

roundtool.com

# High-Performance Solid Carbide Diamond Coated Round Tools

Milling, drilling, routing & reaming tools for  
Medical, Die & Mold, Consumer Electronic, Aerospace,  
Automotive, Composite & Micro Machining

 **RoundTool**®  
L A B O R A T O R I E S

Catalog v2021.1



American Made  
American Designed  
American Owned



**“Not just where machining is, but where machining will be.”**

RoundTool Laboratories was created to combine American manufacturing efficiency and product creativity with the high quality standards of Japanese and Western European carbide round tool manufacturing. We use only the best technology available from throughout the world, combined into a product line that offers the ultimate in milling, drilling and reaming application productivity yet is affordable and made in the USA.

We guarantee your satisfaction. This Company was created with a total “white-paper” approach; there are no compromises regarding performance. Either we’ll meet or beat your current machining value on approved test, or we’ll credit your tools.

At RoundTool Labs we take great pride in manufacturing solid carbide rotary cutting tools that our customers will want to use time and again. Our product is direct evidence of that. Please ask for it by name.

Sincerely,

David Povich  
President



## Tool Series Nomenclature

**In Order: Series • Flute Count • End Condition • Coating Type • Size**

Examples:

**GR4SD1 1/2**

GR Series, 4 flute, Square end, D1 coated, 1/2" diameter

**MP2BAT 0.1**

MP Series, 2 flute, Ball end, AT coated, 0.1mm diameter

**LR8X3BUC .031**

LR8X Series, 3 flute, Ball end, UnCoated, .031 diameter

**GRERN4BD2 .030**

GR Extended Reach w/Neck Series, 4 flute, Ball end, D2 coated, .030 diameter

**SS5SA1 .062**

SS Series, 5 flute, Square end, A1 coated, .062 diameter

**HT6RAT 6.0**

HT Series, 6 flute, Radius end, AT coated, 6.0mm diameter

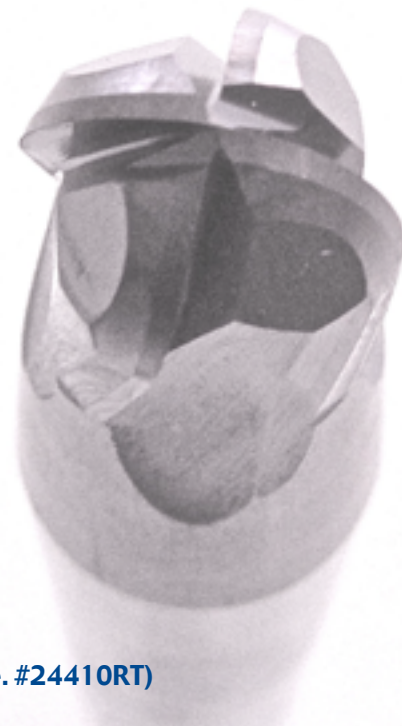
**DM4BAT 1/4L**

DM Series, 4 flute, Ball end, AT coated, 1/4" diameter Long selection

**MD2PUC 0.75**

MD Series, 2 flute, Pointed end, UnCoated, 0.75mm diameter

Please use listed EDP #'s followed by the “RT” suffix for inquiries and ordering (i.e. #24410RT)



Manufactured in the USA  
toolalliance.com







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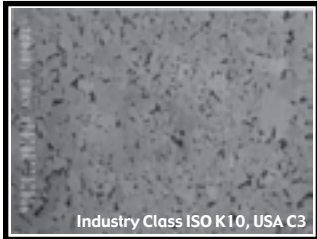
Phone 714 / 898-9224 or 800 / 854-2431 Fax 714 / 891-7816  
eMail: sales@roundtool.com Domains: roundtool.com & toolalliance.com  
Special note: All RoundTool Laboratories EDP #'s will carry an "RT" suffix within the Tool Alliance database.  
Uniform Code Council (UCC) #713646

1

ULTRA-Grain®

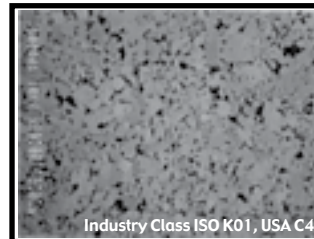
## Components of Guaranteed Quality

**COMPONENT #1: Carbide Substrate** From being the first Company to introduce MicroGrain carbide to the mass-market round tool industry through the present day, Tool Alliance® has consistently innovated new powder and grade combinations for demanding applications. We recognize that our material is the very first Significant Characteristic. By creating partnerships with a limited number of tungsten powder and cemented-carbide material suppliers, we are able to guarantee that our customers receive precision-tolerance tools ground from only the purest, finest grades available worldwide. The following photographs of **Ultra-Carb® 1** and **Ultra-Grain® 2** respectively demonstrate the complexity of the compound we commonly refer to as Cemented Carbide. Taken at magnification of 10,000X through an SEM (Scanning Electron Microscope), the visible grains are tungsten while the cobalt binder appears as dark shadows. The largest tungsten grains appearing in the Ultra-Carb photo are less than one micron in size. Note that these grades are two samples representing more than a dozen different substrates we use throughout our product lines, each having a particular application niche. Compared to other industry participants, you will find that Tool Alliance offers the best month-to-month and year-to-year consistency in carbide grain structure.



**Ultra-Carb® 1**  
Cobalt Percentage: 6%  
Grain Size (µm): ≤ 0.8  
Hardness: 93.5 HRa  
Fracture Toughness (K1c): 6.6  
TRS (GPa): 3.8  
Density (gm/cc): 14.90

ULTRA-Carb®



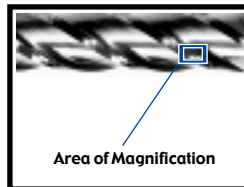
**Ultra-Grain® 2**  
Cobalt Percentage: 8%  
Grain Size (µm): ≤ 0.6  
Hardness: 93.8 HRa  
Fracture Toughness (K1c): 5.8  
TRS (GPa): 4.0  
Density (gm/cc): 14.6

ULTRA-Grain®

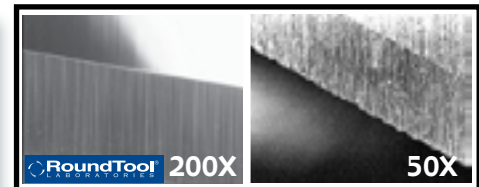
2

## SmoothGrind®

**COMPONENT #2: The Grinding Process** After selecting the best material available, Tool Alliance has perfected the manufacturing technology to optimize 100% of its physical properties. We call this process **SmoothGrind®**. Years in development, SmoothGrind is the result of a proprietary combination of material, abrasive, coolant, machine-tool, software, and grinding method technologies that produce cutting tools with superior qualitative characteristics. Sharper and longer lasting cutting edges, enhanced work piece finishes, and improved lubricity are just some of the benefits brought to you by the latest solid carbide rotary tooling advances from Tool Alliance. The following photographs display a RoundTool end mill primary relief featuring SmoothGrind (left) versus a major competitor's product (right). To fully demonstrate the difference, the RoundTool end mill is shown at double the magnification. Note the straight line of our end mill's primary relief in comparison to the jagged edge of the competing product. Keep in mind the competitive end mill is a very good product that has a large following, yet the difference is substantial.



Area of Magnification



## SmoothGrind® Competitor's

3

## SmoothContricity®

SFR 35% tighter shank tolerance than h6!



Shrink Fit Ready



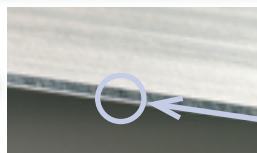
**COMPONENT #3: The Tooling Process** All the best physical ingredients are wasted unless they are pulled together in a comprehensive system that maximizes their respective attributes. Tool Alliance calls this process **SmoothContricity®**. Our customer base represents the leading edge of machine tool utilization, and SmoothContricity ensures that optimum results are obtained using qualitative features; minimal run-out (TIR), industry-leading tolerances on diameter & radius, and 100% Shrink Fit Ready (SFR) shanks. Combined, these attributes allow our consumers to reach full machining potential and position the cutting tool as a systematic contributor to process consistency and repeatability.

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## SmoothEdge®

### COMPONENT #4: The Edge Preparation Process

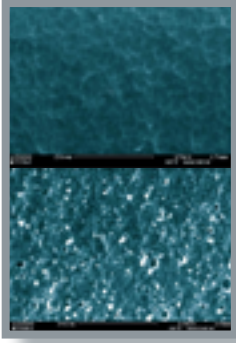
Our cutting edges are literally too sharp for certain materials. For our carbide inserts and now increasingly for our solid carbide round tools, proper edge preparation can yield huge productivity improvements to "out of the box" tool application. Using a treatment we call **SmoothEdge®** and performed on machine tools developed in our own R&D lab, we've taken the mystery out of tool "break-in" and provided a consistency that can be counted on time and again. The processes range from a **microblasting** treatment using extremely fine aluminum oxide powder to a **diamond-lapping** compound to **brushes**. All are application-specific to sound and run smooth from the first cut and protect your tooling investment from unnecessary potential for chipping during your initial tooling paths. Big productivity gains can be achieved in certain applications as well due to improved chip formation and evacuation. Learn more about SmoothEdge at [toolalliance.com](http://toolalliance.com).



.0001 SmoothEdge atop cylindrical margin atop primary relief.







Our coating @ 2,000X (top).  
Everybody else's (bottom).

## SmoothCoat<sup>®</sup> 5

**COMPONENT #5: The Coating Process** The challenge of finding a coating method to leverage 100% of the inherent assets of our carbide grade and grinding technologies was difficult. What we finally discovered was such a perfect fit and so logical for our product lines that we invested heavily into the process we now call SmoothCoat<sup>®</sup>. Much more than simply the standard arc-deposited PVD coating, SmoothCoat involves sputter multi-layering and a multi-step prep & post operation called Micro-Blasting. The advantages of this procedure include relieving of tensile stresses underneath the cutting edge, increased stability of the coating surface, and perhaps most importantly, elevating SmoothGrind even another notch by leveling and activating the cemented carbide substrate. The result is a smooth, shiny, tough, and durable surface that can withstand tomorrow's machining requirements and outlast competitive coatings. Additionally, we've made it a standard feature on thousands of our standard catalog items. Our coating services are performed within our own factories for quality & extremely quick turnaround times.

