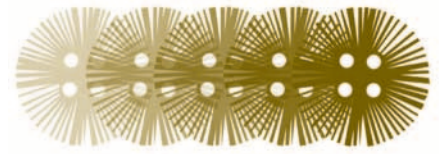


Schaefer Brush



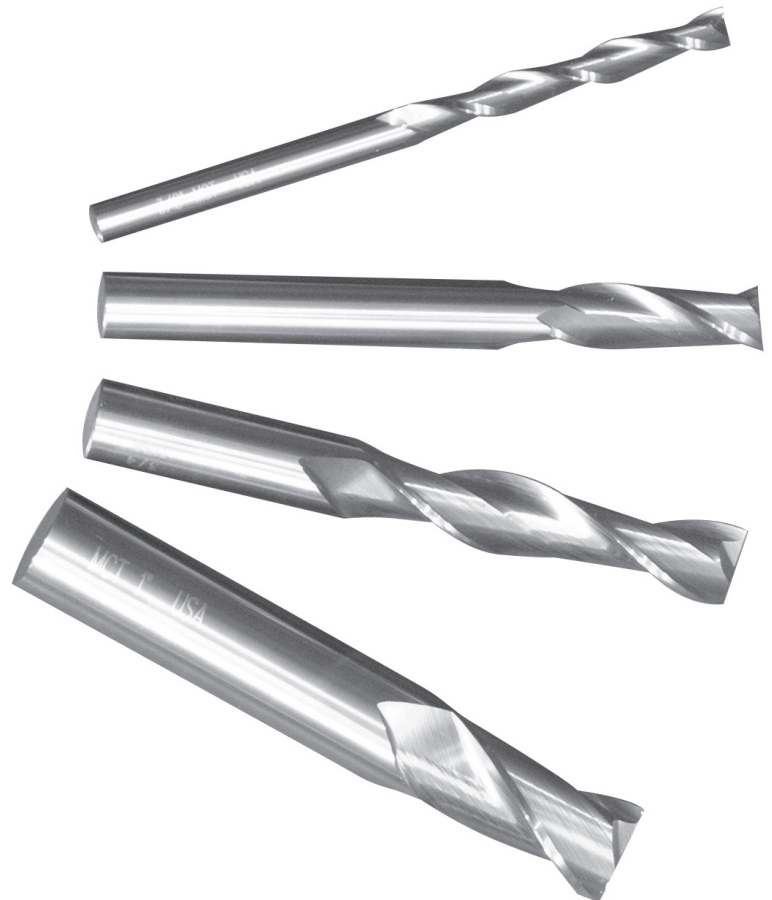
Cutting Tools

Section 16

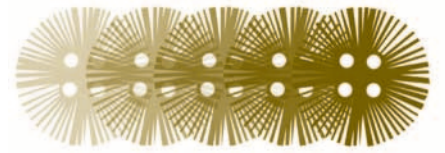
We offer carbide and HSS special-cutters, rotary files and complete resharpening service.



- Standard Carbide End mills
- Extra Length Carbide End mills
- Special Carbide End mills
- Carbide Burrs
- Form Cutters
- Tapered Carbide End mills
- Carbide Blanks - Split and Round
- Step Drills and Other Step Tooling
- Special Carbide Compression Router Bits
- Laser Marking System
- Full Service Resharpening Shop



Schaefer Brush



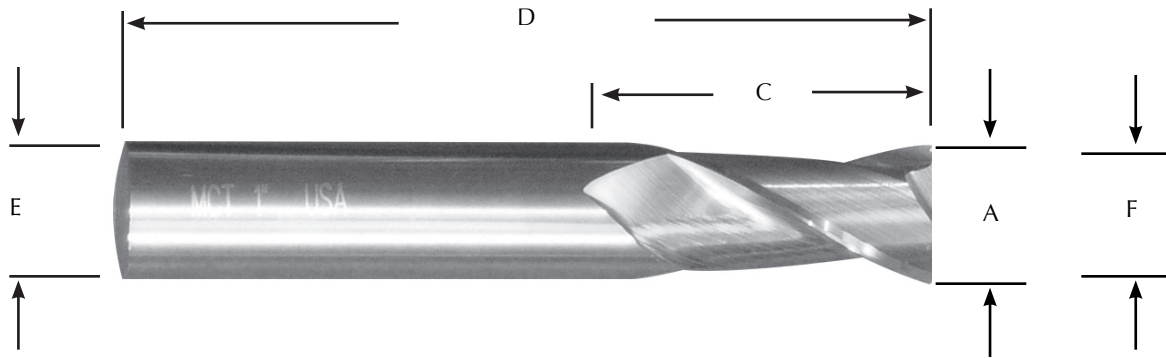
End Mill Quotation Request for Special Applications

Name: _____ Company: _____

Address: _____ City: _____ State: _____ Zip: _____

Phone: _____ Fax: _____ Email: _____

Date: _____



A. Cutter Diameter: _____

E. Shank Diameter: _____

B. Cutter Tolerance: _____

F. Tip Diameter: _____

C. Length of Cut: _____

G. Taper: _____

D. Overall Length: _____

Flutes 2 3 4 Multi Other: _____

Spiral 15° 30° 60° Straight Other: _____

End Cut Options:

- | | | |
|---|------------------------------------|---------------------------------------|
| <input type="checkbox"/> Center Cut | <input type="checkbox"/> Ball Nose | <input type="checkbox"/> Chamfer |
| <input type="checkbox"/> Non Center Cutting | <input type="checkbox"/> Radius | <input type="checkbox"/> Other: _____ |
| <input type="checkbox"/> No End Cut | <input type="checkbox"/> Square | |

Holding Options:

- | | |
|--------------------------------------|---------------------------------------|
| <input type="checkbox"/> None | <input type="checkbox"/> Tang |
| <input type="checkbox"/> Whistle | <input type="checkbox"/> Other: _____ |
| <input type="checkbox"/> Weldon Flat | |

Grade of Carbide: _____ (Std. C-2 Micro Grain)

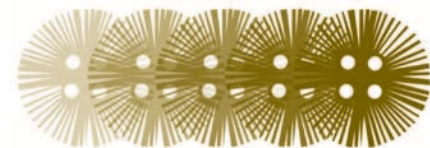
Material Machined: _____ Hardness: _____

Titanium Nitride Coating: Yes No

Quantity: _____

For special cutting tools (Solid Carbide Tapered End Mills, Solid Carbide Step Drills). Please fax this request to us at **262-547-3927**.

Solid Carbide High Helix End Mills



45 or 60 Degree High Helix 2, 3, or 4 Flute Solid Carbide Ends Mills

Part #	Diameter	LOC	OAL	Pack	Pack Weight
H125	1/8"	1/2"	1-1/2"	1	.031
H187	3/16"	5/8"	2"	1	.031
H250	1/4"	3/4"	2-1/2"	1	.062
H312	5/16"	13/16"	2-1/2"	1	.093
H375	3/8"	7/8"	2-1/2"	1	.156
H500	1/2"	1-1/4"	3"	1	.281
H625	5/8"	1-1/4"	3-1/2"	1	.531
H750	3/4"	1-1/2"	4"	1	.843
H100	1"	1-1/2"	4"	1	1.500

Add 45 or 60 (degree) and then 2, 3, or 4 (Flute) to complete part number.

Resharpener service of HSS

Shell mill, slab mills, face mills, milling cutters, reamers, drills, weldon countersinks, keyway cutters, plus modifications of special cutters, spot facers, core drills, step drills and cutters in sets, etc.

