

Cutting Tools

Cutting Tools such as solid carbide end mills, hand reamers, carbide reamers and ejector pin counter-bores to efficiently machine details in your mold. AlTiN, Hard Carbon and TiAlN coatings for longer tool life.



Table of Contents

Category	Page Numbers
Ball Nose End Mills	
Ball Nose End Mill (80% Core) - Inch	1
Ball Nose End Mill (80% Core) - Metric Metric	2
Ball Nose Finishing End Mill (80% Core)	3
Ball Nose Extended Reach End Mill	4
Ball Nose End Mill (For Machining Aluminum)	5
Corner Radius End Mills	
Corner Radius End Mill	6-7
Corner Radius Finishing End Mill (80%Core)	8
Corner Radius Extended Reach End Mill	9
Corner Radius End Mill (For Machining Aluminum)	10-11
Square End Mills	
Square End Mill	12
Square Extended Reach End Mill	13
Square Extended End Mill - (For Machining Aluminum)	14
Reamers	
Carbide Reamers	15
Sprue Bushing Reamers (Hand & Machine)	16
Counterbores	
Ejector Pin Counter Bores	17



Ball Nose End Mill - Inch

Features

- 80% Core
- 2 Flute Coated Solid Carbide
- AlTiN Coated for longer tool life
- Premium micro grain carbide
- H6 Shank tolerance for heat shrink applications
- Cutting diameter tolerance +.0000 - .0015
- Eliminates rough finish commonly left by typical 4 flute tools
- Made in the U.S.A.


U Inch

M Solid Carbide

Item Number	Flute Diameter	Flute Length	Shank Diameter
Overall Length: 4			
80-2125P	1/8	1/2	1/8
80-2187P	3/16	3/4	3/16
80-2250P	1/4	3/4	1/4
80-2312P	5/16	3/4	5/16
80-2375P	3/8	7/8	3/8
80-2500P	1/2	1	1/2
Overall Length: 6			
80-2126P	1/8	1/2	1/8
80-2188P	3/16	3/4	3/16
80-2251P	1/4	3/4	1/4
80-2313P	5/16	3/4	5/16
80-2376P	3/8	7/8	3/8
80-2501P	1/2	1	1/2
Overall Length: 8			
80-2377P	3/8	7/8	3/8
80-2502P	1/2	1	1/2
Overall Length: 12			
80-2503P	1/2	1	1/2



Ball Nose End Mill - Metric

Features

- 80% Core
- 2 Flute Coated Solid Carbide
- AlTiN Coated for longer tool life
- Premium micro grain carbide
- H6 Shank tolerance for heat shrink applications
- Cutting diameter tolerance $+.0000 - .0015$
- Eliminates rough finish commonly left by typical 4 flute tools
- Made in the U.S.A.



U Millimeter **M** Solid Carbide

Item Number	Flute Diameter	Flute Length	Shank Diameter
Overall Length: 100 mm			
80-2236P	6 mm	18 mm	6 mm
80-2315P	8 mm	20 mm	8 mm
80-2393P	10 mm	22 mm	10 mm
80-2472P	12 mm	25 mm	12 mm
Overall Length: 150 mm			
80-2237P	6 mm	18 mm	6 mm
80-2316P	8 mm	20 mm	8 mm
80-2394P	10 mm	22 mm	10 mm
80-2473P	12 mm	25 mm	12 mm



Ball Nose Finishing End Mill

Features

- 80% Core
- AlTiN Coated for longer tool life
- Premium micro grain carbide
- H6 Shank tolerance for heat shrink applications
- Cutting diameter tolerance $+.0000 - .0015$
- Eliminates rough finish commonly left by typical 4 flute tools
- Larger shank with 3° draft angles, gives extra reach with added strength

80% core geometry offers added strength and excellent rigidity for profile milling and contouring applications. The result is less push, reduced chatter, and improved chip extraction which produces excellent finishes in valleys and pockets. Designed for hard metal milling up to 58 HRC.


