO. OF FLUTES | PRICE | AITiN |
|-----------|-------------|------------|---------------|------------|----------|-------------|---------------|--------|--------|
| DTNDH1/16 | .070 | .057 | .036 | .051 | .005 | .015 | 1 | \$68. | \$72. |
| DTNDH3/32 | .103 | .085 | .048 | .082 | .010 | .015 | 1 | \$68. | \$72. |
| DTNDH1/8 | .139 | .115 | .0685 | .112 | .010 | .031 | 2 | \$75. | \$79. |
| DTNDH3/16 | .210 | .173 | .0835 | .172 | .015 | .031 | 2 | \$85. | \$90. |
| DTNDH1/4 | .275 | .233 | .1235 | .232 | .015 | .062 | 2 | \$100. | \$107. |
| DTNDH3/8 | .375 | .317 | .178 | .317 | .020 | .094 | 3 | \$130. | \$137. |



Reference Chart

| NUMBER | MAJOR Ø | SHANK Ø | OAL |
|-----------|---------|---------|-----|
| DTNDH1/16 | .060 | 3/16 | 2 |
| DTNDH3/32 | .094 | 3/16 | 2 |
| DTNDH1/8 | .124 | 3/16 | 2 |
| DTNDH3/16 | .187 | 1/4 | 2 |
| DTNDH1/4 | .247 | 5/16 | 2.5 |
| DTNDH3/8 | .337 | 3/8 | 2.5 |

**Specials in 4-6
Working Days**



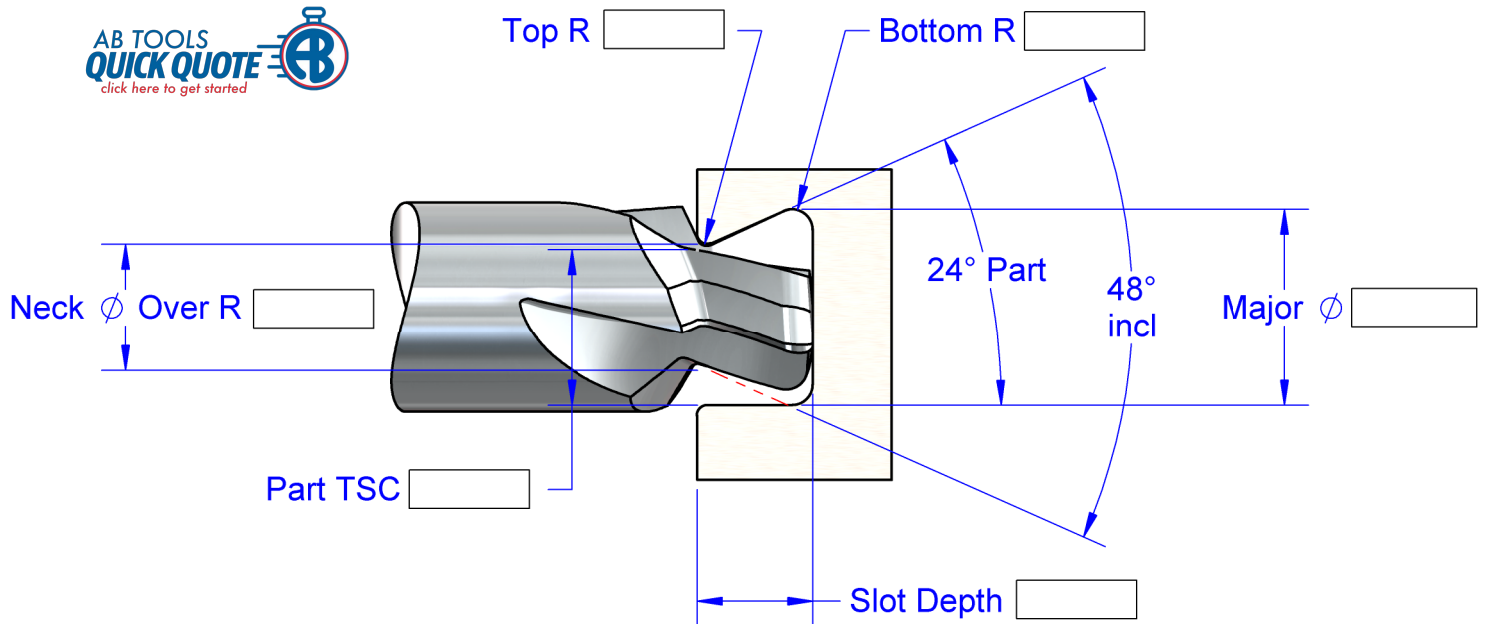
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Solid Carbide Dovetail Cutters for Half Dovetail O-Ring Grooves

| NUMBER | O-RING SIZE | PART Ø TSC | NECK Ø OVER R | SLOT DEPTH | TOP RAD. | BOTTOM RAD. | NO. OF FLUTES | PRICE | AITiN |
|---------|-------------|------------|---------------|------------|----------|-------------|---------------|--------|--------|
| HDG1/16 | .070 | .065 | .0545 | .054 | .005 | .015 | 2 | \$68. | \$72. |
| HDG3/32 | .103 | .096 | .0775 | .084 | .010 | .015 | 2 | \$68. | \$72. |
| HDG1/8 | .139 | .126 | .103 | .114 | .010 | .031 | 2 | \$75. | \$79. |
| HDG3/16 | .210 | .1915 | .146 | .1745 | .015 | .031 | 2 | \$85. | \$92. |
| HDG1/4 | .275 | .256 | .2005 | .236 | .015 | .062 | 3 | \$100. | \$107. |
| HDG3/8 | .375 | .354 | .283 | .321 | .020 | .093 | 4 | \$130. | \$139. |



Reference Chart

| NUMBER | MAJOR Ø | SHANK Ø | OAL |
|---------|---------|---------|-----|
| HDG1/16 | .081 | 3/16 | 2 |
| HDG3/32 | .125 | 3/16 | 2 |
| HDG1/8 | .160 | 3/16 | 2 |
| HDG3/16 | .253 | 5/16 | 2.5 |
| HDG1/4 | .328 | 3/8 | 2.5 |
| HDG3/8 | .447 | 1/2 | 2.5 |

Specials in 4-6
Working Days



A. B. TOOLS, INC.
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Lincoln, CA 95648-9312

Phone 916 408-2442
FAX 916 993-3949

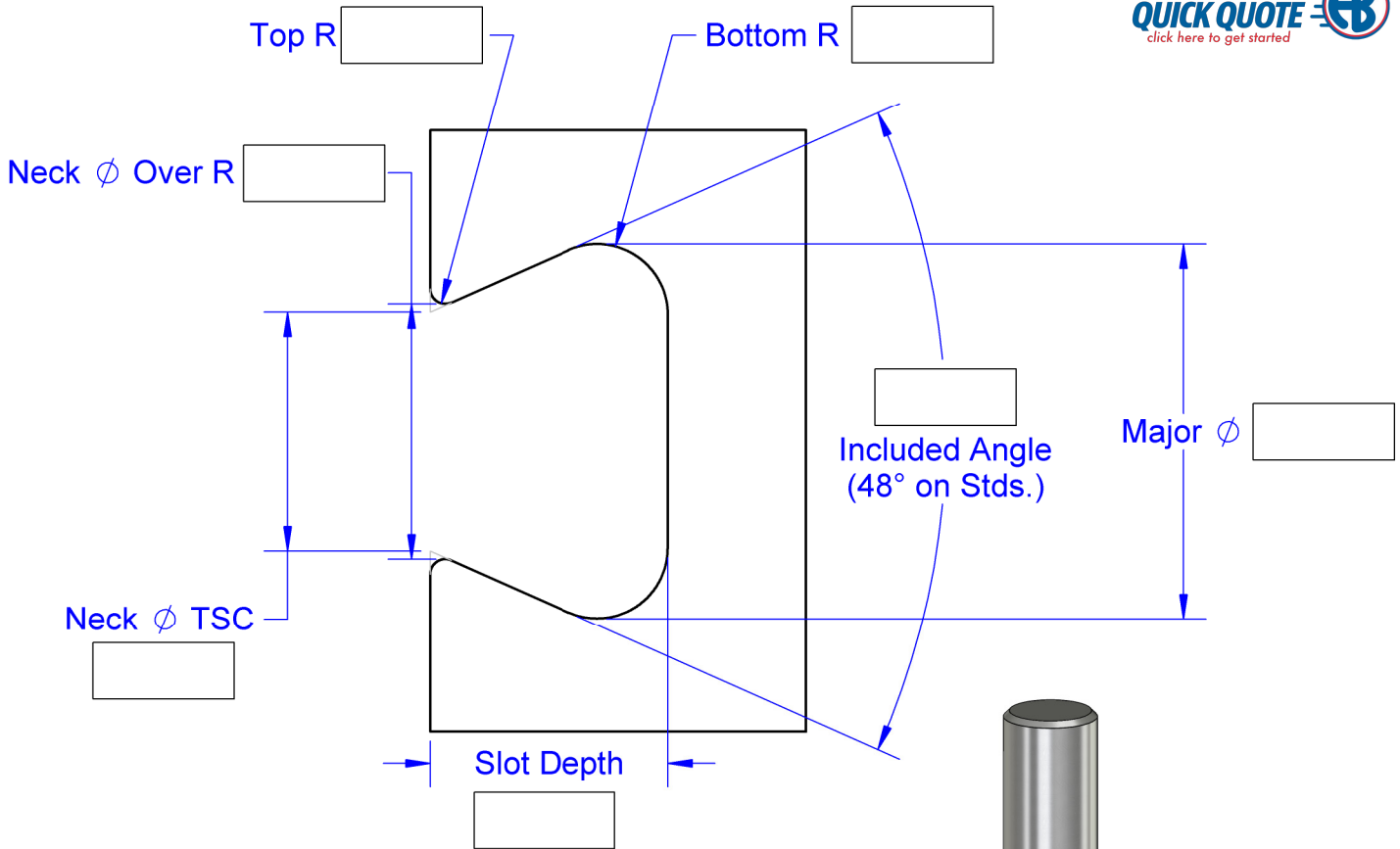
www.abtoolsinc.com
E-Mail: mail@abtoolsinc.com

Solid Carbide Dovetail Cutters for O-Ring Grooves

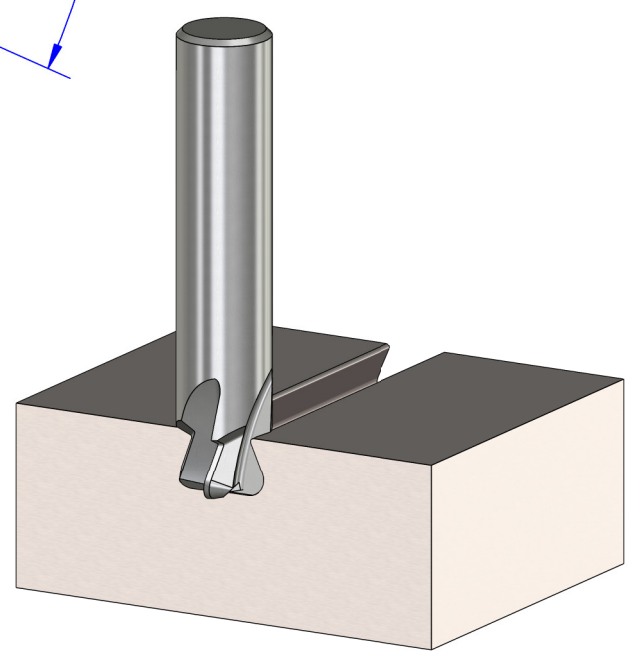
Specials in 4-6 working days

Machining what part material, please? _____

Number of flutes is based on part material and Neck ϕ .



Shank ϕ and overall length are based on cutter Major ϕ . Or per request if feasible.



| Basic Prices | | |
|----------------|--------|-----------|
| Major ϕ | 1 tool | 2 tools |
| Up to .250 | \$160. | \$135. ea |
| .251 thru .375 | \$195. | \$150. ea |
| .376 thru .500 | \$235. | \$165. ea |
| .501 thru .625 | \$325. | \$240. ea |
| .626 thru .750 | \$360. | \$265. ea |



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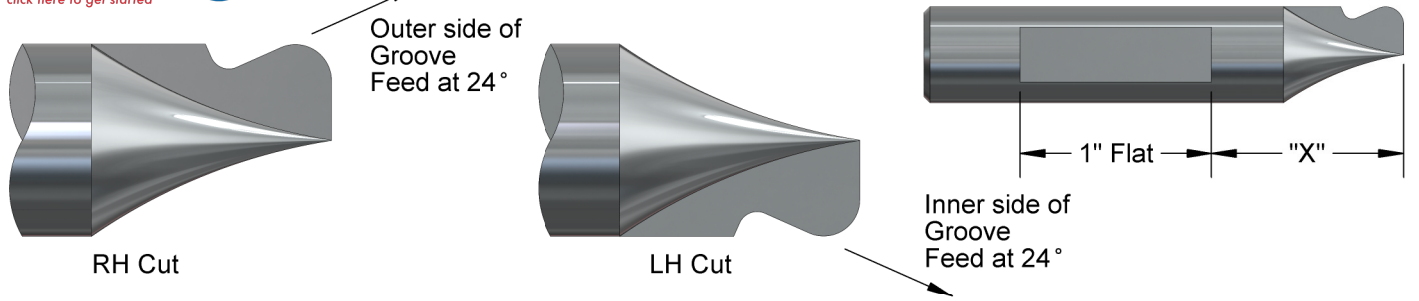
Phone 916 408-2442
FAX 916 993-3949

www.abtoolsinc.com
E-Mail: mail@abtoolsinc.com

Solid Carbide O-Ring Dovetails for Lathes



Single flute carbide O-Ring form tools for lathe applications that match Parker-Hannifin standards

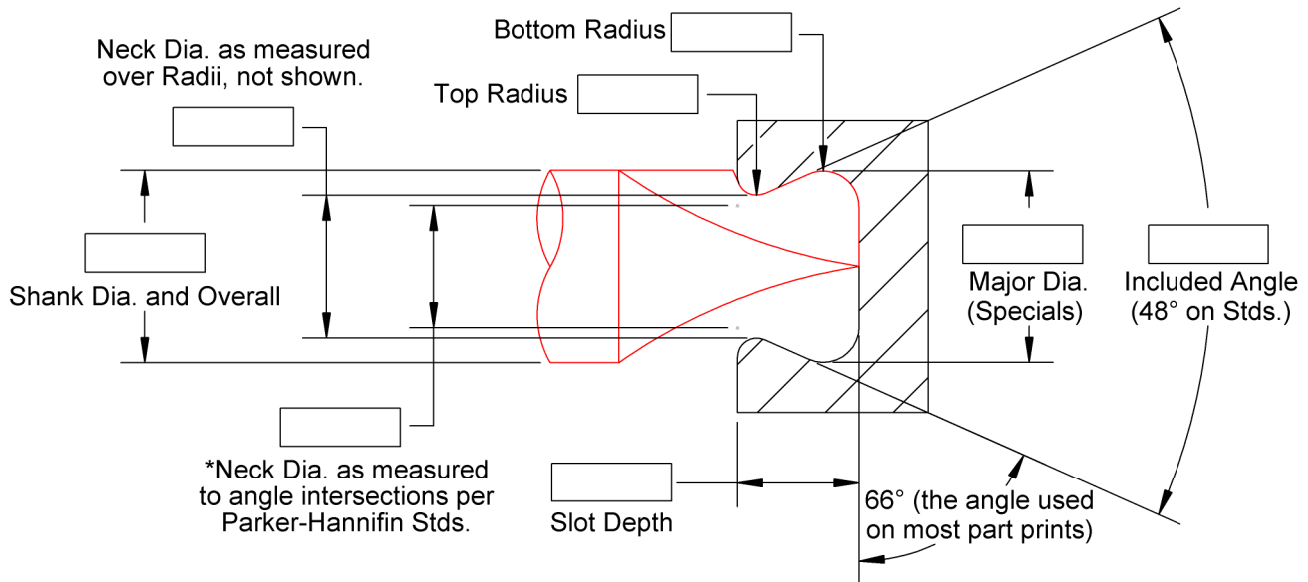


| NUMBER | | O'RING DIA. | *NECK DIA. | SLOT DEPTH | TOP RAD. | BOTT. RAD. | X | SHANK & OAL | PRICES | |
|---------------|---------------|-------------|------------|------------|----------|------------|------|-------------|---------|--------|
| RH Cut | LH Cut | | | | | | | | No Coat | AlTiN |
| DTL1/16-R | DTL1/16-L | .070 | .057 | .051 | .005 | .015 | 1/2" | 3/16 X 2 | \$78. | \$82. |
| DTL1/16-054-R | DTL1/16-054-L | .070 | .059 | .054 | .005 | .016 | 1/2" | 3/16 X 2 | \$78. | \$82. |
| DTL3/32-R | DTL3/32-L | .103 | .085 | .082 | .010 | .015 | 1/2" | 3/16 X 2 | \$78. | \$82. |
| DTL1/8-R | DTL1/8-L | .139 | .115 | .112 | .010 | .031 | 5/8" | 1/4 X 2 | \$85. | \$89. |
| DTL3/16-R | DTL3/16-L | .210 | .173 | .172 | .015 | .031 | 3/4" | 5/16 X 2.5 | \$95. | \$102. |
| DTL1/4-R | DTL1/4-L | .275 | .233 | .232 | .015 | .062 | 7/8" | 3/8 X 2.5 | \$110. | \$117. |
| DTL3/8-R | DTL3/8-L | .375 | .317 | .317 | .020 | .094 | 1" | 1/2 X 2.5 | \$155. | \$164. |

Specials in 4-6 working days

Machining what part material, please? _____

Low Carbon Steel: 500 SFM, .0005-.0010 IPR
 Aluminum: 6000 SFM, .0005-.0010 IPR
 304 SS: 225 SFM, .0005-.0010 IPR



| | | |
|--|---------------------------|--|
| Special Carbide Cutters for O-Ring Grooves | To 1/4 Major Diameter | 1 at \$175. and 2 at \$150. each |
| | .251 thru .375 Major Dia. | 1 at \$210. and 2 at \$165. each |
| | .376 thru .500 Major Dia. | 1 at \$250. and 2 at \$180. each |



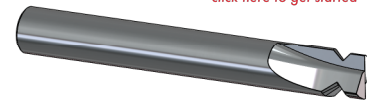
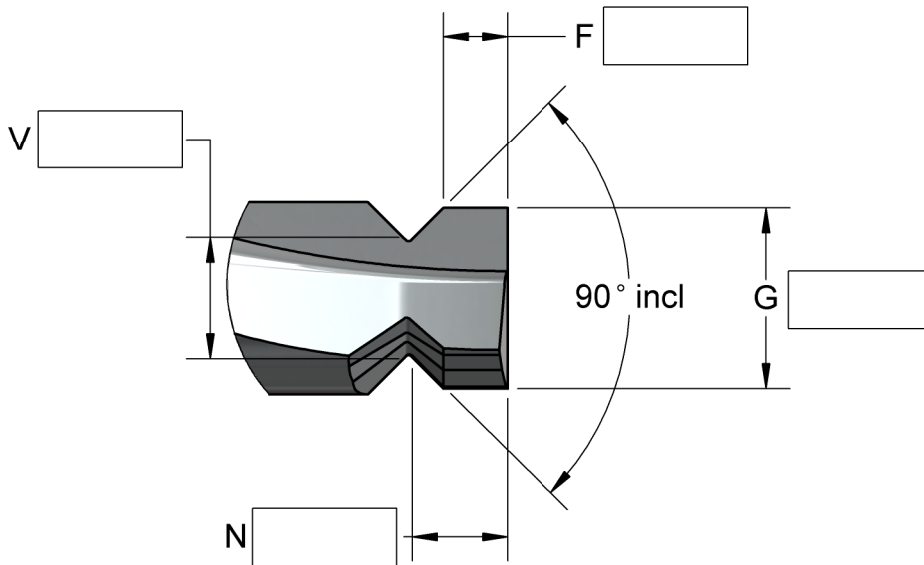
A. B. TOOLS, INC.
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 Lincoln, CA 95648-9312

Phone 916 408-2442
 FAX 916 993-3949

www.abtoolsinc.com
 E-Mail: mail@abtoolsinc.com

Solid Carbide DSP Cutters for protective cable grooves

| Number | "G" | "N" | "F" | "V" | Shank Ø | OAL | Flutes | Price |
|---------|------|------|-------|------|---------|-----|--------|--------|
| DSP-02 | .047 | .023 | .0125 | .026 | 3/16 | 2 | 2 | \$70. |
| DSP-03 | .064 | .036 | .021 | .034 | 3/16 | 2 | 2 | \$70. |
| DSP-04B | .095 | .045 | .022 | .049 | 3/16 | 2 | 2 | \$75. |
| DSP-070 | .095 | .053 | .0325 | .054 | 3/16 | 2 | 2 | \$75. |
| DSP-05B | .110 | .059 | .035 | .062 | 3/16 | 2 | 2 | \$75. |
| DSP-06 | .126 | .071 | .0455 | .075 | 3/16 | 2 | 2 | \$80. |
| DSP-103 | .142 | .077 | .048 | .084 | 3/16 | 2 | 2 | \$80. |
| DSP-07B | .157 | .079 | .0485 | .094 | 3/16 | 2 | 2 | \$80. |
| DSP-08 | .172 | .096 | .060 | .100 | 3/16 | 2 | 2 | \$80. |
| DSP-139 | .188 | .113 | .0715 | .105 | 1/4 | 2 | 2 | \$90. |
| DSP-09 | .188 | .105 | .0705 | .119 | 1/4 | 2 | 2 | \$90. |
| DSP-11 | .235 | .129 | .0835 | .144 | 1/4 | 2 | 2 | \$90. |
| DSP-12 | .251 | .147 | .093 | .144 | 3/8 | 2.5 | 2 | \$100. |
| DSP-16 | .344 | .185 | .128 | .229 | 3/8 | 2.5 | 2 | \$105. |
| DSP-20 | .407 | .233 | .164 | .269 | 1/2 | 2.5 | 3 | \$120. |
| DSP-24 | .501 | .280 | .196 | .333 | 1/2 | 2.5 | 3 | \$175. |
| DSP-32 | .657 | .377 | .267 | .437 | 3/4 | 3 | 4 | \$240. |



**Specials in 4-6
Working Days**

Multi Seal Solid Carbide DMSP Cutter

| Number | "G" | "N" | "F" | "V" | Shank Ø | OAL | Flutes | Price |
|---------|------|------|------|------|---------|-----|--------|--------|
| DMSP-04 | .187 | .051 | .016 | .117 | 3/16 | 2 | 2 | \$80. |
| DMSP-06 | .250 | .074 | .028 | .159 | 3/8 | 2.5 | 2 | \$90. |
| DMSP-08 | .313 | .086 | .044 | .229 | 3/8 | 2.5 | 3 | \$100. |
| DMSP-12 | .500 | .145 | .063 | .336 | 1/2 | 2.5 | 3 | \$175. |
| DMSP-16 | .625 | .192 | .106 | .454 | 5/8 | 3.5 | 4 | \$205. |



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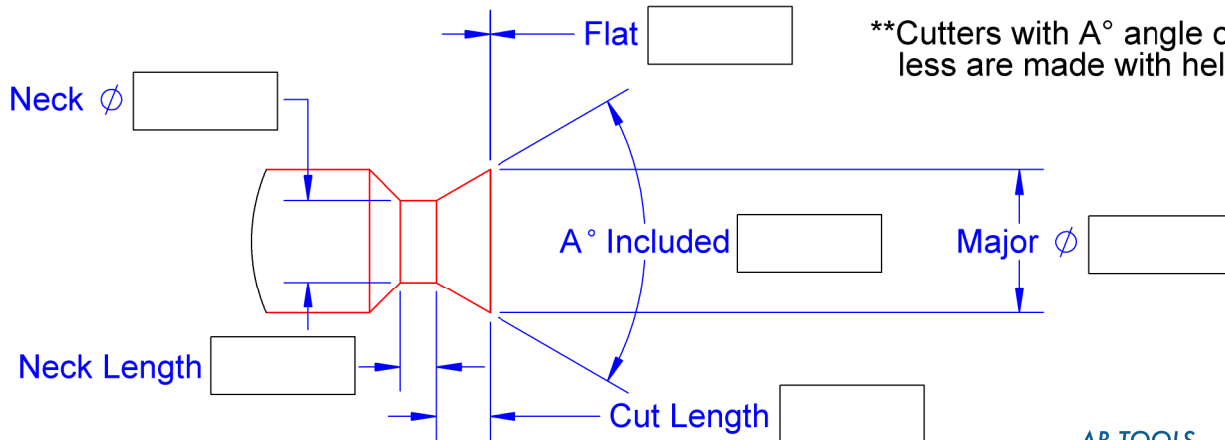
Solid Carbide Dovetail Cutters

1/8" Major Ø x 1.5" OAL. With 1/8" Neck Length. 3 Flutes.

| Number | A° | Cut Lngth | Neck Ø | Flat | Price | AlTiN |
|-----------|-----|-----------|--------|------|-------|-------|
| DS1/8-10 | 10 | .188 | .090 | .001 | \$60. | \$65. |
| DS1/8-20 | 20 | .125 | .080 | .001 | \$60. | \$65. |
| DS1/8-30 | 30 | .090 | .075 | .001 | \$60. | \$65. |
| DS1/8-40 | 40 | .080 | .065 | .001 | \$60. | \$65. |
| DS1/8-45 | 45 | .070 | .065 | .001 | \$60. | \$65. |
| DS1/8-50 | 50 | .065 | .065 | .002 | \$60. | \$65. |
| DS1/8-60 | 60 | .050 | .065 | .002 | \$60. | \$65. |
| DS1/8-70 | 70 | .040 | .065 | .002 | \$60. | \$65. |
| DS1/8-80 | 80 | .035 | .065 | .002 | \$60. | \$65. |
| DS1/8-90 | 90 | .030 | .065 | .002 | \$60. | \$65. |
| DS1/8-100 | 100 | .025 | .065 | .003 | \$60. | \$65. |
| DS1/8-120 | 120 | .020 | .065 | .003 | \$60. | \$65. |

3/16" Major Ø x 2" OAL. With 1/8" Neck Length. 3 Flutes.

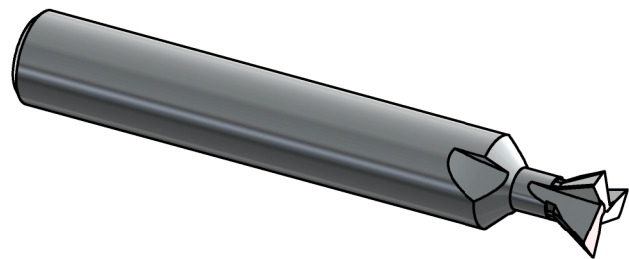
| Number | A° | Cut Lngth | Neck Ø | Flat | Price | AlTiN |
|------------|-----|-----------|--------|------|---------|-------|
| DS3/16-10 | 10 | .270 | .140 | .001 | \$62.50 | \$66. |
| DS3/16-20 | 20 | .210 | .110 | .001 | \$62.50 | \$66. |
| DS3/16-30 | 30 | .160 | .100 | .001 | \$62.50 | \$66. |
| DS3/16-40 | 40 | .130 | .090 | .001 | \$62.50 | \$66. |
| DS3/16-45 | 45 | .115 | .090 | .001 | \$62.50 | \$66. |
| DS3/16-50 | 50 | .100 | .090 | .002 | \$62.50 | \$66. |
| DS3/16-60 | 60 | .080 | .090 | .002 | \$62.50 | \$66. |
| DS3/16-70 | 70 | .070 | .090 | .002 | \$62.50 | \$66. |
| DS3/16-80 | 80 | .055 | .090 | .002 | \$62.50 | \$66. |
| DS3/16-90 | 90 | .050 | .090 | .002 | \$62.50 | \$66. |
| DS3/16-100 | 100 | .040 | .090 | .003 | \$62.50 | \$66. |
| DS3/16-120 | 120 | .030 | .090 | .003 | \$62.50 | \$66. |



Cutters with A° angle of 45° and less are made with helical flutes.