Resharpener service of carbide cutting tools

End mills, rotary files, routers, de-bur, countersinks, special step reamers, step drills, special angles or radius milling cutters, etc.

Solid Carbide Double End Stubs

Double End Stub 2 or 4 Flute Solid Carbide End Mills.

Part #	Diameter	LOC	OAL	Pack	Pack Weight
D062	1/16"	1/8"	1-1/2"	1	.031
D093	3/32"	3/16"	1-1/2"	1	.031
D125	1/8"	1/4"	1-1/2"	1	.031
D156	5/32"	5/16"	2"	1	.031
D187	3/16"	3/8"	2"	1	.031
D218	7/32"	1/2"	2-1/2"	1	.031
D250	1/4"	3/4"	2-1/2"	1	.062
D312	5/16"	1/2"	2-1/2"	1	.093
D375	3/8"	9/16"	2-1/2"	1	.156
D437	7/16"	5/8"	3"	1	.188
D500	1/2"	5/8"	3"	1	.281

Add F (Flat) or B (Ball Nose) and then 2 or 4 (Flutes) to complete part numbers.



Standard Length Solid Carbide End Mills

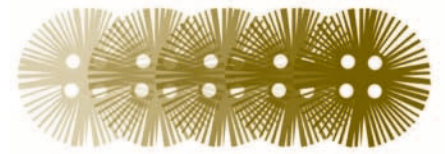
Part #	Diameter	LOC	Shank	OAL	Pack	Pack Weight	Part #	Diameter	LOC	Shank	OAL	Pack	Pack Weight
E032S	1/32"	5/64"	1/8"	1-1/2"	1	.031	E312S	5/16"	13/16"	5/16"	2-1/2"	1	.093
E046S	3/64"	7/64"	1/8"	1-1/2"	1	.031	E328S	21/64"	7/8"	3/8"	2-1/2"	1	.125
E062S	1/16"	3/16"	1/8"	1-1/2"	1	.688	E343S	11/32"	7/8"	3/8"	2-1/2"	1	.125
E078S	5/64"	3/16"	1/8"	1-1/2"	1	.688	E359S	23/64"	7/8"	3/8"	2-1/2"	1	.125
E093S	3/32"	3/8"	1/8"	1-1/2"	1	.031	E375S	3/8"	7/8"	3/8"	2-1/2"	1	.156
E109S	7/64"	3/8"	1/8"	1-1/2"	1	.031	E390S	25/64"	7/8"	7/16"	2-1/2"	1	.156
E125S	1/8"	1/2"	1/8"	1-1/2"	1	.031	E406S	13/32"	7/8"	7/16"	2-1/2"	1	.188
E140S	9/64"	9/16"	3/16"	2"	1	.031	E421S	27/64"	7/8"	7/16"	2-1/2"	1	.188
E156S	5/32"	9/16"	3/16"	2"	1	.031	E437S	7/16"	7/8"	7/16"	2-1/2"	1	.188
E171S	11/64"	5/8"	3/16"	2"	1	.031	E453S	29/64"	1"	1/2"	3"	1	.188
E187S	3/16"	5/8"	3/16"	2"	1	.031	E468S	15/32"	1"	1/2"	3"	1	.188
E203S	13/64"	5/8"	1/4"	2-1/2"	1	.062	E484S	31/64"	1"	1/2"	3"	1	.188
E218S	7/32"	5/8"	1/4"	2-1/2"	1	.062	E500S	1/2"	1"	1/2"	3"	1	.281
E234S	15/64"	3/4"	1/4"	2-1/2"	1	.062	E562S	9/16"	1-1/4"	9/16"	3"	1	.438
E250S	1/4"	3/4"	1/4"	2-1/2"	1	.062	E625S	5/8"	1-1/4"	5/8"	3-1/2"	1	.531
E265S	17/64"	3/4"	5/16"	2-1/2"	1	.093	E750S	3/4"	1-1/2"	3/4"	4"	1	.844
E281S	9/32"	3/4"	5/16"	2-1/2"	1	.093	E875S	7/8"	1-1/2"	7/8"	4"	1	.875
E296S	19/64"	13/16"	5/16"	2-1/2"	1	.093	E100S	1"	1-1/2"	1"	4"	1	1.500

Add F (Flat) or B (Ball Nose) and then 2 or 4 (Flutes) to complete part numbers.



1101 S. Prairie Ave. PO Box 148 Waukesha, WI 53187
 Phone 262-547-3500 1-800-347-3501 Fax 262-547-3927
 Email brushes@schaferbrush.com www.schaferbrush.com

Extra Length Carbide End Mills



Part #	Diameter	LOC	Shank	OAL	Pack	Pack Weight
E1252	1/8"	5/8"	1/8"	2"	1	.031
E125L	*1/8"	3/4"	1/8"	2-1/4"	1	.031
E187L	*3/16"	3/4"	3/16"	2-1/2"	1	.063
E2503	*1/4"	1-1/8"	1/4"	3"	1	.063
E3123	*5/16"	1-1/8"	5/16"	3"	1	.094
E3753	*3/8"	1-1/8"	3/8"	3"	1	.156
E437L4	*7/16"	2"	7/16"	4"	1	.281
E5003	1/2"	1-1/4"	1/2"	3"	1	.375
E5004	1/2"	1-1/2"	1/2"	4"	1	.406
E500X4	*1/2"	2"	1/2"	4"	1	.406
E6254	5/8"	1-1/2"	5/8"	4"	1	.593
E6255	*5/8"	2-1/4"	5/8"	5"	1	.625
E7505	*3/4"	2-1/4"	3/4"	5"	1	1.35
E1005	*1"	2-1/4"	1"	5"	1	1.50

Add F (Flat) or B (Ball Nose) and then 2 or 4 (Flutes) to complete part numbers.

*Denotes Industry Standard

Part #	Diameter	LOC	Shank	OAL	Pack	Pack Weight
E1253	1/8"	3/4"	1/8"	3"	1	.031
E125L3	*1/8"	1"	1/8"	3"	1	.031
E1254	1/8"	1"	1/8"	4"	1	.063
E1256	1/8"	1"	1/8"	6"	1	.063
E1873	*3/16"	1-1/8"	3/16"	3"	1	.063
E1874	3/16"	1"	3/16"	4"	1	.063
E1876	3/16"	1"	3/16"	6"	1	.094
E2504	*1/4"	1-1/2"	1/4"	4"	1	.125
E250X4	1/4"	2"	1/4"	4"	1	.125
E2506	1/4"	1-1/2"	1/4"	6"	1	.156
E3124	*5/16"	1-5/8"	5/16"	4"	1	.156