**RoundTool Lab's Standard Coating Availability** Order by adding the suffix AT, A1, TC, D1 or D2 to the base EDP#. An EDP without suffix or UC will denote UnCoated.

Other Tool Alliance coatings:



UnCoated



AlTiN



TiB2



TiCN

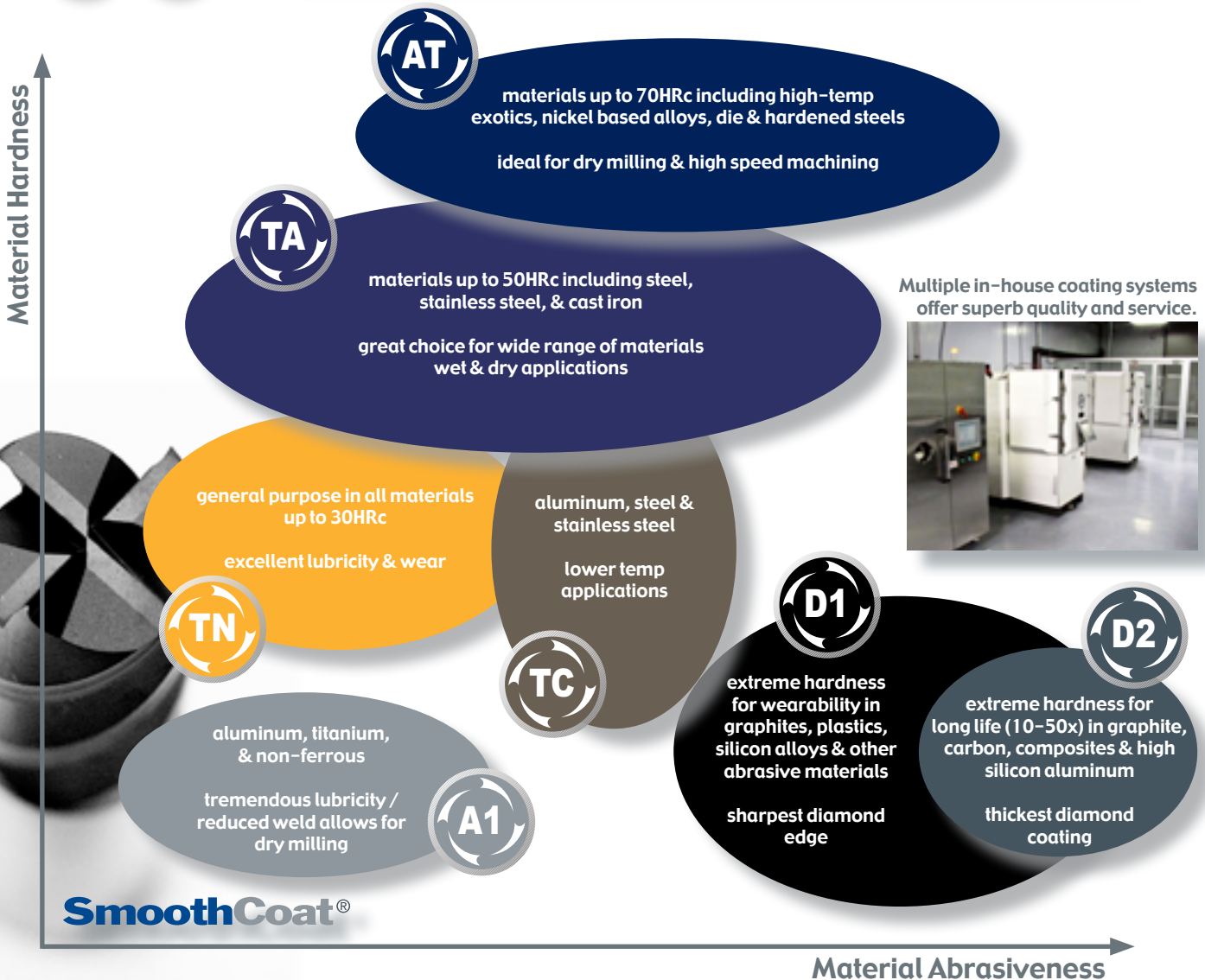


PVD Diamond



CVD Diamond

Standard Coatings available at respective "Coated" List Price



Diam	2 Sq	2 Ball	4 Sq	4 Ball	UnCoat	ATcoat	D1coat	2 Sq	2 Ball	4 Sq	4 Ball	UnCoat	ATcoat	D1coat
.003	40578	40678			\$23.00	\$26.00	\$30.00	40634	40734			\$28.00	\$31.00	\$34.00
.004	40579	40679			\$23.00	\$26.00	\$30.00	40635	40735			\$28.00	\$31.00	\$34.00
.005	40799	40899			\$16.00	\$17.00	\$20.00	40636	40736			\$19.00	\$20.00	\$23.00
.006	40800	40900			\$16.00	\$17.00	\$20.00	40637	40737			\$19.00	\$20.00	\$23.00
.007	40002	40102			\$16.00	\$17.00	\$20.00	40638	40738			\$19.00	\$20.00	\$23.00
.008	40003	40103			\$16.00	\$17.00	\$20.00	40639	40739			\$19.00	\$20.00	\$23.00
.009	40004	40104			\$16.00	\$17.00	\$20.00	40640	40740			\$19.00	\$20.00	\$23.00
.010	43244	43344	40599	40699	\$14.00	\$15.00	\$18.00	40009	40048	40660	40760	\$17.00	\$18.00	\$21.00
.011	43245	43345	40600	40700	\$14.00	\$15.00	\$18.00	40010	40049	40661	40761	\$17.00	\$18.00	\$21.00
.012	43246	43346	40601	40701	\$14.00	\$15.00	\$18.00	40011	40050	40662	40762	\$17.00	\$18.00	\$21.00
.013	43247	43347	40602	40702	\$14.00	\$15.00	\$18.00	40012	40051	40663	40763	\$17.00	\$18.00	\$21.00
.014	43298	43398	40603	40703	\$14.00	\$15.00	\$18.00	40013	40052	40664	40764	\$17.00	\$18.00	\$21.00
.015	43249	43349	40604	40704	\$14.00	\$15.00	\$18.00	40014	40053	40665	40765	\$17.00	\$18.00	\$21.00
.016	43250	43350	40605	40705	\$14.00	\$15.00	\$18.00	40015	40054	40666	40766	\$17.00	\$18.00	\$21.00
.017	43251	43351	40606	40706	\$14.00	\$15.00	\$18.00	40016	40055	40667	40767	\$17.00	\$18.00	\$21.00
.018	43252	43352	40607	40707	\$14.00	\$15.00	\$18.00	40017	40056	40668	40768	\$17.00	\$18.00	\$21.00
.019	43253	43353	40608	40708	\$14.00	\$15.00	\$18.00	40018	40057	40669	40769	\$17.00	\$18.00	\$21.00
.020	43254	43354	40609	40709	\$14.00	\$15.00	\$18.00	40019	40040	40670	40770	\$17.00	\$18.00	\$21.00
.021	43255	43355	40610	40710	\$13.50	\$14.50	\$18.00	40020	40058	40671	40771	\$16.50	\$18.00	\$21.00
.022	43256	43356	40611	40711	\$13.50	\$14.50	\$17.50	40021	40059	40777	40877	\$16.50	\$17.50	\$20.50
.023	43257	43357	40612	40712	\$13.50	\$14.50	\$17.50	40022	40060	40778	40878	\$16.50	\$17.50	\$20.50
.024	43258	43358	40613	40713	\$13.50	\$14.50	\$17.50	40023	40061	40779	40879	\$16.50	\$17.50	\$20.50
.025	43259	43359	42259	42359	\$13.50	\$14.50	\$17.50	40024	40041	40073	40090	\$16.50	\$17.50	\$20.50
.026	43260	43360	42260	42360	\$13.50	\$14.50	\$17.50	40025	40062	40074	40091	\$16.50	\$17.50	\$20.50
.027	43261	43361	42261	42361	\$13.50	\$14.50	\$17.50	40026	40063	40075	40092	\$16.50	\$17.50	\$20.50
.028	43262	43362	42262	42362	\$13.50	\$14.50	\$17.50	40027	40064	40076	40093	\$16.50	\$17.50	\$20.50
.029	43263	43363	42263	42363	\$13.50	\$14.50	\$17.50	40028	40065	40077	40094	\$16.50	\$17.50	\$20.50
.030	43264	43364	42264	42364	\$13.00	\$14.00	\$17.00	40029	40042	40078	40095	\$16.00	\$17.00	\$20.00
.031	43265	43365	42265	42365	\$13.00	\$14.00	\$17.00	40030	40043	40079	40096	\$16.00	\$17.00	\$20.00
.032	40005	40574	40470	40570	\$13.00	\$14.00	\$17.00	40031	40066	40080	40097	\$16.00	\$17.00	\$20.00
.033	40580	40680	40614	40714	\$13.00	\$14.00	\$17.00	40641	40741	40780	40880	\$16.00	\$17.00	\$20.00
.034	40581	40681	40615	40715	\$13.00	\$14.00	\$17.00	40642	40742	40781	40881	\$16.00	\$17.00	\$20.00
.035	43266	43366	42266	42366	\$13.00	\$14.00	\$17.00	40047	40067	40081	40098	\$16.00	\$17.00	\$20.00
.036	40582	40682	40616	40716	\$13.00	\$14.00	\$17.00	40643	40743	40782	40882	\$16.00	\$17.00	\$20.00
.037	40006	40575	40471	40571	\$13.00	\$14.00	\$17.00	40032	40068	40082	40099	\$16.00	\$17.00	\$20.00
.038	40583	40683	40617	40717	\$13.00	\$14.00	\$17.00	40644	40744	40783	40883	\$16.00	\$17.00	\$20.00
.039	40584	40684	40618	40718	\$13.00	\$14.00	\$17.00	40645	40745	40784	40884	\$16.00	\$17.00	\$20.00
.040	43267	43367	42267	42367	\$13.00	\$14.00	\$17.00	40033	40044	40083	40100	\$16.00	\$17.00	\$20.00
.041	40585	40685	40619	40719	\$13.00	\$14.00	\$17.00	40646	40746	40785	40885	\$16.00	\$17.00	\$20.00
.042	40586	40686	40620	40720	\$13.00	\$14.00	\$17.00	40647	40747	40786	40886	\$16.00	\$17.00	\$20.00
.043	40587	40687	40621	40721	\$13.00	\$14.00	\$17.00	40648	40748	40787	40887	\$16.00	\$17.00	\$20.00
.044	40588	40688	40623	40723	\$13.00	\$14.00	\$17.00	40649	40749	40788	40888	\$16.00	\$17.00	\$20.00
.045	40589	40689	40624	40724	\$13.00	\$14.00	\$17.00	40650	40750	40789	40889	\$16.00	\$17.00	\$20.00
.046	40007	40576	40472	40572	\$13.00	\$14.00	\$17.00	40034	40069	40084	40101	\$16.00	\$17.00	\$20.00
.047	43268	43368	42268	42368	\$13.00	\$14.00	\$17.00	40035	40045	40085	40108	\$16.00	\$17.00	\$20.00
.048	40590	40690	40625	40725	\$13.00	\$14.00	\$17.00	40651	40751	40790	40890	\$16.00	\$17.00	\$20.00
.049	40591	40691	40626	40726	\$13.00	\$14.00	\$17.00	40652	40752	40791	40891	\$16.00	\$17.00	\$20.00
.050	43269	43369	42269	42369	\$12.00	\$13.00	\$16.00	40036	40070	40086	40109	\$15.00	\$16.00	\$19.00
.051	40592	40692	40627	40727	\$12.00	\$13.00	\$16.00	40653	40753	40792	40892	\$15.00	\$16.00	\$19.00
.052	40593	40693	40628	40728	\$12.00	\$13.00	\$16.00	40654	40754	40793	40893	\$15.00	\$16.00	\$19.00
.053	40594	40694	40629	40729	\$12.00	\$13.00	\$16.00	40655	40755	40794	40894	\$15.00	\$16.00	\$19.00
.054	40595	40695	40630	40730	\$12.00	\$13.00	\$16.00	40656	40756	40795	40895	\$15.00	\$16.00	\$19.00
.055	43270	43370	42270	42370	\$12.00	\$13.00	\$16.00	40037	40046	40087	40110	\$15.00	\$16.00	\$19.00
.056	40596	40696	40631	40731	\$12.00	\$13.00	\$16.00	40657	40757	40796	40896	\$15.00	\$16.00	\$19.00
.057	40008	40577	40473	40573	\$12.00	\$13.00	\$16.00	40038	40071	40088	40111	\$15.00	\$16.00	\$19.00
.058	40597	40697	40632	40732	\$12.00	\$13.00	\$16.00	40658	40758	40797	40897	\$15.00	\$16.00	\$19.00
.059	40598	40698	40633	40733	\$12.00	\$13.00	\$16.00	40659	40759	40798	40898	\$15.00	\$16.00	\$19.00
.060	43271	43371	42271	42371	\$12.00	\$13.00	\$16.00	40039	40072	40089	40112	\$15.00	\$16.00	\$19.00
.061	43299	43399	42299	42399	\$12.00	\$13.00	\$16.00	40201	40202	40203	40204	\$15.00	\$16.00	\$19.00
.062	44000	44100	45000	45100	\$12.00	\$13.00	\$16.00	44016	44116	45016	45116	\$15.00	\$16.00	\$19.00
.065	44001	44101	45001	45101	\$12.00	\$13.00	\$16.00	44017	44117	45017	45117	\$15.00	\$16.00	\$19.00