1/4" Major Ø x 2" OAL. With 1/8" Neck Length. 3 Flutes.

| Number | A° | Cut Lngth | Neck Ø | Flat | Price | AlTiN |
|-----------|-----|-----------|--------|------|-------|-------|
| DS1/4-10 | 10 | .320 | .160 | .001 | \$65. | \$70. |
| DS1/4-20 | 20 | .300 | .130 | .001 | \$65. | \$70. |
| DS1/4-30 | 30 | .250 | .115 | .001 | \$65. | \$70. |
| DS1/4-32 | 32 | .125 | .155 | N/A | \$65. | \$70. |
| DS1/4-40 | 40 | .190 | .110 | .001 | \$65. | \$70. |
| DS1/4-45 | 45 | .165 | .110 | .001 | \$65. | \$70. |
| DS1/4-50 | 50 | .150 | .110 | .002 | \$65. | \$70. |
| DS1/4-60 | 60 | .120 | .110 | .002 | \$65. | \$70. |
| DS1/4-70 | 70 | .100 | .110 | .002 | \$65. | \$70. |
| DS1/4-80 | 80 | .085 | .110 | .002 | \$65. | \$70. |
| DS1/4-90 | 90 | .070 | .110 | .002 | \$65. | \$70. |
| DS1/4-100 | 100 | .060 | .110 | .003 | \$65. | \$70. |
| DS1/4-120 | 120 | .045 | .110 | .003 | \$65. | \$70. |



Specials in 4-6 Working Days



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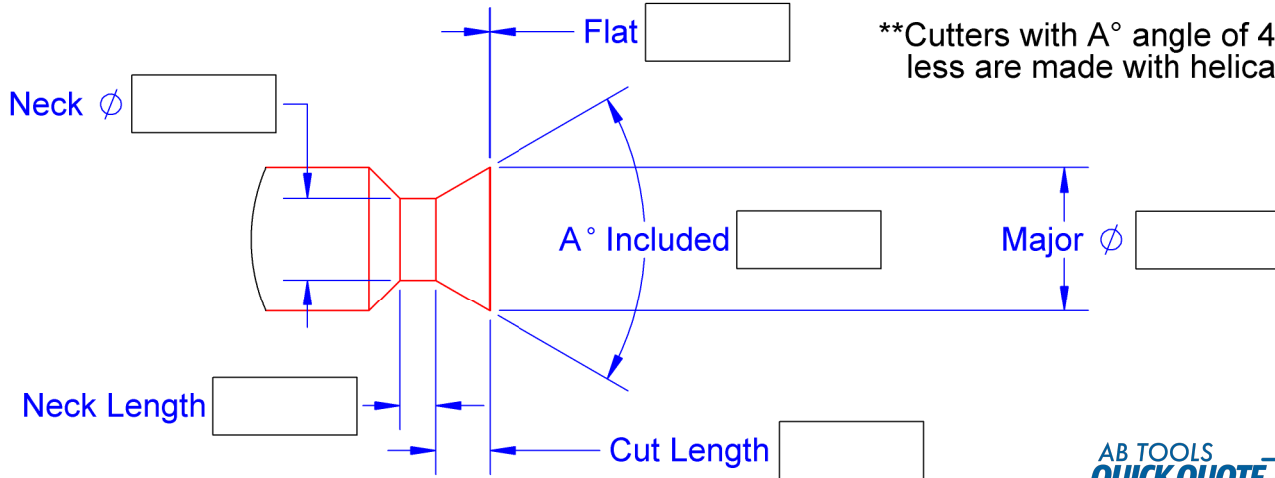
Solid Carbide Dovetail Cutters

3/8" Major Ø x 2.5" OAL. With 3/16" Neck Length. 3 Flutes.

| Number | A° | Cut Lngth | Neck Ø | Flat | Price | AlTiN |
|-----------|-----|-----------|--------|------|---------|-------|
| DS3/8-10 | 10 | .370 | .260 | .001 | \$82.50 | \$89. |
| DS3/8-20 | 20 | .370 | .230 | .001 | \$82.50 | \$89. |
| DS3/8-30 | 30 | .370 | .170 | .001 | \$82.50 | \$89. |
| DS3/8-40 | 40 | .260 | .170 | .001 | \$82.50 | \$89. |
| DS3/8-45 | 45 | .235 | .170 | .001 | \$82.50 | \$89. |
| DS3/8-50 | 50 | .210 | .170 | .002 | \$82.50 | \$89. |
| DS3/8-60 | 60 | .180 | .170 | .002 | \$82.50 | \$89. |
| DS3/8-70 | 70 | .145 | .170 | .002 | \$82.50 | \$89. |
| DS3/8-80 | 80 | .130 | .160 | .002 | \$82.50 | \$89. |
| DS3/8-90 | 90 | .110 | .160 | .002 | \$82.50 | \$89. |
| DS3/8-100 | 100 | .090 | .160 | .003 | \$82.50 | \$89. |
| DS3/8-120 | 120 | .060 | .160 | .003 | \$82.50 | \$89. |

1/2" Major Ø x 2.5" OAL. With 3/16" Neck Length. 3 Flutes.

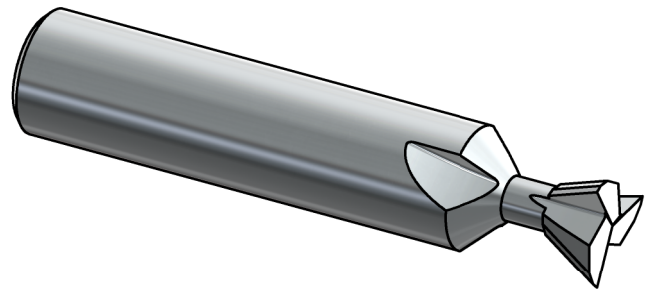
| Number | A° | Cut Lngth | Neck Ø | Flat | Price | AlTiN |
|-----------|-----|-----------|--------|------|-------|--------|
| DS1/2-10 | 10 | .500 | .360 | .001 | \$95. | \$104. |
| DS1/2-20 | 20 | .400 | .300 | .001 | \$95. | \$104. |
| DS1/2-30 | 30 | .320 | .200 | .001 | \$95. | \$104. |
| DS1/2-40 | 40 | .320 | .180 | .001 | \$95. | \$104. |
| DS1/2-45 | 45 | .320 | .180 | .001 | \$95. | \$104. |
| DS1/2-50 | 50 | .320 | .180 | .002 | \$95. | \$104. |
| DS1/2-60 | 60 | .250 | .180 | .002 | \$95. | \$104. |
| DS1/2-70 | 70 | .210 | .180 | .002 | \$95. | \$104. |
| DS1/2-80 | 80 | .180 | .180 | .002 | \$95. | \$104. |
| DS1/2-90 | 90 | .140 | .180 | .002 | \$95. | \$104. |
| DS1/2-100 | 100 | .120 | .180 | .003 | \$95. | \$104. |
| DS1/2-120 | 120 | .090 | .180 | .003 | \$95. | \$104. |



Cutters with A° angle of 45° and less are made with helical flutes.

5/8" Major Ø x 3" OAL. With 3/16" Neck Length. 4 Flutes.

| Number | A° | Cut Lngth | Neck Ø | Flat | Price | AlTiN |
|-----------|-----|-----------|--------|------|--------|--------|
| DS5/8-10 | 10 | .600 | .500 | .001 | \$135. | \$144. |
| DS5/8-20 | 20 | .500 | .440 | .001 | \$135. | \$144. |
| DS5/8-30 | 30 | .450 | .360 | .001 | \$135. | \$144. |
| DS5/8-40 | 40 | .400 | .330 | .001 | \$135. | \$144. |
| DS5/8-45 | 45 | .350 | .330 | .001 | \$135. | \$144. |
| DS5/8-50 | 50 | .310 | .330 | .002 | \$135. | \$144. |
| DS5/8-60 | 60 | .250 | .330 | .002 | \$135. | \$144. |
| DS5/8-70 | 70 | .210 | .330 | .002 | \$135. | \$144. |
| DS5/8-80 | 80 | .185 | .310 | .002 | \$135. | \$144. |
| DS5/8-90 | 90 | .150 | .310 | .002 | \$135. | \$144. |
| DS5/8-100 | 100 | .130 | .310 | .003 | \$135. | \$144. |
| DS5/8-120 | 120 | .090 | .310 | .003 | \$135. | \$144. |



Specials in 4-6 Working Days



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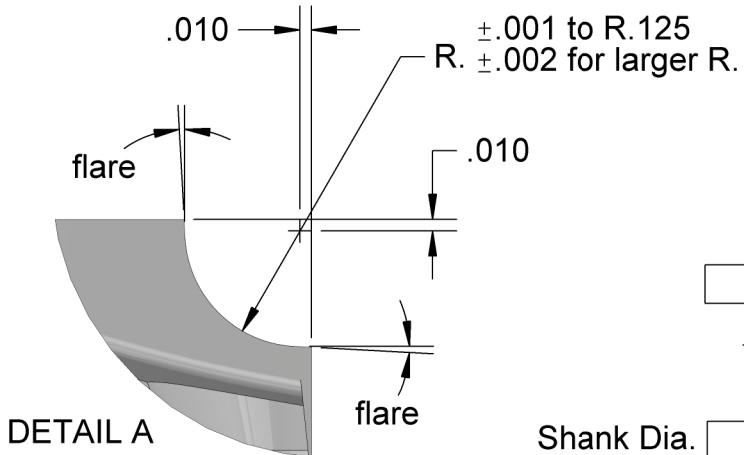
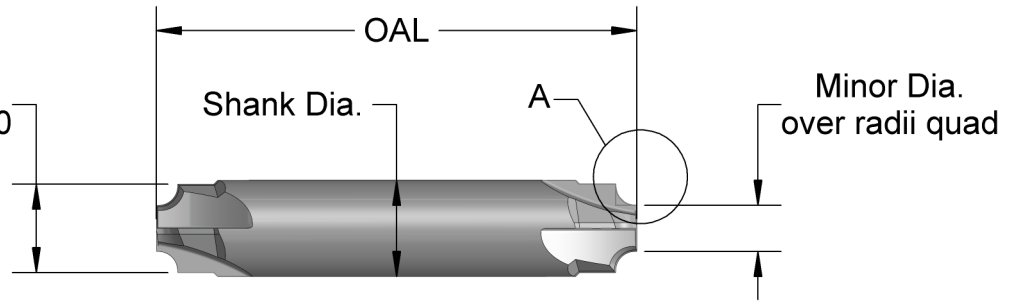
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Solid Carbide Corner Rounders

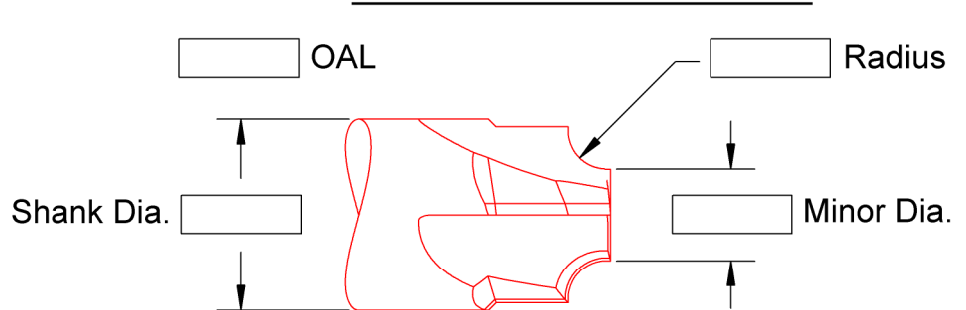
CNC Profile Ground, Double End



The Major Cut Dia. equals
the Minor Dia. + (R. X 2) + .020



**Special Corner Rounders
in 4-6 working days**
Machining what part
material, please?



All AB Tools corner rounders
are made with these features
to avoid gouging.

| Tool No. | (add R. to prefix, example CR12-031) Radius Sizes Available | Minor Dia. | No. Flutes | Shank & OAL | Prices | |
|----------|--|---------------|---------------|-------------------------------|-----------|--------|
| | | | | | No-Coat | AlTiN |
| CR1-___ | .010 .013 .015 .018 .020 .022 .025 .028 .031 | | | 3/8 x 2.5 | \$95. | \$109. |
| | .035 .038 .040 .046 .048 .050 .055 | | | | | |
| CR2-___ | .062 .070 .078 .080 .085 .093 .098 .100 .109 .118 .120 .125 | .240 | 4 | 1/2 x 2.5 | \$115. | \$133. |
| | .140 .156 .170 .187 | | | 5/8 x 3.5 | \$180. | \$206. |
| | | | | 3/4 x 4.0 | \$215. | \$245. |
| | | | | .197 .203 .218 .234 .250 | | |
| CR03-___ | .010 .015 .020 .025 .031 .040 .046 .050 .055 | .030 | 2 | 3/16 x 2 | \$60. | \$67. |
| | .062 .070 .078 | | | | | |
| CR06-___ | .010 .013 .015 .018 .020 .022 .025 .028 .031 .035 .040 | .060 | 2 | 3/16 x 2 | \$60. | \$67. |
| | .046 .048 .050 .055 .060 | | | | | |
| CR12-___ | .010 .013 .015 .018 .020 .022 .025 .028 .031 | .120 | 2 | 1/4 x 2 | \$70. | \$78. |
| | .035 .038 .040 .046 .048 .050 .055 .060 | | | | | |
| CR18-___ | .015 .020 .031 .035 .046 .055 .062 .070 .078 .080 | .180 | 3 | 3/8 x 2.5 | \$95. | \$109. |
| | .085 .093 .098 .109 .118 .120 .125 .130 .135 .140 .150 .156 | | | 1/2 x 2.5 | \$115. | \$133. |
| | | | | 5/8 x 3.5 | \$180. | \$206. |
| | | | | .170 .180 .187 .197 .203 .218 | 3/4 x 4.0 | \$215. |
| | .234 .250 | | | | | |

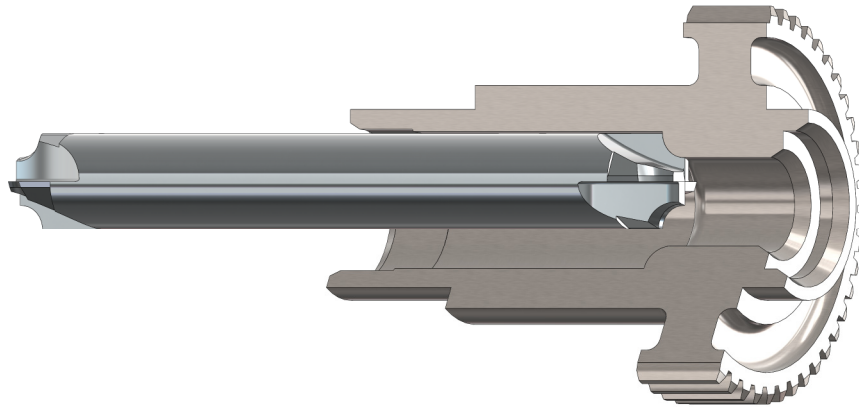


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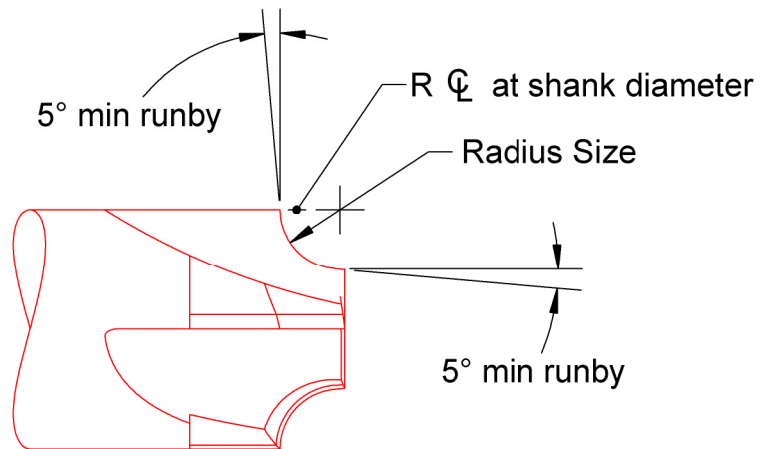
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Extended Reach, Double End, Solid Carbide, Corner Rounders



Specials in 4-6 Working Days

Radius center at shank diameter allows machining close to other features.



| Number | Radius sizes, add to prefix, example CRL1/2-062 | | | | | | | Shank & OAL | Flutes | Price | |
|---------|---|------|------|------|------|------|------|-------------|---------|--------|--------|
| CRL1/4- | .010 | .015 | .020 | .031 | .046 | .062 | | 1/4 X 3 | 2 or 4 | \$95. | |
| CRL3/8- | .010 | .015 | .020 | .031 | .046 | .062 | | 3/8 X 4 | 2 or 4 | \$115. | |
| | .093 | .125 | | | | | | 3/8 X 4 | 2 or 4 | | |
| CRL1/2- | .010 | .015 | .020 | .031 | .046 | .062 | .093 | .125 | 1/2 X 4 | 2 or 4 | \$135. |
| | .156 | .187 | | | | | | | 1/2 X 4 | 2 or 4 | |

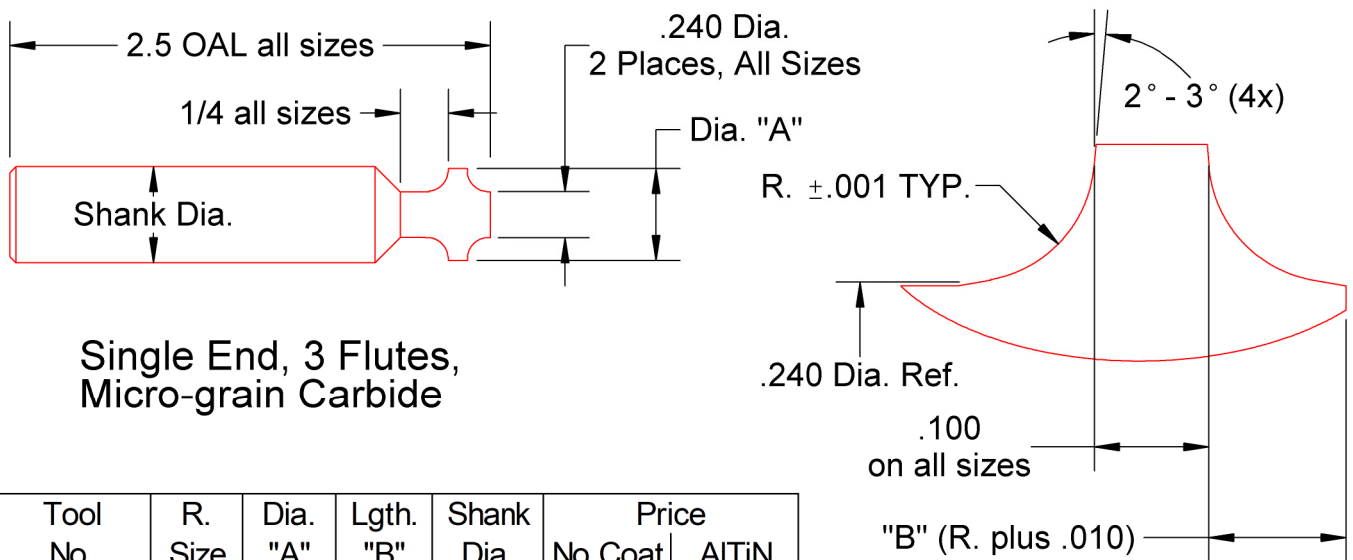
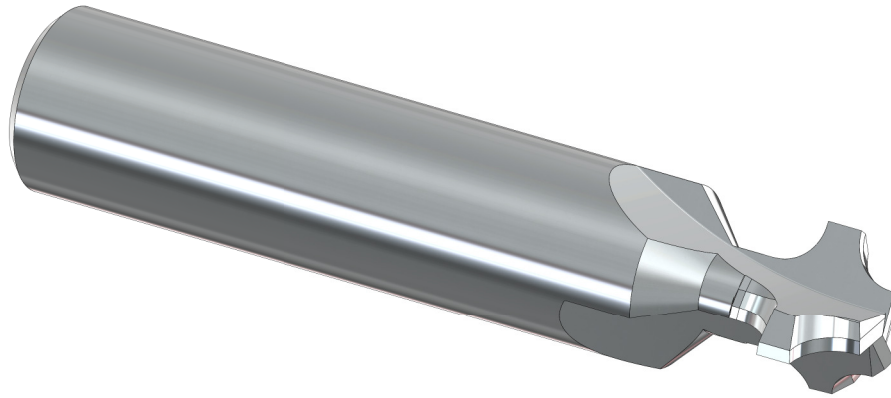


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Solid Carbide TOP & BOTTOM Corner Rounders



Single End, 3 Flutes,
Micro-grain Carbide

| Tool No. | R. Size | Dia. "A" | Lgth. "B" | Shank Dia. | Price | |
|----------|---------|----------|-----------|------------|---------|--------|
| | | | | | No Coat | AlTiN |
| CRD-015 | .015 | .290 | .025 | 3/8 | \$135. | \$142. |
| CRD-020 | .020 | .300 | .030 | 3/8 | \$135. | \$142. |
| CRD-031 | .031 | .322 | .041 | 3/8 | \$135. | \$142. |
| CRD-040 | .040 | .340 | .050 | 3/8 | \$135. | \$142. |
| CRD-046 | .046 | .352 | .056 | 3/8 | \$135. | \$142. |
| CRD-062 | .062 | .384 | .072 | 1/2 | \$150. | \$159. |
| CRD-078 | .078 | .416 | .088 | 1/2 | \$150. | \$159. |
| CRD-093 | .093 | .446 | .103 | 1/2 | \$150. | \$159. |
| CRD-109 | .109 | .478 | .119 | 1/2 | \$150. | \$159. |
| CRD-125 | .125 | .510 | .135 | 1/2 | \$150. | \$159. |

**Specials in 4-6
Working Days**

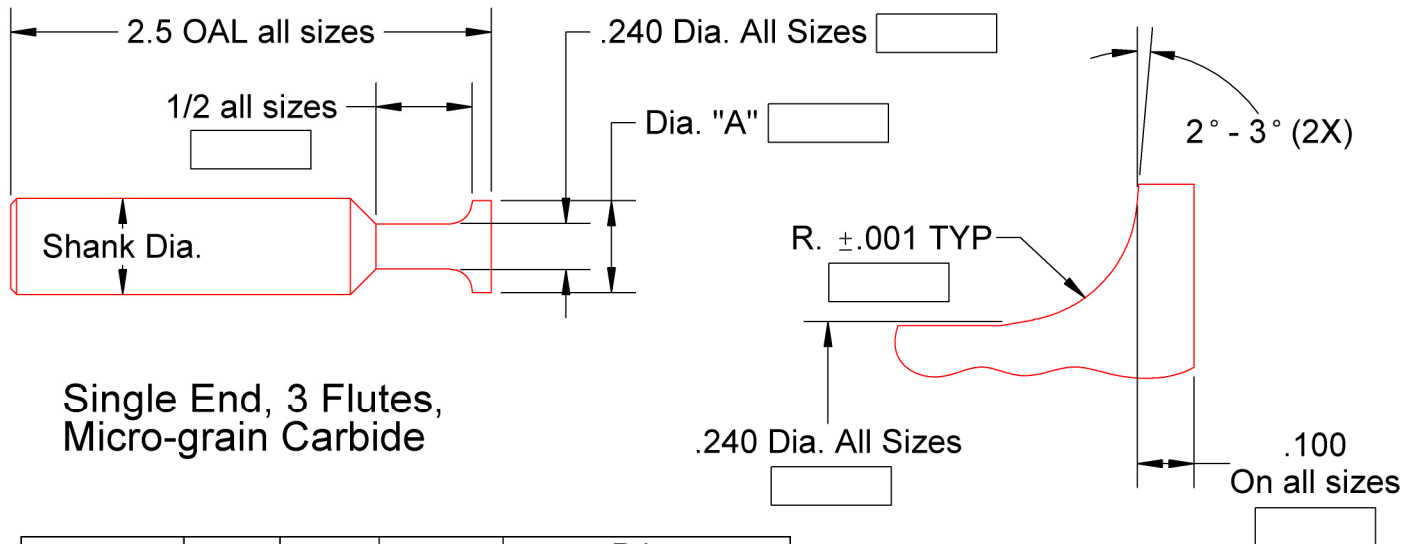


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1051 Aviation Blvd.
Lincoln, CA 95648-9312

Phone 916 408-2442
FAX 916 993-3949

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E-Mail: mail@abtoolsinc.com

Solid Carbide BACK Corner Rounders



Single End, 3 Flutes,
Micro-grain Carbide

| Tool No. | R. Size | Dia. "A" | Shank Dia. | Price | |
|----------|---------|----------|------------|---------|--------|
| | | | | No Coat | AlTiN |
| BCR-015 | .015 | .290 | 3/8 | \$110. | \$117. |
| BCR-020 | .020 | .300 | 3/8 | \$110. | \$117. |
| BCR-031 | .031 | .322 | 3/8 | \$110. | \$117. |
| BCR-040 | .040 | .340 | 3/8 | \$110. | \$117. |
| BCR-046 | .046 | .352 | 3/8 | \$110. | \$117. |
| BCR-062 | .062 | .384 | 1/2 | \$120. | \$129. |
| BCR-078 | .078 | .416 | 1/2 | \$120. | \$129. |
| BCR-093 | .093 | .446 | 1/2 | \$120. | \$129. |
| BCR-109 | .109 | .478 | 1/2 | \$120. | \$129. |
| BCR-125 | .125 | .510 | 1/2 | \$120. | \$129. |

**Specials in 4-6
Working Days**

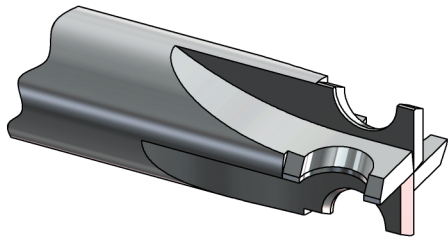


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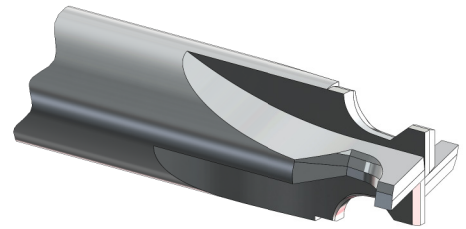
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Solid Carbide Full Concave Cutters

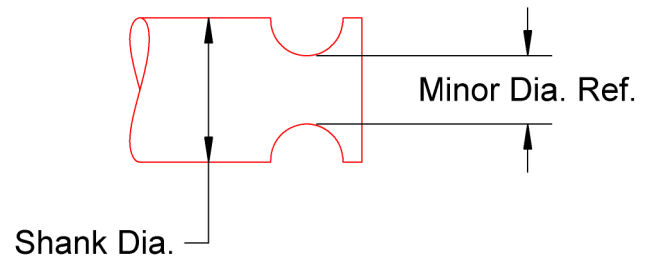
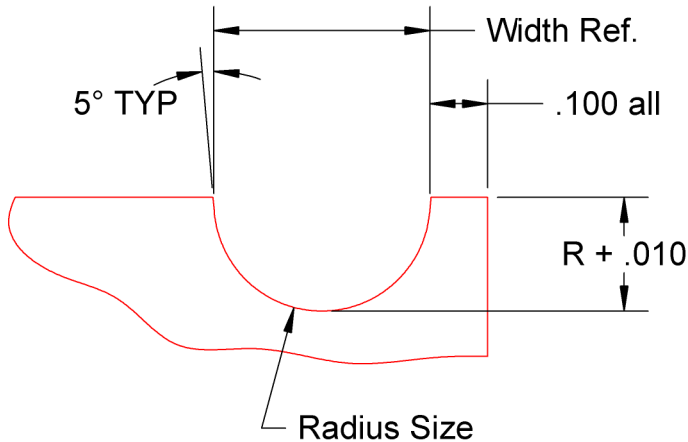