U Inch

M Solid Carbide

Item Number	Flute Diameter	Flute Length	Shank Diameter
82-2032P	1/32	1/16	1/4
82-2062P	1/16	1/8	1/4
82-2093P	3/32	3/16	1/4
82-2125P	1/8	1/4	1/4
82-2126P	1/8	1/4	3/8
82-2187P	3/16	3/8	3/8
82-2250P	1/4	1/2	3/8
82-2312P	5/16	5/8	3/8
82-2375P	3/8	3/4	1/2
82-2437P	7/16	7/8	1/2



Ball Nose Extended Reach End Mill

Features

- 4 Flute
- Solid Carbide
- Extra long shanks for hard to reach machining
- TiAlN Coated for extended tool life
- Premium micro grain carbide
- H6 Shank tolerance for heat shrink applications
- Cutting diameter tolerance $\pm .0000$ - $\pm .0015$
- Shorter flute length for maximum strength
- 30° helix general purpose ball nose

These extended reach tools add extra length to normal diameters for deeper cuts.


U Inch

M Solid Carbide

Item Number	Flute Diameter	Flute Length	Shank Diameter
Overall Length: 4			
51-4125P	1/8	1/2	1/8
51-4187P	3/16	5/8	3/16
51-4250P	1/4	3/4	1/4
51-4312P	5/16	7/8	5/16
51-4375P	3/8	7/8	3/8
51-4500P	1/2	1	1/2
Overall Length: 6			
51-4126P	1/8	1/2	1/8
51-4188P	3/16	5/8	3/16
51-4251P	1/4	3/4	1/4
51-4313P	5/16	7/8	5/16
51-4376P	3/8	7/8	3/8
51-4501P	1/2	1	1/2
51-4626P	5/8	1-1/4	5/8
51-4751P	3/4	1-1/2	3/4



Ball Nose End Mill - (For Machining Aluminum)

Features

- 2 Flute
- Solid Carbide
- Extra long shanks for hard to reach machining
- Premium micro grain carbide
- H6 Shank tolerance for heat shrink applications
- Cutting diameter tolerance +.0000 - .0015
- Shorter flute length for maximum strength
- 30° helix general purpose ball nose

Great for cutting Aluminum, these extended reach tools add extra length to normal diameters for deeper cuts.


U Inch

M Solid Carbide

Item Number	Flute Diameter	Flute Length	Shank Diameter
Overall Length: 4			
50-2125P	1/8	1/2	1/8
50-2187P	3/16	5/8	3/16
50-2250P	1/4	3/4	1/4
50-2312P	5/16	7/8	5/16
50-2375P	3/8	7/8	3/8
50-2500P	1/2	1	1/2
Overall Length: 6			
50-2126P	1/8	1/2	1/8
50-2188P	3/16	5/8	3/16
50-2251P	1/4	3/4	1/4
50-2313P	5/16	7/8	5/16
50-2376P	3/8	7/8	3/8
50-2501P	1/2	1	1/2
50-2626P	5/8	1 1/4	5/8
50-2751P	3/4	1 1/2	3/4
Overall Length: 8			
50-2377P	3/8	7/8	3/8
50-2502P	1/2	1	1/2
Overall Length: 10			
50-2503P	1/2	1	1/2
Overall Length: 12			
50-2504P	1/2	1	1/2



Corner Radius End Mill

Features

- Variable 4 Flute
- Solid Carbide
- AlTiN Coated for longer tool life
- Premium micro grain carbide
- H6 Shank tolerance for heat shrink applications
- Cutting diameter tolerance +.0000 - .0015
- Designed for rough cut and finish milling
- Ideal for hard to machine materials such as P-20, Stainless Steel and pre-heat treated metals up to 45 HRc

The unique high performance variable helix flute geometry reduces harmonics and diminishes chatter so higher feed rates can be obtained. The versatility of this tool helps you to save time by reducing tool changes. Use this tool to replace the typical old fashioned 4 flute end mills.


U Inch

M Solid Carbide

Item Number	Flute Diameter	Flute Length	Shank Diameter	Corner Radius
Overall Length: 1-1/2				
90-4125P	1/8	1/2	1/8	0.015
Overall Length: 2				
90-4126P	1/8	3/4	1/8	0.015
90-4187P	3/16	5/8	3/16	0.020
Overall Length: 2-1/2				
90-4188P	3/16	3/4	3/16	0.020
90-4250P	1/4	3/4	1/4	0.020
90-4312P	5/16	7/8	5/16	0.020
90-4375P	3/8	7/8	3/8	0.030
Overall Length: 2-3/4				
90-4437P	7/16	1	7/16	0.030
Overall Length: 3				
90-4251P	1/4	1 1/8	1/4	0.020
90-4313P	5/16	1 1/8	5/16	0.020
90-4376P	3/8	1 1/8	3/8	0.030
90-4500P	1/2	1	1/2	0.030