RTL Specs Micro end mills  
Cutting Diam  $\pm .0005$   
Shank Diam  $+0 / -.0002$   
Radius  $\pm .0002$   
LOC  $+0.010 / -.000$   
SFR = Shrink Fit Ready



Diam

1.5X

MP2S / MP2B  
MP4S / MP4B

2-flute, LOC = 1.5X  
4-flute, LOC = 1.5X



2 Sq

2 Ball

4 Sq

4 Ball

UnCoat

ATcoat

D1coat

.070

44002

44102

45002

45102

\$12.00

\$13.00

\$16.00

.075

44003

44103

45003

45103

\$12.00

\$13.00

\$16.00

.078

44004

44104

45004

45104

\$12.00

\$13.00

\$16.00

.080

44005

44105

45005

45105

\$12.00

\$13.00

\$16.00

.085

44006

44106

45006

45106

\$12.00

\$13.00

\$16.00

.090

44007

44107

45007

45107

\$12.00

\$13.00

\$16.00

.093

44008

44108

45008

45108

\$12.00

\$13.00

\$16.00

.095

44009

44109

45009

45109

\$12.00

\$13.00

\$16.00

.100

44010

44110

45010

45110

\$12.00

\$13.00

\$16.00

.105

44011

44111

45011

45111

\$12.00

\$13.00

\$16.00

.110

44012

44112

45012

45112

\$12.00

\$13.00

\$16.00

.115

44013

44113

45013

45113

\$12.00

\$13.00

\$16.00

.118

44014

44114

45014

45114

\$12.00

\$13.00

\$16.00

.120

44015

44115

45015

45115

\$12.00

\$13.00

\$16.00

1/8" shank

## new! MP & MPL Series: Multi-Purpose metric micro end mills

Premium carbide substrate with advanced geometry featuring  
two different LOC to Diameter ratios and AT or D1 coating.

- Designed for diverse application range • 38 mm OAL • 3.0 mm shank
- Tight diameter tolerance of  $\pm 0.012$  mm
- Available UnCoated, AT (AlTiN) coated, or D1 PVD Diamond coated
- Match rigidity to application via choice of 1.5X (MP) or 3.0X (MPL) LOC to Diameter ratios
- Use AT in cobalt chrome, steels, stainless, high-temp alloys, and more
- Use D1 in graphites, aluminum-silicon alloys, carbon fiber composites, reinforced plastics, and more
- One price for all square & ball end, two & four flute configurations (within respective coating category)

35% tighter shank  
tolerance than h6!  
Shrink-Fit Ready!



RTL Specs Micro metric  
Cutting Diam  $\pm 0.012$ mm  
Shank Diam  $+0.0 / -.005$ mm  
Radius  $\pm 0.005$ mm  
LOC  $+0.25 / -.0$ mm  
SFR = Shrink Fit Ready



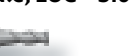
3.0mm shank

Diam

1.5X

MP2S / MP2B  
MP4S / MP4B

2-flute, LOC = 1.5X  
4-flute, LOC = 1.5X



2 Sq

2 Ball

4 Sq

4 Ball

UnCoat

ATcoat

D1coat

0.10mm

40801

40901

\$22.00

\$23.00

\$26.00

0.15

40802

40902

\$16.00

\$17.00

\$20.00

0.20

40803

40903

\$16.00

\$17.00

\$20.00

0.25

43272

43372

40804

40904

\$14.00

\$15.00

\$18.00

0.30

43273

43373

40805

40905

\$14.00

\$15.00

\$18.00

0.35

43274

43374

40806

40906

\$14.00

\$15.00

\$18.00

0.40

43275

43375

40807

40907

\$14.00

\$15.00

\$18.00

0.45

43276

43376

40808

40908

\$14.00

\$15.00

\$18.00

0.50

43277

43377

40809

40909

\$14.00

\$15.00

\$18.00

0.55

43278

43378

40810

40910

\$13.50

\$14.50

\$17.50

0.60

43279

43379

40811

40911

\$13.50

\$14.50

\$17.50

0.65

43280

43380

40812

40912

\$13.50

\$14.50

\$17.50

0.70

43281

43381

42281

42381

\$13.50

\$14.50

\$17.50

0.75

43282

43382

42282

42382

\$13.50

\$14.50

\$17.50

0.80

43283

43383

42283

42383

\$13.00

\$14.00

**GR Series • decimal micro end mills w/LOC=5x diameter**

- Designed for milling of hardened steels, non-metals & non-ferrous alloys
- Proprietary cemented carbide grade offers extremely high hardness and density
- Features heavy core construction for maximum rigidity • Tight tolerance  $\pm .0005$  (with coating)



RTL Specs Micro end mills  
Cutting Diam  $\pm .0005$   
Shank Diam  $+0 / -.0002$   
Radius  $\pm .0002$   
LOC  $+0.010 / -.000$   
SFR = Shrink Fit Ready









GR2SUC GR2BUC GR4SUC GR4BUC 

- Add suffix to EDP# for UC, AT, D1 or D2 surface treatment

- Use UnCoated for general purpose needs

- Use AT (AlTiN) coated for high-temp exotics & alloys, die & hardened steels, stainless

- Use D1 PVD or D2 CVD Diamond for CFC's, graphite, plastics, and aluminum-silicon alloys