Full Form Design

Specials in 4-6 Working Days



Alternating Tooth Design



Profile ground (not formed) for rounder, more free cutting concave cutters.

| Tool Number | Radius Size | Width Ref. | Shank X OAL | Number of Flutes | Minor Dia. Ref. | Price | |
|-------------|-------------|------------|-------------|------------------|-----------------|---------|--------|
| | | | | | | No-Coat | AlTiN |
| FCR-031 * | .031 | .062 | 1/2 X 2.5 | 6 | .418 | \$160. | \$169. |
| FCR-040 * | .040 | .080 | 1/2 X 2.5 | 4 | .400 | \$160. | \$169. |
| FCR-046 * | .046 | .092 | 1/2 X 2.5 | 4 | .388 | \$160. | \$169. |
| FCR-0625 | .0625 | .125 | 1/2 X 2.5 | 4 | .355 | \$170. | \$179. |
| FCR-079 | .079 | .158 | 1/2 X 2.5 | 4 | .322 | \$175. | \$184. |
| FCR-094 | .094 | .188 | 5/8 X 3.5 | 6 | .417 | \$205. | \$218. |
| FCR-100 | .100 | .200 | 5/8 X 3.5 | 4 | .405 | \$205. | \$218. |
| FCR-120 | .120 | .240 | 5/8 X 3.5 | 4 | .365 | \$210. | \$223. |
| FCR-125 | .125 | .250 | 5/8 X 3.5 | 4 | .355 | \$210. | \$223. |
| FCR-157 | .157 | .314 | 3/4 X 4.0 | 6 | .416 | \$235. | \$250. |
| FCR-1875 | .1875 | .375 | 3/4 X 4.0 | 4 | .355 | \$250. | \$265. |
| FCR-197 | .197 | .394 | 3/4 X 4.0 | 4 | .336 | \$250. | \$265. |

*Cutters with smaller radii are ground with alternating tooth design

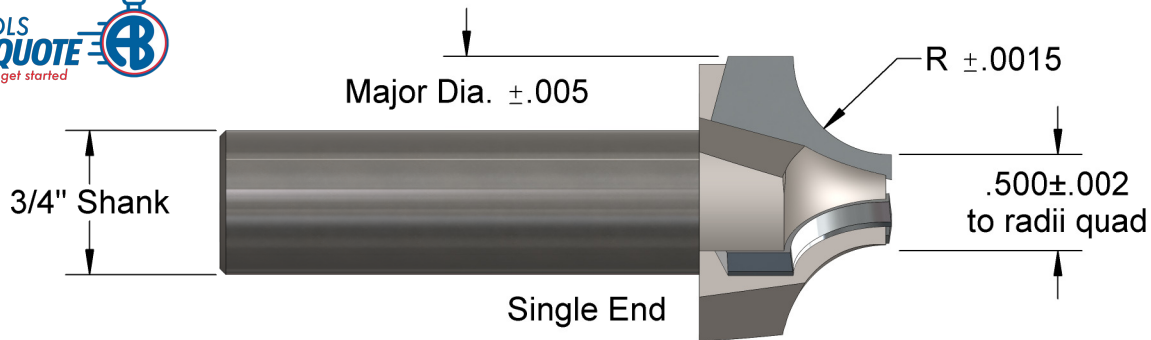


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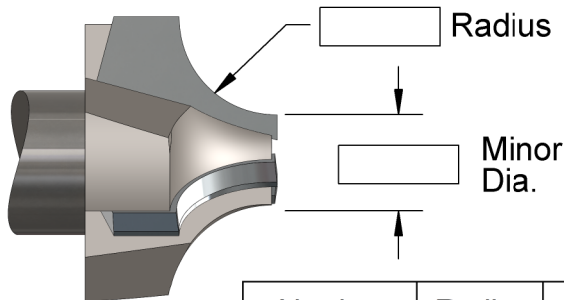
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E-Mail: mail@abtoolsinc.com

Carbide Tipped Corner Rounders

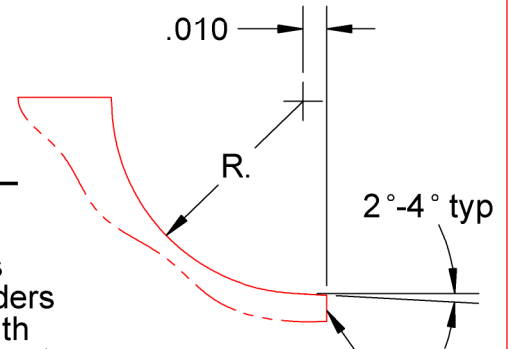


Special Carbide Tipped Corner Rounders in 4-6 working days

Machining what part material, please? _____



All AB Tools corner rounders are made with these features to avoid gouging.



End Cutting, also the major Dia. is cutting for 1/8 min.

| Number | Radius | Major Dia. | OAL | Price | |
|-------------------------|--------|------------|--------|---------|--------|
| | | | | No-Coat | AlTiN |
| 3 Flutes, Positive Rake | | | | | |
| CR3-187 | .187 | .895 | 3.25 | \$205. | \$226. |
| CR3-203 | .203 | .926 | | \$215. | \$236. |
| CR3-218 | .218 | .956 | | \$230. | \$251. |
| CR3-250 | .250 | 1.020 | | \$235. | \$259. |
| CR3-281 | .281 | 1.082 | | \$250. | \$274. |
| CR3-312 | .312 | 1.144 | | \$260. | \$284. |
| CR3-343 | .343 | 1.206 | | \$285. | \$309. |
| CR3-375 | .375 | 1.270 | | \$310. | \$336. |
| CR3-406 | .406 | 1.332 | | \$325. | \$351. |
| CR3-437 | .437 | 1.394 | | \$335. | \$361. |
| CR3-468 | .468 | 1.456 | | \$350. | \$376. |
| CR3-500 | .500 | 1.520 | \$370. | \$402. | |
| CR3-562 | .562 | 1.644 | 3.50 | \$400. | \$432. |
| CR3-625 | .625 | 1.770 | | \$445. | \$546. |

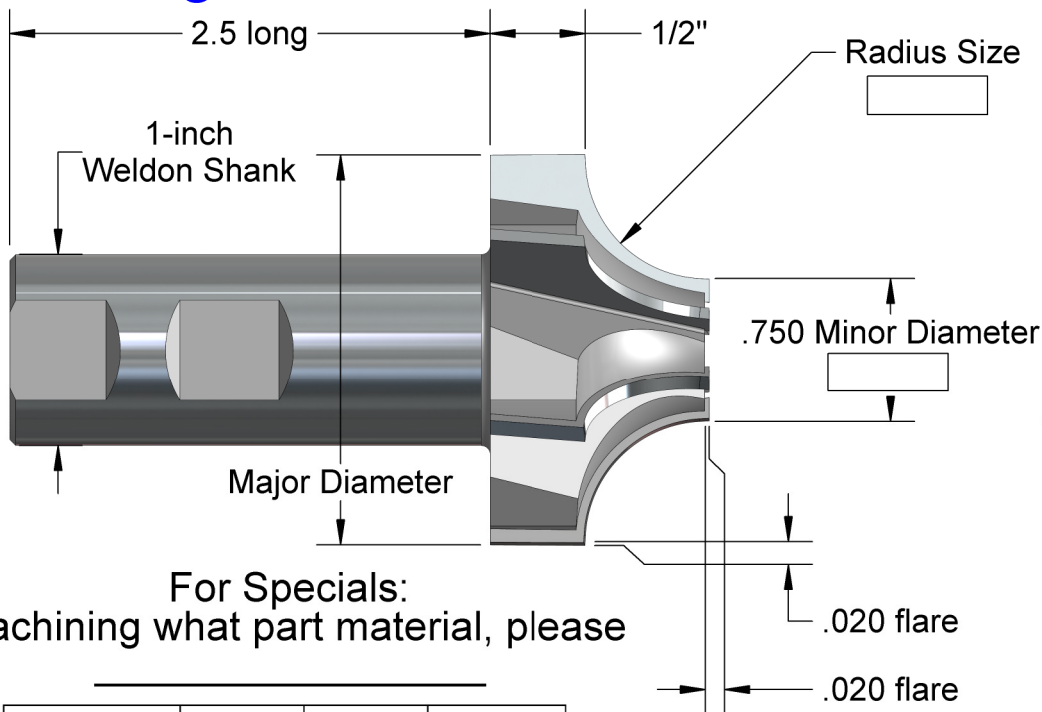


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Large Radii M42 Cobalt Corner Rounders



For Specials:
Machining what part material, please

| Number | Radius | Major Dia. | Price |
|----------|--------|------------|--------|
| CCR-625 | .625 | 2.04 | \$530. |
| CCR-687 | .687 | 2.16 | \$540. |
| CCR-719 | .719 | 2.23 | \$545. |
| CCR-750 | .750 | 2.29 | \$550. |
| CCR-787 | .787 | 2.36 | \$555. |
| CCR-812 | .812 | 2.41 | \$560. |
| CCR-875 | .875 | 2.54 | \$575. |
| CCR-937 | .937 | 2.66 | \$590. |
| CCR-984 | .984 | 2.76 | \$600. |
| CCR-1000 | 1.000 | 2.79 | \$605. |
| CCR-1063 | 1.063 | 2.91 | \$620. |
| CCR-1125 | 1.125 | 3.04 | \$635. |
| CCR-1181 | 1.181 | 3.15 | \$650. |
| CCR-1250 | 1.250 | 3.29 | \$675. |
| CCR-1312 | 1.312 | 3.41 | \$710. |
| CCR-1375 | 1.375 | 3.54 | \$765. |
| CCR-1437 | 1.437 | 3.66 | \$835. |
| CCR-1500 | 1.500 | 3.79 | \$895. |



We've milled full radius cuts with these Corner Rounders in M2 HSS at 90 SFM and .0015 Inch Per Tooth Chip Load with GREAT results

***Coatings available upon request.

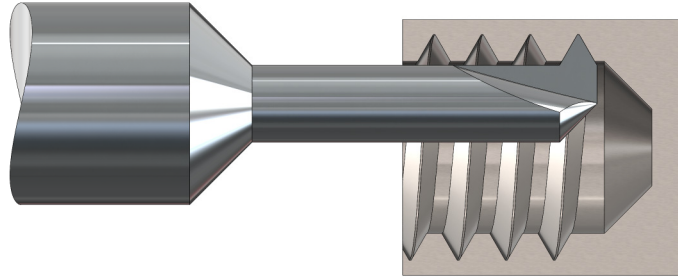


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Solid Carbide Thread Mills

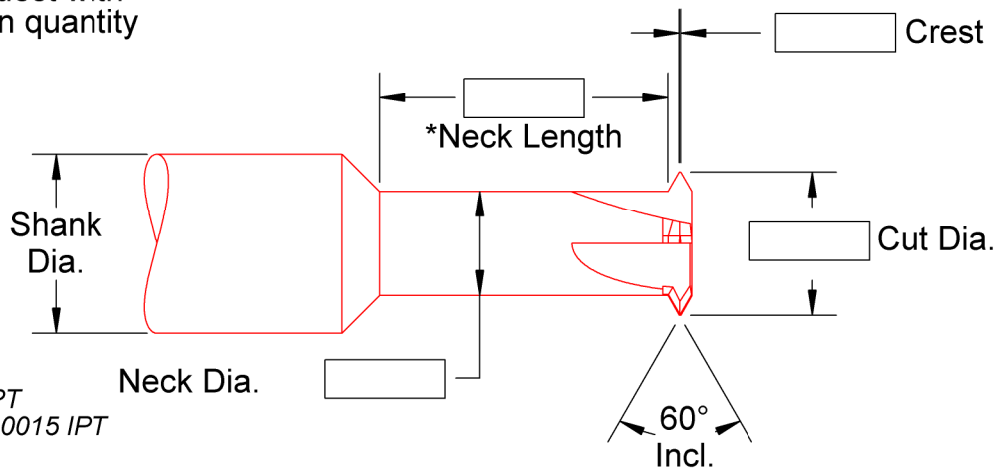


With these 12 cutters you can mill Coarse or Fine threads from No. 3 thru 3/4 and from 2MM thru 24MM

| Number | For Sizes (NC & NF) | | Cut Dia. | Crest | Neck Dia. | Neck* Length | Shank & OAL | No. of Flutes | Price | |
|--------|---------------------|-------|----------|-------|-----------|--------------|-------------|---------------|---------|--------|
| | | | | | | | | | No-Coat | AlTiN |
| TM3 | #3 | 2MM | .072 | .001 | .040 | .160 | 3/16 X 2 | 1 | \$65. | \$69. |
| TM4 | #4 | 3MM | .083 | .001 | .045 | .190 | 3/16 X 2 | 1 | \$65. | \$69. |
| | #5 | 3.5MM | | | | | | | | |
| TM6 | #6 | 4MM | .099 | .0015 | .055 | .260 | 3/16 X 2 | 2 | \$65. | \$69. |
| TM8 | #8 | 4.5MM | .128 | .002 | .083 | .320 | 3/16 X 2 | 3 | \$70. | \$74. |
| TM10 | #10 | 5MM | .139 | .0025 | .081 | .380 | 3/16 X 2 | 3 | \$70. | \$74. |
| TM1/4 | 1/4 | 6MM | .188 | .003 | .124 | .400 | 1/4 X 2 | 4 | \$75. | \$79. |
| TM5/16 | 5/16 | 8MM | .247 | .003 | .175 | .500 | 3/8 X 2.5 | 4 | \$85. | \$92. |
| TM3/8 | 3/8 | 10MM | .300 | .003 | .218 | .600 | 3/8 X 2.5 | 4 | \$90. | \$97. |
| TM7/16 | 7/16 | 12MM | .330 | .0035 | .184 | .660 | 3/8 X 2.5 | | \$95. | \$102. |
| TM1/2 | 1/2 | 16MM | .420 | .0035 | .300 | .800 | 1/2 X 2.5 | 6 | \$110. | \$119. |
| TM5/8 | 5/8 | 20MM | .500 | .0026 | .307 | 1.00 | 5/8 X 3.5 | 6 | \$155. | \$168. |
| TM3/4 | 3/4 | 24MM | .625 | .0026 | .416 | 1.25 | 3/4 X 4 | 6 | \$210. | \$225. |

*Necks ground longer on request with minimal charges based upon quantity

Special Thread Mills in 4-6 Working Days
Machining what part material, please?



Suggested Starting Data:
Ferrous 150/300 SFM; .0002/.001 IPT
Non-Ferrous 500/1000 SFM; .0005/.0015 IPT
Interpolate helix from bottom up.

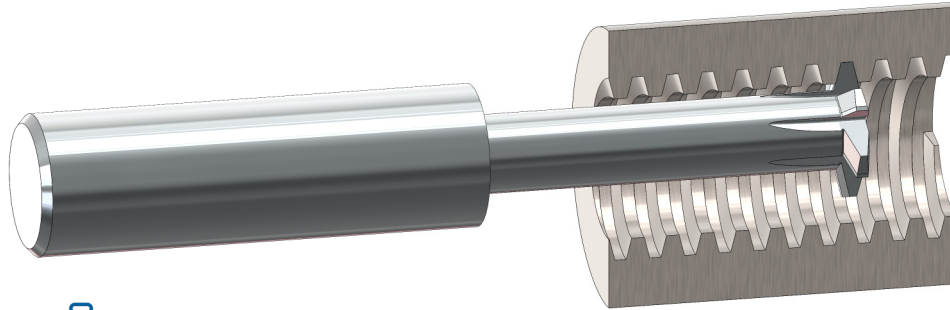


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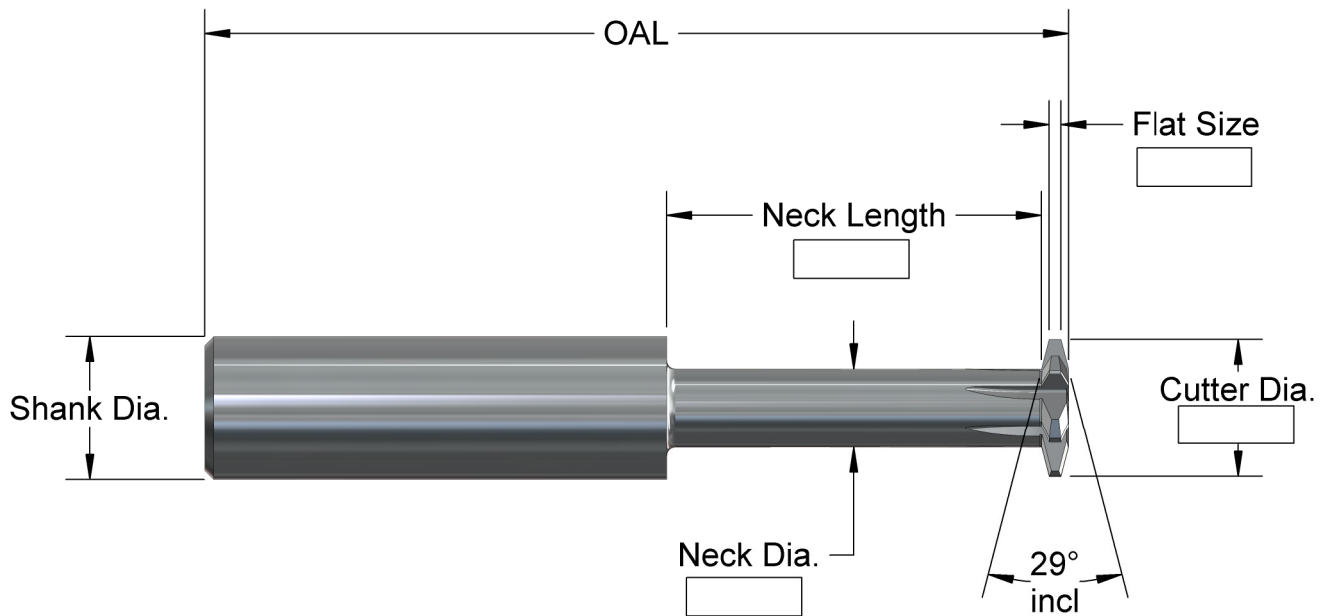
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E-Mail: mail@abtoolsinc.com

NEW !!! ACME Thread Mills NEW !!!



| Number | TPI | Cutter Dia. | Flat Size | Neck Dia. | Neck Length | Shank Dia. | OAL | No of Flutes | Price |
|----------|-----|-------------|-----------|-----------|-------------|------------|--------|--------------|--------|
| TM-16ATM | 16 | .178 | .0206 | .075 | 1/4" | 1/4" | 2" | 3 | \$80. |
| TM-14ATM | 14 | .231 | .0239 | .100 | 3/8" | 1/4" | 2-1/2" | 3 | \$85. |
| TM-12ATM | 12 | .282 | .0283 | .138 | 1/2" | 5/16" | 2-1/2" | 3 | \$105. |
| TM-10ATM | 10 | .375 | .0319 | .200 | 5/8" | 3/8" | 2-1/2" | 5 | \$125. |
| TM-8ATM | 8 | .480 | .0411 | .275 | 3/4" | 1/2" | 3" | 5 | \$140. |
| TM-6ATM | 6 | .543 | .0566 | .297 | 1" | 5/8" | 3-1/2" | 5 | \$185. |
| TM-5ATM | 5 | .750 | .0689 | .446 | 1-1/4" | 3/4" | 5" | 5 | \$235. |
| TM-4ATM | 4 | .750 | .0875 | .396 | 1-1/2" | 3/4" | 5" | 5 | \$250. |

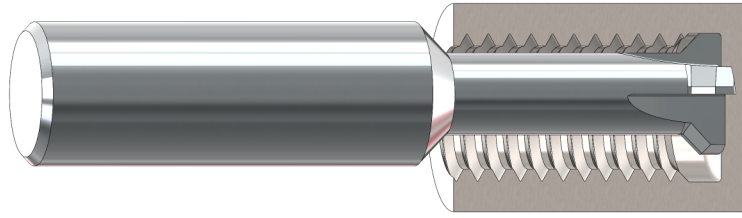


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Solid Carbide Internal Thread Relief Mills



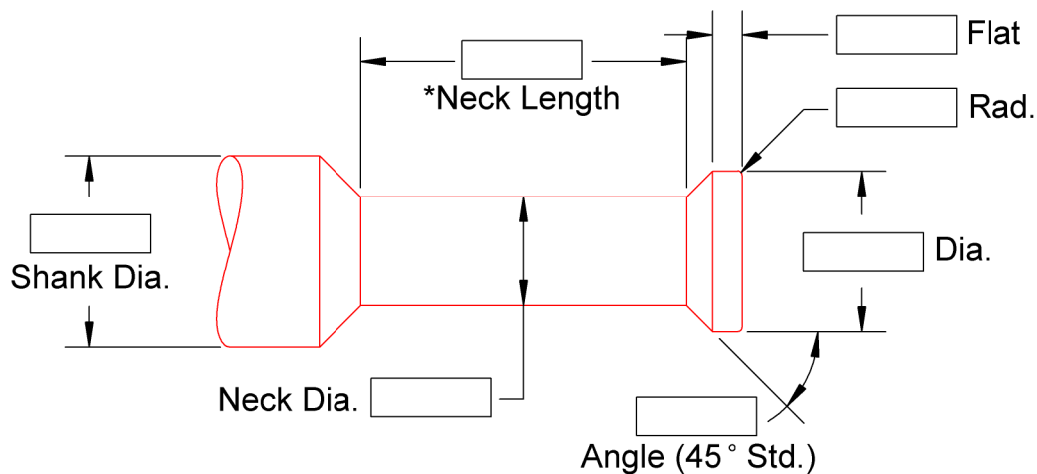
| Number | Dia. | Flat | Rad. | Neck Dia. | Neck Length | Shank Dia. | OAL | No. of Flutes | Price | |
|-----------|------|------|------|-----------|-------------|------------|-------|---------------|---------|--------|
| | | | | | | | | | No-Coat | AlTiN |
| TR3-48 | .072 | .021 | .005 | .032 | .180 | 3/16 | 2 | 2 | \$65. | \$69. |
| TR4-40 | .080 | .025 | .005 | .032 | .210 | 3/16 | 2 | 2 | \$65. | \$69. |
| TR6-32 | .099 | .031 | .010 | .047 | .290 | 3/16 | 2 | 2 | \$65. | \$69. |
| TR8-32 | .128 | .031 | .010 | .076 | .330 | 3/16 | 2 | 3 | \$65. | \$69. |
| TR10-24 | .139 | .042 | .012 | .073 | .410 | 3/16 | 2 | 3 | \$65. | \$69. |
| TR1/4-20 | .188 | .050 | .012 | .108 | .435 | 1/4 | 2 | 4 | \$70. | \$74. |
| TR5/16-18 | .247 | .056 | .012 | .159 | .538 | 3/8 | 2-1/2 | 4 | \$80. | \$87. |
| TR3/8-16 | .300 | .063 | .012 | .202 | .641 | 3/8 | 2-1/2 | 4 | \$90. | \$97. |
| TR1/2-13 | .420 | .077 | .012 | .284 | .848 | 1/2 | 2-1/2 | 6 | \$105. | \$114. |

*Necks ground longer on request with minimal charges based upon quantity

Undercut diameter:
 Pitches finer than 20 TPI = thread basic major dia + .0075
 Pitches of 20 TPI and courser = thread basic major dia + .0150

Special Thread Relief Mills Made in 4-6 Working Days

Machining what part material, please? _____

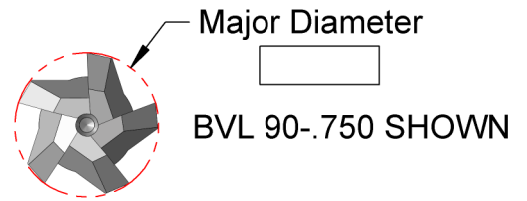
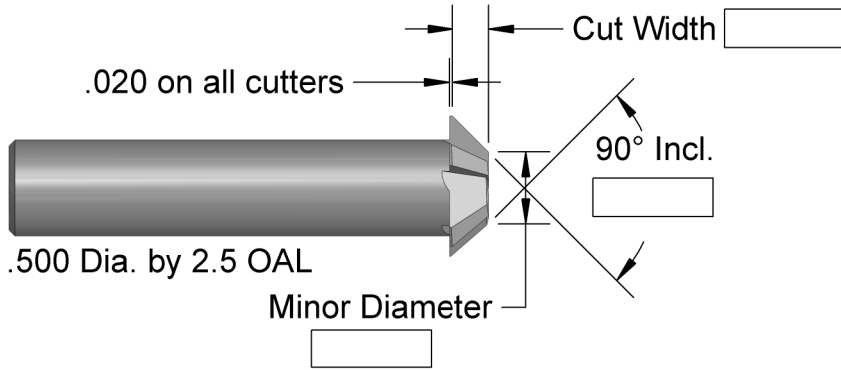


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Bevel Cutters, Solid Carbide, In Stock.