Extra Long Length Carbide End Mills

Part #	Diameter	LOC	Shank	OAL	Pack	Pack Weight	Part #	Diameter	LOC	Shank	OAL	Pack	Pack Weight
E312X4	5/16"	2"	5/16"	4"	1	.156	E7056	3/4"	1-1/2"	3/4"	6"	1	1.625
E3126	5/16"	1-1/2"	5/16"	6"	1	.219	E750L6	3/4"	2"	3/4"	6"	1	1.625
E3754	*3/8"	1-3/4"	3/8"	4"	1	.219	E750X6	*3/4"	3"	3/4"	6"	1	1.625
E375X4	3/8"	2"	3/8"	4"	1	.250	E750XX6	3/4"	4"	3/4"	6"	1	1.625
E3756	3/8"	1-1/2"	3/8"	6"	1	.343	E7508	3/4"	2"	3/4"	8"	1	1.413
E3758	3/8"	1-1/2"	3/8"	8"	1	.456	E75010	3/4"	2"	3/4"	10"	1	1.769
E437X6	*7/16"	3"	7/16"	6"	1	.594	E75012	3/4"	2"	3/4"	12"	1	2.119
E5006	1/2"	1-1/2"	1/2"	6"	1	.594	E1006	1"	1-1/2"	1"	6"	1	2.500
E500L6	1/2"	2"	1/2"	6"	1	.594	E100L6	1"	2"	1"	6"	1	2.500
E500X6	*1/2"	3"	1/2"	6"	1	.594	E100XL6	1"	2-1/2"	1"	6"	1	2.563
E5008	1/2"	1-1/2"	1/2"	8"	1	.788	E100X6	*1"	3"	1"	6"	1	2.563
E50010	1/2"	1-1/2"	1/2"	10"	1	.988	E100XX6	1"	4"	1"	6"	1	2.563
E625L6	5/8"	2"	5/8"	6"	1	.844	E1008	1"	2"	1"	8"	1	3.413
E625X6	*5/8"	3"	5/8"	6"	1	.844	E10010	1"	2"	1"	10"	1	4.269
E6258	5/8"	2"	5/8"	8"	1	1.125	E10012	1"	2"	1"	12"	1	5.125
E62510	5/8"	2"	5/8"	10"	1	1.400							
E62512	5/8"	2"	5/8"	12"	1	1.688							

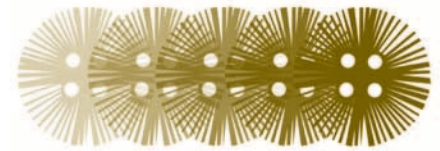
Add F (Flat) or B (Ball Nose) and then 2 or 4 (Flutes) to complete part numbers.

*Denotes Industry Standard

Add F (Flat) or B (Ball Nose) and then 2 or 4 (Flutes) to complete part numbers.

*Denotes Industry Standard

Solid Carbide Rougher



4 Flute Fine Pitch

For shallow slotting or peripheral milling

Part #	Diameter	LOC	OAL	Pack	Pack Weight
RF187F3 Note 3 Flute	3/16" on 1/4" Shank	5/8"	2-1/2"	1	.063
RF250F4	1/4"	3/4"	2-1/2"	1	.063
RF312F4	5/16"	13/16"	2-1/2"	1	.125
RF375F4	3/8"	7/8"	2-1/2"	1	.125
RF500F4	1/2"	1-1/4"	3"	1	.281
RF625F4	5/8"	1-1/4"	3-1/2"	1	.531
RF750F4	3/4"	1-1/2"	4"	1	.844
RF100F4	1"	1-1/2"	4"	1	1.500



4 Flute Coarse Pitch

For deeper slotting or heavy side cuts (general purpose applications)

Part #	Diameter	LOC	OAL	Pack	Pack Weight
RC250F4	1/4"	3/4"	2-1/2"	1	.063
RC312F4	5/16"	13/16"	2-1/2"	1	.125
RC375F4	3/8"	7/8"	2-1/2"	1	.125
RC500F4	1/2"	1-1/4"	3"	1	.281
RC625F4	5/8"	1-1/4"	3-1/2"	1	.531
RC750F4	3/4"	1-1/2"	4"	1	.844
RC100F4	1"	1-1/2"	4"	1	1.500



V-Max High Performance

Variable Flute Design For Maximum Performance

Benefits of the V-Max

- Chatter Free High Performance Machining
- Improved Surface Finish and Tool Life
- For High Speed Machining Of:
 - Stainless Steel/Low Carbon Steels
 - Cast Iron/High Temperature Alloys



High Performance V-Max Tools Standard Length

Part #	Diameter	LOC	Shank	OAL	Pack	Pack Weight
E375VF4	3/8"	7/8"	3/8"	2-1/2"	1	.125
E500VF4	1/2"	1"	1/2"	3"	1	.281
E625VF4	5/8"	1-1/4"	5/8"	3-1/2"	1	.531
E750VF4	3/4"	1-1/2"	3/4"	4"	1	.844
E100VF4	1"	1-1/2"	1"	4"	1	1.500

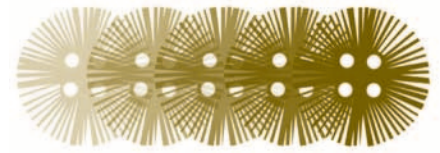


Other sizes available upon request



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Solid Carbide Double Edge Compression Routers

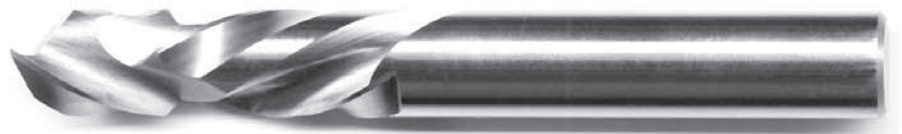


The tool provides a "double edge upcut/downcut" design for fast feed rates and optimum edge finish on both sides of laminated materials.

Use on:

- Double sided laminated materials
- Hard Wood
- Wood Composites

Part #	CED	CEL	Shank Dia.	OAL	Pack	Pack Weight
CR250	1/4"	7/8"	1/4"	2-1/2"	1	.063
CR375	3/8"	1-1/8"	3/8"	3"	1	.187
CR5001	1/2"	1"	1/2"	3"	1	.375
CR5001125	1/2"	1-1/8"	1/2"	3"	1	.375
CR5001375	1/2"	1-3/8"	1/2"	3-1/2"	1	.437
CR5001625	1/2"	1-5/8"	1/2"	4"	1	.406
CR625250	5/8"	2-1/4"	5/8"	5"	1	.605
CR7501875	3/4"	1-7/8"	3/4"	4"	1	1.08
CR750250	3/4"	2-1/2"	3/4"	5"	1	1.35



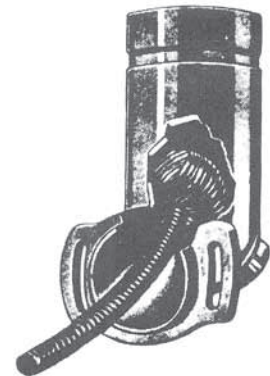
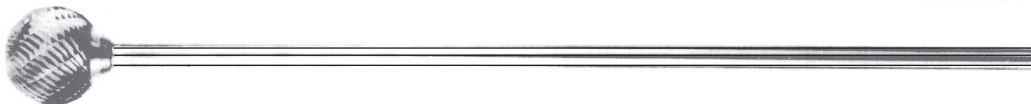
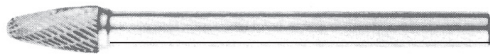
Solid Carbide Burrs

We offer carbide and HSS special-cutters, rotary files, and complete resharping service.

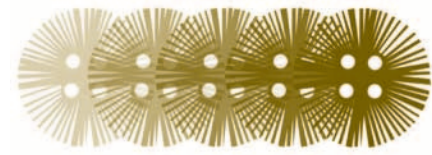
Special solid carbide tooling designed and engineered for specific requirements.

Requirements for special tooling such as special shapes, diameters, cuts, flutes, shank lengths, etc., or modification of existing standard items will be given prompt, expert attention.

We invite inquiries - send blueprints, specifications, tolerances, material to be machined and sample workspace, if available.