Diam	LOC	OAL	Shank	 2 flute Square EDP#		 2 flute Ball EDP#		 4 flute Square EDP#		 4 flute Ball EDP#		 UnCoated	 AT Coated	 D1 Coated	 D2 Coated
				EDP#	EDP#	EDP#	EDP#	EDP#	EDP#	EDP#	EDP#				
.005	.025	1-1/2	1/8	11270	11275							\$22.00	\$23.00	\$26.00	
.006	.030	1-1/2	1/8	11271	11276							\$22.00	\$23.00	\$26.00	
.007	.035	1-1/2	1/8	11272	11277							\$22.00	\$23.00	\$26.00	
.008	.040	1-1/2	1/8	11273	11278							\$22.00	\$23.00	\$26.00	
.009	.045	1-1/2	1/8	11274	11279							\$22.00	\$23.00	\$26.00	
.010	.050	1-1/2	1/8	10001	10065	11242	11256					\$20.00	\$21.00	\$24.00	
.011	.055	1-1/2	1/8	10002	10066	11243	11257					\$20.00	\$21.00	\$24.00	
.012	.060	1-1/2	1/8	10003	10067	11244	11258					\$20.00	\$21.00	\$24.00	
.013	.065	1-1/2	1/8	10004	10068	11245	11259					\$20.00	\$21.00	\$24.00	
.014	.070	1-1/2	1/8	10005	10069	11246	11260					\$20.00	\$21.00	\$24.00	
.015	.075	1-1/2	1/8	10006	10070	11247	11261					\$20.00	\$21.00	\$24.00	\$48.00
.016	.080	1-1/2	1/8	10007	10071	11248	11262					\$20.00	\$21.00	\$24.00	\$48.00
.017	.085	1-1/2	1/8	10008	10072	11249	11263					\$20.00	\$21.00	\$24.00	\$48.00
.018	.090	1-1/2	1/8	10009	10073	11250	11264					\$20.00	\$21.00	\$24.00	\$48.00
.019	.095	1-1/2	1/8	10010	10074	11251	11265					\$20.00	\$21.00	\$24.00	\$48.00
.020	.100	1-1/2	1/8	10011	10075	12232	12234					\$19.50	\$20.50	\$23.50	\$47.50
.021	.105	1-1/2	1/8	10012	10076	11252	11266					\$19.50	\$20.50	\$23.50	\$47.50
.022	.110	1-1/2	1/8	10013	10077	11253	11267					\$19.50	\$20.50	\$23.50	\$47.50
.023	.115	1-1/2	1/8	10014	10078	11254	11268					\$19.50	\$20.50	\$23.50	\$47.50
.024	.120	1-1/2	1/8	10015	10079	11255	11269					\$19.50	\$20.50	\$23.50	\$47.50
.025	.125	1-1/2	1/8	10016	10080	10129	10178					\$19.50	\$20.50	\$23.50	\$47.50
.026	.130	1-1/2	1/8	10017	10081	10130	10179					\$19.50	\$20.50	\$23.50	\$47.50
.027	.135	1-1/2	1/8	10018	10082	10131	10180					\$19.50	\$20.50	\$23.50	\$47.50
.028	.140	1-1/2	1/8	10019	10083	10132	10181					\$19.50	\$20.50	\$23.50	\$47.50
.029	.145	1-1/2	1/8	10020	10084	10133	10182					\$19.50	\$20.50	\$23.50	\$47.50
.030	.150	1-1/2	1/8	10021	10085	10134	10183					\$19.00	\$20.00	\$23.00	\$47.00
.031	.155	1-1/2	1/8	10022	10086	10135	10184					\$19.00	\$20.00	\$23.00	\$47.00
.032	.160	1-1/2	1/8	10023	10087	10136	10185					\$19.00	\$20.00	\$23.00	\$47.00
.033	.165	1-1/2	1/8	10024	10088	10137	10186					\$19.00	\$20.00	\$23.00	\$47.00
.034	.170	1-1/2	1/8	10025	10089	10138	10187					\$19.00	\$20.00	\$23.00	\$47.00
.035	.175	1-1/2	1/8	10026	10090	10139	10188					\$19.00	\$20.00	\$23.00	\$47.00
.036	.180	1-1/2	1/8	10027	10091	10140	10189					\$19.00	\$20.00	\$23.00	\$47.00
.037	.185	1-1/2	1/8	10028	10092	10141	10190					\$19.00	\$20.00	\$23.00	\$47.00
.038	.190	1-1/2	1/8	10029	10093	10142	10191					\$19.00	\$20.00	\$23.00	\$47.00
.039	.195	1-1/2	1/8	10030	10094	10143	10192					\$19.00	\$20.00	\$23.00	\$47.00
.040	.200	1-1/2	1/8	10031	10095	10144	10193					\$19.00	\$20.00	\$23.00	\$47.00
.041	.205	1-1/2	1/8	10032	10096	10145	10194					\$19.00	\$20.00	\$23.00	\$47.00
.042	.210	1-1/2	1/8	10033	10097	10146	10195					\$19.00	\$20.00	\$23.00	\$47.00
.043	.215	1-1/2	1/8	10034	10098	10147	10196					\$19.00	\$20.00	\$23.00	\$47.00
.044	.220	1-1/2	1/8	10035	10099	10148	10197					\$19.00	\$20.00	\$23.00	\$47.00
.045	.225	1-1/2	1/8	10036	10100	10149	10198					\$19.00	\$20.00	\$23.00	\$47.00
.046	.230	1-1/2	1/8	10037	10101	10150	10199					\$19.00	\$20.00	\$23.00	\$47.00
.047	.235	1-1/2	1/8	10038	10102	10151	10200					\$19.00	\$20.00	\$23.00	\$47.00
.048	.240	1-1/2	1/8	10039	10103	10152	10201					\$19.00	\$20.00	\$23.00	\$47.00
.049	.245	1-1/2	1/8	10040	10104	10153	10202					\$19.00	\$20.00	\$23.00	\$47.00
.050	.250	1-1/2	1/8	10041	10105	10154	10203					\$18.00	\$19.00	\$22.00	\$46.00
.051	.255	1-1/2	1/8	10042	10106	10155	10204					\$18.00	\$19.00	\$22.00	\$46.00
.052	.260	1-1/2	1/8	10043	10107	10156	10205					\$18.00	\$19.00	\$22.00	\$46.00
.053	.265	1-1/2	1/8	10044	10108	10157	10206					\$18.00	\$19.00	\$22.00	\$46.00
.054	.270	1-1/2	1/8	10045	10109	10158	10207					\$18.00	\$19.00	\$22.00	\$46.00
.055	.275	1-1/2	1/8	10046	10110	10159	10208					\$18.00	\$19.00	\$22.00	\$46.00
.056	.280	1-1/2	1/8	10047	10111	10160	10209					\$18.00	\$19.00	\$22.00	\$46.00
.057	.285	1-1/2	1/8	10048	10112	10161	10210					\$18.00	\$19.00	\$22.00	\$46.00
.058	.290	1-1/2	1/8	10049	10113	10162	10211					\$18.00	\$19.00	\$22.00	\$46.00
.059	.295	1-1/2	1/8	10050	10114	10163	10212					\$18.00	\$19.00	\$22.00	\$46.00
.060	.300	1-1/2	1/8	10051	10115	10164	10213					\$18.00	\$19.00	\$22.00	\$46.00
.061	.305	1-1/2	1/8	10052	10116	10165	10214					\$18.00	\$19.00	\$22.00	\$46.00
.062	.310	1-1/2	1/8	10053	10117	10166	10215					\$18.00	\$19.00	\$22.00	\$46.00





## GRER & GRERN Series • Extended Reach 4 flute micro end mills

High strength and hardness, 3" extra-long solid carbide end mills  
featuring LOC = 5X diameter & available standard neck clearance (GRERN).

1/8" shank



- Designed for machining electrodes & other reach applications • 3" OAL
- Proprietary cemented carbide grade & available AT, D1 or D2 coating
- Use D1 (PVD) or D2 (CVD) Diamond coating for graphite & abrasive non-metals
- Use AT coating for die steels and other hard metals
- Tight diameter tolerance of  $\pm .0005$  including all coatings
- "N" designates inclusion of extended clearance neck (GRERN)

**SFR 35% tighter shank tolerance than h6!**  
Shrink-Fit Ready!



Diam	LOC	LBS	OAL	Shank
.015	.075		3"	1/8
.015N	.075	.150	3"	1/8
.020	.100		3"	1/8
.020N	.100	.200	3"	1/8
.025	.125		3"	1/8
.025N	.125	.250	3"	1/8
.030	.150		3"	1/8
.030N	.150	.300	3"	1/8
.031	.155		3"	1/8
.031N	.155	.310	3"	1/8
.035	.175		3"	1/8
.035N	.175	.350	3"	1/8
.040	.200		3"	1/8
.040N	.200	.400	3"	1/8
.045	.225		3"	1/8
.045N	.225	.450	3"	1/8
.047	.235		3"	1/8
.047N	.235	.500	3"	1/8
.050	.250		3"	1/8
.050N	.250	.500	3"	1/8
.060	.300		3"	1/8
.060N	.300	1.0"	3"	1/8
.062	.310		3"	1/8
.062N	.310	1.0"	3"	1/8
.075	.375		3"	1/8
.075N	.375	1.0"	3"	1/8
.078	.390		3"	1/8
.078N	.390	1.0"	3"	1/8
.090	.450		3"	1/8
.090N	.450	1.0"	3"	1/8
.093	.465		3"	1/8
.093N	.465	1.25"	3"	1/8
.1245	.625		3"	1/8
.1245N	.625	1.5"	3"	1/8

Square EDP#	Ball EDP#	UnCoated Price	AT Coated Price	D1 Coated Price	D2 Coated Price
00127	00716	\$25.40	\$28.40	\$32.40	\$61.40
00128	00717	\$31.80	\$34.80	\$38.80	\$67.80
00129	00718	\$25.40	\$28.40	\$32.40	\$61.40
00746	00719	\$31.80	\$34.80	\$38.80	\$67.80
00747	00720	\$25.40	\$28.40	\$32.40	\$61.40
00748	00721	\$31.80	\$34.80	\$38.80	\$67.80
00749	00722	\$25.40	\$28.40	\$32.40	\$61.40
00750	00723	\$31.80	\$34.80	\$38.80	\$67.80
00751	00724	\$25.40	\$28.40	\$32.40	\$61.40
00752	00725	\$31.80	\$34.80	\$38.80	\$67.80
00753	00726	\$25.40	\$28.40	\$32.40	\$61.40
00754	00727	\$31.80	\$34.80	\$38.80	\$67.80
00755	00728	\$25.40	\$28.40	\$32.40	\$61.40
00756	00729	\$31.80	\$34.80	\$38.80	\$67.80
00757	00730	\$25.40	\$28.40	\$32.40	\$61.40
00758	00176	\$31.80	\$34.80	\$38.80	\$67.80
00759	00177	\$25.40	\$28.40	\$32.40	\$61.40
00760	00178	\$31.80	\$34.80	\$38.80	\$67.80
00761	00179	\$25.40	\$28.40	\$32.40	\$61.40
00762	00731	\$31.80	\$34.80	\$38.80	\$67.80
00763	00732	\$25.40	\$28.40	\$32.40	\$61.40
00764	00733	\$31.80	\$34.80	\$38.80	\$67.80
00765	00734	\$25.40	\$28.40	\$32.40	\$61.40
00766	00735	\$31.80	\$34.80	\$38.80	\$67.80
00767	00736	\$25.40	\$28.40	\$32.40	\$61.40
00768	00737	\$31.80	\$34.80	\$38.80	\$67.80
00769	00738	\$25.40	\$28.40	\$32.40	\$61.40
00770	00739	\$31.80	\$34.80	\$38.80	\$67.80
00771	00740	\$25.40	\$28.40	\$32.40	\$61.40
00226	00741	\$31.80	\$34.80	\$38.80	\$67.80
00227	00742	\$25.40	\$28.40	\$32.40	\$61.40
00228	00743	\$31.80	\$34.80	\$38.80	\$67.80
00229	00744	\$25.40	\$28.40	\$32.40	\$61.40
00715	00745	\$31.80	\$34.80	\$38.80	\$67.80



RTL Specs Micro end mills  
Cutting Diam  $\pm .0005$   
Shank Diam  $+0 / -.0002$   
Radius  $\pm .0002$   
LOC  $+0.010 / -.000$   
SFR = Shrink Fit Ready

### HSM's New Best Friend



**SmoothContricity®**

Maximized Tool Concentricity Exclusively by Tool Alliance™

- Please note that due to extreme hardness D2 coated tools are generally unable to be reground or resharpened.