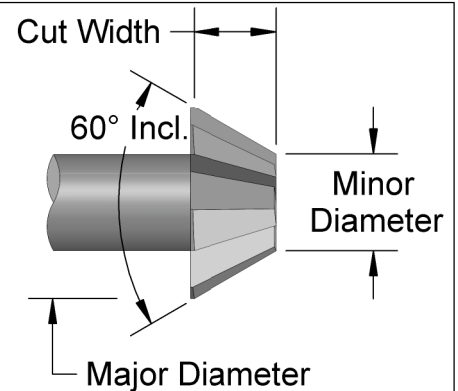
Specials in 4-6 Working Days

90° Included Angles

| Number | Major Diameter | Minor Diameter | Cut Width | Number of Flutes | Price |
|--------------|----------------|----------------|-----------|------------------|--------|
| BVL 90-.500 | .500 | .250 | .125 | 4 | \$110. |
| BVL 90-.750 | .750 | .375 | .188 | 5 | \$135. |
| BVL 90-1.00 | 1.000 | .375 | .312 | 6 | \$165. |
| BVL 90-1.25 | 1.250 | .500 | .375 | 8 | \$195. |
| BVL 90-1.50* | 1.500 | .500 | .500 | 10 | \$235. |

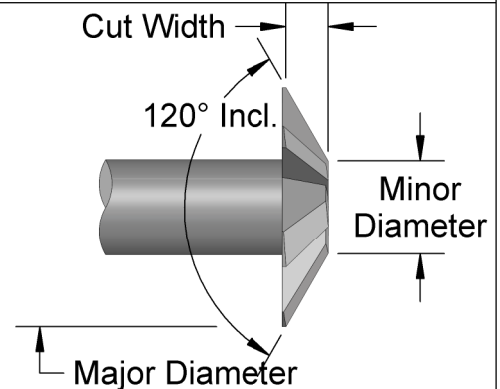
60° Included Angles

| Number | Major Diameter | Minor Diameter | Cut Width | Number of Flutes | Price |
|--------------|----------------|----------------|-----------|------------------|--------|
| BVL 60-.500 | .500 | .246 | .220 | 4 | \$110. |
| BVL 60-.750 | .750 | .390 | .312 | 5 | \$135. |
| BVL 60-1.00 | 1.000 | .503 | .430 | 6 | \$165. |
| BVL 60-1.25* | 1.250 | .673 | .500 | 8 | \$195. |
| BVL 60-1.50* | 1.500 | .778 | .625 | 10 | \$235. |



120° Included Angles

| Number | Major Diameter | Minor Diameter | Cut Width | Number of Flutes | Price |
|--------------|----------------|----------------|-----------|------------------|--------|
| BVL 120-.500 | .500 | .188 | .090 | 4 | \$110. |
| BVL 120-.750 | .750 | .317 | .125 | 5 | \$135. |
| BVL 120-1.00 | 1.000 | .350 | .188 | 6 | \$165. |
| BVL 120-1.25 | 1.250 | .488 | .220 | 8 | \$195. |
| BVL 120-1.50 | 1.500 | .634 | .250 | 10 | \$235. |



* These cutters are on 3/4" shanks and 2-3/4" OAL



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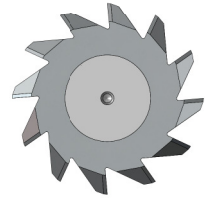
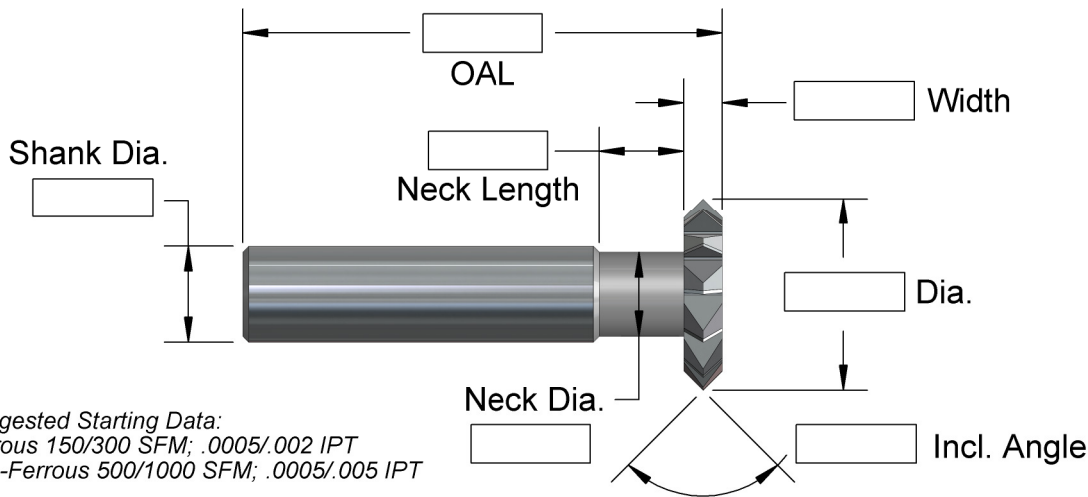
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Solid Carbide TOP & BOTTOM Chamfer Cutters

Specials in 4-6 Working Days

Machining what part material, please? _____



Suggested Starting Data:
 Ferrous 150/300 SFM; .0005/.002 IPT
 Non-Ferrous 500/1000 SFM; .0005/.005 IPT

| Number | Dia. | Width | Neck Dia. | Neck Length | Incl. Angle | Shank & OAL | No. of Flutes | Price | |
|-------------|------|-------|-----------|-------------|-------------|-------------|---------------|---------|--------|
| | | | | | | | | No-Coat | AlTiN |
| CCD-187-90 | .187 | .060 | .115 | .38 | 90 | 3/16-2 | 4 | \$68. | \$72. |
| CCD-250-90 | .250 | .090 | .150 | .44 | 90 | 1/4-2 | 4 | \$80. | \$84. |
| CCD-375-90 | .375 | .110 | .250 | .50 | 90 | 3/8-2.5 | 6 | \$100. | \$107. |
| CCD-500-90 | .500 | .125 | .350 | .68 | 90 | 1/2-2.5 | 6 | \$120. | \$129. |
| CCD-625-90 | .625 | .140 | As Cast | | 90 | 1/2-2.5 | 8 | \$145. | \$155. |
| CCD-750-90 | .750 | .170 | As Cast | | 90 | 1/2-2.5 | 10 | \$160. | \$172. |
| CCD-100-90 | 1.00 | .200 | As Cast | | 90 | 1/2-2.5 | 12 | \$190. | \$204. |
| CCD-187-60 | .187 | .030 | .115 | .38 | 60 | 3/16-2 | 4 | \$68. | \$72. |
| CCD-250-60 | .250 | .045 | .150 | .44 | 60 | 1/4-2 | 4 | \$80. | \$84. |
| CCD-375-60 | .375 | .060 | .250 | .50 | 60 | 3/8-2.5 | 6 | \$100. | \$107. |
| CCD-500-60 | .500 | .075 | .350 | .68 | 60 | 1/2-2.5 | 6 | \$120. | \$129. |
| CCD-625-60 | .625 | .090 | As Cast | | 60 | 1/2-2.5 | 8 | \$145. | \$155. |
| CCD-750-60 | .750 | .150 | As Cast | | 60 | 1/2-2.5 | 10 | \$160. | \$172. |
| CCD-100-60 | 1.00 | .200 | As Cast | | 60 | 1/2-2.5 | 12 | \$190. | \$204. |
| CCD-187-120 | .187 | .060 | .115 | .38 | 120 | 3/16-2 | 4 | \$68. | \$72. |
| CCD-250-120 | .250 | .090 | .150 | .44 | 120 | 1/4-2 | 4 | \$80. | \$84. |
| CCD-375-120 | .375 | .110 | .250 | .50 | 120 | 3/8-2.5 | 6 | \$100. | \$107. |
| CCD-500-120 | .500 | .125 | .350 | .68 | 120 | 1/2-2.5 | 6 | \$120. | \$129. |
| CCD-625-120 | .625 | .140 | As Cast | | 120 | 1/2-2.5 | 8 | \$145. | \$155. |
| CCD-750-120 | .750 | .170 | As Cast | | 120 | 1/2-2.5 | 10 | \$160. | \$172. |
| CCD-100-120 | 1.00 | .200 | As Cast | | 120 | 1/2-2.5 | 12 | \$190. | \$204. |



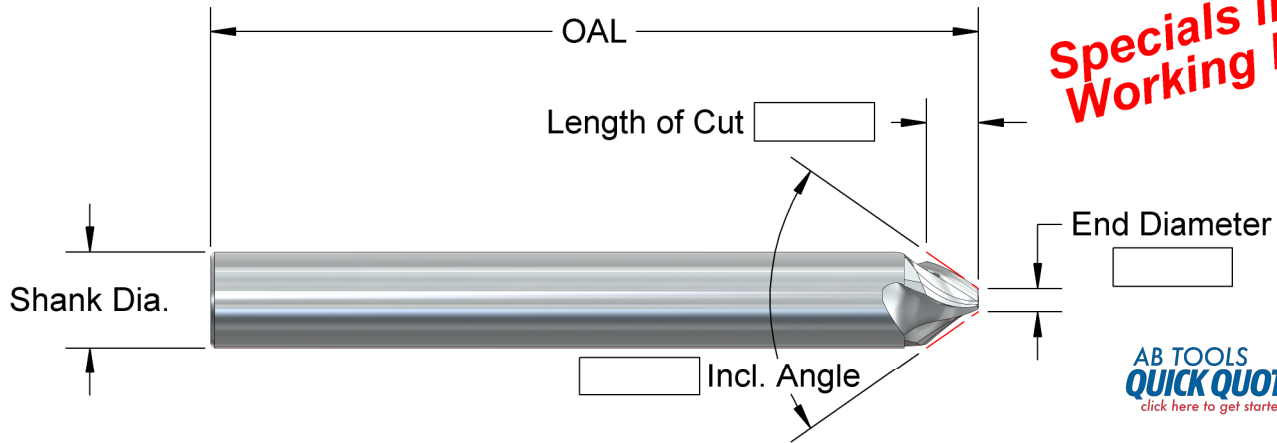
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Solid Carbide Chamfer End Mills

Specials in 4-6 Working Days



| Number | End Dia. | Incl. Angle | Length of Cut | Shank X OAL | No. of Flutes | Price | |
|------------|----------|-------------|---------------|-------------|---------------|---------|--------|
| | | | | | | No-Coat | AlTiN |
| CEM060-70 | .060 | 70° | .136 | 1/4 X 2.0 | 3 | \$75. | \$79. |
| CEM060-74 | .060 | 74° | .126 | 1/4 X 2.0 | 3 | \$75. | \$79. |
| CEM060-80 | .060 | 80° | .113 | 1/4 X 2.0 | 3 | \$75. | \$79. |
| CEM060-82 | .060 | 82° | .109 | 1/4 X 2.0 | 3 | \$75. | \$79. |
| CEM060-90 | .060 | 90° | .095 | 1/4 X 2.0 | 3 | \$75. | \$79. |
| CEM060-100 | .060 | 100° | .080 | 1/4 X 2.0 | 3 | \$75. | \$79. |
| CEM060-120 | .060 | 120° | .091 | 3/8 X 2.5 | 3 | \$85. | \$92. |
| CEM120-70 | .120 | 70° | .182 | 3/8 X 2.5 | 3 | \$85. | \$92. |
| CEM120-74 | .120 | 74° | .169 | 3/8 X 2.5 | 3 | \$85. | \$92. |
| CEM120-80 | .120 | 80° | .152 | 3/8 X 2.5 | 3 | \$85. | \$92. |
| CEM120-82 | .120 | 82° | .147 | 3/8 X 2.5 | 3 | \$85. | \$92. |
| CEM120-90 | .120 | 90° | .128 | 3/8 X 2.5 | 3 | \$85. | \$92. |
| CEM120-100 | .120 | 100° | .107 | 3/8 X 2.5 | 3 | \$85. | \$92. |
| CEM120-120 | .120 | 120° | .110 | 1/2 X 2.5 | 3 | \$100. | \$109. |
| CEM180-70 | .180 | 70° | .229 | 1/2 X 2.5 | 3 | \$100. | \$109. |
| CEM180-74 | .180 | 74° | .212 | 1/2 X 2.5 | 3 | \$100. | \$109. |
| CEM180-80 | .180 | 80° | .191 | 1/2 X 2.5 | 3 | \$100. | \$109. |
| CEM180-82 | .180 | 82° | .184 | 1/2 X 2.5 | 3 | \$100. | \$109. |
| CEM180-90 | .180 | 90° | .160 | 1/2 X 2.5 | 3 | \$100. | \$109. |
| CEM180-100 | .180 | 100° | .134 | 1/2 X 2.5 | 3 | \$100. | \$109. |
| CEM180-120 | .180 | 120° | .128 | 5/8 X 3.0 | 3 | \$115. | \$127. |

These are stocked with helical flutes. Positive axial rake is an option, same price. Ask for the same tool with -AX at the end of the tool number. eg: CEM120-90-AX



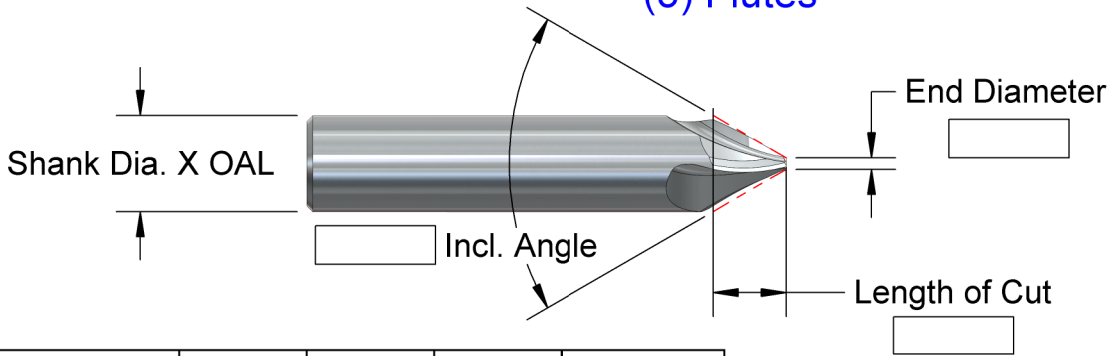
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FAX 916 993-3949

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E-Mail: mail@abtoolsinc.com

Solid Carbide Taper End Mills

(3) Flutes



Specials in 4-6 Working Days

| Number | End Dia. | Incl. Angle | Length of Cut | Shank X OAL |
|-----------|----------|-------------|---------------|-------------|
| TEM060-10 | .060 | 10° | .729 | 3/16 X 2.5 |
| TEM060-12 | .060 | 12° | .607 | 3/16 X 2.5 |
| TEM060-15 | .060 | 15° | .484 | 3/16 X 2.5 |
| TEM060-20 | .060 | 20° | .893 | 3/8 X 2.5 |
| TEM060-25 | .060 | 25° | .710 | 3/8 X 2.5 |
| TEM060-30 | .060 | 30° | .588 | 3/8 X 2.5 |
| TEM060-35 | .060 | 35° | .500 | 3/8 X 2.5 |
| TEM060-40 | .060 | 40° | .604 | 1/2 X 2.5 |
| TEM060-45 | .060 | 45° | .531 | 1/2 X 2.5 |
| TEM060-50 | .060 | 50° | .472 | 1/2 X 2.5 |
| TEM060-60 | .060 | 60° | .381 | 1/2 X 2.5 |

| Shank X OAL | Price | |
|-------------|---------|--------|
| | No-Coat | AlTiN |
| 3/16 X 2.5 | \$75. | \$79. |
| 1/4 X 2.5 | \$75. | \$81. |
| 3/8 X 2.5 | \$90. | \$97. |
| 1/2 X 2.5 | \$100. | \$109. |
| 1/2 X 3 | \$105. | \$114. |
| 1/2 X 4 | \$115. | \$126. |

| Number | End Dia. | Incl. Angle | Length of Cut | Shank X OAL |
|-----------|----------|-------------|---------------|-------------|
| TEM120-10 | .120 | 10° | .743 | 1/4 X 2.5 |
| TEM120-12 | .120 | 12° | .618 | 1/4 X 2.5 |
| TEM120-15 | .120 | 15° | .494 | 1/4 X 2.5 |
| TEM120-20 | .120 | 20° | .723 | 3/8 X 2.5 |
| TEM120-25 | .120 | 25° | .575 | 3/8 X 2.5 |
| TEM120-30 | .120 | 30° | .476 | 3/8 X 2.5 |
| TEM120-35 | .120 | 35° | .404 | 3/8 X 2.5 |
| TEM120-40 | .120 | 40° | .522 | 1/2 X 2.5 |
| TEM120-45 | .120 | 45° | .459 | 1/2 X 2.5 |
| TEM120-50 | .120 | 50° | .407 | 1/2 X 2.5 |
| TEM120-60 | .120 | 60° | .329 | 1/2 X 2.5 |

| Number | End Dia. | Incl. Angle | Length of Cut | Shank X OAL |
|-----------|----------|-------------|---------------|-------------|
| TEM180-10 | .180 | 10° | 1.829 | 1/2 X 4 |
| TEM180-12 | .180 | 12° | 1.522 | 1/2 X 4 |
| TEM180-15 | .180 | 15° | 1.215 | 1/2 X 3 |
| TEM180-20 | .180 | 20° | .907 | 1/2 X 3 |
| TEM180-25 | .180 | 25° | .722 | 1/2 X 3 |
| TEM180-30 | .180 | 30° | .597 | 1/2 X 3 |
| TEM180-35 | .180 | 35° | .507 | 1/2 X 2.5 |
| TEM180-40 | .180 | 40° | .440 | 1/2 X 2.5 |
| TEM180-45 | .180 | 45° | .386 | 1/2 X 2.5 |
| TEM180-50 | .180 | 50° | .343 | 1/2 X 2.5 |
| TEM180-60 | .180 | 60° | .277 | 1/2 X 2.5 |

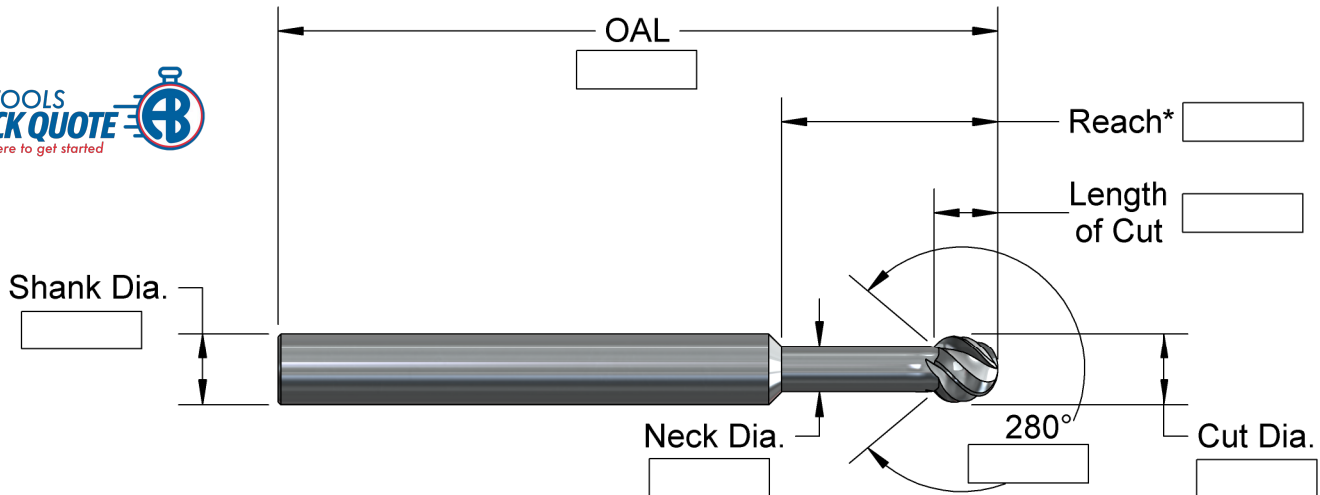


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NEW !!! Lollipop Undercut End Mills NEW !!!



* Longer necks can be ground in 1 work day

| Tool No. | Cut Dia. | Length of Cut | Neck Dia. | Reach | Shank Dia. | OAL | No. of Flutes | Price |
|-----------|----------|---------------|-----------|-------|------------|-----|---------------|--------|
| BE040-280 | .040 | .035 | .026 | .120 | 1/8" | 2.0 | 4 | \$75. |
| BE050-280 | .050 | .044 | .032 | .150 | 1/8" | 2.0 | 4 | \$75. |
| BE062-280 | .062 | .055 | .040 | .190 | 1/8" | 2.0 | 4 | \$70. |
| BE078-280 | .078 | .069 | .050 | .235 | 1/8" | 2.0 | 4 | \$70. |
| BE093-280 | .093 | .082 | .060 | .280 | 1/8" | 2.0 | 4 | \$70. |
| BE110-280 | .110 | .097 | .071 | .330 | 1/8" | 2.0 | 4 | \$70. |
| BE118-280 | .118 | .104 | .076 | .355 | 1/8" | 2.0 | 4 | \$70. |
| BE125-280 | .125 | .110 | .080 | .375 | 1/8" | 2.0 | 4 | \$70. |
| BE140-280 | .140 | .124 | .090 | .420 | 3/16" | 2.0 | 4 | \$85. |
| BE156-280 | .156 | .138 | .100 | .470 | 3/16" | 2.0 | 4 | \$85. |
| BE187-280 | .187 | .165 | .120 | .565 | 3/16" | 2.0 | 4 | \$85. |
| BE197-280 | .197 | .174 | .127 | .595 | 1/4" | 2.5 | 4 | \$95. |
| BE218-280 | .218 | .192 | .140 | .655 | 1/4" | 2.5 | 4 | \$95. |
| BE236-280 | .236 | .208 | .152 | .710 | 1/4" | 2.5 | 4 | \$95. |
| BE250-280 | .250 | .221 | .161 | .750 | 1/4" | 2.5 | 4 | \$95. |
| BE281-280 | .281 | .248 | .181 | .845 | 5/16" | 2.5 | 4 | \$115. |
| BE312-280 | .312 | .276 | .201 | .940 | 5/16" | 2.5 | 6 | \$115. |
| BE340-280 | .340 | .300 | .219 | 1.020 | 3/8" | 2.5 | 6 | \$125. |
| BE375-280 | .375 | .331 | .241 | 1.125 | 3/8" | 2.5 | 6 | \$125. |
| BE393-280 | .393 | .347 | .253 | 1.180 | 1/2" | 2.5 | 6 | \$185. |
| BE437-280 | .437 | .386 | .281 | 1.315 | 1/2" | 2.5 | 6 | \$185. |
| BE500-280 | .500 | .442 | .321 | 1.500 | 1/2" | 2.5 | 8 | \$185. |
| BE530-280 | .530 | .468 | .341 | 1.590 | 5/8" | 3.5 | 8 | \$235. |
| BE562-280 | .562 | .496 | .361 | 1.690 | 5/8" | 3.5 | 8 | \$235. |
| BE625-280 | .625 | .552 | .402 | 1.875 | 5/8" | 3.5 | 8 | \$235. |
| BE750-280 | .750 | .662 | .482 | 2.250 | 3/4" | 5.0 | 8 | \$295. |



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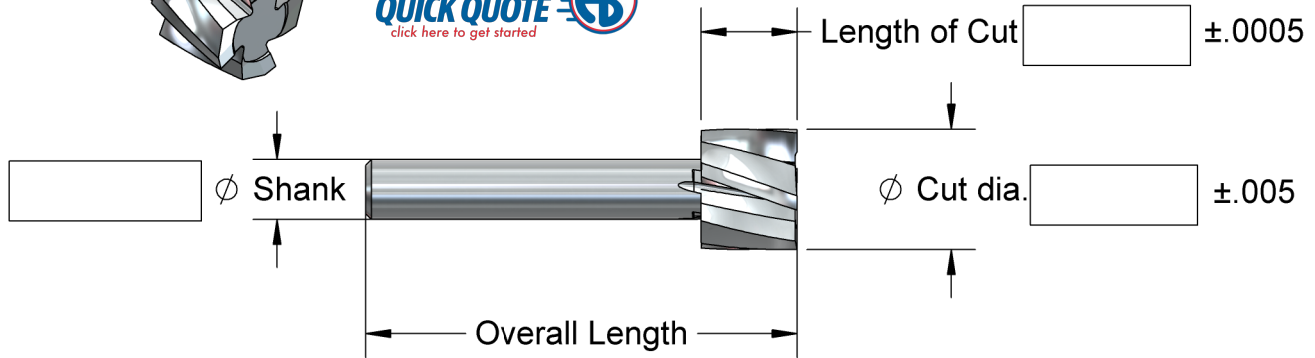
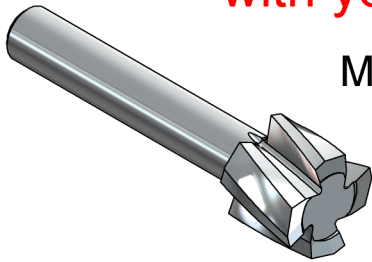
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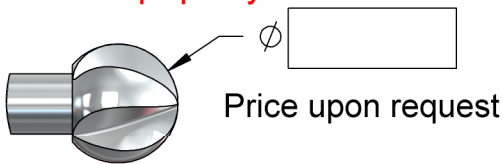
Reduced Shank Solid Carbide End Mills

NEW !!! from .140 to 1.0 diameters **NEW !!!**
with your decimal width in 4-6 working days

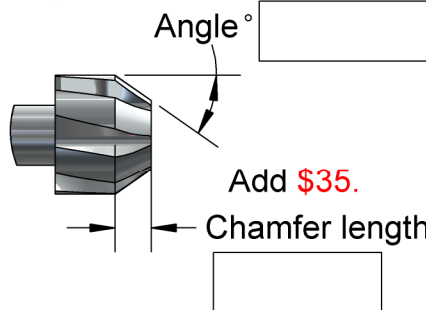
Machining what part material, please? _____



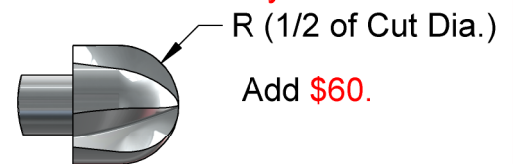
Lollipop Style



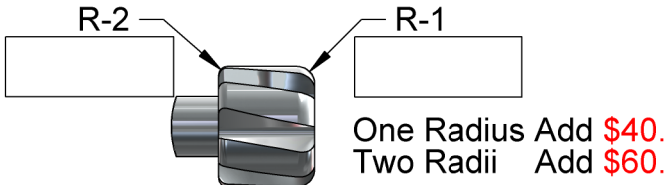
Taper/Chamfer



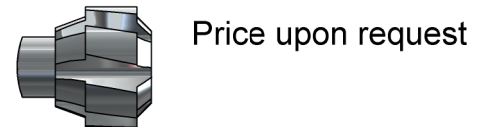
Ballnose Style



Corner Radius



Slot plus Top Chamfers



| Ø Shank | OAL | Cut Diameter | Length of Cut Max | Basic Prices |
|---------|--------|--------------|-------------------|--------------|
| 1/8" | 1-1/2" | .140 - .250 | .250 | \$110. |
| 3/16" | 1-1/2" | .195 - .375 | .375 | \$120. |
| 1/4" | 2" | .260 - .500 | .500 | \$135. |
| 5/16" | 2-1/4" | .320 - .625 | .625 | \$150. |
| 3/8" | 2-1/2" | .390 - .750 | .750 | \$180. |
| 1/2" | 3" | .515 - 1.0 | 1.0 | \$195. |

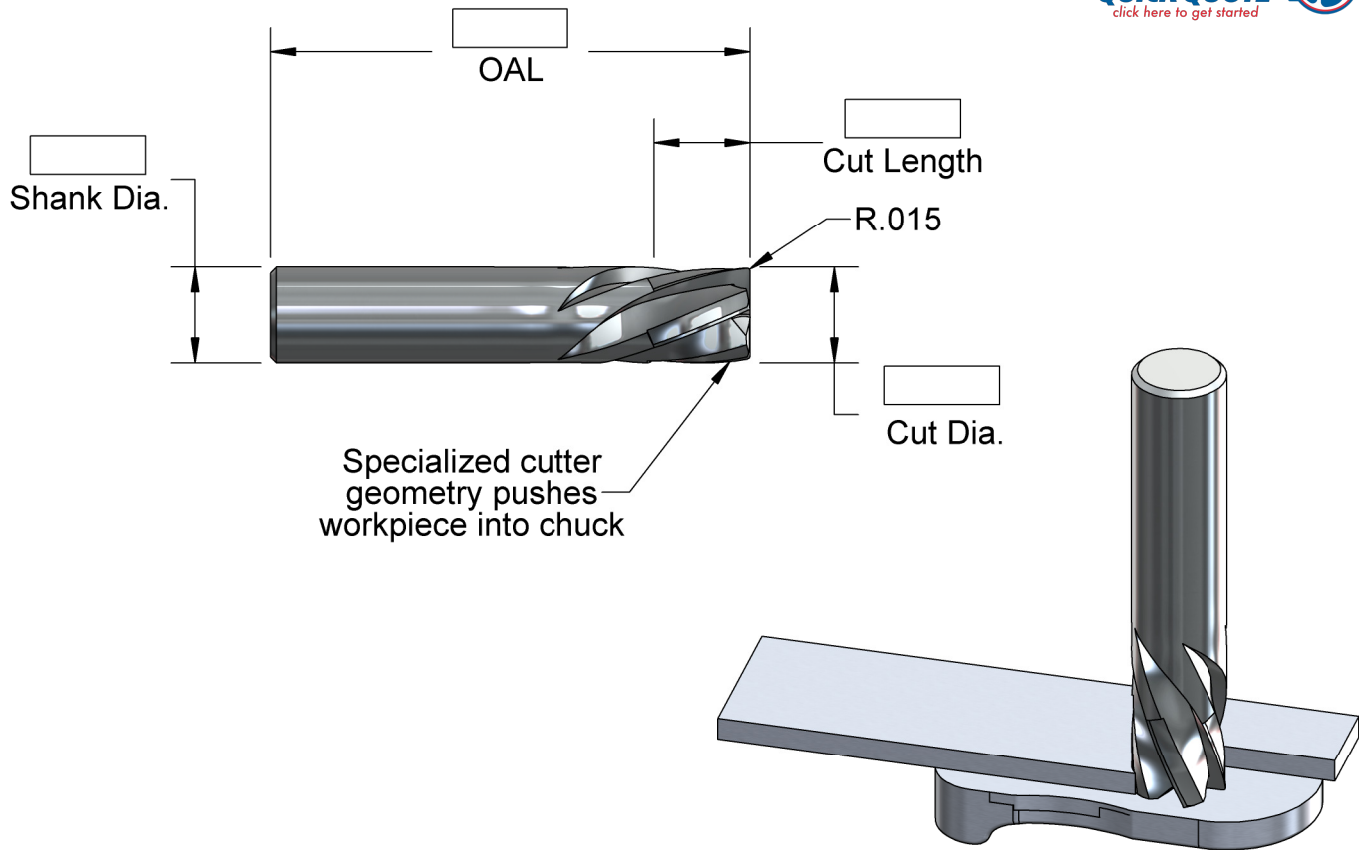


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NEW !!! TOP HAT REMOVAL TOOL NEW !!!