Solid Carbide Burrs



Fluting Specifications

The following cuts illustrate most of the variables that are used in the teeth of rotary files to perform various jobs. You may request your own specifications and we will furnish the tool, custom ground, taking in all possible variations. Standard cut for size, is always furnished unless otherwise specified.

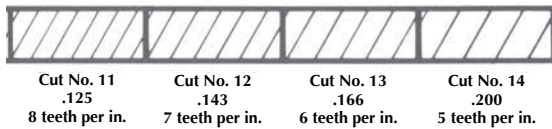
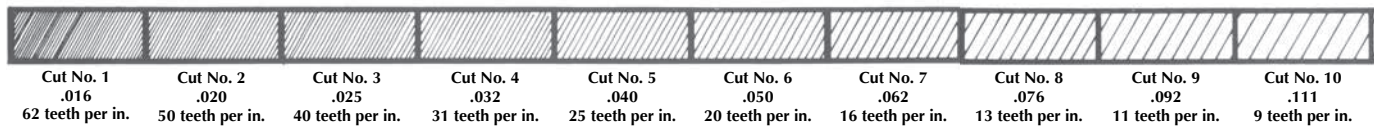
Recommended Operation Speeds for Carbide Burrs

No hard and fast rule can be laid down. Operating conditions vary greatly. Experience must guide the individual operator as to the most economical speed according to skill or operating technique. For abrasive conditions, reduce speed. The following in RPM's are given only as a general guide.

We regrind any make of carbide cutting tools. Regrind prices are approximately 25% of list. **All prices are subject to change without notice. All special tooling per quotes.**

Minimum charge of \$15 per order.

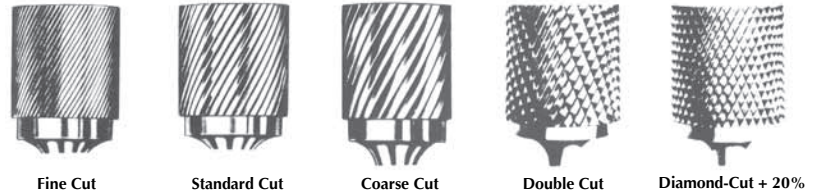
Pitches (or distance between teeth) and their cut numbers



Cut Chart

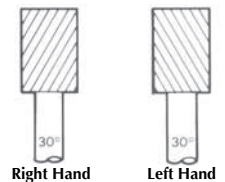
Diameter	Fine	Std.	Coarse
3/32"	2	3	5
1/8"	3	4	5
3/16"	3	5	6
1/4"	4	5	7
5/16"	4	6	7
3/8"	4	6	8
7/16"	5	6	8
1/2"	5	7	9
9/16"	5	7	9
5/8"	5	7	9
3/4"	6	8	10
7/8"	6	8	10
1"	6	8	10
1-1/8"	6	9	11
1-1/4"	6	9	11
1-1/2"	7	9	12

Basic Cuts That Are Available



Cutter Diameter	Standard Spiral Angles			
	Aluminum Magnesium Brass	Cast Iron	Steel	
1/8"	20,000	7,500	5,000	
1/4"	15,000	5,600	3,750	
3/8"	12,500	4,650	3,100	
1/2"	10,000	3,700	2,500	
3/4"	7,500	2,750	1,850	
1"	5,000	1,800	1,250	

Standard Spiral Angles

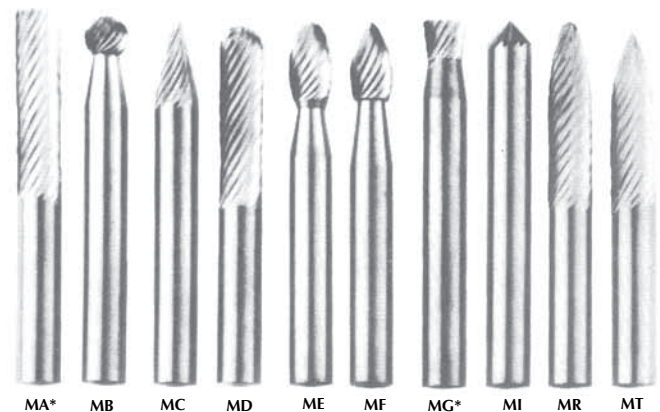


Above are 30 degree angles, however in some cases other than the standard may have definite advantages and can be furnished.

Solid Carbide Burrs

1/4" Shanks x 2" - 3" - 4" - 6" O.A.L.

Tool No.	Dia.	Head Length	Pack	2" Pack Weight	3" Pack Weight	4" Pack Weight	6" Pack Weight
MA-250-S	1/4"	3/4"	1	.063	.113	.156	.234
MB-250-S	1/4"	3/4"	1	.063	.113	.156	.234
MC-250-S	1/4"	3/4"	1	.063	.113	.156	.234
MD-250-S	1/4"	1/8"	1	.063	.113	.156	.234
ME-250-S	1/4"	1/8"	1	.063	.113	.156	.234
MF-250-S	1/4"	1/2"	1	.063	.113	.156	.234
MG-250-S	1/4"	1/4"	1	.063	.113	.156	.234
MI-250-S	1/4"	1/8"	1	.063	.113	.156	.234
MR-250-S	1/4"	3/4"	1	.063	.113	.156	.234
MT-250-S	1/4"	3/4"	1	.063	.113	.156	.234



*15% extra for end cut. Please specify. Example MD-250-SL-4"
Available in 3", 4", 6" Lengths

Add suffix to end of tool no. to indicate correct OAL tool length.



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3/16" Shanks x 2" - 3" - 4" - 6" O.A.L.

Tool No.	Dia.	Head Length	Pack	2" Pack Weight	3" Pack Weight	4" Pack Weight	6" Pack Weight
MA-187-S	3/16"	5/8"	1	.063	.113	.156	.234
MB-187-S	3/16"	3/16"	1	.063	.113	.156	.234
MC-187-S	3/16"	1/2"	1	.063	.113	.156	.234
MD-187-S	3/16"	5/8"	1	.063	.113	.156	.234
ME-187-S	3/16"	5/16"	1	.063	.113	.156	.234
MF-187-S	3/16"	3/8"	1	.063	.113	.156	.234
MG-187-S	3/16"	3/16"	1	.063	.113	.156	.234
MI-187-S	3/16"	3/16"	1	.063	.113	.156	.234
MR-187-S	3/16"	5/8"	1	.063	.113	.156	.234
MT-187-S	3/16"	5/8"	1	.063	.113	.156	.234

Add suffix to end of tool no. to indicate correct tool length.

1/8" Shanks x 2" - 3" - 4" - 6" O.A.L.

Tool No.	Dia.	Head Length	Pack	2" Pack Weight	3" Pack Weight	4" Pack Weight	6" Pack Weight
MA-125-S	1/8"	1/2"	1	.031	.063	.086	.125
MB-125-S	1/8"	1/8"	1	.031	.063	.086	.125
MC-125-S	1/8"	3/8"	1	.031	.063	.086	.125
MD-125-S	1/8"	1/2"	1	.031	.063	.086	.125
ME-125-S	1/8"	3/16"	1	.031	.063	.086	.125
MF-125-S	1/8"	1/4"	1	.031	.063	.086	.125
MG-125-S	1/8"	1/8"	1	.031	.063	.086	.125
MI-125-S	1/8"	6/9"	1	.031	.063	.086	.125
MR-125-S	1/8"	1/2"	1	.031	.063	.086	.125
MT-125-S	1/8"	1/2"	1	.031	.063	.086	.125

Add suffix to end of tool no. to indicate correct tool length.