GR2RUC



GR4RUC



RTL Specs end mills  
Cutting Diam +0 / -.002  
Shank Diam +0 / -.0003  
Radius ±.001  
LOC +.030 / -.000  
SFR = Shrink Fit Ready

## GR Series • fractional end mills with Radius

High strength, high hardness solid carbide end mills for wide application range featuring extended cutting lengths.

- Designed for milling of hardened steels, non-metals & non-ferrous alloys
- Proprietary cemented carbide grade offers extremely high hardness and density
- Features heavy core construction for maximum rigidity • Tight tolerance
- Regular, Long (L), and Extra-Long (XL) lengths
- Add suffix to EDP# for UC, AT, D1 or D2 surface treatment
- Use UnCoated for general purpose needs
- Use AT (AlTiN) coated for high-temp exotics & alloys, die & hardened steels, stainless
- Use D1 PVD or D2 CVD Diamond for CFC's, graphite, plastics, and aluminum-silicon alloys

				.015 Rad		.031 Rad		.062 Rad		2 or 4 flute available			
Diam	LOC	OAL	Shank	2 flute EDP#	4 flute EDP#	2 flute EDP#	4 flute EDP#	2 flute EDP#	4 flute EDP#	UnCoated Price	AT Coated Price	D1 Coated Price	D2 Coated Price
1/16L	1/4	2"	1/8	12245	12262					\$23.30	\$25.00	\$27.30	\$51.20
1/16XL	1/2	2"	1/8	12246	12263					\$28.60	\$30.20	\$32.60	\$56.50
1/8	5/8	1-1/2	1/8	12247	12264	12279	12294			\$18.00	\$19.80	\$22.00	\$45.90
1/8L	1/2	3"	1/8	12248	12265	12280	12295			\$24.40	\$28.10	\$31.40	\$52.30
1/8XL	1"	4"	1/8	12249	12266	12281	12296			\$33.90	\$37.40	\$41.80	\$61.80
3/16	3/4	2"	3/16	12250	12267	12282	12297			\$24.40	\$27.60	\$30.40	\$78.50
3/16L	3/4	3"	3/16	12251	12268	12283	12298			\$30.70	\$35.40	\$39.20	\$84.80
3/16XL	1-3/8	4"	3/16	12252	12269	12284	12299	12310	12321	\$42.40	\$47.80	\$52.90	\$96.50
1/4	1"	2-1/2	1/4	12253	12270	12285	12300	12311	12322	\$30.70	\$35.40	\$39.50	\$97.80
1/4L	1"	4"	1/4	12254	12271	12286	12301	12312	12323	\$40.30	\$46.80	\$52.70	\$107.40
1/4XL	1-1/2	6"	1/4	12255	12272	12287	12302	12313	12324	\$58.30	\$66.60	\$74.30	\$130.70
3/8	1"	2-1/2	3/8	12256	12273	12288	12303	12314	12325	\$47.70	\$54.10	\$58.40	\$160.30
3/8L	1-3/8	4"	3/8	12257	12274	12289	12304	12315	12326	\$66.80	\$74.90	\$80.80	\$179.40
3/8XL	2"	6"	3/8	12258	12275	12290	12305	12316	12327	\$92.20	\$106.10	\$113.60	\$209.40
1/2	1-1/4	3"	1/2	12259	12276	12291	12306	12317	12328	\$74.20	\$83.20	\$88.50	\$221.40
1/2L	1-3/8	4"	1/2	12260	12277	12292	12307	12318	12329	\$89.00	\$100.90	\$108.70	\$236.20
1/2XL	2"	6"	1/2	12261	12278	12293	12308	12319	12330	\$114.50	\$131.00	\$142.40	\$299.20

GR4RUC



RTL Specs metric end mills  
Cutting Diam +0.0 / -0.05mm  
Shank Diam +0.0 / -0.008mm  
Radius ±0.025mm  
LOC +0.76 / -0.0mm  
SFR = Shrink Fit Ready

## GR Series • metric 4 flute end mills with Radius

High strength, high hardness solid carbide end mills for wide application range featuring extended cutting lengths.

- Designed for milling of hardened steels, non-metals & non-ferrous alloys
- Proprietary cemented carbide grade offers extremely high hardness and density
- Features heavy core construction for maximum rigidity • Tight tolerance
- Regular, Long (L), and Extra-Long (XL) lengths
- Add suffix to EDP# for UC, AT, D1 or D2 surface treatment
- Use UnCoated for general purpose needs
- Use AT (AlTiN) coated for high-temp exotics & alloys, die & hardened steels, stainless
- Use D1 PVD or D2 CVD Diamond for CFC's, graphite, plastics, and aluminum-silicon alloys

				4 flute metric rads											
Diam	LOC	OAL	Shank	Rad= 0.2mm EDP#	Rad= 0.3mm EDP#	Rad= 0.5mm EDP#	Rad= 1.0mm EDP#	Rad= 1.5mm EDP#	Rad= 2.0mm EDP#	Rad= 2.5mm EDP#	Rad= 3.0mm EDP#	UnCoated Price	AT Coated Price	D1 Coated Price	D2 Coated Price
3.0mm	15	38	3.0	44035	44036	44037	44038					\$20.90	\$22.90	\$25.00	\$49.20
4.0	20	50	4.0	44039	44040	44041	44042					\$27.10	\$29.60	\$33.30	\$73.10
5.0	20	50	5.0	44044	44045	44046	44047	44048				\$28.70	\$32.20	\$36.40	\$91.60
6.0	25	63	6.0	44050	44051	44052	44053	44054	44055			\$34.50	\$39.50	\$43.70	\$97.50
8.0	28	63	8.0	44057	44058	44059	44060	44061	44062	44063		\$44.50	\$52.00	\$54.60	\$128.00
10.0	30	70	10.0	44065	44066	44067	44068	44069	44070	44071	44072	\$69.00	\$78.00	\$83.20	\$188.50
12.0	32	74	12.0	44073	44074	44075	44076	44077	44078	44079	44080	\$79.40	\$88.40	\$94.60	\$212.60



## GR Series • metric end mills

High strength, high hardness solid carbide end mills

for wide application range featuring extended cutting lengths.

- Designed for milling of hardened steels, non-metals & non-ferrous alloys
- Proprietary cemented carbide grade offers extremely high hardness and density
- Features heavy core construction for maximum rigidity • Tight tolerance
- Regular, Long (L), and Extra-Long (XL) lengths
- Add suffix to EDP# for UC, AT, D1 or D2 surface treatment
- Use UnCoated for general purpose needs
- Use AT (AlTiN) coated for high-temp exotics & alloys, die & hardened steels, stainless
- Use D1 PVD or D2 CVD Diamond for CFC's, graphite, plastics, and aluminum-silicon alloys



RTL Specs Micro metric  
Cutting Diam  $\pm 0.012\text{mm}$   
Shank Diam  $+0.0 / -0.005\text{mm}$   
Radius  $\pm 0.005\text{mm}$   
LOC  $+0.25 / -0.0\text{mm}$   
SFR = Shrink Fit Ready



Diam	LOC	OAL	Shank
0.25mm	1.2	38	3.0
0.3	1.5	38	3.0
0.4	2.0	38	3.0
0.5	2.5	38	3.0
0.6	3.0	38	3.0
0.7	3.5	38	3.0
0.8	4.0	38	3.0
0.9	4.5	38	3.0
1.0	5.0	38	3.0
1.1	5.5	38	3.0
1.2	6.0	38	3.0
1.3	6.5	38	3.0
1.4	7.0	38	3.0
1.5	7.5	38	3.0
1.6	8.0	38	3.0
1.7	8.5	38	3.0
1.8	9.0	38	3.0
1.9	9.5	38	3.0
2.0	10.0	38	3.0
2.1	10.5	38	3.0
2.2	11.0	38	3.0
2.3	11.5	38	3.0
2.4	12.0	38	3.0
2.5	12.5	38	3.0
2.6	13.0	38	3.0
2.7	13.5	38	3.0
2.8	14.0	38	3.0
2.9	14.5	38	3.0
3.0	15	38	3.0
3.5	16	50	4.0
4.0	20	50	4.0
4.5	20	50	5.0
5.0	20	50	5.0
6.0	25	63	6.0
8.0	28	63	8.0
10.0	30	70	10.0
12.0	32	74	12.0