| Number | Cut Dia. | Cut Length | Shank Dia. | OAL | No. of Flutes | Price | AlTiN |
|-------------|----------|------------|------------|-----|---------------|--------|--------|
| SEM25-30LH | .250 | .250 | 1/4 | 2.0 | 3 | \$60. | \$64. |
| SEM375-30LH | .375 | .375 | 3/8 | 2.5 | 5 | \$71. | \$78. |
| SEM5-30LH | .500 | .500 | 1/2 | 2.5 | 5 | \$79. | \$88. |
| SEM625-30LH | .625 | .625 | 5/8 | 3.0 | 6 | \$105. | \$115. |
| SEM75-30LH | .750 | .750 | 3/4 | 4.0 | 8 | \$150. | \$163. |
| SEM1-30LH | 1.0 | 1.0 | 1.0 | 4.0 | 9 | \$222. | \$242. |
| SEM125-30LH | 1.250 | 1.250 | 1-1/4 | 4.5 | 9 | \$320. | \$345. |

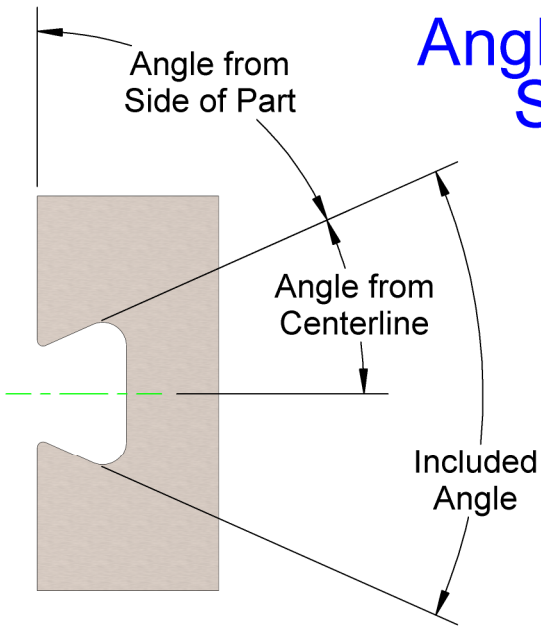


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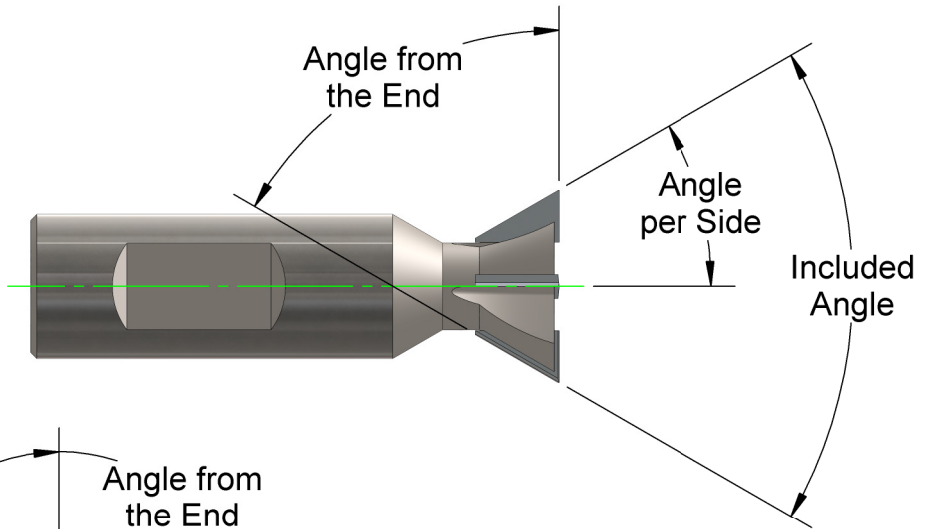
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Angle Reference and Standard Flats

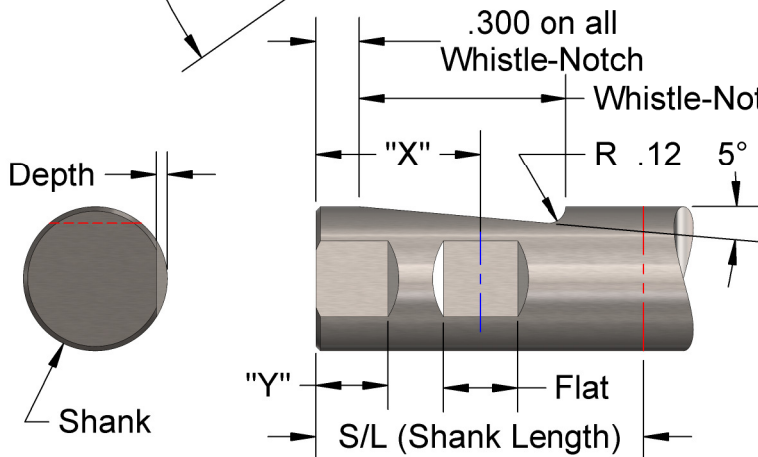
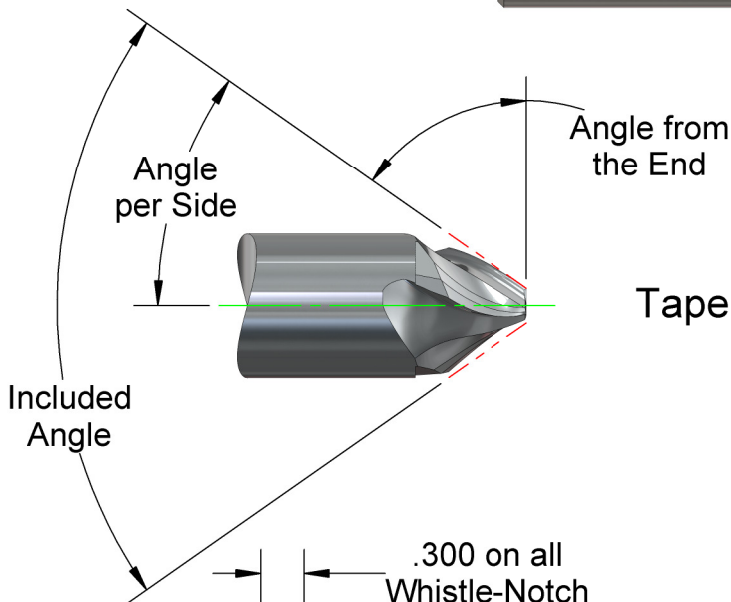


Part Angles



Angles on a Dovetail Style Cutter

Angles on a Taper End Mill or Chamfer Mill Style Cutter



| Shank | Flat | "Y" | "X" | Depth | S/L | W/N |
|-------|------|-----|-------|-------|------|------|
| 3/8 | .280 | | .781 | .050 | 1.56 | 1.0 |
| 1/2 | .330 | | .890 | .065 | 1.78 | 1.06 |
| 5/8 | .400 | | .953 | .070 | 1.90 | 1.19 |
| 3/4 | .455 | | 1.015 | .075 | 2.03 | 1.25 |
| 7/8 | .455 | .50 | 1.015 | .075 | 2.03 | 1.25 |
| 1.0 | .515 | .50 | 1.140 | .075 | 2.28 | 1.44 |
| 1-1/4 | .515 | .50 | 1.140 | .095 | 2.28 | 1.44 |



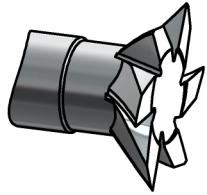
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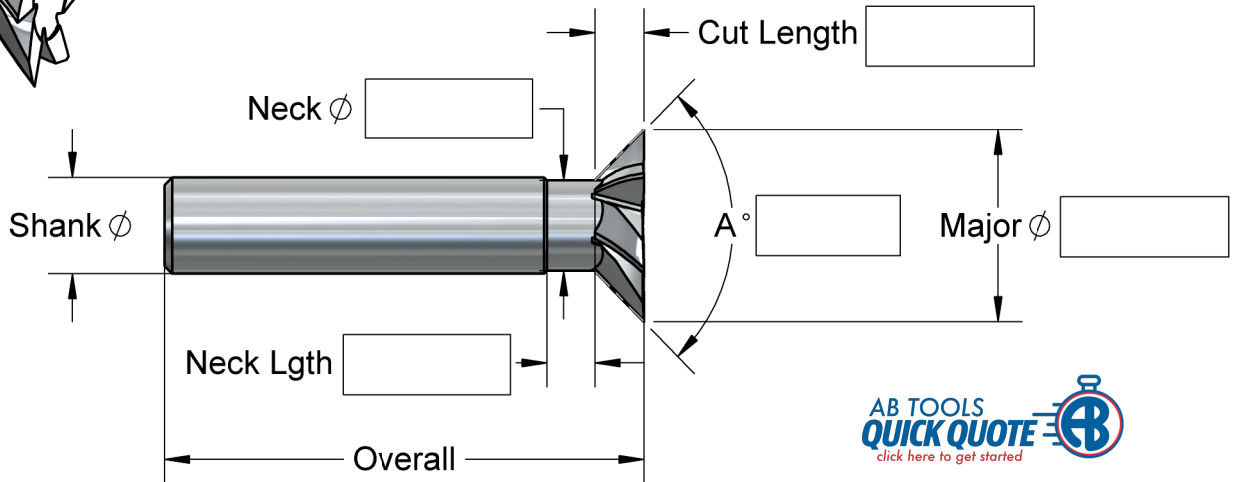
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NEW !!! Solid Carbide Dovetail Cutters **NEW !!!** from .750 to 1.5 diameters

Custom specials upon request.



Machining what part material, please? _____



Add **\$40.** each for corner radius (R.060 Max)

| Ø1/2" shank x 2.5" Overall | | | Number | Major ϕ | A° | Cut Length | Neck ϕ | Neck Lgth | Flutes | Price | Altin |
|----------------------------|--|--|----------|--------------|-----------|------------|-------------|-----------|--------|--------|--------|
| Ø1/2" shank x 2.5" Overall | | | DS75-60 | .750 | 60 | .313 | .370 | .250 | 6 | \$215. | \$226. |
| Ø1/2" shank x 2.5" Overall | | | DS75-90 | .750 | 90 | .188 | .360 | .250 | 6 | \$215. | \$226. |
| Ø1/2" shank x 2.5" Overall | | | DS75-120 | .750 | 120 | .120 | .320 | .370 | 6 | \$215. | \$226. |
| Ø1/2" shank x 2.5" Overall | | | DS1-60 | 1.0 | 60 | .435 | .480 | .250 | 6 | \$230. | \$246. |
| Ø1/2" shank x 2.5" Overall | | | DS1-90 | 1.0 | 90 | .255 | .470 | .250 | 6 | \$230. | \$246. |
| Ø1/2" shank x 2.5" Overall | | | DS1-120 | 1.0 | 120 | .160 | .430 | .370 | 6 | \$230. | \$246. |

| Ø5/8" shank x 3" Overall | | | Number | Major ϕ | A° | Cut Length | Neck ϕ | Neck Lgth | Flutes | Price | Altin |
|--------------------------|--|--|-----------|--------------|-----------|------------|-------------|-----------|--------|--------|--------|
| Ø5/8" shank x 3" Overall | | | DS125-60 | 1.25 | 60 | .500 | .600 | .250 | 8 | \$285. | \$305. |
| Ø5/8" shank x 3" Overall | | | DS125-90 | 1.25 | 90 | .360 | .515 | .250 | 8 | \$285. | \$305. |
| Ø5/8" shank x 3" Overall | | | DS125-120 | 1.25 | 120 | .225 | .450 | .370 | 8 | \$285. | \$305. |

| Ø3/4" shank x 3.5" Overall | | | Number | Major ϕ | A° | Cut Length | Neck ϕ | Neck Lgth | Flutes | Price | Altin |
|----------------------------|--|--|----------|--------------|-----------|------------|-------------|-----------|--------|--------|--------|
| Ø3/4" shank x 3.5" Overall | | | DS15-60 | 1.5 | 60 | .625 | .725 | .250 | 8 | \$340. | \$365. |
| Ø3/4" shank x 3.5" Overall | | | DS15-90 | 1.5 | 90 | .440 | .600 | .250 | 8 | \$340. | \$365. |
| Ø3/4" shank x 3.5" Overall | | | DS15-120 | 1.5 | 120 | .285 | .500 | .370 | 8 | \$340. | \$365. |



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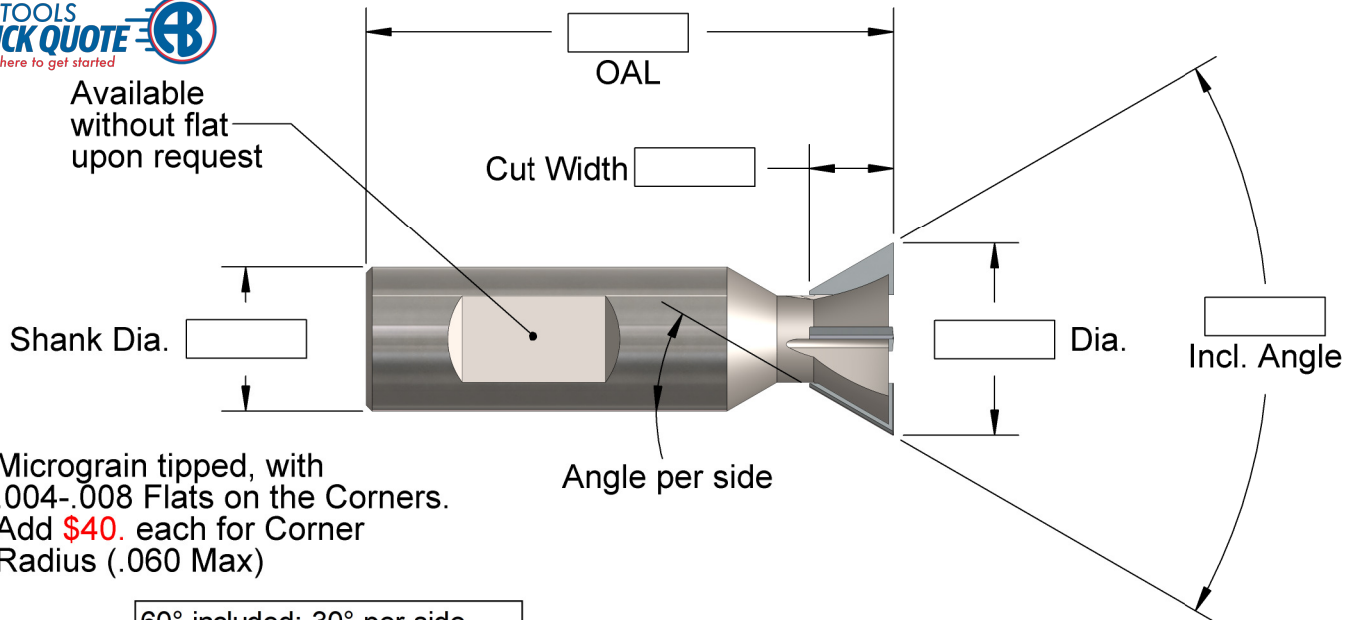
Carbide Tipped Dovetail Cutters

Specials in 4-6 Working Days

Machining what part material, please? _____



Available without flat upon request



Micrograin tipped, with .004-.008 Flats on the Corners.
Add **\$40.** each for Corner Radius (.060 Max)

| 60° included; 30° per side | | | | | | | Price | |
|----------------------------|-------------|------|-----------|------------|-------|---|---------|--------|
| Number | Incl. Angle | Dia. | Cut Width | Shank Dia. | OAL | N | No-Coat | AlTiN |
| D60-.75 | 60° | 3/4 | 5/16 | 3/4 | 2-3/4 | 3 | \$180. | \$192. |
| D60-1.0 | 60° | 1.00 | 7/16 | 3/4 | 2-3/4 | 4 | \$190. | \$207. |
| D60-1.25 | 60° | 1.25 | 1/2 | 3/4 | 3 | 5 | \$200. | \$221. |
| D60-1.38 | 60° | 1.38 | 1/2 | 3/4 | 3 | 6 | \$210. | \$234. |
| D60-1.5 | 60° | 1.50 | 5/8 | 3/4 | 3-1/2 | 6 | \$265. | \$289. |
| D60-2.0 | 60° | 2.00 | 7/8 | 1.0 | 3-3/4 | 8 | \$305. | \$406. |
| D60-2.5 | 60° | 2.50 | 7/8 | 1.0 | 3-3/4 | 8 | \$395. | \$512. |

| 90° included; 45° per side | | | | | | | Price | |
|----------------------------|-------------|------|-----------|------------|-------|---|---------|--------|
| Number | Incl. Angle | Dia. | Cut Width | Shank Dia. | OAL | N | No-Coat | AlTiN |
| D90-.75 | 90° | 3/4 | 3/16 | 1/2 | 2-1/4 | 3 | \$185. | \$197. |
| D90-1.0 | 90° | 1.00 | 1/4 | 1/2 | 2-1/2 | 5 | \$195. | \$212. |
| D90-1.25 | 90° | 1.25 | 5/16 | 5/8 | 2-3/4 | 5 | \$255. | \$276. |
| D90-1.5 | 90° | 1.50 | 7/16 | 3/4 | 3-1/4 | 6 | \$325. | \$351. |
| D90-1.75 | 90° | 1.75 | 1/2 | 3/4 | 3-3/4 | 6 | \$375. | \$407. |
| D90-2.0 | 90° | 2.00 | 9/16 | 1.0 | 4 | 6 | \$410. | \$511. |
| D90-2.5 | 90° | 2.50 | 3/4 | 1.0 | 4-1/2 | 6 | \$475. | \$592. |

N = number of flutes



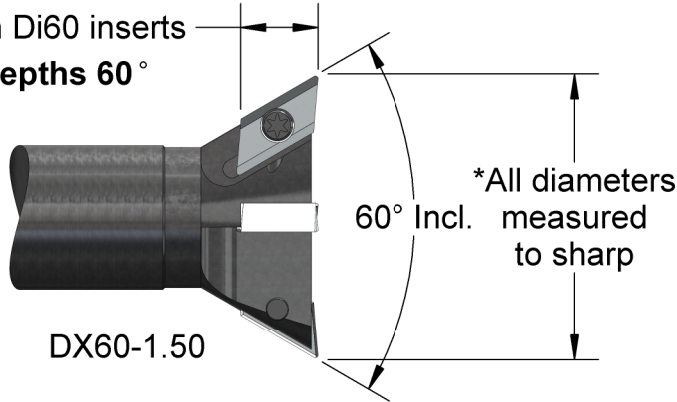
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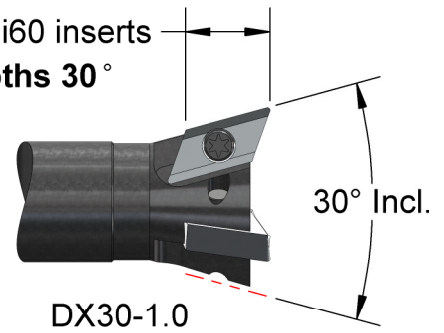
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The Dexi-Dovetail Short Inserts

.390 with Di60 inserts
Cut Depths 60°



.447 with Di60 inserts
Cut Depths 30°



| Cutter Number | *Dia. | Cut Depth | Incl. Angle | Shank & Overall | Flutes | Price |
|---------------|-------|-----------|-------------|-----------------|--------|---------------|
| DX10-1.25 | 1-1/4 | .440 | 10° | 3/4 X 3.5 | 4 | \$225. |
| DX20-1.0 | 1.0 | .430 | 20° | 5/8 X 3.5 | 3 | \$205. |
| DX20-1.25 | 1-1/4 | .430 | 20° | 3/4 X 3.5 | 3 | \$215. |
| DX20-1.50 | 1-1/2 | .430 | 20° | 3/4 X 3.5 | 4 | \$235. |
| DX30-1.0 | 1.0 | .420 | 30° | 5/8 X 3.5 | 3 | \$215. |
| DX30-1.25 | 1-1/4 | .420 | 30° | 3/4 X 3.5 | 3 | \$215. |
| DX40-1.25 | 1-1/4 | .410 | 40° | 3/4 X 3.5 | 3 | \$215. |
| DX45-1.25 | 1-1/4 | .405 | 45° | 3/4 X 3.5 | 3 | \$215. |
| DX50-1.25 | 1-1/4 | .400 | 50° | 3/4 X 3.5 | 3 | \$215. |
| DX60-1.25 | 1-1/4 | .390 | 60° | 1/2 X 3.0 | 3 | \$215. |
| DX60-1.38 | 1-3/8 | .390 | 60° | 5/8 X 3.5 | 3 | \$225. |
| DX60-1.50 | 1-1/2 | .390 | 60° | 3/4 X 3.5 | 4 | \$250. |
| DX60-8 | 1-1/4 | .390 | 60° | 1-1/4 X 8.0 | 3 | \$300. |

| Short Insert | Insert Number | Radius | Price | |
|--------------|---------------|--------|----------------|----------------|
| | | | No-Coat | AlTiN |
| | Di60-0078 | .0078 | | |
| | Di60-1 | .015 | \$12.25 | \$15.00 |
| | Di60-2 | .030 | | |

| Screw & Key | Number | Price |
|-------------|--------|---------------|
| | DX-3MM | \$2.50 |
| | T8 | \$6.00 |

We use all these cutters in production, milling (38Rc) 4340 at 1100 to 1800 RPM and .001 to .002 IPT.

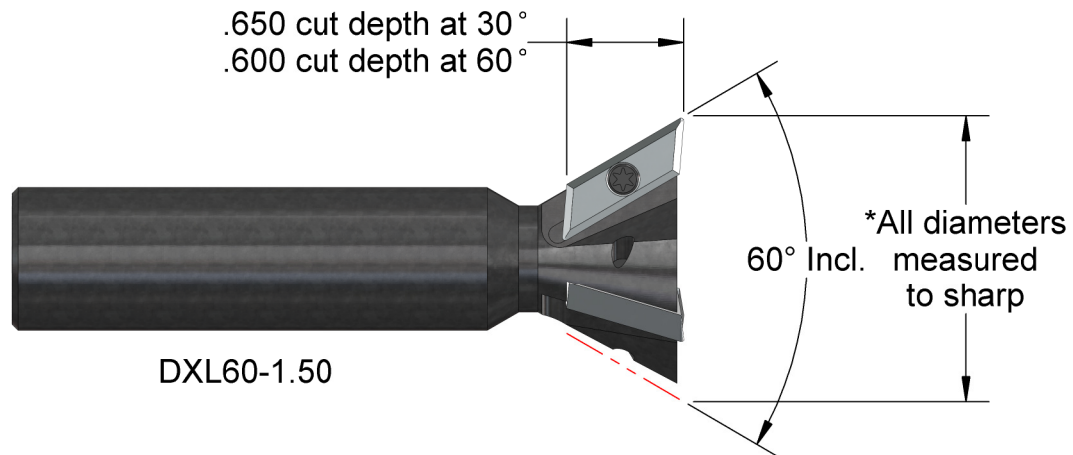


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The Dexi-Dovetail Long Inserts



| Number | *Dia. | Cut Depth | Incl. Angle | Shank & Overall | Flutes | Price |
|-------------|--------|-----------|-------------|-----------------|--------|---------------|
| DXL20-1.25 | 1-1/4 | .650 | 20° | 3/4 X 3.5 | 3 | \$265. |
| DXL30-1.25 | 1-1/4 | .640 | 30° | 3/4 X 3.5 | 3 | \$265. |
| DXL30-1.312 | 1-5/16 | .640 | 30° | 3/4 X 3.5 | 3 | \$270. |
| DXL30-1.37 | 1-3/8 | .640 | 30° | 3/4 X 3.5 | 3 | \$275. |
| DXL30-2.0 | 2.0 | .640 | 30° | 1 X 3.88 | 5 | \$395. |
| DXL40-1.50 | 1-1/2 | .650 | 40° | 3/4 X 3.5 | 3 | \$285. |
| DXL50-1.50 | 1-1/2 | .620 | 50° | 3/4 X 3.5 | 3 | \$285. |
| DXL50-2.0 | 2.0 | .620 | 50° | 1 X 4.0 | 4 | \$375. |
| DXL60-1.50 | 1-1/2 | .600 | 60° | 3/4 X 3.5 | 3 | \$285. |
| DXL60-1.62 | 1-5/8 | .600 | 60° | 3/4 X 3.5 | 3 | \$300. |
| DXL60-2.0 | 2.0 | .600 | 60° | 1 X 3.88 | 4 | \$395. |
| DXL60-3.0 | 3.0 | .600 | 60° | 1-1/4 X 4.5 | 6 | \$575. |

| Long Insert  | Insert Number | Radius | Price | |
|--|---------------|--------|----------------|----------------|
| | | | No-Coat | AlTiN |
| | Di60L-1 | .015 | | |
| | Di60L-2 | .030 | \$13.75 | \$16.25 |
| | Di60L-3 | .046 | | |

| Screw & Key | Number | Price |
|---|--------|---------------|
|  | DX-3MM | \$2.50 |
|  | T8 | \$6.00 |

We use all these cutters in production, milling (38Rc) 4340 at 1100 to 1800 RPM and .001 to .002 IPT.