Corner Radius End Mill - Continued

Features

- Variable 4 Flute
- Solid Carbide
- AlTiN Coated for longer tool life
- Premium micro grain carbide
- H6 Shank tolerance for heat shrink applications
- Cutting diameter tolerance +.0000 - .0015
- Designed for rough cut and finish milling
- Ideal for hard to machine materials such as P-20, Stainless Steel and pre-heat treated metals up to 45 HRc

The unique high performance variable helix flute geometry reduces harmonics and diminishes chatter so higher feed rates can be obtained. The versatility of this tool helps you to save time by reducing tool changes. Use this tool to replace the typical old fashioned 4 flute end mills.


U Inch

M Solid Carbide

Item Number	Flute Diameter	Flute Length	Shank Diameter	Corner Radius
Overall Length: 3-1/2				
90-4625P	5/8	1-1/4	5/8	0.030
Overall Length: 4				
90-4438P	7/16	2	7/16	0.030
90-4501P	1/2	2	1/2	0.030
90-4750P	3/4	1-1/2	3/4	0.030
90-4100P	1	1-1/2	1	0.030
Overall Length: 5				
90-4626P	5/8	2-1/4	5/8	0.030
90-4751P	3/4	2-1/4	3/4	0.030
90-4101P	1	2-1/4	1	0.030
Overall Length: 6				
90-4752P	3/4	3	3/4	0.030
90-4102P	1	3	1	0.030
Overall Length: 7				
90-4103P	1	4	1	0.030



Corner Radius Finishing End Mill

Features

- 80% Core
- 2 Flute
- Solid Carbide
- AlTiN Coated for longer tool life
- Premium micro grain carbide
- H6 Shank tolerance for heat shrink applications
- Cutting diameter tolerance $+.0000 - .0015$
- Eliminates rough finish commonly left by typical 4 flute tools

80% core geometry offers added strength and excellent rigidity for profile milling and contouring applications. The result is less push, reduced chatter, and improved chip extraction which produces excellent finishes in valleys and pockets. Designed for hard metal milling up to 58 HRC.



U Inch

M 1.4034 (~420) Stainless Steel

Item Number	Flute Diameter	Flute Length	Shank Diameter	Corner Radius
Overall Length: 4				
81-2187P	3/16	3/4	3/16	0.020
81-2250P	1/4	3/4	1/4	0.030
81-2375P	3/8	7/8	3/8	0.030
81-2500P	1/2	1	1/2	0.030
Overall Length: 6				
81-2188P	3/16	3/4	3/16	0.020
81-2251P	1/4	3/4	1/4	0.030
81-2376P	3/8	7/8	3/8	0.030
81-2501P	1/2	1	1/2	0.030
Overall Length: 8				
81-2502P	1/2	1	1/2	0.030
Overall Length: 12				
81-2503P	1/2	1	1/2	0.030



Corner Radius Extended Reach End Mill

Features

- Variable 4 Flute
- Solid Carbide
- Extra long shanks for hard to reach machining
- AlTiN Coated for longer tool life
- Premium micro grain carbide
- H6 Shank tolerance for heat shrink applications
- Cutting diameter tolerance $+.0000 - .0015$
- Designed for rough cut and finish milling
- Ideal for hard to machine materials such as P-20, Stainless Steel and pre-heat treated metals up to 45 HRC

The unique high performance variable helix flute geometry reduces harmonics and diminishes chatter so higher feed rates can be obtained. The versatility of this tool helps you to save time by reducing tool changes. Use this tool to replace the typical old fashioned 4 flute end mills.