2 flute Square	2 flute Ball	4 flute Square	4 flute Ball	UC	AT	D1	D2
EDP#	EDP#	EDP#	EDP#	Price	Price	Price	Price
10453	10487			\$20.10	\$21.80	\$24.00	
10454	10488			\$20.10	\$21.80	\$24.00	
10455	10489			\$20.10	\$21.80	\$24.00	
10456	10490	12233	12235	\$20.10	\$21.80	\$24.00	\$47.00
10457	10491			\$20.10	\$21.80	\$24.00	\$47.00
10458	10492	10521	10550	\$19.10	\$20.80	\$23.00	\$47.00
10459	10493	10522	10551	\$19.10	\$20.80	\$23.00	\$47.00
10460	10494	10523	10552	\$19.10	\$20.80	\$23.00	\$47.00
10461	10495	10524	10553	\$19.10	\$20.80	\$23.00	\$47.00
10462	10496	10525	10554	\$19.10	\$20.80	\$23.00	\$47.00
10463	10497	10526	10555	\$19.10	\$20.80	\$23.00	\$47.00
10464	10498	10527	10556	\$19.10	\$20.80	\$23.00	\$47.00
10465	10499	10528	10557	\$19.10	\$20.80	\$23.00	\$47.00
10466	10500	10529	10558	\$18.00	\$19.80	\$22.00	\$46.00
10467	10501	10530	10559	\$18.00	\$19.80	\$22.00	\$46.00
10468	10502	10531	10560	\$18.00	\$19.80	\$22.00	\$46.00
10469	10503	10532	10561	\$18.00	\$19.80	\$22.00	\$46.00
10470	10504	10533	10562	\$18.00	\$19.80	\$22.00	\$46.00
10471	10505	10534	10563	\$18.00	\$19.80	\$22.00	\$46.00
10472	10506	10535	10564	\$18.00	\$19.80	\$22.00	\$46.00
10473	10507	10536	10565	\$18.00	\$19.80	\$22.00	\$46.00
10474	10508	10537	10566	\$18.00	\$19.80	\$22.00	\$46.00
10475	10509	10538	10567	\$18.00	\$19.80	\$22.00	\$46.00
10476	10510	10539	10568	\$18.00	\$19.80	\$22.00	\$46.00
10477	10511	10540	10569	\$18.00	\$19.80	\$22.00	\$46.00
10478	10512	10541	10570	\$18.00	\$19.80	\$22.00	\$46.00
10479	10513	10542	10571	\$18.00	\$19.80	\$22.00	\$46.00
10480	10514	10543	10572	\$18.00	\$19.80	\$22.00	\$46.00
10481	10515	10544	10573	\$17.00	\$18.70	\$21.00	\$45.00
10482	10516	10545	10574	\$23.30	\$25.50	\$29.10	\$69.80
10483	10517	10546	10575	\$23.30	\$25.50	\$29.10	\$69.80
10484	10518	10547	10576	\$24.90	\$28.10	\$32.20	\$89.40
10485	10519	10548	10577	\$24.90	\$28.10	\$32.20	\$89.40
10486	10520	10549	10578	\$28.60	\$33.30	\$37.40	\$93.10
10737	10740	10743	10746	\$37.10	\$44.20	\$46.80	\$121.10
10738	10741	10744	10747	\$61.50	\$69.70	\$74.90	\$185.00
10739	10742	10745	10748	\$72.10	\$80.10	\$86.30	\$208.10

35% tighter shank  
tolerance than h6!

Shrink-Fit Ready!



RTL Specs metric end mills  
Cutting Diam  $+0.0 / -0.05\text{mm}$   
Shank Diam  $+0.0 / -0.008\text{mm}$   
Radius  $\pm 0.025\text{mm}$   
LOC  $+0.76 / -0.0\text{mm}$   
SFR = Shrink Fit Ready





## CBN Series: Cubic Boron Nitride 2 flute micro ball end mills

High speed and high precision milling of hardened steels up to 70HRC.



CBN2BUC

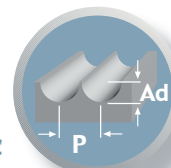


Specs (CBN micro end mills):  
Cutting Diam  $\pm .0004$  /  $-.0004$   
Shank Diam  $\pm .0000$  /  $-.0003$   
Radius  $\pm .0002$   
SFR = Shrink Fit Ready

- Solid CBN head yields extremely hard & durable cutting surface
- Mills a superb polished surface finish on work piece material
- Extremely long life and high chipping resistance
- Precision ball accuracy tolerance of  $\pm .0002$
- Oversized 1/4" carbide shank for strength w/ 2" OAL
- Clearance neck followed by 15° TPS for reach
- Up to 20X life of solid carbide end mill
- UnCoated



Ad = Axial DOC  
P = Radial step over



Diam	Radius	LOC	LBS	Neck Ø	OAL	Shank	EDP#	Price	Recommendations (for 62-70 HRc)			
									Speed	Feed	Ad	P
.010	.0050	.009	.035	.009	2"	1/4	41000	\$340.00	50,000	40	.0003	.0006
.015	.0075	.012	.047	.014	2"	1/4	41001	\$340.00	50,000	50	.0004	.0008
.020	.0100	.016	.051	.019	2"	1/4	41002	\$340.00	50,000	50	.0004	.0008
.025	.0125	.016	.063	.024	2"	1/4	41003	\$340.00	50,000	60	.0004	.0010
1/32	.0156	.020	.079	.030	2"	1/4	41004	\$340.00	50,000	80	.0006	.0012
1/16	.0312	.040	.169	.061	2"	1/4	41005	\$340.00	50,000	120	.0009	.0020

## NF Series: Non-Ferrous 2 flute micro end mills

High helix, square end design for improved milling of aluminum, copper, brass, bronze & related alloys featuring proprietary SmoothCoat coatings.



NF2SUC



RTL Specs Micro end mills  
Cutting Diam  $\pm .0005$   
Shank Diam  $\pm 0$  /  $-.0002$   
Radius  $\pm .0002$   
LOC  $\pm .010$  /  $-.000$   
SFR = Shrink Fit Ready

- Designed for milling of non-ferrous materials • Tight tolerance  $\pm .0005$  includes coating
- Proprietary cemented carbide grade with 4 different SmoothCoat micro coatings
- Features 45° helix for improved finish & increased chip removal
- LOC equals 3X cutting diameter • Necks & modifications available
- Use UnCoated for general purpose needs, corner rad alterations, etc.
- Use TC (TiCN) coated for abrasive alloys
- Use A1 (TiB2) coated for non-abrasive aluminum & magnesium alloys
- Use D1 (PVD) or D2 (CVD) Diamond coating for graphite & abrasive non-metals

Diam	LOC	OAL	Shank	EDP#	UC	TC	A1	D1	D2
					UnCoated Price	TC Coated Price	A1 Coated Price	D1 Coated Price	D2 Coated Price
.031	.093	1-1/2	1/8	50800	\$16.00	\$17.00	\$18.00	\$20.00	\$44.00
.035	.105	1-1/2	1/8	50804	\$16.00	\$17.00	\$18.00	\$20.00	\$44.00
.039	.117	1-1/2	1/8	50808	\$16.00	\$17.00	\$18.00	\$20.00	\$44.00
.040	.120	1-1/2	1/8	50812	\$16.00	\$17.00	\$18.00	\$20.00	\$44.00
.045	.135	1-1/2	1/8	50816	\$16.00	\$17.00	\$18.00	\$20.00	\$44.00
.047	.141	1-1/2	1/8	50820	\$16.00	\$17.00	\$18.00	\$20.00	\$44.00
.050	.150	1-1/2	1/8	50824	\$15.00	\$16.00	\$17.00	\$19.00	\$43.00
.055	.165	1-1/2	1/8	50828	\$15.00	\$16.00	\$17.00	\$19.00	\$43.00
.060	.180	1-1/2	1/8	50832	\$15.00	\$16.00	\$17.00	\$19.00	\$43.00
.062	.186	1-1/2	1/8	50836	\$15.00	\$16.00	\$17.00	\$19.00	\$43.00
.065	.195	1-1/2	1/8	50840	\$15.00	\$16.00	\$17.00	\$19.00	\$43.00
.070	.210	1-1/2	1/8	50844	\$15.00	\$16.00	\$17.00	\$19.00	\$43.00
.075	.225	1-1/2	1/8	50848	\$15.00	\$16.00	\$17.00	\$19.00	\$43.00
.078	.234	1-1/2	1/8	50852	\$15.00	\$16.00	\$17.00	\$19.00	\$43.00
.080	.240	1-1/2	1/8	50856	\$15.00	\$16.00	\$17.00	\$19.00	\$43.00
.085	.255	1-1/2	1/8	50860	\$15.00	\$16.00	\$17.00	\$19.00	\$43.00
.090	.270	1-1/2	1/8	50864	\$15.00	\$16.00	\$17.00	\$19.00	\$43.00
.093	.279	1-1/2	1/8	50868	\$15.00	\$16.00	\$17.00	\$19.00	\$43.00
.095	.285	1-1/2	1/8	50872	\$15.00	\$16.00	\$17.00	\$19.00	\$43.00
.100	.300	1-1/2	1/8	50876	\$15.00	\$16.00	\$17.00	\$19.00	\$43.00
.118	.354	1-1/2	1/8	50880	\$15.00	\$16.00	\$17.00	\$19.00	\$43.00
.1245	.375	1-1/2	1/8	50884	\$15.00	\$16.00	\$17.00	\$19.00	\$43.00

## SS Series: 5 flute micro end mills for finishing

High helix, square end design for finishing operations in stainless, steels, titanium, high-temp alloys & more featuring unequal indexing plus SmoothCoat coatings.



SS5SUC

1/8" shank



RTL Specs Micro end mills  
Cutting Diam  $\pm .0005$   
Shank Diam  $+0 / -.0002$   
Radius  $\pm .0002$   
LOC  $+ .010 / -.000$   
SFR = Shrink Fit Ready

- Designed for finishing of tough ferrous materials • Tight tolerance  $\pm .0005$  includes coating
- Proprietary cemented carbide grade with 3 different SmoothCoat micro coatings
- Features 45° helix with heavy core for strength & unequal indexing
- LOC equals 3X cutting diameter • Necks & modifications available
- Use UnCoated for general purpose needs, corner rad alterations, etc.
- Use AT (AlTiN) coated for stainless, carbon, & tool steels, and high temp alloys
- Use D1 PVD or D2 CVD Diamond for CFC's, graphite, plastics, and aluminum-silicon alloys

						UC	AT	D1	D2
						UnCoated Price	AT Coated Price	D1 Coated Price	D2 Coated Price
Diam	LOC	OAL	Shank	EDP#					
.031	.093	1-1/2	1/8	50900		\$18.00	\$19.00	\$22.00	\$46.00
.040	.120	1-1/2	1/8	50904		\$18.00	\$19.00	\$22.00	\$46.00
.047	.141	1-1/2	1/8	50908		\$18.00	\$19.00	\$22.00	\$46.00
.050	.150	1-1/2	1/8	50912		\$17.00	\$18.00	\$21.00	\$45.00
.060	.180	1-1/2	1/8	50916		\$17.00	\$18.00	\$21.00	\$45.00
.062	.186	1-1/2	1/8	50920		\$17.00	\$18.00	\$21.00	\$45.00
.070	.210	1-1/2	1/8	50924		\$17.00	\$18.00	\$21.00	\$45.00
.078	.234	1-1/2	1/8	50928		\$17.00	\$18.00	\$21.00	\$45.00
.080	.240	1-1/2	1/8	50932		\$17.00	\$18.00	\$21.00	\$45.00
.090	.270	1-1/2	1/8	50936		\$17.00	\$18.00	\$21.00	\$45.00
.093	.279	1-1/2	1/8	50940		\$17.00	\$18.00	\$21.00	\$45.00
.100	.300	1-1/2	1/8	50944		\$17.00	\$18.00	\$21.00	\$45.00
.1245	.375	1-1/2	1/8	50948		\$17.00	\$18.00	\$21.00	\$45.00

## SSL Series: Long 5 flute micro end mills for finishing

High helix, square end design for finishing operations in stainless, steels, titanium, high-temp alloys & more featuring unequal indexing, SmoothCoat and 2.5" OAL.