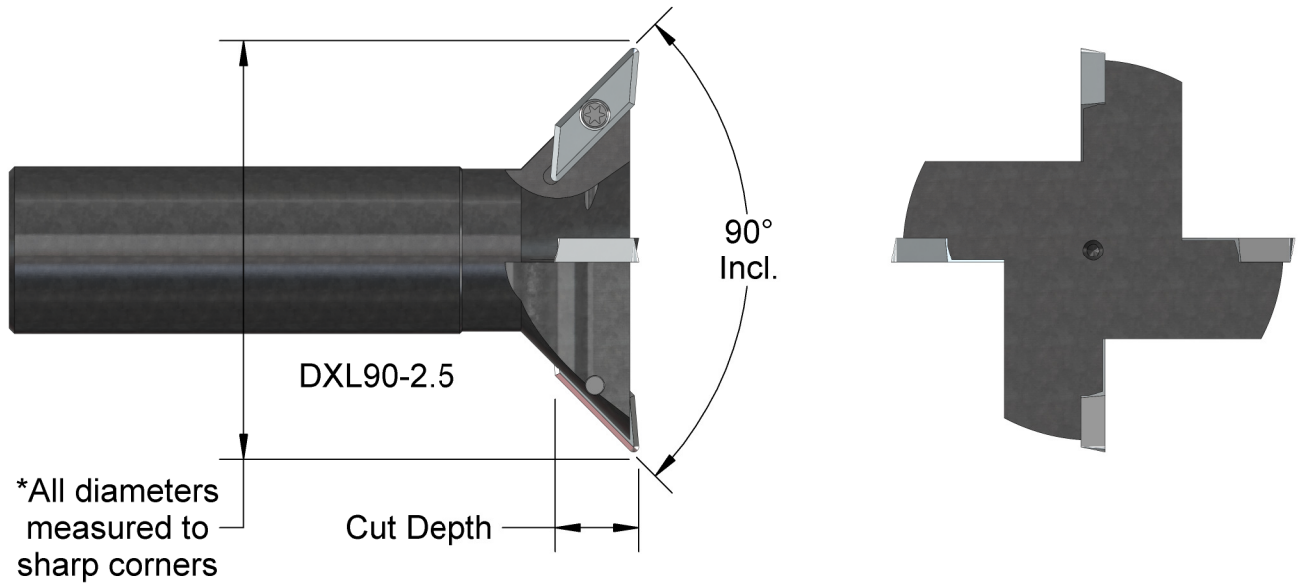


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70° to 90° Dexi-Dovetail Original Width Inserts



| Number | *Dia. | Cut Depth | Incl. Angle | Shank & OAL | Flutes | Price |
|------------|-------|-----------|-------------|-------------|--------|--------|
| DXL70-1.75 | 1.750 | .560 | 70° | 3/4 X 3.75 | 3 | \$365. |
| DXL70-2.0 | 2.000 | .560 | 70° | 1 X 3.75 | 3 | \$375. |
| DXL75-2.0 | 2.000 | .550 | 75° | 1 X 3.75 | 3 | \$375. |
| DXL80-2.0 | 2.000 | .530 | 80° | 1 X 3.75 | 3 | \$375. |
| DXL90-2.0 | 2.000 | .490 | 90° | 3/4 X 3.75 | 3 | \$375. |
| DXL90-2.5 | 2.500 | .490 | 90° | 1 X 3.75 | 4 | \$475. |
| DXL90-3.0 | 3.000 | .490 | 90° | 1 X 3.75 | 5 | \$540. |

| Original Long Insert  | Insert Number | Radius | Price | |
|---|---------------|--------|---------|---------|
| | | | No-Coat | AITiN |
| | Di90L-1 | .015 | | |
| | Di90L-2 | .030 | \$13.75 | \$16.25 |
| | Di90L-3 | .046 | | |

| Screw & Key | Number | Price |
|---|--------|--------|
|  | DX-3MM | \$2.50 |
|  | T8 | \$6.00 |

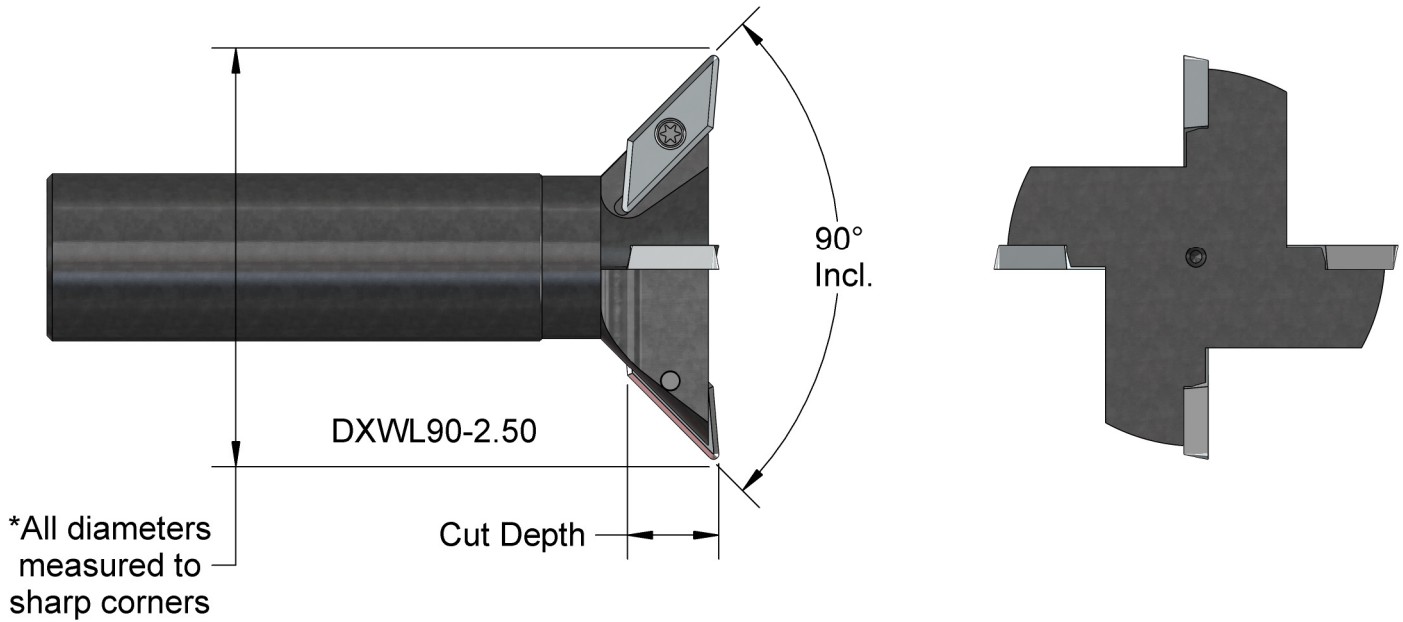


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70° to 90° Dexi-Dovetails wider, stronger inserts



| Number | *Dia. | Cut Depth | Incl. Angle | Shank & OAL | Flutes | Price |
|-------------|-------|-----------|-------------|-------------|--------|--------|
| DXWL70-2.0 | 2.000 | .560 | 70° | 1 X 4 | 3 | \$385. |
| DXWL80-2.25 | 2.250 | .530 | 80° | 1 X 4 | 3 | \$425. |
| DXWL90-2.25 | 2.250 | .490 | 90° | 1 X 4 | 3 | \$425. |
| DXWL90-2.50 | 2.500 | .490 | 90° | 1 X 4 | 4 | \$440. |
| DXWL90-3.0 | 3.000 | .490 | 90° | 1 X 4 | 4 | \$550. |

| Wide Insert | | | | |
|---|---------------|--------|---------|---------|
|  | Insert Number | Radius | Price | |
| | | | No-Coat | AlTiN |
| | Di90WL-1 | .015 | \$15.00 | \$17.50 |
| Di90WL-2 | .030 | | | |

| Screw & Key | Number | Price |
|---|--------|--------|
|  | DX-3MM | \$2.50 |
|  | T8 | \$6.00 |



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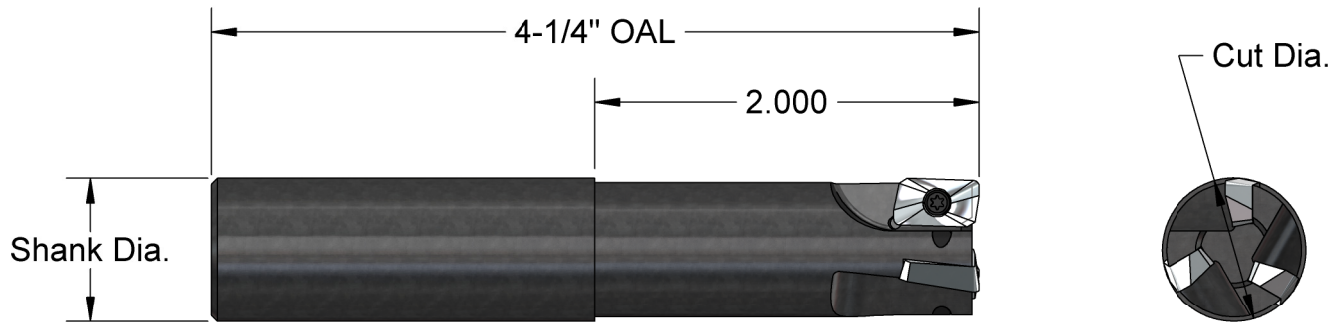
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NEW !!!


All Purpose Indexable End Mills

NEW !!!

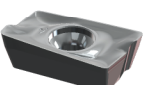




APM750-75 Shown Full Size

| Number | Cut Dia. | Shank Dia. | No. of Flutes | Insert size | Price |
|-----------|----------|------------|---------------|-------------|--------|
| APM625-5 | .625 | 1/2" | 2 | APi11 | \$210. |
| APM625-75 | .625 | 3/4" | 2 | APi11 | \$210. |
| APM750-5 | .750 | 1/2" | 3 | APi11 | \$235. |
| APM750-75 | .750 | 3/4" | 3 | APi11 | \$235. |
| APM100-75 | 1.000 | 3/4" | 2 | APi16 | \$260. |
| APM100-1 | 1.000 | 1" | 2 | APi16 | \$260. |
| APM125-75 | 1.250 | 3/4" | 3 | APi16 | \$310. |
| APM125-1 | 1.250 | 1" | 3 | APi16 | \$310. |

| APi11 Inserts | | | |
|---|------------|--------|-------|
| | Number | Radius | Price |
|  | APi11-031G | 0.031 | \$9. |
| | APi11-031N | 0.031 | \$9. |
| | | | |

G = General Purpose/Steels N = Non-Ferrous/Aluminum

| APi16 Inserts | | | |
|---|------------|--------|---------|
| | Number | Radius | Price |
|  | APi16-063G | 0.063 | \$13.75 |
| | APi16-094G | 0.094 | \$13.75 |
| | APi16-125G | 0.125 | \$13.75 |
| | APi16-037N | 0.037 | \$13.75 |

| Hardware | |
|---|---|
| | |
|  |  |
| Insert Screw | Wrench |
| APM11 Insert Size | |
| 2.5mm-AP | T8 |
| \$4.25 | \$6. |
| APM16 Insert Size | |
| 4mm-AP | T15 |
| \$5. | \$7.50 |

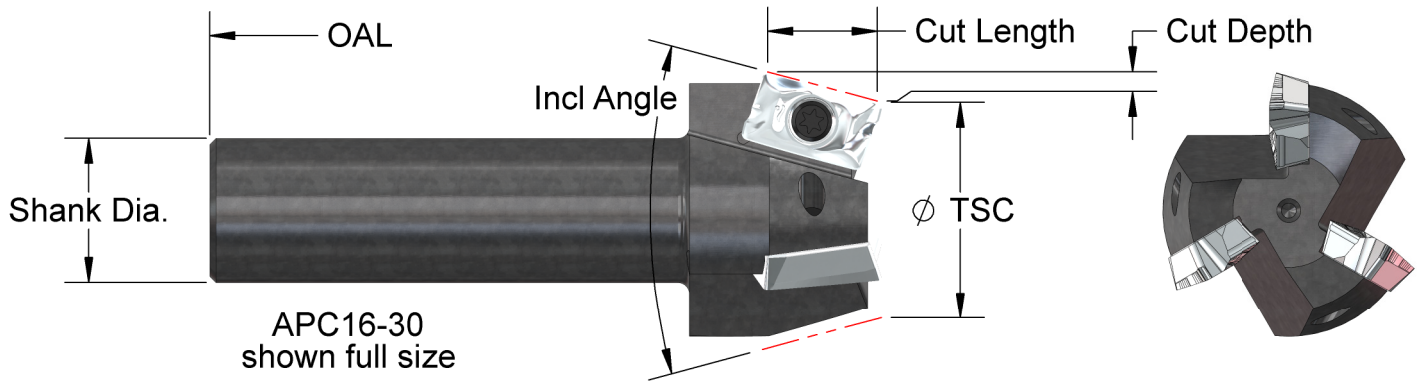


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
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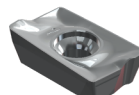
NEW !!! All Purpose Indexable Chamfer Cutters NEW !!!





| Number | Ø TSC | Incl Angle | Cut Length | Cut Depth | Shank Dia. | OAL | No. of Flutes | Insert Size | Price |
|-----------|-------|------------|------------|-----------|------------|-------|---------------|-------------|--------|
| APC11-30 | 3/4 | 30° | .325 | .080 | 1/2 | 2-1/2 | 3 | APi11 | \$250. |
| APC11-60 | 3/4 | 60° | .290 | .165 | 1/2 | 2-1/2 | 3 | APi11 | \$250. |
| APC11-82 | 3/4 | 82° | .250 | .220 | 1/2 | 2-1/2 | 3 | APi11 | \$250. |
| APC11-90 | 3/4 | 90° | .235 | .235 | 3/4 | 3-1/2 | 3 | APi11 | \$295. |
| APC11-100 | 3/4 | 100° | .210 | .260 | 3/4 | 3-1/2 | 3 | APi11 | \$295. |
| APC11-120 | 3/4 | 120° | .160 | .290 | 3/4 | 3-1/2 | 3 | APi11 | \$295. |
| APC11-150 | 3/4 | 150° | .080 | .325 | 3/4 | 3-1/2 | 3 | APi11 | \$295. |
| | | | | | | | | | |
| APC16-30 | 1.0 | 30° | .540 | .140 | 3/4 | 3-1/2 | 3 | APi16 | \$415. |
| APC16-60 | 1.0 | 60° | .480 | .285 | 3/4 | 3-1/2 | 3 | APi16 | \$415. |
| APC16-82 | 1.0 | 82° | .415 | .370 | 3/4 | 3-1/2 | 3 | APi16 | \$415. |
| APC16-90 | 1.0 | 90° | .390 | .400 | 3/4 | 3-1/2 | 3 | APi16 | \$415. |
| APC16-100 | 1.0 | 100° | .350 | .430 | 3/4 | 3-1/2 | 3 | APi16 | \$415. |
| APC16-120 | 1.0 | 120° | .270 | .490 | 3/4 | 3-1/2 | 3 | APi16 | \$450. |
| APC16-150 | 1.0 | 150° | .125 | .545 | 3/4 | 3-1/2 | 3 | APi16 | \$450. |

| APi11 Inserts | | | |
|---|------------|--------|-------|
| | Number | Radius | Price |
|  | APi11-031G | 0.031 | \$9. |
| | APi11-031N | 0.031 | \$9. |

G = General Purpose/Steels N = Non-Ferrous/Aluminum

| APi16 Inserts | | | |
|---|------------|--------|---------|
| | Number | Radius | Price |
|  | APi16-063G | 0.063 | \$13.75 |
| | APi16-094G | 0.094 | \$13.75 |
| | APi16-125G | 0.125 | \$13.75 |
| | APi16-037N | 0.037 | \$13.75 |

| Hardware | |
|---|---|
|  |  |
| Insert Screw | Wrench |
| APM11 Insert Size | |
| 2.5mm-AP | T8 |
| \$4.25 | \$6. |
| APM16 Insert Size | |
| 4mm-AP | T15 |
| \$5. | \$7.50 |

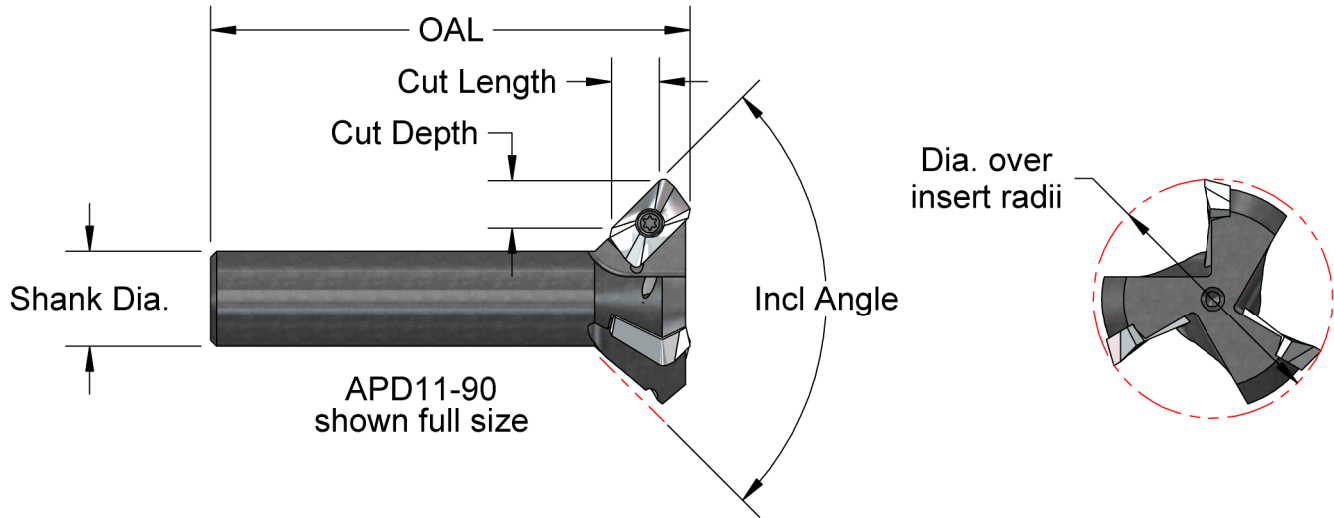


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NEW !!! All Purpose Indexable Back Chamfer Cutters NEW !!!





| Number | Dia. | Incl Angle | Cut Depth | Cut Length | Shank Dia. | OAL | No. of Flutes | Insert Size | Price |
|-----------|-------|------------|-----------|------------|------------|-------|---------------|-------------|--------|
| APD11-90 | 1.250 | 90 | .235 | .235 | 1/2 | 2-1/2 | 3 | APi11 | \$240. |
| APD11-100 | 1.375 | 100 | .255 | .210 | 1/2 | 2-1/2 | 3 | APi11 | \$250. |
| APD11-120 | 1.375 | 120 | .290 | .160 | 1/2 | 2-1/2 | 3 | APi11 | \$250. |
| APD11-140 | 1.375 | 140 | .315 | .110 | 1/2 | 2-1/2 | 3 | APi11 | \$250. |
| APD11-150 | 1.375 | 150 | .325 | .080 | 1/2 | 2-1/2 | 3 | APi11 | \$250. |
| APD16-90 | 2.0 | 90 | .390 | .400 | 3/4 | 3-1/2 | 3 | APi16 | \$415. |
| APD16-100 | 2.0 | 100 | .420 | .350 | 3/4 | 3-1/2 | 3 | APi16 | \$415. |
| APD16-120 | 2.0 | 120 | .480 | .280 | 3/4 | 3-1/2 | 3 | APi16 | \$415. |
| APD16-140 | 2.0 | 140 | .530 | .190 | 3/4 | 3-1/2 | 3 | APi16 | \$415. |
| APD16-150 | 2.0 | 150 | .540 | .140 | 3/4 | 3-1/2 | 3 | APi16 | \$415. |

| APi11 Inserts | | | |
|---|------------|--------|-------|
| | Number | Radius | Price |
|  | APi11-031G | 0.031 | \$9. |
| | APi11-031N | 0.031 | \$9. |

G = General Purpose/Steels N = Non-Ferrous/Aluminum

| APi16 Inserts | | | |
|---|------------|--------|---------|
| | Number | Radius | Price |
|  | APi16-063G | 0.063 | \$13.75 |
| | APi16-094G | 0.094 | \$13.75 |
| | APi16-125G | 0.125 | \$13.75 |
| | APi16-037N | 0.037 | \$13.75 |

| Hardware | |
|---|---|
|  |  |
| Insert Screw | Wrench |
| APM11 Insert Size | |
| 2.5mm-AP | T8 |
| \$4.25 | \$6. |
| APM16 Insert Size | |
| 4mm-AP | T15 |
| \$5. | \$7.50 |



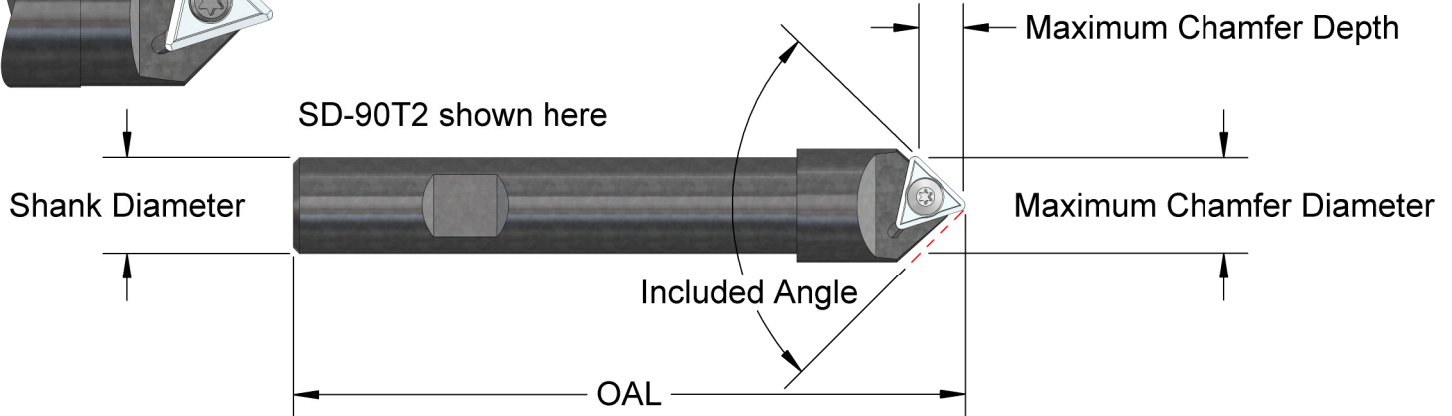
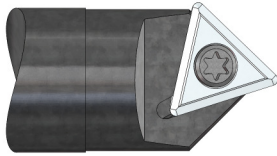
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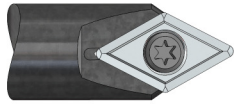
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Spot-Dex Tools (for all part materials)

SD-90T3 shown here



SD-60D3 shown here



SD-60D2 shown here



These all use Industry Standard inserts with secondary clearance facets ground to avoid dragging on the small cut diameters.

We've spot drilled to .190 depth with the SD-60D2 in mild steel at 4000 RPM and 1 IPM, and milled grooves in X-Y at 10 IPM.

| Number | Included Angle | Max Chamfer Dia. | Max Chamfer Depth | *Insert No. (modified) | Screw Size | Shank and OAL | Price including Wrench & Screw |
|----------|----------------|------------------|-------------------|------------------------|------------|---------------|--------------------------------|
| SD-60D2 | 60° | .310 | .240 | DPMT-21.51 | 2.5MM | 1/2 X 3.5 | \$190. |
| SD-60D3 | 60° | .480 | .380 | DPMT-32.52 | 4MM | | \$210. |
| SD-70D2 | 70° | .350 | .230 | DPMT-21.51 | 2.5MM | | \$190. |
| SD-70D3 | 70° | .530 | .340 | DPMT-32.52 | 4MM | | \$210. |
| SD-82T2 | 82° | .530 | .290 | TPMT2-2 | 4-40 | 1/2 X 3.5 | \$190. |
| SD-82T3 | 82° | .770 | .410 | TPMT322 | 4MM | 3/4 X 5.0 | \$210. |
| SD-90T2 | 90° | .570 | .270 | TPMT2-2 | 4-40 | 1/2 X 3.5 | \$190. |
| SD-90T3 | 90° | .820 | .390 | TPMT322 | 4MM | 3/4 X 5.0 | \$210. |
| SD-100T2 | 100° | .610 | .240 | TPMT2-2 | 4-40 | 1/2 X 3.5 | \$190. |
| SD-100T3 | 100° | .890 | .350 | TPMT322 | 4MM | 3/4 X 5.0 | \$210. |
| SD-120T2 | 120° | .680 | .190 | TPMT2-2 | 4-40 | 1/2 X 3.5 | \$190. |
| SD-120T3 | 120° | .990 | .270 | TPMT322 | 4MM | 3/4 X 5.0 | \$210. |

| Insert Number | R. Size | Price |
|---------------|---------|---------|
| DPMT-21.51 | .015 | \$17.50 |
| TPMT2-2 | .031 | \$15.00 |
| DPMT-32.52 | .031 | \$19.00 |
| TPMT322 | .031 | \$17.50 |

| Screw | Price |
|--------|--------|
| 2.5 MM | \$4.25 |
| 4-40 | \$5.00 |
| 4 MM | \$5.00 |
| 4 MM | \$5.00 |

| Wrench | Price |
|-----------|--------|
| Torxit-7 | \$6.00 |
| Torxit-7 | \$6.00 |
| Torxit-15 | \$7.50 |
| Torxit-15 | \$7.50 |

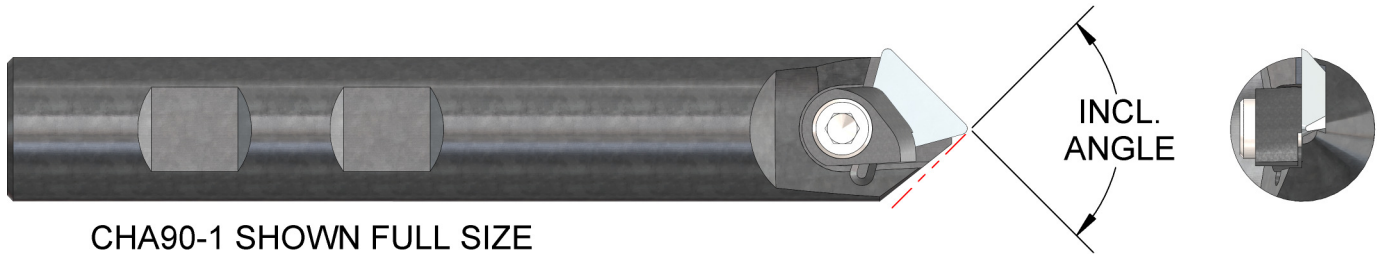


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The Single Flute Chamfer Hogs



CHA90-1 SHOWN FULL SIZE

This cutter was developed in 1982 for spot drilling and chamfer milling small slots in non-ferrous part materials. If used prior to drilling in non-ferrous materials it performs well. If used as a countersink after the hole is drilled it is chatter prone.

It is not for use as a rotating cutter in ferrous materials since the (25 °) relief angle is too weak. However, in the more rigid lathe environment it can be used successfully to spot drill holes in ferrous materials. We spot drill our Accu-Holds (4340) in CNC lathes at 900 RPM and .0005 IPR, with tool life of 200 holes per insert corner.

It should never be used in a drill press.

All five cutters have 3/4 shanks and are 5" overall.

All Single Flute Chamfer-Hogs, including inserts, are **\$205.** ea.

| Number | Included Angle | Maximum Chamfer Diameter | Insert | Clamp | Insert Prices | |
|----------|----------------|--------------------------|----------|-------|------------------------|----------------|
| | | | | | | |
| CHA90-1 | 90° | .800 | TFG32-90 | CL-4 | TFG32-90 | \$13.75 |
| CHA82-1 | 82° | .730 | TFG32-90 | CL-4 | TFG32-90T (TiN Coated) | \$16.00 |
| CHA100-1 | 100° | .940 | TFG32-90 | CL-4 | TD6P-120 | \$15.00 |
| CHA120-1 | 120° | 1.00 | TD6P-120 | 5-40 | | |
| CHA60-1* | 60° | 1.00 | TFG32-90 | CL-4 | | |

* Note: CHA60-1 is **not** center cut; it has .200 end cut diameter.