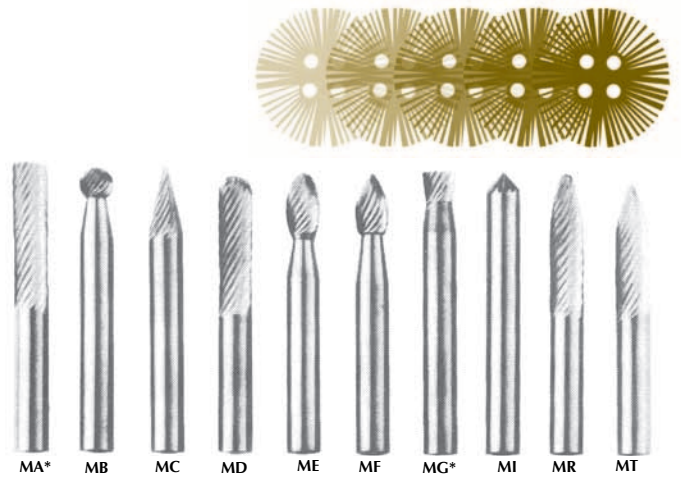
1/4" Diameter Carbide Burr on 1/8" Steel Shank.

Tool No.	Dia.	Head Length	Pack	2" Pack Weight	3" Pack Weight	4" Pack Weight	6" Pack Weight
MA-250-B	1/4"	1/2"	1	.063	.113	.156	.234
MB-250-B	1/4"	1/4"	1	.063	.113	.156	.234
MC-250-B	1/4"	1/2"	1	.063	.113	.156	.234
MD-250-B	1/4"	1/2"	1	.063	.113	.156	.234
ME-250-B	1/4"	3/8"	1	.063	.113	.156	.234
MG-250-B	1/4"	1/4"	1	.063	.113	.156	.234
MI-250-B	1/4"	1/8"	1	.063	.113	.156	.234
MR-250-B	1/4"	1/2"	1	.063	.113	.156	.234
MT-250-B	1/4"	1/2"	1	.063	.113	.156	.234

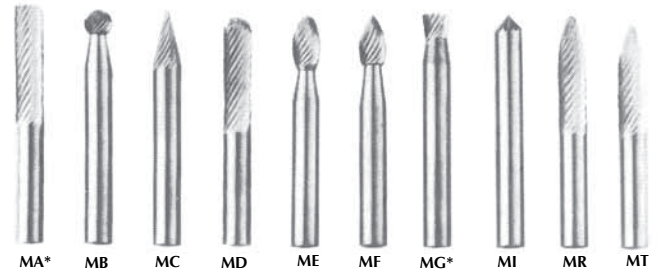
Add suffix to end of tool no. to indicate correct tool length.

H.S.S Fin-Cutters 1/4" Shank (High Speed)

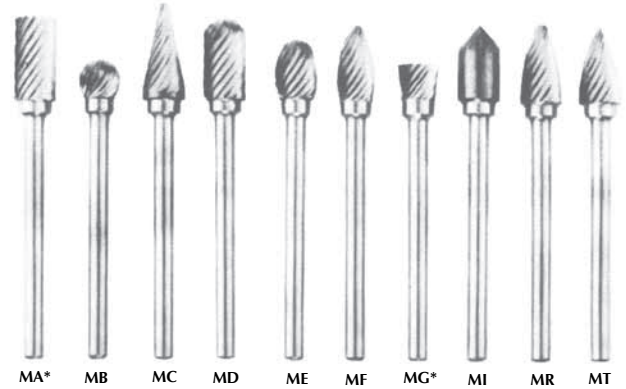
Tool No.	Diameter	Flute Length	OAL	Pack	Weight
250-MD-HHS	1/4"	2-1/2"	4"	1	.156
250-ML-HHS	1/4"	2-1/2"	4"	1	.156



*15% extra for end cut. Please specify. Example MD-250-SL-4"
Available in 3", 4", 6" Lengths



*15% extra for end cut. Please specify. Example MD-250-SL-4"
Available in 3", 4", 6" Lengths



Designed for faster stock removal on all non-metallic materials, such as Melmac, Magnesium, Formica, Hard Rubber, Aluminum, etc.

MD-250-SL-6"

SMR - Solid Carbide Routers

Tool No.	Diameter	Flute Length	Shank Diameter	OAL	Pack	Weight
SMR	1/8"	1/2"	1/8"	1-1/2"	1	.031
SMR	3/16"	5/8"	3/16"	2"	1	.063
SMR	1/4"	1"	1/4"	2-1/2"	1	.063
SMR	5/16"	1"	5/16"	2-1/2"	1	.078
SMR	3/8"	1"	3/8"	2-1/2"	1	.094
SMR	1/2"	1"	1/2"	3"	1	.125

Solid Carbide Extra Long Burrs



Call today! Can be ordered in any length.

Solid Carbide Tooling



Shape - MB Ball



Tool No.	Size	Pack	Pack Weight
MB-250	1/4"	1	.063
MB-375	3/8"	1	.094
MB-500	1/2"	1	.125
MB-625	5/8"	1	.188
MB-750*	3/4"	1	.250
MB-1000*	1"	1	.344

Shape - MA Cylindrical Flat End



Tool No.	Size	Head Length	Pack	Pack Weight
MA-250	1/8"	1/2"	1	.063
MA-375	3/8"	3/4"	1	.094
MA-500	1/2"	N/A	1	.125
MA-625	5/8"	N/A	1	.188
MA-750*	3/4"	N/A	1	.250
MA-1000*	1"	N/A	1	.344

Shape - MD Cylindrical Ball Nose



Tool No.	Size	Head Length	Pack	Pack Weight
MD-250	1/4"	1/2"	1	.063
MD-375	3/8"	3/4"	1	.094
MD-500	1/2"	1"	1	.125
MD-625	5/8"	1"	1	.188
MD-750*	3/4"	1"	1	.250

Shape - MC Cone Flathead



Tool No.	Dia.	Head Length	Incl. Degrees	Pack	Pack Weight
MC-250	1/4"	1/2"	14	1	.063
MC-375	3/8"	5/8"	28	1	.094
MC-500	1/2"	7/8"	28	1	.125
MC-625	5/8"	1"	31	1	.188
MC-750*	3/4"	1"	35	1	.250

Shape - ME Egg Shape



Tool No.	Size	Head Length	Pack	Pack Weight
ME-250	1/4"	3/8"	1	.063
ME-375	3/8"	5/8"	1	.094
ME-500	1/2"	3/4"	1	.125
ME-625	5/8"	N/A	1	.188
ME-750*	3/4"	N/A	1	.250

Shape - MF Flame



Tool No.	Dia.	Head Length	Pack	Pack Weight
MF-250	5/16"	3/4"	1	.063
MF-500	1/2"	1-1/4"	1	.125
MF-625	5/8"	1-7/16"	1	.188
MF-750*	3/4"	1-5/8"	1	.250

Shape - ML Cone Radius Head



Tool No.	Dia.	Head Length	Incl. Degrees	Pack	Pack Weight
ML-250	1/4"	5/8"	14	1	.063
ML-375	3/8"	1-1/16"	14	1	.094
ML-500	1/2"	1-1/8"	14	1	.125
ML-625	5/8"	1-5/16"	14	1	.188
ML-750*	3/4"	1-1/2"	14	1	.250
ML-1000-20*	1"	2"	20	1	.344
ML-1000-10*	1"	2"	10	1	.344