SSL5SUC

1/8" shank



RTL Specs Micro end mills  
Cutting Diam  $\pm .0005$   
Shank Diam  $+0 / -.0002$   
Radius  $\pm .0002$   
LOC  $+ .010 / -.000$   
SFR = Shrink Fit Ready

- Designed for finishing of tough ferrous materials • Tight tolerance  $\pm .0005$  includes coating
- Proprietary cemented carbide grade with 3 different SmoothCoat micro coatings
- Features 45° helix with heavy core for strength with OAL = 2.5"
- LOC equals 5X cutting diameter • Necks & modifications available
- Use UnCoated for general purpose needs, corner rad alterations, etc.
- Use AT (AlTiN) coated for stainless, carbon, & tool steels, and high temp alloys
- Use D1 PVD or D2 CVD Diamond for CFC's, graphite, plastics, and aluminum-silicon alloys

						UC	AT	D1	D2
						UnCoated Price	AT Coated Price	D1 Coated Price	D2 Coated Price
Diam	LOC	OAL	Shank	EDP#					
.031	.155	2-1/2	1/8	50952		\$27.00	\$29.00	\$33.00	\$62.00
.040	.200	2-1/2	1/8	50956		\$27.00	\$29.00	\$33.00	\$62.00
.047	.235	2-1/2	1/8	50960		\$27.00	\$29.00	\$33.00	\$62.00
.050	.250	2-1/2	1/8	50964		\$27.00	\$29.00	\$33.00	\$62.00
.060	.300	2-1/2	1/8	50968		\$27.00	\$29.00	\$33.00	\$62.00
.062	.310	2-1/2	1/8	50972		\$27.00	\$29.00	\$33.00	\$62.00
.070	.350	2-1/2	1/8	50976		\$27.00	\$29.00	\$33.00	\$62.00
.078	.390	2-1/2	1/8	50980		\$27.00	\$29.00	\$33.00	\$62.00
.080	.400	2-1/2	1/8	50984		\$27.00	\$29.00	\$33.00	\$62.00
.090	.450	2-1/2	1/8	50988		\$27.00	\$29.00	\$33.00	\$62.00
.093	.465	2-1/2	1/8	50992		\$27.00	\$29.00	\$33.00	\$62.00
.100	.500	2-1/2	1/8	50996		\$27.00	\$29.00	\$33.00	\$62.00
.1245	.625	2-1/2	1/8	51100		\$27.00	\$29.00	\$33.00	\$62.00





## LR5X Series: Long Reach 3 flute micro end mills

Short flute length for rigidity in deep cavity milling with 5X diameter reach  
featuring proprietary SmoothCoat coating and 2.5" OAL.



LR5X3RUC (pictured)

Also available as LR5X3SUC and LR5X3BUC  
plus 3 coating options.

- Designed for cavity milling of a wide range of materials • Tight tolerance  $\pm .0005$
- Proprietary cemented carbide grade with 3 different SmoothCoat micro coatings
- Features three flutes @ 30° helix & reduced neck for clearance
- LOC = 1.5X cutting diameter • Total length below shank (LBS) = 5X.
- Use UnCoated for general purpose needs
- Use AT (AlTiN) coated for high-temp exotics & alloys, die & hardened steels, stainless
- Use D1 PVD or D2 CVD Diamond for CFC's, graphite, plastics, and aluminum-silicon alloys

1/8" shank

RTL Specs Micro end mills  
Cutting Diam  $\pm .0005$   
Shank Diam  $+0 / -.0002$   
Radius  $\pm .0002$   
LOC  $+0.010 / -.000$   
SFR = Shrink Fit Ready

							UC	AT	D1	D2
Diam	End	LOC	LBS	OAL	Shank	EDP#	UnCoated Price	AT Coated Price	D1 Coated Price	D2 Coated Price
.031	Square	.046	.156	2-1/2	1/8	50640	\$27.00	\$29.00	\$33.00	\$62.00
.031	.005 Rad	.046	.156	2-1/2	1/8	50644	\$27.00	\$29.00	\$33.00	\$62.00
.031	.010 Rad	.046	.156	2-1/2	1/8	50648	\$27.00	\$29.00	\$33.00	\$62.00
.031	Ball	.046	.156	2-1/2	1/8	50652	\$27.00	\$29.00	\$33.00	\$62.00
.047	Square	.070	.250	2-1/2	1/8	50656	\$27.00	\$29.00	\$33.00	\$62.00
.047	.005 Rad	.070	.250	2-1/2	1/8	50660	\$27.00	\$29.00	\$33.00	\$62.00
.047	.010 Rad	.070	.250	2-1/2	1/8	50664	\$27.00	\$29.00	\$33.00	\$62.00
.047	Ball	.070	.250	2-1/2	1/8	50668	\$27.00	\$29.00	\$33.00	\$62.00
.062	Square	.093	.312	2-1/2	1/8	50672	\$27.00	\$29.00	\$33.00	\$62.00
.062	.005 Rad	.093	.312	2-1/2	1/8	50676	\$27.00	\$29.00	\$33.00	\$62.00
.062	.010 Rad	.093	.312	2-1/2	1/8	50680	\$27.00	\$29.00	\$33.00	\$62.00
.062	.015 Rad	.093	.312	2-1/2	1/8	50684	\$27.00	\$29.00	\$33.00	\$62.00
.062	Ball	.093	.312	2-1/2	1/8	50688	\$27.00	\$29.00	\$33.00	\$62.00
.078	Square	.117	.406	2-1/2	1/8	50692	\$27.00	\$29.00	\$33.00	\$62.00
.078	.005 Rad	.117	.406	2-1/2	1/8	50696	\$27.00	\$29.00	\$33.00	\$62.00
.078	.010 Rad	.117	.406	2-1/2	1/8	50700	\$27.00	\$29.00	\$33.00	\$62.00
.078	.015 Rad	.117	.406	2-1/2	1/8	50704	\$27.00	\$29.00	\$33.00	\$62.00
.078	Ball	.117	.406	2-1/2	1/8	50708	\$27.00	\$29.00	\$33.00	\$62.00
.093	Square	.139	.500	2-1/2	1/8	50712	\$27.00	\$29.00	\$33.00	\$62.00
.093	.005 Rad	.139	.500	2-1/2	1/8	50716	\$27.00	\$29.00	\$33.00	\$62.00
.093	.010 Rad	.139	.500	2-1/2	1/8	50720	\$27.00	\$29.00	\$33.00	\$62.00
.093	.015 Rad	.139	.500	2-1/2	1/8	50724	\$27.00	\$29.00	\$33.00	\$62.00
.093	Ball	.139	.500	2-1/2	1/8	50728	\$27.00	\$29.00	\$33.00	\$62.00
.1245	Square	.187	.625	2-1/2	1/8	50732	\$27.00	\$29.00	\$33.00	\$62.00
.1245	.005 Rad	.187	.625	2-1/2	1/8	50736	\$27.00	\$29.00	\$33.00	\$62.00
.1245	.010 Rad	.187	.625	2-1/2	1/8	50740	\$27.00	\$29.00	\$33.00	\$62.00
.1245	.015 Rad	.187	.625	2-1/2	1/8	50744	\$27.00	\$29.00	\$33.00	\$62.00
.1245	Ball	.187	.625	2-1/2	1/8	50748	\$27.00	\$29.00	\$33.00	\$62.00

35% tighter shank  
tolerance than h6!  
Shrink-Fit Ready!



## LR8X Series: Long Reach 3 flute micro end mills

Short flute length for rigidity in deep cavity milling with 8X diameter reach  
featuring proprietary SmoothCoat coatings and 2.5" OAL.



LR8X3RUC (pictured)

Also available as LR8X3SUC and LR8X3BUC  
plus 3 coating options.

- Designed for cavity milling of a wide range of materials • Tight tolerance  $\pm .0005$
- Proprietary cemented carbide grade with 3 different SmoothCoat micro coatings
- Features three flutes @ 30° helix & reduced neck for clearance
- LOC = 1.5X cutting diameter • Total length below shank (LBS) = 8X.
- Use UnCoated for general purpose needs
- Use AT (AlTiN) coated for high-temp exotics & alloys, die & hardened steels, stainless
- Use D1 PVD or D2 CVD Diamond for CFC's, graphite, plastics, and aluminum-silicon alloys