The CL-4 Clamps are **\$17.50** each, includes screw.

The 10-32 Socket Head Cap Screw is Industry Standard.

TFG-322 and TD-6P are Industry Standard Inserts modified with a secondary facet near the point to prevent "heeling".

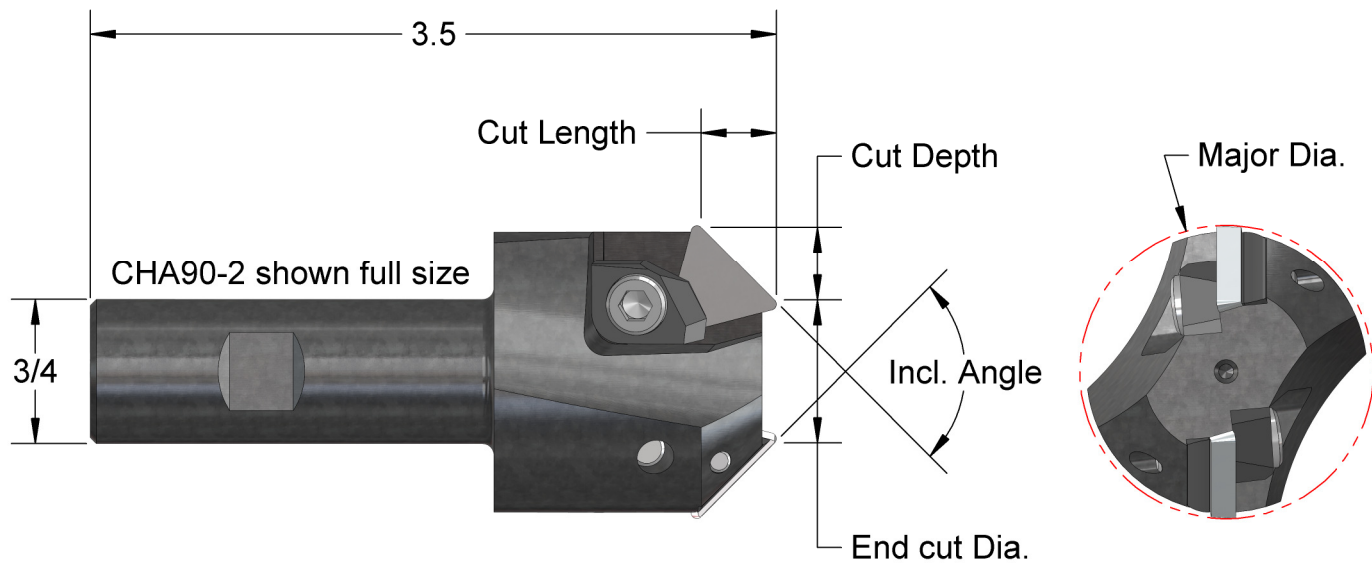


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Positive Rake Chamfer-Hogs



All Positive Chamfer-Hogs use
Insert TPU322 and Shim SM41
For Ferrous or Non-Ferrous

| Number | Included Angle | No. of Flutes | End Dia. | Major Dia. | Cut Lgth. | Cut Depth | Clamp No. | Price Incl. Inserts |
|----------|----------------|---------------|----------|------------|-----------|-----------|-----------|---------------------|
| CHA90-2 | 90° | 2 | 3/4 | 1.5 | .37 | .37 | CL2 | \$310. |
| CHA120-2 | 120° | 2 | 5/8 | 1.6 | .19 | .42 | CL2 | \$310. |
| CHA60-3P | 60° | 3 | 1.1 | 1.6 | .42 | .19 | CL5 | \$410. |
| CHA150-2 | 150° | 2 | .47 | 1.56 | .14 | .52 | CL2 | \$310. |

| Insert | Price | Clamps | Price | Shims | Price | Screws at no charge with each purchase of Clamps & Shims. Ind. Standard 10-32 & 1/4-20 Socket Head, and 5-40 Flat Head. |
|-----------|----------|--------|----------|---------------|----------|---|
| TPU322 C5 | \$12.50. | CL2 | \$17.50. | SM41 Modified | \$17.50. | |
| | | CL5 | \$22.50. | | | |

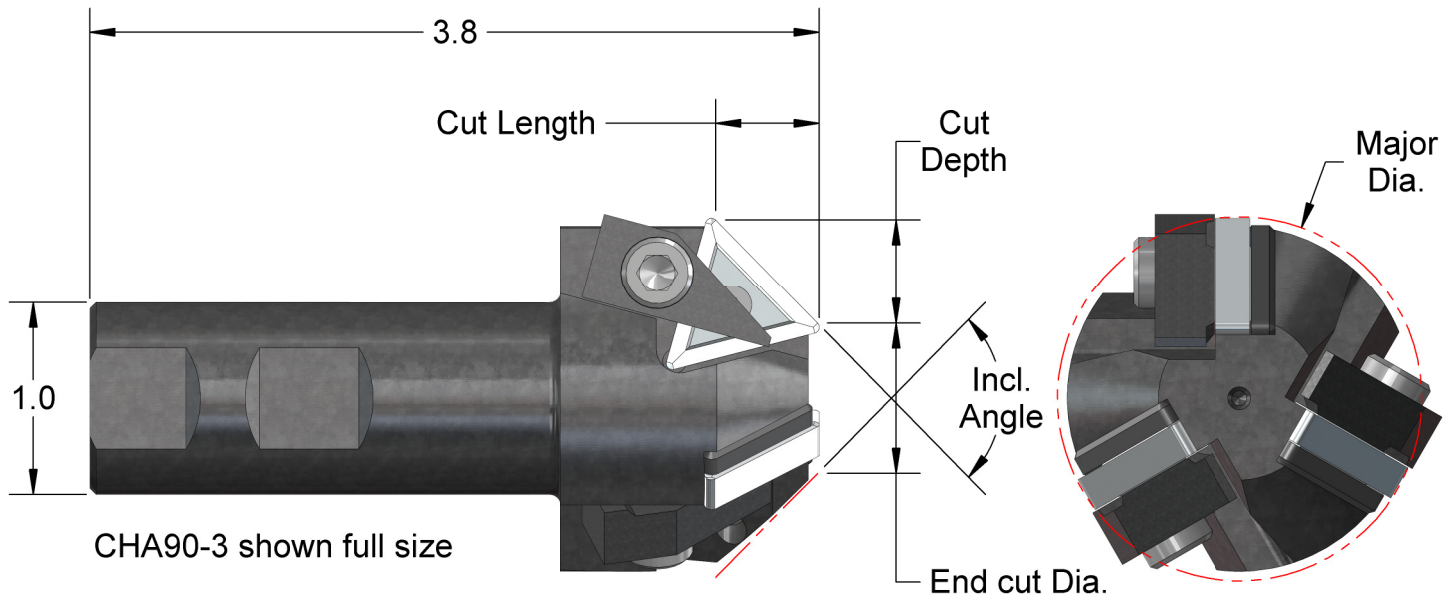


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Negative Rake Chamfer-Hogs (Ferrous Only)



| Number | Included Angle | No. of Flutes | End Dia. | Major Dia. | Cut Lgth. | Cut Depth | Clamp No. | Price Incl. Inserts |
|----------|----------------|---------------|----------|------------|-----------|-----------|-----------|---------------------|
| CHA30-3 | 30° | 3 | 1.75 | 2.16 | .73 | .25 | CL5 | \$450. |
| CHA60-3N | 60° | 3 | 1.40 | 1.60 | .65 | .45 | CL5 | \$450. |
| CHA70-3 | 70° | 3 | 1.25 | 2.14 | .62 | .44 | CL5 | \$450. |
| CHA82-3 | 82° | 3 | 1.0 | 2.02 | .57 | .50 | CL5 | \$450. |
| CHA90-3 | 90° | 3 | .75 | 1.90 | .52 | .52 | CL5 | \$450. |
| CHA90-4 | 90° | 4 | 1.76 | 2.85 | .52 | .52 | CL5 | \$515. |
| CHA100-3 | 100° | 3 | .82 | 1.99 | .49 | .58 | CL5 | \$450. |
| CHA110-3 | 110° | 3 | .75 | 2.02 | .43 | .62 | CL5 | \$450. |
| CHA120-3 | 120° | 3 | .75 | 2.10 | .29 | .62 | CL5 | \$450. |
| CHA130-3 | 130° | 3 | .77 | 2.16 | .32 | .67 | CL5 | \$450. |
| CHA140-3 | 140° | 3 | .75 | 2.20 | .25 | .70 | CL5 | \$450. |

All Negative Rake Chamfer-Hogs use the below insert, clamp, and shim

| Insert | Price | Clamp | Price | Shim | Price | Screws at no charge with each purchase of Clamps & Shims. Ind. Standard 10-32 & 1/4-20 Socket Head and 5-40 Flat Head. |
|------------|-------|-------|----------|----------------|-------|--|
| TNMG432 C5 | \$16. | CL5 | \$22.50. | SM26 Ind. Std. | \$12. | |



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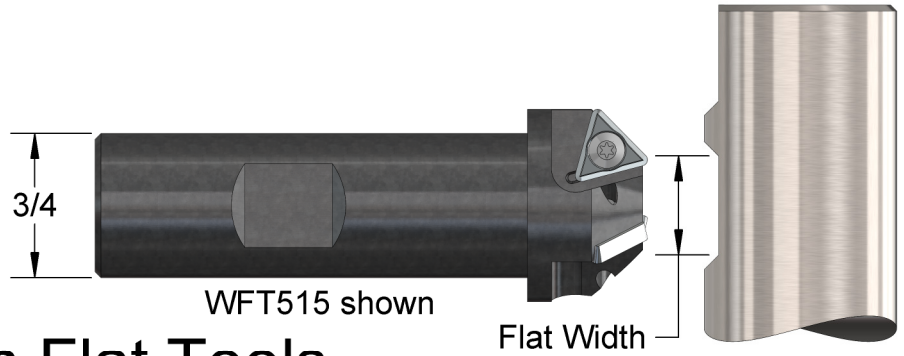
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Are you tired of hand ground screw flats on your tool and cutter shanks?

Mill precise flats with our Weldon Flat Tools.

See page 49 for the USCTI Weldon Flat specifications

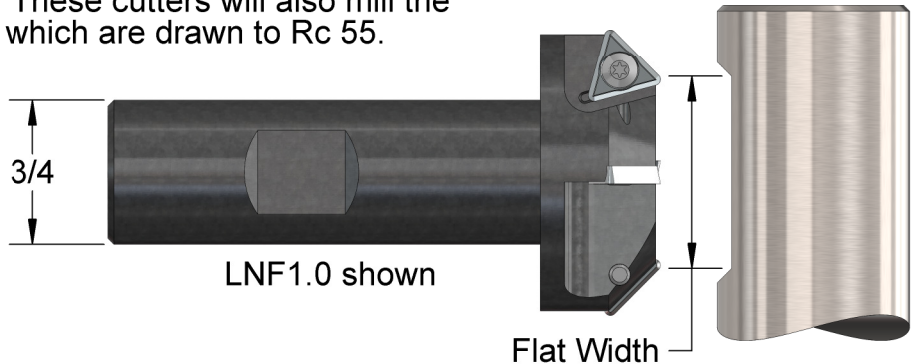


Weldon Flat Tools

| Number | Flat Width | For these Shank sizes | Number of Flutes | Price |
|--------|------------|-----------------------|------------------|--------|
| WFT280 | .280 | .375 | 1 | \$205. |
| WFT330 | .330 | .500 | 2 | \$220. |
| WFT400 | .400 | .625 | 2 | \$235. |
| WFT455 | .455 | .750 & .875 | 3 | \$265. |
| WFT515 | .515 | 1.0, 1.25, 1.5 | 3 | \$285. |
| WFT700 | .700 | 2.0 | 3 | \$345. |

We mill Weldon Flats with the WFT515 in 4340 alloy steel hardened to Rc 46 @ 1500 RPM and .002 IPT. These cutters will also mill the shanks on standard HSS end mills which are drawn to Rc 55.

Would you prefer linear flats for easy "Z" Axis adjustment?



Linear Flat Tools for any Shank size

| Number | Flat Width | Number of Flutes | Price |
|---------|------------|------------------|--------|
| LNF750 | .750 | 4 | \$350. |
| LNF1.0 | 1.000 | 4 | \$375. |
| LNF1125 | 1.125 | 4 | \$405. |
| LNF1250 | 1.250 | 5 | \$450. |

| Insert | Price |
|---------|---------|
| TPMT2-2 | \$15.00 |

| Screw | Price |
|-----------|--------|
| SR 14-505 | \$4.50 |

| Wrench | Price |
|----------|--------|
| Torxit-8 | \$6.00 |

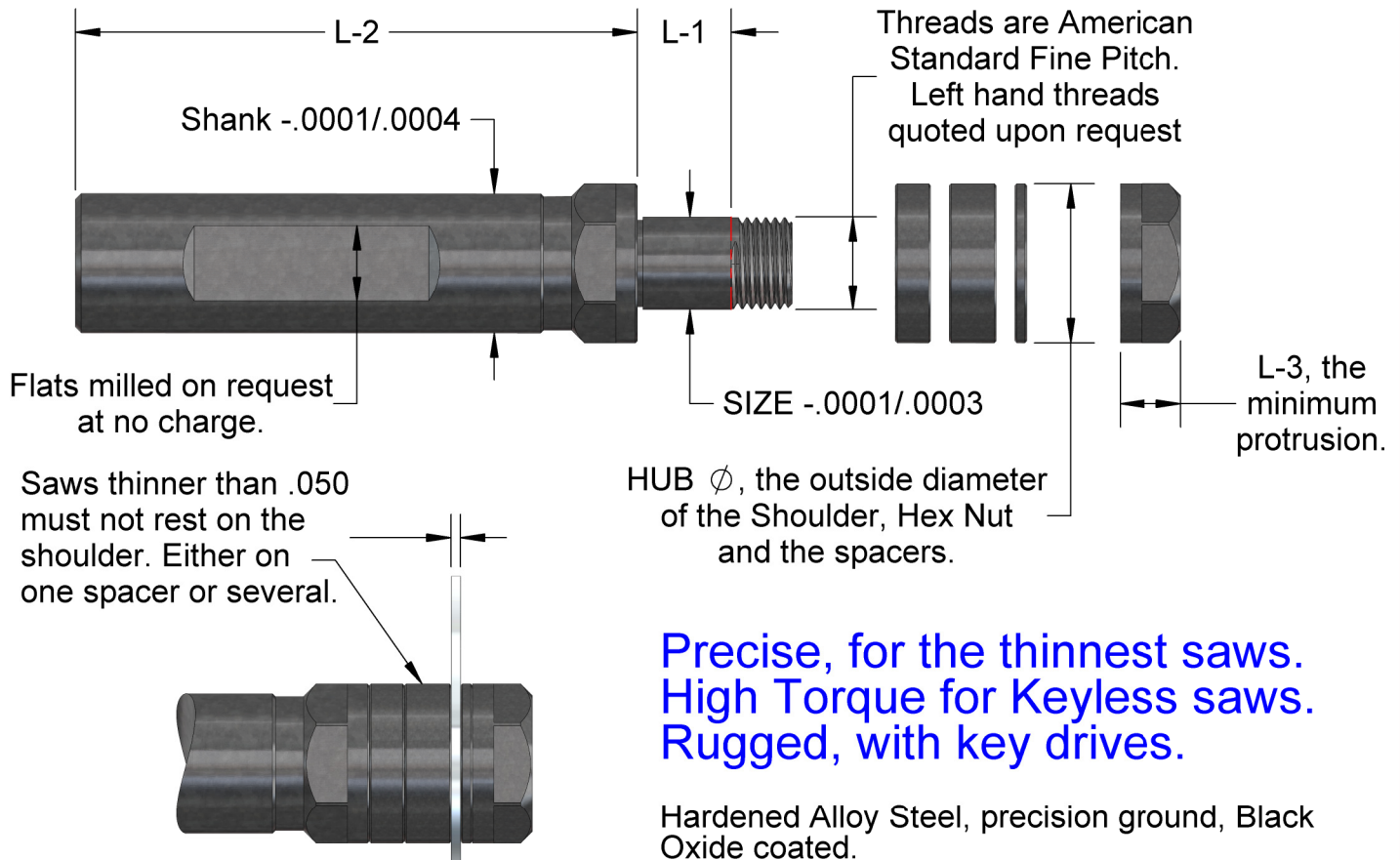


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SAW ARBORS for Carbide or HSS Saws with key drives for 5/8 and larger arbors



Shim Style spacers in sets from .001 thru .015 are available from your Industrial Distributor.

The spacer assortments will accommodate most saws and spacers that will fit in the L-1 Length.
*Spacers ordered with Keyed Arbors will also have keyways.

| Number | Size | Shank | L-1 | L-2 | L-3 | Hub | Spacers with each Arbor | Price |
|--------|------|-------|------|------|------|-------|-------------------------|--------|
| SA250 | .250 | .500 | .350 | 2.13 | .250 | .570 | .0625 .125 .1875 | \$225. |
| SA375 | .375 | .625 | .375 | 2.40 | .280 | .710 | | \$245. |
| SA500 | .500 | .750 | .500 | 3.00 | .325 | .855 | | \$265. |
| SA625 | .625 | .875 | .500 | 3.15 | .390 | 1.000 | .0625 .1875 .250 | \$330. |
| SA750 | .750 | 1.00 | .500 | 3.40 | .440 | 1.215 | | \$345. |
| SA875 | .875 | 1.00 | .500 | 3.40 | .440 | 1.434 | | \$360. |
| SA100 | 1.00 | 1.00 | .500 | 3.50 | .440 | 1.480 | | \$400. |
| SA125 | 1.25 | 1.25 | .500 | 3.50 | .440 | 2.000 | | \$475. |

*Sorry, unable to manufacture precise spacers thinner than .0625 in steel; suggest Robb-Jack's Solid Carbide spacers for thinner sizes.



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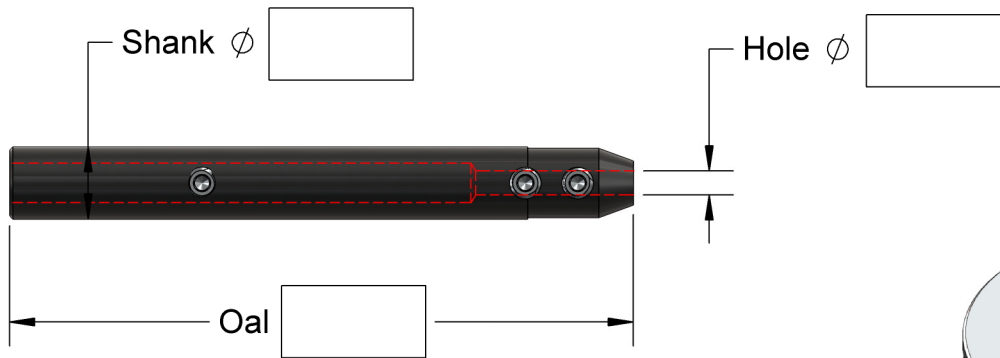
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The Accu-Hold

The **MOST** precise extension holder you have ever used.

Concentric within .0003; Hole size is plus .00015 and minus Zero.

Improves rigidity, concentricity, and coolant effectiveness.



| Number | Hole size Ø | Decimal Equiv. | Shank size Ø | Overall Length | Screw Size | Price |
|-------------|----------------|-------------------|-----------------|-------------------|---------------|---------------|
| ACH3/32 | 3/32 | .0937 | 3/8 | 2-1/4 | 5-40 | \$175. |
| ACH1/8 | 1/8 | .125 | 3/8 | 3-1/4 | 8-32 | \$185. |
| ACH1/8-6 | 1/8 | .125 | 3/8 | 6 | 8-32 | \$275. |
| ACH5/32 | 5/32 | .1562 | 1/2 | 3-1/2 | 8-32 | \$160. |
| ACH3/16 | 3/16 | .1875 | 1/2 | 3-1/2 | 8-32 | \$160. |
| ACH3/16-5 | 3/16 | .1875 | 1/2 | 5 | 8-32 | \$195. |
| ACH1/4 | 1/4 | .250 | 5/8 | 4-1/4 | 10-32 | \$170. |
| ACH1/4-6 | 1/4 | .250 | 5/8 | 6 | 10-32 | \$200. |
| ACH5/16 | 5/16 | .3125 | 3/4 | 4-1/2 | 1/4-28 | \$185. |
| ACH3/8 | 3/8 | .375 | 3/4 | 4-1/2 | 5/16-24 | \$195. |
| ACH3/8-6 | 3/8 | .375 | 3/4 | 6 | 5/16-24 | \$225. |
| ACH7/16 | 7/16 | .4375 | 3/4 | 4-1/2 | 5/16-24 | \$210. |
| ACH1/2* | 1/2 | .500 | 3/4 | 4-3/4 | 3/8-24 | \$250. |
| ACH1/2-1 | 1/2 | .500 | 1 | 4-3/4 | 3/8-24 | \$275. |
| ACH1/2-6 | 1/2 | .500 | 1 | 6 | 3/8-24 | \$295. |
| ACH9/16 | 9/16 | .5625 | 1 | 5-1/4 | 3/8-24 | \$295. |
| ACH5/8 | 5/8 | .625 | 1 | 5-1/2 | 3/8-24 | \$295. |
| ACH3/4** | 3/4 | .750 | 1 | 5-1/4 | 7/16-20 | \$340. |
| ACH3/4-1.25 | 3/4 | .750 | 1-1/4 | 6 | 7/16-20 | \$350. |
| ACH1.0** | 1 | 1.000 | 1 | 5-1/2 | 7/16-20 | \$475. |

*The ACH1/2 has a 1" Dia. x 1.5" long head.

**The ACH3/4 and ACH1.0 have a 1-1/4" Dia. x 2-1/4" long head and the holes are only 2" deep.



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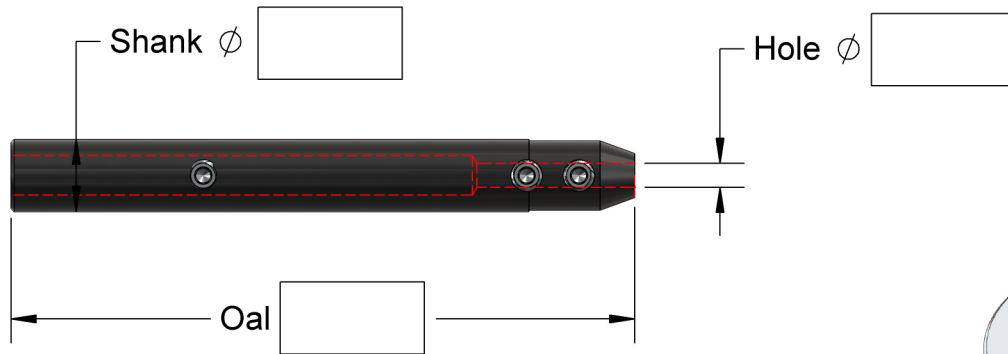
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The Metric Accu-Hold

The MOST precise extension holder you have ever used.

Concentric within .0003; Hole size is plus .00015 and minus Zero.

Improves rigidity, concentricity, and coolant effectiveness.



| Number | Hole size Ø | Decimal Equiv. | Shank size Ø | Overall Length | Screw Size | Price |
|-----------|-------------|----------------|--------------|----------------|------------|--------|
| ACH3MM | 3MM | .1181 | 3/8 | 3-1/4 | 8-32 | \$185. |
| ACH4MM | 4MM | .1575 | 1/2 | 3-1/2 | 8-32 | \$170. |
| ACH5MM | 5MM | .1968 | 1/2 | 3-1/2 | 8-32 | \$170. |
| ACH6MM | 6MM | .2362 | 5/8 | 4-1/4 | 10-32 | \$175. |
| ACH7MM | 7MM | .2756 | 5/8 | 4-1/4 | 10-32 | \$225. |
| ACH8MM | 8MM | .3149 | 3/4 | 4-1/2 | 1/4-28 | \$185. |
| ACH9MM | 9MM | .3543 | 3/4 | 4-1/2 | 5/16-24 | \$240. |
| ACH10MM | 10MM | .3937 | 3/4 | 4-1/2 | 5/16-24 | \$215. |
| ACH11MM | 11MM | .4331 | 3/4 | 4-1/2 | 5/16-24 | \$260. |
| ACH12MM* | 12MM | .4724 | 3/4 | 4-3/4 | 3/8-24 | \$245. |
| ACH12MM-1 | 12MM | .4724 | 1 | 4-3/4 | 3/8-24 | \$255. |
| ACH13MM | 13MM | .5118 | 1 | 4-3/4 | 3/8-24 | \$285. |
| ACH14MM | 14MM | .5512 | 1 | 5-1/2 | 3/8-24 | \$285. |
| ACH15MM | 15MM | .5905 | 1 | 5-1/2 | 3/8-24 | \$305. |
| ACH16MM | 16MM | .6299 | 1 | 5-1/2 | 3/8-24 | \$300. |
| ACH18MM** | 18MM | .7086 | 1 | 5-1/4 | 7/16-20 | \$315. |
| ACH20MM-1 | 20MM | .7874 | 1 | 6 | 7/16-20 | \$340. |
| ACH20MM | 20MM | .7874 | 1-1/4 | 6 | 7/16-20 | \$340. |
| ACH25MM** | 25MM | .9842 | 1 | 6-1/2 | 7/16-20 | \$475. |

*The ACH12MM has a 1" Dia. x 1.5" long head.

**The ACH18MM and ACH25MM have a 1-1/4" Dia. x 2-1/4" long head and the holes are only 2" deep.



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NEW !!!

Accu-Hold MMH - All Metric

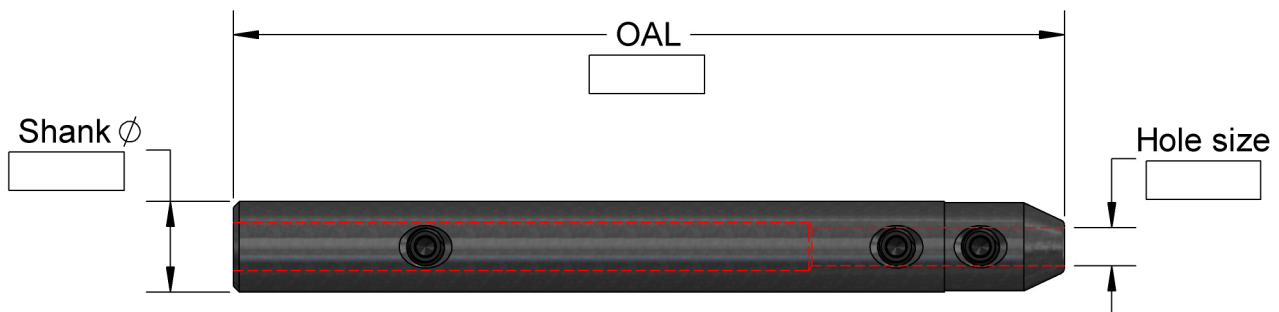
NEW !!!



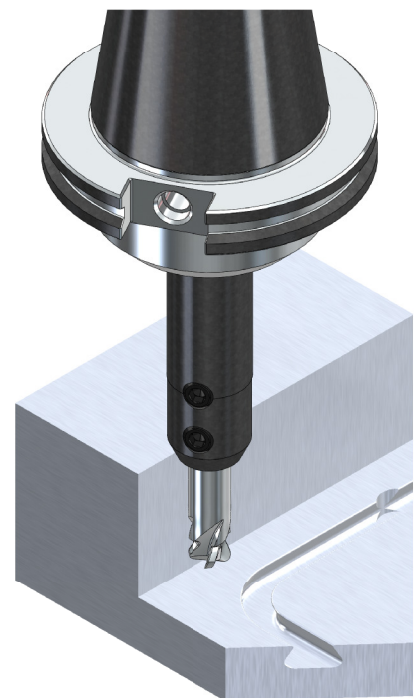
The MOST precise extension holder you have ever used.