Shape - MT Tree Pointed Head



Tool No.	Dia.	Head Length	Pack	Pack Weight
MT-250	1/4"	1/2"	1	.063
MT-375	3/8"	3/4"	1	.094
MT-500	1/2"	1"	1	.125
MT-625	5/8"	1"	1	.188
MT-750*	3/4"	1"	1	.250

Shape - MG Inverted Cone



Tool No.	Size	Head Length	Pack	Pack Weight
MG-250	1/4"	1/4"	1	.063
MG-375	3/8"	3/8"	1	.094
MG-500	1/2"	1/2"	1	.125
MG-625	5/8"	5/8"	1	.188
MG-750*	3/4"	5/8"	1	.250

Shape - MR Tree Radius Head



Tool No.	Dia.	Head Length	Pack	Pack Weight
MR-250	1/4"	1/2"	1	.063
MR-375	3/8"	3/4"	1	.094
MR-500	1/2"	1"	1	.125
MR-625	5/8"	1"	1	.188
MR-750*	3/4"	1-1/4"	1	.250
MR-750A*	3/4"	1-1/2"	1	.250
MR-1.125*	1-1/8"	2"	1	.369

Shape - MI Angle Incline



30 Degree Angle
Angle 60
Degree Incline

Tool No.	Size	C/L Angle Degrees	Pack	Pack Weight
MI-250	1/4"	30-41-45	1	.063
MI-375	3/8"	30-41-45	1	.094
MI-500	1/2"	30-41-45	1	.125
MI-625	5/8"	30-41-45	1	.188
MI-750*	3/4"	30-41-45	1	.250
MI-1000*	1"	30-41-45	1	.344



41 or 45 Degree
Specify Angle
Angle 82 or 90
Degree Incline

Carbide head brazed onto 1/4"
hardened steel shank
*3/8" shank is recommended
for burrs over 5/8" diameter

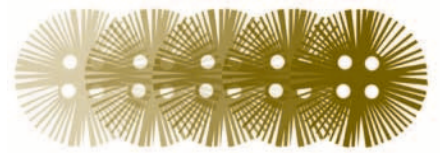


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BRUSHES WEAR
GOGGLES OR
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Solid Carbide Tooling

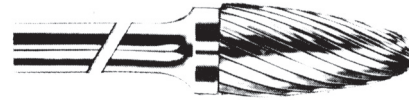


Cylinder Shape



Tool No.	Head Dia.	Flute Length	Pack	Pack Weight
MA-250-L6	1/4"	1/2"	1	.234
MA-375-L6	3/8"	3/4"	1	.266
MA-500-L6	1/2"	1"	1	.297
MA-625-L6	5/8"	1"	1	.360
MA-750-L6	3/4"	1"	1	.422

Tree Shape Radius End



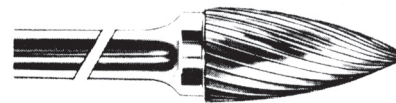
Tool No.	Head Dia.	Flute Length	Pack	Pack Weight
MR-250-L6	1/4"	1/2"	1	.234
MR-375-L6	3/8"	3/4"	1	.266
MR-500-L6	1/2"	1"	1	.297
MR-625-L6	5/8"	1"	1	.360
MR-750-L6	3/4"	1-1/4"	1	.422

Ball Shape



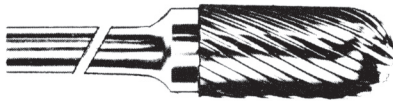
Tool No.	Head Dia.	Flute Length	Pack	Pack Weight
MB-250-L6	1/4"	3/16"	1	.234
MB-375-L6	3/8"	5/16"	1	.266
MB-500-L6	1/2"	7/16"	1	.297
MB-625-L6	5/8"	9/16"	1	.360
MB-750-L6	3/4"	11/16"	1	.422
MB-1000-L6	1"	13/16"	1	.516

Tree Shape Pointed End



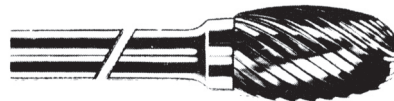
Tool No.	Head Dia.	Flute Length	Pack	Pack Weight
MT-250-L6	1/4"	1/2"	1	.234
MT-375-L6	3/8"	3/4"	1	.266
MT-500-L6	1/2"	1"	1	.297
MT-625-L6	5/8"	1"	1	.360
MT-750-L6	3/4"	1"	1	.422

Cylinder Radius End



Tool No.	Head Dia.	Flute Length	Pack	Pack Weight
MD-250-L6	1/4"	1/2"	1	.234
MD-375-L6	3/8"	3/4"	1	.266
MD-500-L6	1/2"	1"	1	.297
MD-625-L6	5/8"	1"	1	.360
MD-750-L6	3/4"	1"	1	.422

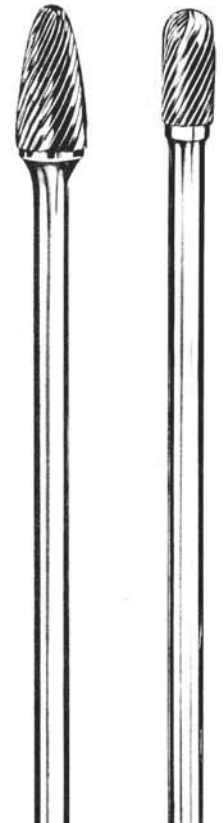
Oval Shape



Tool No.	Head Dia.	Flute Length	Pack	Pack Weight
ME-250-L6	1/4"	3/8"	1	.234
ME-375-L6	3/8"	5/8"	1	.266
ME-500-L6	1/2"	7/8"	1	.297
ME-625-L6	5/8"	1"	1	.360
ME-750-L6	3/4"	1"	1	.422

MR-500-L6

MD-375-L6

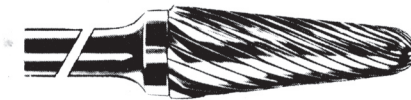


Flame Shape



Tool No.	Head Dia.	Flute Length	Pack	Pack Weight
MF-250-L6	5/16"	3/4"	1	.250
MF-500-L6	1/2"	1-1/4"	1	.297
MF-625-L6	5/8"	1-7/16"	1	.360
MF-750-L6	3/4"	1-5/8"	1	.422

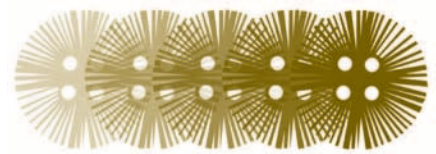
14 Degree Taper Radius End



Tool No.	Head Dia.	Flute Length	Pack	Pack Weight
ML-250-L6	1/4"	5/8"	1	.234
ML-375-L6	3/8"	1-1/16"	1	.266
ML-500-L6	1/2"	1-1/8"	1	.297
ML-625-L6	5/8"	1-5/16"	1	.360
ML-750-L6	3/4"	1-1/2"	1	.422

Long shank carbide burrs are for hard to reach det

Solid Carbide Tooling



ME-500-L18

Extra



MB-625-FL-24



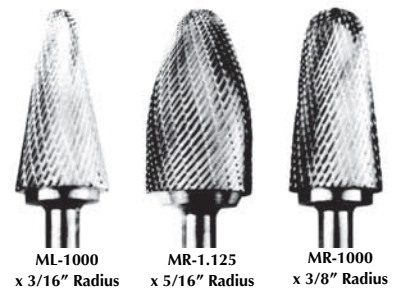
To solve most of your grinding problems for castings that requires fast stock removal or hard to reach places, we can supply burrs on extra long steel shanks and FLEXO shanks that can go around bends.