U Inch

M Solid Carbide

Item Number	Flute Diameter	Flute Length	Shank Diameter	Corner Radius
Overall Length: 4				
90-4125-4P	1/8	1/2	1/8	0.020
90-4187-4P	3/16	5/8	3/16	0.020
90-4250-4P	1/4	3/4	1/4	0.020
90-4312-4P	5/16	7/8	5/16	0.020
90-4375-4P	3/8	7/8	3/8	0.020
Overall Length: 5				
90-4500-4P	5/32	1-1/2	1/4	0.007
Overall Length: 6				
90-4507-060P	1/2	1	1/2	0.060



Corner Radius End Mill (For Machining Aluminum)

Features

- Variable 3 Flute
- Solid Carbide
- Hard Carbon Coating out performs TIN, TICN and ZRN in aluminum and nonferrous applications
- Premium micro grain carbide
- H6 Shank tolerance for heat shrink applications
- Cutting diameter tolerance +.0000 - .0015
- Designed for rough cut and finish milling
- Small corner radius for added strength
- Ideal for spindle speeds above 5000 rpm

Have the need for Speed? Take this Variable 3 flute tool and run through aluminum like a hot knife through butter. These high performance tools have a new hydrogen free coating that out performs TIN, TICN and ZRN in aluminum and non-ferrous applications. This tool will not adhere to aluminum.


U Inch

M Solid Carbide

Item Number	Flute Diameter	Flute Length	Shank Diameter	Corner Radius
Overall Length: 1-1/2				
42-3125P	1/8	1/2	1/8	0.007
Overall Length: 2				
42-3126P	1/8	3/4	1/8	0.007
42-3187P	3/16	5/8	3/16	0.010
Overall Length: 2-1/2				
42-3188P	3/16	3/4	3/16	0.010
42-3250P	1/4	3/4	1/4	0.010
42-3312P	5/16	7/8	5/16	0.010
42-3375P	3/8	7/8	3/8	0.010
Overall Length: 3				
42-3127P	1/8	1	1/8	0.007
42-3189P	3/16	1-1/8	3/16	0.010
42-3251P	1/4	1-1/8	1/4	0.010
42-3313P	5/16	1-1/8	5/16	0.010
42-3376P	3/8	1-1/8	3/8	0.010
42-3500P	1/2	1-1/4	1/2	0.010



Corner Radius End Mill (For Machining Aluminum) - Continued

Features

- Variable 3 Flute
- Solid Carbide
- Hard Carbon Coating out performs TIN, TICN and ZRN in aluminum and nonferrous applications
- Premium micro grain carbide
- H6 Shank tolerance for heat shrink applications
- Cutting diameter tolerance $\pm .0000$ - $\pm .0015$
- Designed for rough cut and finish milling
- Small corner radius for added strength
- Ideal for spindle speeds above 5000 rpm

Have the need for Speed? Take this Variable 3 flute tool and run through aluminum like a hot knife through butter. These high performance tools have a new hydrogen free coating that out performs TIN, TICN and ZRN in aluminum and non-ferrous applications. This tool will not adhere to aluminum.


U Inch

M Solid Carbide

Item Number	Flute Diameter	Flute Length	Shank Diameter	Corner Radius
Overall Length: 3-1/2				
42-3625P	5/8	1-1/4	5/8	0.010
Overall Length: 4				
42-3252P	1/4	1 1/2	1/4	0.010
42-3314P	5/16	1 3/4	5/16	0.010
42-3377P	3/8	1 3/4	3/8	0.010
42-3501P	1/2	2	1/2	0.010
42-3750P	3/4	1 1/2	3/4	0.010
42-3100P	1	1 1/2	1	0.010
Overall Length: 5				
42-3626P	5/8	2 1/4	5/8	0.010
42-3751P	3/4	2 1/4	3/4	0.010
42-3101P	1	2 1/4	1	0.010
Overall Length: 6				
42-3502P	1/2	3	1/2	0.010
42-3627P	5/8	3	5/8	0.010
42-3752P	3/4	3	3/4	0.010
42-3102P	1	3	1	0.010



Square End Mill

Features

- Variable 4 Flute
- Solid Carbide
- AlTiN Coated for longer tool life
- Premium micro grain carbide
- H6 Shank tolerance for heat shrink applications
- Cutting diameter tolerance $+.0000 - .0015$
- Designed for rough cut and finish milling
- Ideal for hard to machine materials such as P-20, Stainless Steel and pre-heat treated metals up to 45 HRC

The unique high performance variable helix flute geometry reduces harmonics and diminishes chatter so higher feed rates can be obtained. The versatility of this tool helps you to save time by reducing tool changes. Use this tool to replace the typical old fashioned 4 flute end mills.