Concentric within .0003; Hole size is plus .00015 and minus Zero.

Improves rigidity, concentricity, and coolant effectiveness.



| | Hole size ϕ | Decimal size | Shank size ϕ | Overall Length | Screw size | Price |
|--------|---------------------|-----------------|----------------------|-------------------|---------------|--------|
| MMH-03 | 3 mm | 0.118 | 10 mm | 82 mm | M2.5 | \$220. |
| MMH-04 | 4 mm | 0.157 | 12 mm | 110 mm | M4 | \$200. |
| MMH-05 | 5 mm | 0.197 | 12 mm | 110 mm | M5 | \$200. |
| MMH-06 | 6 mm | 0.236 | 16 mm | 125 mm | M5 | \$205. |
| MMH-08 | 8 mm | 0.315 | 20 mm | 135 mm | M6 | \$225 |
| MMH-10 | 10 mm | 0.394 | 20 mm | 135 mm | M8 | \$275. |
| MMH-12 | 12 mm | 0.472 | 25 mm | 150 mm | M10 | \$285. |
| MMH-16 | 16 mm | 0.630 | 32 mm | 150 mm | M12 | \$315. |
| MMH-20 | 20 mm | 0.787 | 32 mm | 150 mm | M12 | \$365. |

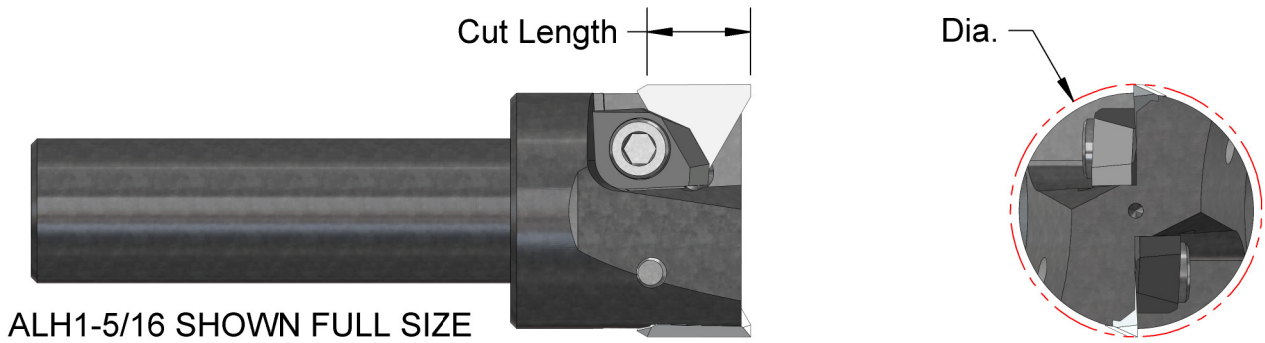


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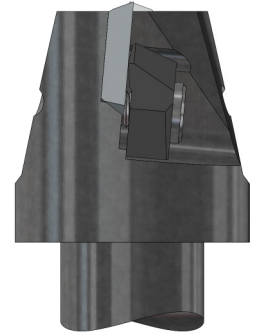
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The Aluma-Hogs



We started making ALUMA-HOGS in 1982. In 1997 we introduced the SHEAR-HOG; see back cover. With its high shear inserts, and no top clamps, the SHEAR-HOG outperforms the ALUMA-HOGS by 50% in Metal Removal rates. We will stock Aluma-Hogs, inserts, and parts as long as needed.



| NUMBER | Dia. | Shank Dia. | OAL | Cut Length | Insert & Qty. | Clamp | Shim | Price Incl. Inserts |
|-----------|-------|------------|------|------------|---------------|-------|------|---------------------|
| ALH1A | 1.0 | 3/4 | 3.75 | 1/4 | TEG2.522 (2) | CL1 | | \$215. |
| ALH1B | 1.0 | 1.0 | 3.75 | 1/4 | TEG2.522 (2) | CL1 | | \$215. |
| ALH1-5/16 | 1.312 | 3/4 | 3.75 | 1/2 | TEG32MF (2) | CL2 | | \$265. |
| ALH1-7/8A | 1.875 | 3/4 | 3.87 | 3/4 | TEG42MF (2) | CL3 | | \$285. |
| ALH1-7/8B | 1.875 | 1.0 | 4.12 | 3/4 | TEG42MF (2) | CL3 | | \$285. |
| ALH2 | 2.0 | 1.0 | 4.12 | 3/4 | TEG42MF (2) | CL3 | | \$325. |
| ALH3S | 3.0 | 1.0 | 4.12 | 3/4 | TEG42MF (3) | CL3 | SM37 | \$410. |
| ALH4S | 4.0 | 1.0 | 4.25 | 3/4 | TEG42MF (4) | CL3 | SM37 | \$535. |

| Inserts/Hardware | Relief Angle | Price |
|-----------------------|--------------|---------|
| TEG2.522 (.031 R) | 20° | \$12.50 |
| TEG2.52MF (Mill Flat) | 20° | \$14.00 |
| TFG322 (.031 R) | 25° | \$12.50 |
| TFG32MF (Mill Flat) | 25° | \$14.00 |
| TEG422 (.031 R) | 20° | \$14.75 |
| TEG42MF (Mill Flat) | 20° | \$17.00 |
| CL1 or CL2 Clamp | | \$16.50 |
| CL3 Clamp | | \$21.50 |
| SM37 Shim, Modified | | \$16.50 |

*Suggested Starting Data:
Non-Ferrous ONLY
500/2,000 SFM; .002/.010 IPT
10,000 max RPM*

See back cover, inside back cover and page 50 for information on the SHEAR-HOG, which will rough mill Aluminum at 6 CIM per HP.

Screws included with any Clamp/Shim orders.



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Aluminum Milling Tests

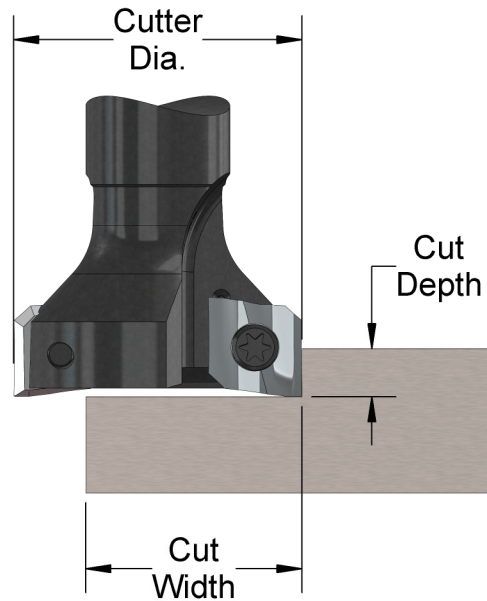
Faster CIM metal removal rates in aluminum depend more on IPM feed rates, horsepower and the cutter geometry than RPM.

You'll get higher CIM with smaller cutters, (assuming you're rough milling with cutters about 1-1/4" diameter and larger). On tests with full diameter cuts, the 1-1/4" diameter cutter gets 42 CIM and the 2" diameter cutter gets 37 CIM.

You'll get higher CIM with a cut width that is about 3/4 of the cutter diameter than with a full diameter cut width, (a long accepted machinist's rule).

Compare tests below

You can get greater CIM with fewer flutes, plus reduced insert costs; see Test 3.



See back cover for all shank style Shear-Hogs.

| Test No. | Cutter | Cutter Dia. | RPM | Cut Width | Cut Depth | IPM Feed | No. Flutes | IPT Chip | CIM |
|----------|--------|-------------|------|-----------|-----------|----------|------------|----------|-----|
| 1. | SH125 | 1.25 | 6500 | 1.25 | .125 | 275 | 2 | .027 | 42 |
| 2. | SH125 | 1.25 | 6500 | 1.0 | .250 | 375 | 2 | .037 | 47 |
| 3. | SH200 | 2.0 | 6500 | 2.0 | .250 | 75 | 3 | .004 | 37 |

All tests were run on a recent model Haas VF1 based on the highest Inches Per Minute possible with the load meter showing 100%. Haas estimates 7.5 actual spindle HP at 6500 RPM.

When calculating speeds and feeds for Shear-Hogs we aim for 6 CIM per horse power at the spindle. Please see the sample calculation below.

Given: 10 HP at the spindle, 6,500 RPM, Cut width 3.5", (4) flutes, and Cut depth of .100"

Stock Removal (CIM)... HP X 6.....10 X 6..... 60 CIM
 SFM.....RPM X .262 X Tool Dia.....6,500 X .262 X 3.5..... 5,960 SFM
 IPM.....CIM / (Cut Width X Cut Depth).....60 / (3.5 X .100)..... 171 IPT
 IPT.....IPM / (RPM X No. of Teeth).....171 / (6,500 X 4)..... .0066 IPT



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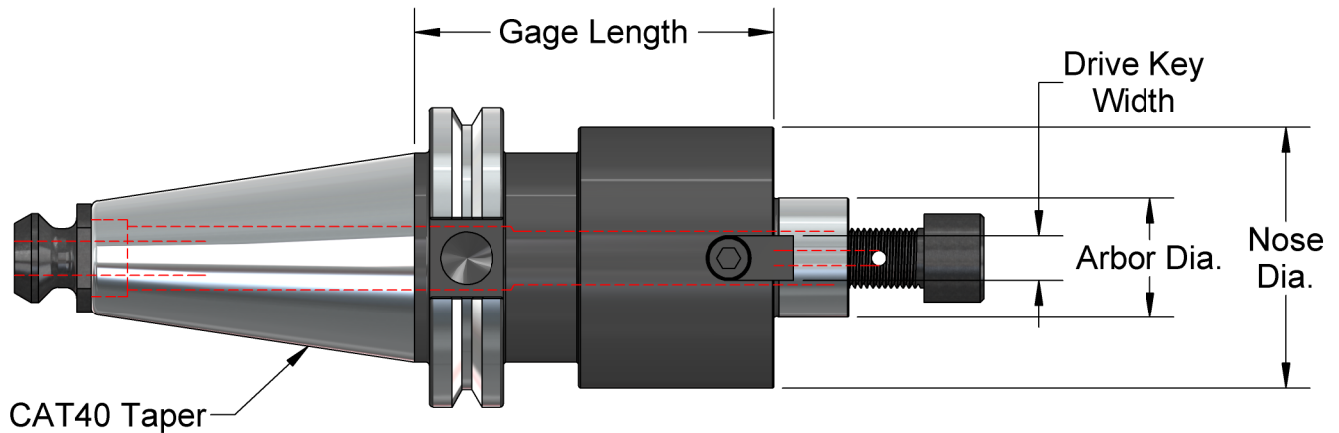
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NEW !!!

Shell Mill Arbors

NEW !!!



Concentricity better than .0002 at face and arbor

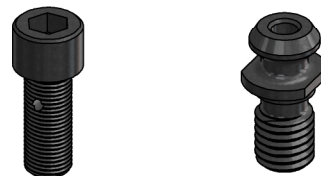
Made from Alloy Steel Rc 54 - 56

Removable drive keys

| No. | Arbor Dia. | Nose Dia. | Gage Length | Drive Key Width | Shell Shear-Hog | Price |
|-------------------|------------|-----------|-------------|-----------------|-----------------|---------------|
| CAT40-FMA.500-2.0 | .500 | 1.74 | 2.0 | .249 | Shell 200 | \$125. |
| CAT40-FMA.750-1.5 | .750 | 1.76 | 1.5 | .312 | Shell 250 | \$140. |
| CAT40-FMA.750-1.5 | .750 | 1.76 | 1.5 | .312 | Shell 275 | \$140. |
| CAT40-FMA1.0-3.0 | 1.00 | 2.18 | 3.0 | .370 | Shell 300 | \$160. |
| CAT40-FMA1.25-1.5 | 1.25 | 2.49 | 1.5 | .495 | Shell 400 | \$125. |
| CAT40-FMA1.5-1.5 | 1.50 | 2.49 | 1.5 | .620 | Shell 500 | \$125. |
| CAT40-FMA1.5-1.5 | 1.50 | 2.49 | 1.5 | .620 | Shell 600 | \$125. |
| CAT40-FMA1.5-1.5 | 1.50 | 2.49 | 1.5 | .620 | Shell 700 | \$125. |

| Thru Coolant Arbor Screws | | |
|---------------------------|-----------------|----------------|
| Size | Shell Shear-Hog | Price |
| 1/4-28 | SHELL 200 | \$7.50 |
| 3/8-24 | SHELL 250 | \$7.50 |
| 3/8-24 | SHELL 275 | \$7.50 |
| 1/2-20 | SHELL 300 | \$8.75 |
| 5/8-18 | SHELL 400 | \$11.00 |
| 3/4-16 | SHELL 500 | \$12.50 |
| 3/4-16 | SHELL 600 | \$12.50 |
| 3/4-16 | SHELL 700 | \$12.50 |

| Thru Coolant Retention Knob | |
|-----------------------------|--------------|
| No. | Price |
| PS-11122 | \$18. |

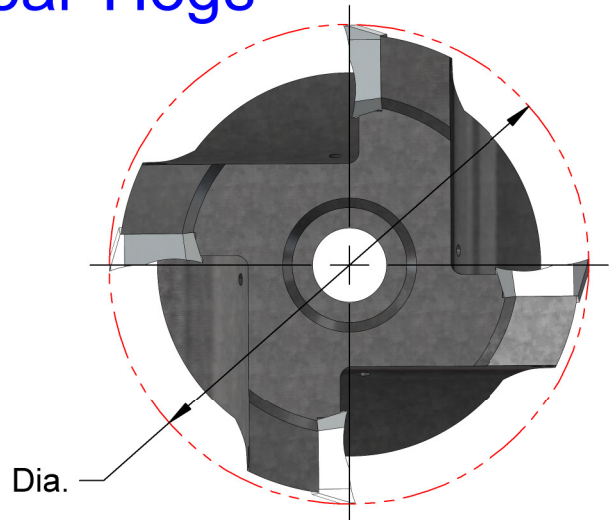
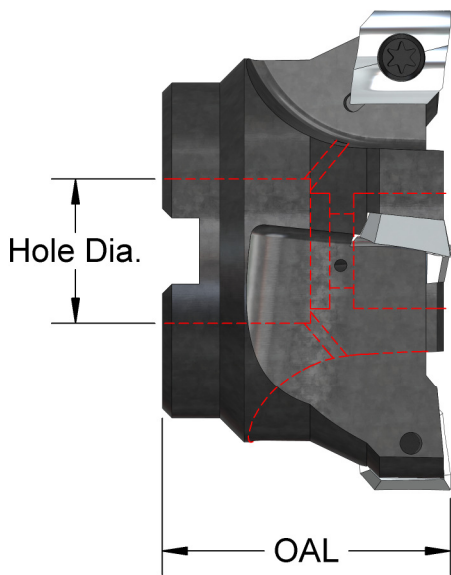


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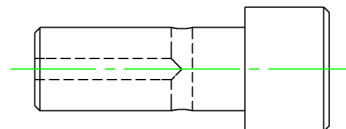
Shell Shear-Hogs®



All cutter prices include inserts, insert screws, coolant screw and wrench

| Number | Dia. | Hole Dia. | OAL | No. of Flutes | Price Incl. Inserts | Coolant Screws | |
|-----------|------|-----------|------|---------------|---------------------|----------------|----------------|
| | | | | | | Size | Price |
| SHELL 200 | 2.0 | .500 | 1.25 | 2 or 3 | \$430. | 1/4-28 | \$7.50 |
| SHELL 250 | 2.5 | .750 | 1.50 | 4 | \$475. | 3/8-24 | \$7.50 |
| SHELL 275 | 2.75 | .750 | 1.50 | 4 | \$510. | 3/8-24 | \$7.50 |
| SHELL 300 | 3.0 | 1.00 | 1.75 | 4 | \$540. | 1/2-20 | \$8.75 |
| SHELL 400 | 4.0 | 1.25 | 1.87 | 4 | \$630. | 5/8-18 | \$11.00 |
| SHELL 500 | 5.0 | 1.50 | 2.25 | 5 | \$750. | 3/4-16 | \$12.50 |
| SHELL 600 | 6.0 | 1.50 | 2.25 | 6 | \$1000. | 3/4-16 | \$12.50 |
| SHELL 700 | 7.0 | 1.50 | 2.25 | 8 | \$1500. | 3/4-16 | \$12.50 |

You may use Std. Socket Head screws without thru-tool coolant. Or, use our modified screws with coolant holes



| Shear-Hog Inserts | Corner | Price |
|-------------------|------------|--------------------|
| ADEH-430 | Sharp | \$19.50 ea. |
| ADEH-431 | .010 R | \$19.50 ea. |
| ADEH-432 | .030 R | \$19.50 ea. |
| ADEH-434 | .060 R | \$19.50 ea. |
| ADEH-436 | .090 R | \$21.50 ea. |
| ADEH-438 | .120 R | \$21.50 ea. |
| ADEH-45 | .015 x 45° | \$21.50 ea. |

| Extra Insert Features | Add to Price |
|---------------------------|-------------------|
| .002 Honed Edge | \$3.00 |
| AlTiN Coat | \$4.25 |
| DLC Coat | \$5.75 |
| Honed Edge & AlTiN Coat | \$7.25 |
| Insert Screws and Wrench | |
| 3.5mm-SH (2012 and newer) | \$2.00 ea. |
| 8-32-SH (Older than 2012) | \$2.00 ea. |
| T15 Wrench | \$7.50 ea. |

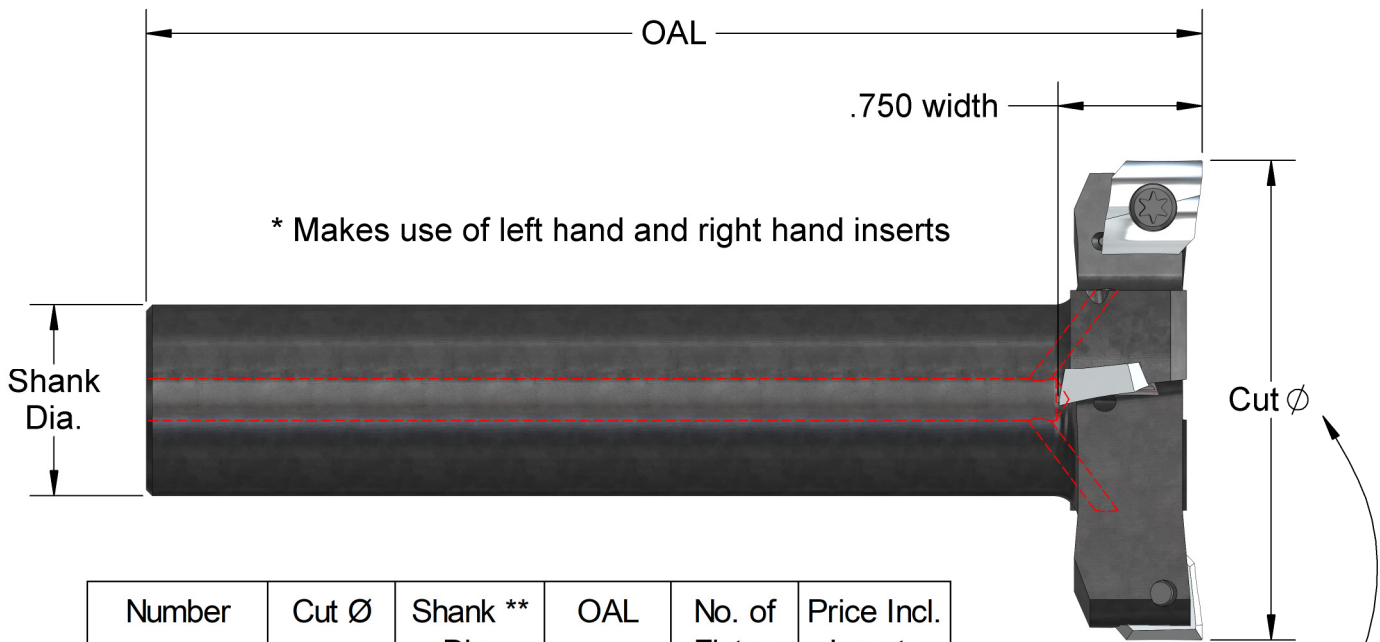


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T-Slot Shear-Hogs®



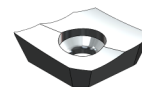
| Number | Cut Ø | Shank ** Dia. | OAL | No. of Flutes | Price Incl. Inserts |
|--------|-------|------------------|-----|------------------|------------------------|
| TS 150 | 1.50 | 3/4 | 4.5 | 2 | \$445. |
| TS 175 | 1.75 | 3/4 | 5.5 | 2 | \$475. |
| TS 200 | 2.00 | 1.0 | 6 | 2 | \$520. |
| TS 250 | 2.50 | 1.0 | 5.5 | 4 | \$550. |
| TS 325 | 3.25 | 1-1/4 | 6 | 4 | \$675. |
| TS 400 | 4.00 | 1-1/4 | 7 | 4 | \$775. |
| TS 450 | 4.50 | 1-1/4 | 7 | 6 | \$825. |

Cutting diameters are not for finish profiling with T-Slot Shear-Hogs.

Inserts can be spun ground in T-Slot Shear-Hogs to cut straight in that tool only at an additional charge.

** We can modify shanks to smaller sizes.
Price & lead time based on specific request.

LH/RH Inserts same price



| Shear-Hog Inserts | Corner | Price |
|-------------------|------------|--------------------|
| ADEH-430 | Sharp | \$19.50 ea. |
| ADEH-431 | .010 R | \$19.50 ea. |
| ADEH-432 | .030 R | \$19.50 ea. |
| ADEH-434 | .060 R | \$19.50 ea. |
| ADEH-436 | .090 R | \$21.50 ea. |
| ADEH-438 | .120 R | \$21.50 ea. |
| ADEH-45 | .015 x 45° | \$21.50 ea. |

| Extra Insert Features | Add to Price |
|---------------------------|-------------------|
| .002 Honed Edge | \$3.00 |
| AlTiN Coat | \$4.25 |
| DLC Coat | \$5.75 |
| Honed Edge & AlTiN Coat | \$7.25 |
| Insert Screws and Wrench | |
| 3.5mm-SH (2012 and newer) | \$2.00 ea. |
| 8-32-SH (Older than 2012) | \$2.00 ea. |
| T15 Wrench | \$7.50 ea. |



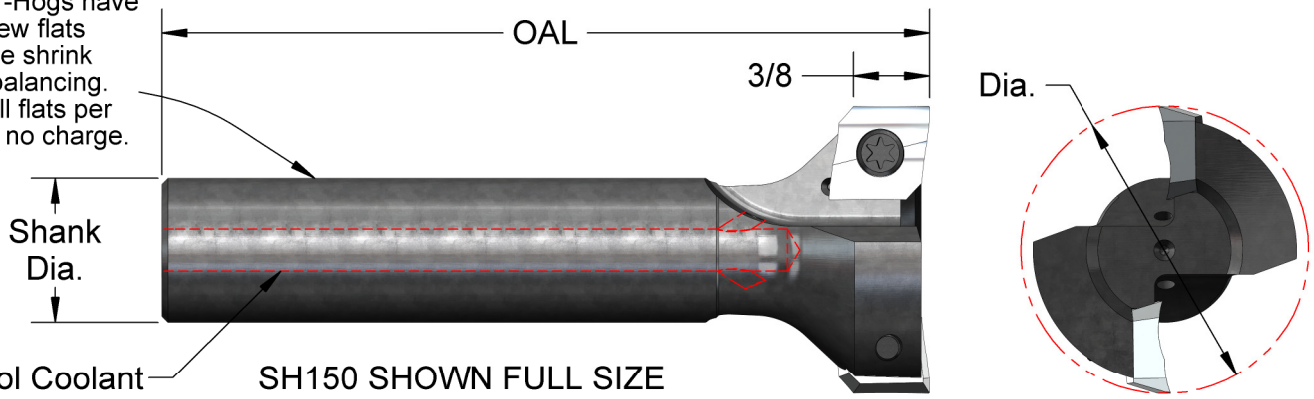
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Lincoln, CA 95648-9312

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E-Mail: mail@abtoolsinc.com

Shank Style Shear-Hogs®

The Shear-Hogs have no set-screw flats for possible shrink fit use or balancing. We will mill flats per request at no charge.



Are you rough milling aluminum at 6 CIM per HP?

| Number | Dia. | Shank Dia. | OAL | No. of Flutes | Ramp Angle | Price | Shear-Hog Inserts | Corner | Price |
|------------|-------|------------|-----|---------------|--------------|---------------|---------------------------|------------|--------------------|
| SH100 | 1.0 | 3/4 | 4.0 | 1 | Drills in Z! | \$215. | ADEH-430 | Sharp | \$19.50 ea. |
| SH100-6 | 1.0 | 3/4 | 6.0 | 1 | Drills in Z! | \$265. | ADEH-431 | .010 R | \$19.50 ea. |
| SH125 | 1-1/4 | 3/4 | 4.0 | 2 | 8° | \$245. | ADEH-432 | .030 R | \$19.50 ea. |
| SH125-1 | 1-1/4 | 1.0 | 4.0 | 2 | 8° | \$255. | ADEH-434 | .060 R | \$19.50 ea. |
| SH125-6 | 1-1/4 | 1.0 | 6.0 | 2 | 8° | \$330. | ADEH-436 | .090 R | \$21.50 ea. |
| SH125-9 | 1-1/4 | 1.0 | 9.0 | 2 | 8° | \$435. | ADEH-438 | .120 R | \$21.50 ea. |
| SH150 | 1-1/2 | 3/4 | 4.0 | 2 | 5° | \$285. | ADEH-45 | .015 x 45° | \$21.50 ea. |
| SH150-1 | 1-1/2 | 1.0 | 4.5 | 2 | 5° | \$295. | Extra Insert Features | | Add to Price |
| SH150-7 | 1-1/2 | 1-1/4 | 7.0 | 2 | 5° | \$365. | .002 Honed Edge | | \$3.00 |
| SH150-8 | 1-1/2 | 1.0 | 8.0 | 2 | 5° | \$395. | AlTiN Coat | | \$4.25 |
| SH200-3/4 | 2.0 | 3/4 | 4.5 | 3 | 4° | \$340. | DLC Coat | | \$5.75 |
| SH200-1 | 2.0 | 1.0 | 5.0 | 3 | 4° | \$340. | Honed Edge & AlTiN Coat | | \$7.25 |
| SH200-7 | 2.0 | 1-1/4 | 7.0 | 3 | 4° | \$410. | Insert Screws and Wrench | | |
| SH200-9 | 2.0 | 1-1/4 | 9.0 | 3 | 4° | \$465. | 3.5mm-SH (2012 and newer) | | \$2.00 ea. |
| SH300-3/4 | 3.0 | 3/4 | 5.0 | 4 | None | \$455. | 8-32-SH (Older than 2012) | | \$2.00 ea. |
| SH300-1 | 3.0 | 1.0 | 5.0 | 4 | None | \$455. | T15 Wrench | | \$7.50 ea. |
| SH300-1.25 | 3.0 | 1-1/4 | 5.0 | 4 | None | \$455. | | | |
| SH400-1.25 | 4.0 | 1-1/4 | 5.5 | 4 | None | \$600. | | | |
| SH450 | 4-1/2 | 1-1/4 | 5.5 | 5 | None | \$675. | | | |

All cutter prices include Inserts, Screws, and Wrench, assembled and ready to cut.

See page 63 for recent test results on a HAAS VF1



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