Tool No.	Cutting Dia.	Head Lgth.	Angle C/L	Radius Nose	Shank Dia.	Pack
ML-1000-FL-10	1"	2"	10	3/16"	3/8"	1
ML-1000-FL-5	1"	2"	5	3/8"	3/8"	1
MR1.125	1-1/8"	2"	N/A	5/16"	3/8"	1

Examples:

Long Shank Burrs

Tool No.	Tool Dia.	Shank Type	Shank Length	Pack
ME-500	500	L	18"	1
MB-625	625	FL	24"	1
MA-187	187	SL	4"	1
MD-500-AL	500-AL	L	6"	1



Alu-Cut

Alu-Cut can solve your problems. Available on 1/4" and 3/8" shanks. Larger shanks available upon request. Alu-Cut burrs are designed for use on aluminum, nonferrous metals, soft steel, reinforced plastic, and other soft materials.



Tool No.	Head Dia.	Lgth.	Pack	Pack Weight
MA-250S-AL	1/4"	3/4"	1	.063
MA-375-AL	3/8"	3/4"	1	.094
MA-500-AL	1/2"	1"	1	.125
MA-625-AL*	5/8"	1"	1	.187
MA-750-AL*	3/4"	1"	1	.250



Tool No.	Head Dia.	Lgth.	Pack	Pack Weight
MD-250S-AL	1/4"	3/4"	1	.063
MD-375-AL	3/8"	3/4"	1	.094
MD-500-AL	1/2"	1"	1	.125
MD-625-AL*	5/8"	1"	1	.187
MD-750-AL*	3/4"	1"	1	.250



Tool No.	Head Dia.	Lgth.	Pack	Pack Weight
MB-250S-AL	1/4"	3/4"	1	.063
MB-375-AL	3/8"	3/4"	1	.094
MB-500-AL	1/2"	1"	1	.125
MB-625-AL*	5/8"	1"	1	.187
MB-750-AL*	3/4"	1"	1	.250



Tool No.	Head Dia.	Lgth.	Pack	Pack Weight
ME-250S-AL	1/4"	3/4"	1	.063
ME-375-AL	3/8"	5/8"	1	.094
ME-500-AL	1/2"	7/8"	1	.125
ME-625-AL*	5/8"	1"	1	.187
ME-750-AL*	3/4"	1"	1	.250



Tool No.	Head Dia.	Lgth.	Pack	Pack Weight
ML-250S-AL	1/4"	3/4"	1	.063
ML-375-AL	3/8"	3/4"	1	.094
ML-500-AL	1/2"	1-1/8"	1	.125
ML-625-AL*	5/8"	1-5-16"	1	.187
ML-750-AL*	3/4"	1-1/2"	1	.250



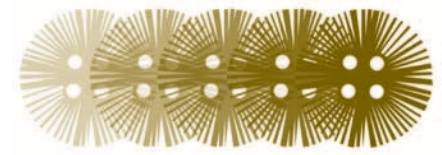
Tool No.	Head Dia.	Lgth.	Pack	Pack Weight
MR-250S-AL	1/4"	3/4"	1	.063
MR-375-AL	3/8"	3/4"	1	.094
MR-500-AL	1/2"	1"	1	.125
MR-625-AL*	5/8"	1"	1	.187
MR-750-AL*	3/4"	1-1/4"	1	.250

*3/8" shank is recommended for burrs 5/8" diameter and over.



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Blanks



Solid Carbide Centerless Ground Blanks

Micrograin



Tool No.	Dia. X OAL	Pack Weight	Tool No.	Dia. X OAL	Pack Weight
CBR1251.5	1/8" x 1-1/2"	.031	CBR3753.5	3/8" x 3-1/2"	.219
CBR1252	1/8" x 2"	.044	CBR3754	3/8" x 4"	.250
CBR1253	1/8" x 3"	.063	CBR3756	3/8" x 6"	.375
CBR1254	1/8" x 4"	.081	CBR37512	3/8" x 12"	.750
CBR1256	1/8" x 6"	.125	CBR4372.5	7/16" x 2-1/2"	.188
CBR12512	1/8" x 12"	.250	CBR4373	7/16" x 3"	.225
CBR1872	3/16" x 2"	.050	CBR4374	7/16" x 4"	.300
CBR1872.5	3/16" x 2-1/2"	.063	CBR4376	7/16" x 6"	.450
CBR1873	3/16" x 3"	.075	CBR43712	7/16" x 12"	.900
CBR1874	3/16" x 4"	.100	CBR5003	1/2" x 3"	.281
CBR1876	3-16" x 6"	.150	CBR5004	1/2" x 4"	.375
CBR18712	3/16" x 12"	.300	CBR5006	1/2" x 6"	.563
CBR2502	1/4" x 2"	.063	CBR50012	1/2" x 12"	1.125
CBR2502.5	1/4" x 2-1/2"	.094	CBR56212	9/16" x 12"	1.75
CBR2503	1/4" x 3"	.113	CBR6253.5	5/8" x 3-1/2"	.531
CBR2504	1/4" x 4"	.150	CBR6254	5/8" x 4"	.606
CBR2506	1/4" x 6"	.225	CBR6256	5/8" x 6"	.906
CBR25012	1/4" x 12"	.138	CBR62512	5/8" x 12"	1.813
CBR3122.5	5/16" x 2-1/2"	.125	CBR7504	3/4" x 4"	.844
CBR3123	5/16" x 3"	.150	CBR7506	3/4" x 6"	1.250
CBR3124	5/16" x 4"	.200	CBR75012	3/4" x 12"	2.500
CBR3126	5/16" x 6"	.300	CBR1004	1" x 4"	1.500
CBR31212	5/16" x 12"	.600	CBR1006	1" x 6"	2.250
CBR3752.5	3/8" x 2-1/2"	.156	CBR10012	1" x 12"	4.625
CBR3753	3/8" x 3"	.188			

Tolerance + .0000-.0005

Special Diameters Available Upon Request

Engraving Blanks

Double End Split



Tool No.	Rod Dia.	Split Length	OAL	Pack Weight
CBDS1251.5	1/8"	3/8"	1-1/2"	.031
CBDS1252	1/8"	3/8"	2"	.044
CBDS1872	3/16"	1/2"	2"	.050
CBDS1873	3/16"	1/2"	3"	.075
CBDS2502	1/4"	1/2"	2"	.063
CBDS2502.5	1/4"	1/2"	2-1/2"	.094
CBDS2503	1/4"	1/2"	3"	.113
CBDS3123	5/16"	1/2"	3"	.150
CBDS3122.5	3/8"	1/2"	2-1/2"	.156
CBDS3753	3/8"	1/2"	3"	.187
CBDS5003	1/2"	5/8"	3"	.281