U Inch

M Solid Carbide

Item Number	Flute Diameter	Flute Length	Shank Diameter
Overall Length: 1-1/2			
90-4125SCP	1/8	1/2	1/8
Overall Length: 2			
90-4093SCP	3/32	1/2	3/32
90-4156SCP	5/32	5/8	5/32
90-4187SCP	3/16	5/8	3/16
Overall Length: 2-1/2			
90-4250SCP	1/4	3/4	1/4



Square Extended Reach End Mill

Features

- 4 Flute
- Solid Carbide
- Extended Reach
- Extra long shanks for hard to reach machining
- TiAlN Coated for extended tool life
- Premium micro grain carbide
- H6 Shank tolerance for heat shrink applications
- Cutting diameter tolerance $+.0000 - .0015$
- Shorter flute length for maximum strength
- 30° helix general purpose Square End

These extended reach tools add extra length to normal diameters for deeper cuts.



U Inch

M Solid Carbide

Item Number	Flute Diameter	Flute Length	Shank Diameter
Overall Length: 4			
41-4125P	1/8	1/2	1/8
41-4187P	3/16	5/8	3/16
41-4250P	1/4	3/4	1/4
41-4312P	5/16	7/8	5/16
41-4375P	3/8	7/8	3/8
41-4500P	1/2	1	1/2
Overall Length: 6			
41-4126P	1/8	1/2	1/8
41-4188P	3/16	5/8	3/16
41-4251P	1/4	3/4	1/4
41-4313P	5/16	7/8	5/16
41-4376P	3/8	7/8	3/8
41-4501P	1/2	1	1/2
41-4626P	5/8	1-1/4	5/8
41-4751P	3/4	1-1/2	3/4



Square Extended End Mill - (For Machining Aluminum)

Features

- 2 Flute
- Solid Carbide
- Extended Reach
- Extra long shanks for hard to reach machining
- Premium micro grain carbide
- H6 Shank tolerance for heat shrink applications
- Cutting diameter tolerance $+.0000 - .0015$
- Shorter flute length for maximum strength
- 30° helix general purpose ball nose

Great for cutting Aluminum, these extended reach tools add extra length to normal diameters for deeper cuts.

U Inch

M Solid Carbide


Item Number	Flute Diameter	Flute Length	Shank Diameter
Overall Length: 4			
40-2125P	1/8	1/2	1/8
40-2187P	3/16	5/8	3/16
40-2250P	1/4	3/4	1/4
40-2312P	5/16	7/8	5/16
40-2375P	3/8	7/8	3/8
40-2500P	1/2	1	1/2
Overall Length: 6			
40-2126P	1/8	1/2	1/8
40-2188P	3/16	5/8	3/16
40-2251P	1/4	3/4	1/4
40-2313P	5/16	7/8	5/16
40-2376P	3/8	7/8	3/8
40-2501P	1/2	1	1/2
40-2626P	5/8	1 1/4	5/8
40-2751P	3/4	1 1/2	3/4
Overall Length: 8			
40-2377P	3/8	7/8	3/8
40-2502P	1/2	1	1/2
Overall Length: 10			
40-2503P	1/2	1	1/2
Overall Length: 12			
50-2504P	1/2	1	1/2



Carbide Reamers

Features

- Designed to work with PCS Oversized Ejector Pins
- Straight flute
- Extra long shank for easy access to holes within a deep cavity
- Four or six flutes to check size precisely
- Extra long flute lengths for greater hole straightness
- Shank diameters smaller than reamer diameter to avoid seizing

Carbide Reamers are manufactured from micro-grain carbide. These reamers are available on-size or .005 oversize. Extra long shanks and flute lengths comestandard, providing a more precise hole.


U Inch

M Micro Grain Carbide

Item Number	Fractional Size	Decimal Size +.0002 / -.0000	No. of Flutes	Flute Length	Overall Length	Shank Diameter +.0000 / -.0005
Standard Oversize .005: 0						
RC-5	1/16	0.0625	4	1/2	4	0.0570
RC-7	3/32	0.0938	4	3/4	4	0.0880
RC-9	1/8	0.1250	4	7/8	4	0.1200
RC-11	5/32	0.1562	6	1	4	0.1510
RC-13	3/16	0.1875	6	1	4-1/2	0.1820
RC-15	7/32	0.2188	6	1-1/8	5	0.2130
RC-17	1/4	0.2500	6	1-1/8	5	0.2450
RC-21	5/16	0.3125	6	1-3/8	5	0.3070
RC-25	3/8	0.3750	4	1-1/2	5	0.1250
RC-33	1/2	0.5000	3	1 3/4	10	0.1560
Standard Oversize .005: 1						
ROS-4	3/64 OS	0.0517	4	1/2	4	0.0460
ROS-5	1/16 OS	0.0673	4	1/2	4	0.0620
ROS-6	5-64 OS	0.0829	4	1/2	4	0.0770
ROS-7	3/32 OS	0.0986	4	3/4	4	0.0930
ROS-9	1/8 OS	0.1298	4	7/8	4	0.1250
ROS-10	9/64 OS	0.1454	6	1	4	0.1400
ROS-11	5/32 OS	0.1610	6	1	4	0.1550
ROS-13	3/16 OS	0.1923	6	1	4-1/2	0.1870
ROS-15	7/32 OS	0.2236	6	1-1/8	5	0.2180
ROS-16	15/64 OS	0.2394	4	1-1/2	5	0.1250
ROS-17	1/4 OS	0.2548	6	1-1/8	5	0.2490
ROS-21	5/16 OS	0.3173	6	1-3/8	5	0.3120
ROS-25	3/8 OS	0.3798	6	1-1/2	5	0.3740
ROS-33	1/2 OS	0.5050	4	1-1/2	5	0.1250



Sprue Bushing Reamers (Hand & Machine)

Features

- High speed steel
- Left hand spiral, right hand cut
- 2° 23' 13" included angle
- 1/2" taper per foot
- Hand reamer for finishing (HR-1 & HR-2)
- Machine reamer for roughing (MR-1 & MR-2)

Sprue Bushing Reamers are manufactured from high-speed steel. Both Machine and Hand Reamers are available with a left hand spiral, right hand cut. Machine reamers should be used for rough work while finish work should be done using a hand reamer.


U Inch

M High Speed Steel

Item Number	No. of Flutes	Small End Diameter	Large End Diameter	Shank Diameter	Flute Length	Overall Length
Description: Hand Reamer						
HR-1	4	7/64	3/8	5/16	6	8
HR-2	6	13/64	5/8	1/2	10-1/2	12-5/8
Description: Machine Reamer						
MR-1	3	7/64	3/8	5/16	6	8
MR-2	3	13/64	5/8	1/2	10-1/2	12-5/8



Ejector Pin Counterbores

Features

- Angled Pilot for easy pickup of holes
- Built in 45° Chamfer provides clearance for radius under Ejector Pin head
- Manufactured from high speed steel with precision ground cutting edges for even
- chip load and fast smooth chip clearance
- Pilot diameter on counterbore tool is .002" - .004" under the corresponding ejector
- pin body diameter.

Ejector Pin Counterbores are manufactured from high speed steel and allow for the drilling of ejector pin holes in the ejector retainer plate. The built in chamfer provides clearance for the radius under the ejector pin head. Holes are easily picked up due to the angled pilot design of each counterbore.


U Inch

M High Speed Steel

Item Number	EJ Pin Body Diameter	Overall Length	Counterbore Body Diameter	Shank Diameter	Pilot Length
ECB-9	1/8	2-5/8	9/32	1/4	3/16
ECB-11	5/32	2-3/4	5/16	1/4	3/16
ECB-13	3/16	3-1/4	13/32	3/8	3/16
ECB-15	7/32	3-3/8	7/16	3/8	1/4
ECB-17	1/4	3-9/16	15/32	7/16	1/4
ECB-19	9/32	3-9/16	15/32	7/16	1/4
ECB-21	5/16	3-7/8	17/32	1/2	5/16
ECB-23	11/32	4-1/4	19/32	1/2	5/16
ECB-25	3/8	4-1/2	21/32	5/8	5/16
ECB-29	7/16	4-3/4	23/32	5/8	5/16
ECB-33	1/2	5-1/8	25/32	5/8	5/16
ECB-37	5/8	5-5/8	29/32	5/8	5/16
ECB-41	3/4	6-1/4	1-1/32	5/8	5/16
ECB-47	1	6-1/4	1-9/32	3/4	5/16





Turn To The Industry Experts