Single End Split



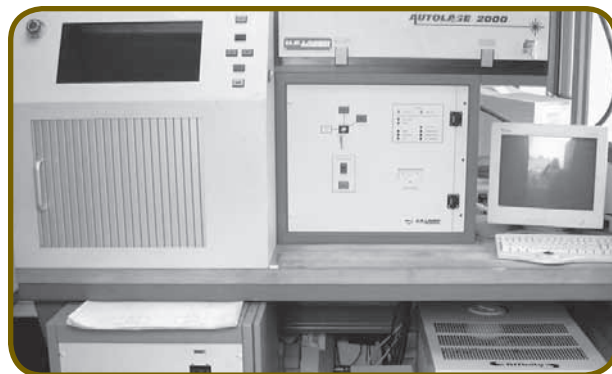
Tool No.	Rod Dia.	Split Length	OAL	Pack Weight
CBSS1251.5	1/8"	3/8"	1-1/2"	.031
CBSS1252	1/8"	3/8"	2"	.044
CBSS1872	3/16"	1/2"	2"	.050
CBSS1873	3/16"	1/2"	3"	.075
CBSS2502	1/4"	1/2"	2"	.063
CBSS2502.5	1/4"	1/2"	2-1/2"	.094
CBSS2503	1/4"	1/2"	3"	.113
CBSS3122.5	5/16"	1/2"	2-1/2"	.150
CBSS3123	5/16"	1/2"	3"	.150
CBSS3752.5	3/8"	1/2"	2-1/2"	.156
CBSS3753	3/8"	1/2"	3"	.187
CBSS5003	1/2"	5/8"	3"	.281

Laser Marking Services

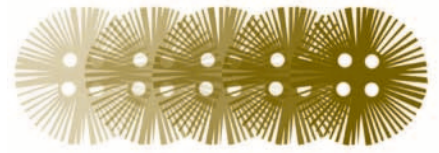
"Laser marking will produce a crisp clear image, leaving your prototypes or long run parts looking more professional and appealing to you customers."

Laser marking is a very cost effective way of permanently marking prototype or long run parts with:

- Part Numbers
- Company Name and/or Logo
- Bar Coding
- Matrix Coding



1101 S. Prairie Ave. PO Box 148 Waukesha, WI 53187
 Phone 262-547-3500 1-800-347-3501 Fax 262-547-3927
 Email brushes@schaeferbush.com www.schaeferbush.com



Standard Coatings

High Performance PVD Tool Coatings



TiN

The general-purpose coating for cutting, forming, injection molding as well as tribological applications

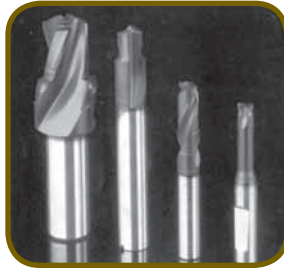
TiCN

Conventional carbon nitride coating:

- For interrupted cutting
- For milling and tapping
- For stamping, punching and forming

TiCN-MP

The tough Multipurpose coating for interrupted cutting, milling, tapping, stamping, forming and hobbing.



TiAlN

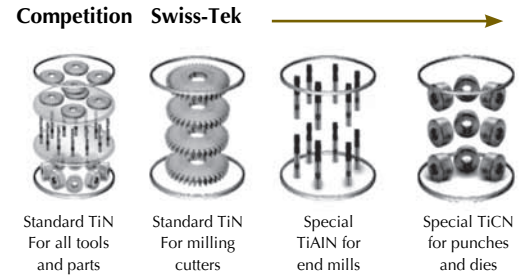
The new universal high performance coating for cutting (drilling, milling, reaming, turning). Also suitable for dry machining.

AlTiN

Special high-performance coating for dry high speed machining. AlTiN performance surpasses all conventional coatings when machining cast iron and hardened steel.

Swiss-Tek Services

With high-volume coating, job coaters apply the same coating to all parts in the batch, regardless of their type or application. Swiss-Tek applies dedicated coatings optimized for each application. Small batch sizes ensure fast turn-around times!



Specialty Coatings



CBC (DLC)

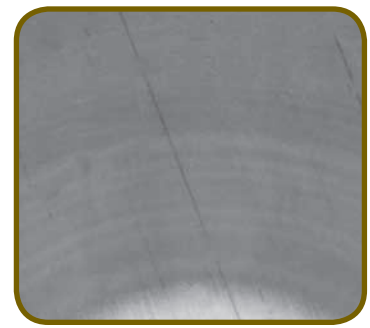
Special gradient coating. Self-lubrication as its own coating or on the top of an appropriate hard coating.

- CBC: carbon-based coating
- DLC: diamond-like carbon



Coating Requirements

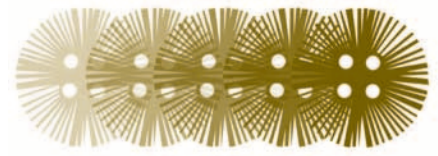
- PVD tool coatings are typically applied between 2-4 microns. This may vary according to tool type.
- PVD coatings are applied at a temperature of 450 degrees C/840 degrees F under high vacuum.



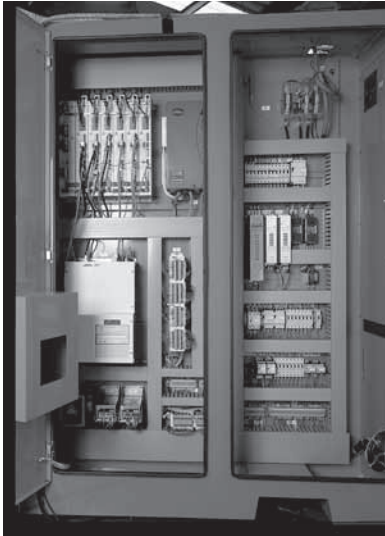
Structure of Gradient Coating

- All carbide and HSS (M-series and T-series) including powder metal types. Tool, die, and mold steels may be coated if they have been properly tempered prior to coating. Other materials are possible, please inquire

Equipment List



- (8) 7 Axis (five hard, two soft) cnc cutter grinders with robotic arm and pallet system capability. (Walters, Anca, Rollomatic)
- Fully functional hand grinding department
- 2 cnc cylindrical grinders
- 7 manual grinders
- Video cutting tool inspection system with 100 x magnification



- Laser marking system
- Milling machine
- Lathe
- Surface grinder
- Winslomatic model HC drill grinder
- Mitutoyo PH350 digital optical comparator
- Anca design cad software



Cutting Tool Formulas

To Find	Using	Formula
SFM = Surface Feet Per Minute	RPM = Revolutions per Minute Dia. = Tool Diameter	$RPM / 3.82 \times Dia = SFM$
RPM = Revolutions per Minute	SFM = Surface Feet per Minute Dia = Tool Diameter	$SFM \times 3.82 / Dia = RPM$
IPM = Inches per Minute	RPM = Revolutions per Minute IPT = Inches per Tooth per Revolutions #FL - # of Cutting Flutes	$RPM / IPT \times \#FL = IPM$
IPT = Inches per Tooth	IPM = Inches per Minutes RPM = Revolutions per Minute #FL - # of Cutting Flutes	$IPM / RPM / \#FL = IPT$
IPR = Inches per Revolution (feed rate)	IPM = Inches per Minute RPM = Revolutions per Minute	$IPM / RPM = IPR (FR)$
MR = Metal Removal Cubic Inches per Minute	ADC = Axial Depth of Cut RDC = Radial Depth of Cut IPM = Inches per Minute	$ADC \times RDC \times IPM = MR$
HP = Horsepower Machine Horsepower Required	IPM = Inches per Minute RDC = Radial Depth of Cut ADC = Axial Depth of Cut PC = Power Constants	$IPM \times RDC \times ADC \times PC = HP$

PC = Power Constraints for HP

HP/CL - MR