Diam	End	LOC	LBS	OAL	Shank	EDP#	UnCoated Price	AT Coated Price	D1 Coated Price	D2 Coated Price
.031	Square	.046	.250	2-1/2	1/8	51640	\$28.00	\$30.00	\$34.00	\$63.00
.031	.005 Rad	.046	.250	2-1/2	1/8	51644	\$28.00	\$30.00	\$34.00	\$63.00
.031	.010 Rad	.046	.250	2-1/2	1/8	51648	\$28.00	\$30.00	\$34.00	\$63.00
.031	Ball	.046	.250	2-1/2	1/8	51652	\$28.00	\$30.00	\$34.00	\$63.00
.047	Square	.070	.375	2-1/2	1/8	51656	\$28.00	\$30.00	\$34.00	\$63.00
.047	.005 Rad	.070	.375	2-1/2	1/8	51660	\$28.00	\$30.00	\$34.00	\$63.00
.047	.010 Rad	.070	.375	2-1/2	1/8	51664	\$28.00	\$30.00	\$34.00	\$63.00
.047	Ball	.070	.375	2-1/2	1/8	51668	\$28.00	\$30.00	\$34.00	\$63.00
.062	Square	.093	.500	2-1/2	1/8	51672	\$28.00	\$30.00	\$34.00	\$63.00
.062	.005 Rad	.093	.500	2-1/2	1/8	51676	\$28.00	\$30.00	\$34.00	\$63.00
.062	.010 Rad	.093	.500	2-1/2	1/8	51680	\$28.00	\$30.00	\$34.00	\$63.00
.062	.015 Rad	.093	.500	2-1/2	1/8	51684	\$28.00	\$30.00	\$34.00	\$63.00
.062	Ball	.093	.500	2-1/2	1/8	51688	\$28.00	\$30.00	\$34.00	\$63.00
.078	Square	.117	.625	2-1/2	1/8	51692	\$28.00	\$30.00	\$34.00	\$63.00
.078	.005 Rad	.117	.625	2-1/2	1/8	51696	\$28.00	\$30.00	\$34.00	\$63.00
.078	.010 Rad	.117	.625	2-1/2	1/8	51700	\$28.00	\$30.00	\$34.00	\$63.00
.078	.015 Rad	.117	.625	2-1/2	1/8	51704	\$28.00	\$30.00	\$34.00	\$63.00
.078	Ball	.117	.625	2-1/2	1/8	51708	\$28.00	\$30.00	\$34.00	\$63.00
.093	Square	.139	.750	2-1/2	1/8	51712	\$28.00	\$30.00	\$34.00	\$63.00
.093	.005 Rad	.139	.750	2-1/2	1/8	51716	\$28.00	\$30.00	\$34.00	\$63.00
.093	.010 Rad	.139	.750	2-1/2	1/8	51720	\$28.00	\$30.00	\$34.00	\$63.00
.093	.015 Rad	.139	.750	2-1/2	1/8	51724	\$28.00	\$30.00	\$34.00	\$63.00
.093	Ball	.139	.750	2-1/2	1/8	51728	\$28.00	\$30.00	\$34.00	\$63.00
.1245	Square	.187	.950	2-1/2	1/8	51732	\$28.00	\$30.00	\$34.00	\$63.00
.1245	.005 Rad	.187	.950	2-1/2	1/8	51736	\$28.00	\$30.00	\$34.00	\$63.00
.1245	.010 Rad	.187	.950	2-1/2	1/8	51740	\$28.00	\$30.00	\$34.00	\$63.00
.1245	.015 Rad	.187	.950	2-1/2	1/8	51744	\$28.00	\$30.00	\$34.00	\$63.00
.1245	Ball	.187	.950	2-1/2	1/8	51748	\$28.00	\$30.00	\$34.00	\$63.00

35% tighter shank  
tolerance than h6!  
Shrink-Fit Ready!



### Material Warning



**SmoothCoat®**  
SuperNitride PVD Hard Coatings Exclusively by Tool Alliance®





## LR12X Series: Long Reach 3 flute micro end mills

Short flute length for rigidity in deep cavity milling with 12X diameter reach  
featuring proprietary SmoothCoat coatings and 2.5" OAL.



LR12X3RUC (pictured)

Also available as LR12X3SUC and LR12X3BUC  
plus 3 coating options.

- Designed for cavity milling of a wide range of materials • Tight tolerance  $\pm .0005$
- Proprietary cemented carbide grade with 3 different SmoothCoat micro coatings
- Features three flutes @ 30° helix & reduced neck for clearance
- LOC = 1.5X cutting diameter • Total length below shank (LBS) = 12X.
- Use UnCoated for general purpose needs
- Use AT (AlTiN) coated for high-temp exotics & alloys, die & hardened steels, stainless
- Use D1 PVD or D2 CVD Diamond for CFC's, graphite, plastics, and aluminum-silicon alloys



RTL Specs Micro end mills  
Cutting Diam  $\pm .0005$   
Shank Diam  $+0 / -.0002$   
Radius  $\pm .0002$   
LOC  $+0.010 / -.000$   
SFR = Shrink Fit Ready

							UC	AT	D1	D2
Diam	End	LOC	LBS	OAL	Shank	EDP#	UnCoated Price	AT Coated Price	D1 Coated Price	D2 Coated Price
.031	Square	.046	.375	2-1/2	1/8	52640	\$29.00	\$31.00	\$35.00	\$64.00
.031	.005 Rad	.046	.375	2-1/2	1/8	52644	\$29.00	\$31.00	\$35.00	\$64.00
.031	.010 Rad	.046	.375	2-1/2	1/8	52648	\$29.00	\$31.00	\$35.00	\$64.00
.031	Ball	.046	.375	2-1/2	1/8	52652	\$29.00	\$31.00	\$35.00	\$64.00
.047	Square	.070	.570	2-1/2	1/8	52656	\$29.00	\$31.00	\$35.00	\$64.00
.047	.005 Rad	.070	.570	2-1/2	1/8	52660	\$29.00	\$31.00	\$35.00	\$64.00
.047	.010 Rad	.070	.570	2-1/2	1/8	52664	\$29.00	\$31.00	\$35.00	\$64.00
.047	Ball	.070	.570	2-1/2	1/8	52668	\$29.00	\$31.00	\$35.00	\$64.00
.062	Square	.093	.750	2-1/2	1/8	52672	\$29.00	\$31.00	\$35.00	\$64.00
.062	.005 Rad	.093	.750	2-1/2	1/8	52676	\$29.00	\$31.00	\$35.00	\$64.00
.062	.010 Rad	.093	.750	2-1/2	1/8	52680	\$29.00	\$31.00	\$35.00	\$64.00
.062	.015 Rad	.093	.750	2-1/2	1/8	52684	\$29.00	\$31.00	\$35.00	\$64.00
.062	Ball	.093	.750	2-1/2	1/8	52688	\$29.00	\$31.00	\$35.00	\$64.00
.078	Square	.117	.940	2-1/2	1/8	52692	\$29.00	\$31.00	\$35.00	\$64.00
.078	.005 Rad	.117	.940	2-1/2	1/8	52696	\$29.00	\$31.00	\$35.00	\$64.00
.078	.010 Rad	.117	.940	2-1/2	1/8	52700	\$29.00	\$31.00	\$35.00	\$64.00
.078	.015 Rad	.117	.940	2-1/2	1/8	52704	\$29.00	\$31.00	\$35.00	\$64.00
.078	Ball	.117	.940	2-1/2	1/8	52708	\$29.00	\$31.00	\$35.00	\$64.00
.093	Square	.139	1.125	2-1/2	1/8	52712	\$29.00	\$31.00	\$35.00	\$64.00
.093	.005 Rad	.139	1.125	2-1/2	1/8	52716	\$29.00	\$31.00	\$35.00	\$64.00
.093	.010 Rad	.139	1.125	2-1/2	1/8	52720	\$29.00	\$31.00	\$35.00	\$64.00
.093	.015 Rad	.139	1.125	2-1/2	1/8	52724	\$29.00	\$31.00	\$35.00	\$64.00
.093	Ball	.139	1.125	2-1/2	1/8	52728	\$29.00	\$31.00	\$35.00	\$64.00
.1245	Square	.187	1.500	2-1/2	1/8	52732	\$29.00	\$31.00	\$35.00	\$64.00
.1245	.005 Rad	.187	1.500	2-1/2	1/8	52736	\$29.00	\$31.00	\$35.00	\$64.00
.1245	.010 Rad	.187	1.500	2-1/2	1/8	52740	\$29.00	\$31.00	\$35.00	\$64.00
.1245	.015 Rad	.187	1.500	2-1/2	1/8	52744	\$29.00	\$31.00	\$35.00	\$64.00
.1245	Ball	.187	1.500	2-1/2	1/8	52748	\$29.00	\$31.00	\$35.00	\$64.00

## About the technology partners of RoundTool Laboratories®

Our technology partners are second to none. We find premiere firms, the technological leaders in their respective industries, throughout the world and work with them in progressive, win-win relationships to bring our customers the very finest components and characteristics that we build into our products. Constant reinvestment into our company-owned factories promise long-term stability & consistency in delivering Performance & Solutions to carbide rotary tooling consumers everywhere.



Coating systems



Substrate, abrasive, coolants & workholding



5-axis VMC control

Robotics



CNC grinder control



Grinding centers



# HT Series • AT coated 6 or 8 flute Square & Radius High strength, heavy core solid carbide end mills for high-speed machining of heat-treated & hardened materials up to 70HRC.

- Designed for peripheral milling or toroidal slotting • Proprietary cemented carbide grade and SmoothCoat AlTiN
- Includes SmoothEdge edge prep • Maximum tool life and performance in HSM applications



HT6SAT					
Diam	LOC	OAL	Shank	Flutes	
1/8	1/2	1-1/2	1/8	6	
3/16	5/8	2"	3/16	6	
1/4	3/4	2-1/2	1/4	6	
5/16	13/16	2-1/2	5/16	6	
3/8	1"	2-1/2	3/8	6	
1/2	1"	3"	1/2	6	
5/8	1-1/4	3-1/2	5/8	8	
3/4	1-1/2	4"	3/4	8	
1"	1-1/2	4"	1"	8	

Square HT6 or HT8SAT	
EDP#	Price
23900AT	\$22.40
23902AT	\$26.00
23904AT	\$32.20
23906AT	\$39.50
23908AT	\$51.00
23910AT	\$78.00
23912AT	\$141.40
23914AT	\$187.20
23916AT	\$291.20

Radius HT6 or HT8RAT	
EDP#	Price
23918AT	\$23.90
23920AT	\$28.10
23922AT	\$35.40
23924AT	\$43.70
23926AT	\$56.20
23928AT	\$85.30
23930AT	\$149.80
23932AT	\$197.60
23934AT	\$301.60

Metric Square HT6 or HT8SAT					
Diam	LOC	OAL	Shank	Flutes	
3.0mm	12	38	3.0	6	
4.0	14	50	4.0	6	
5.0	16	50	5.0	6	
6.0	19	63	6.0	6	
8.0	20	63	8.0	6	
10.0	25	70	10.0	6	
12.0	30	74	12.0	6	
16.0	32	89	16.0	8	
20.0	38	100	20.0	8	

Metric Square HT6 or HT8SAT	
EDP#	Price
23960AT	\$22.40
23962AT	\$25.00
23964AT	\$26.00
23966AT	\$32.20
23968AT	\$39.50
23970AT	\$64.50
23972AT	\$78.00
23974AT	\$141.40
23976AT	\$208.00

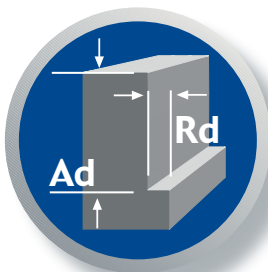
Metric Radius HT6 or HT8RAT	
EDP#	Price
23978AT	\$23.90
23980AT	\$27.00
23982AT	\$28.10
23984AT	\$35.40
23986AT	\$43.70
23988AT	\$69.70
23990AT	\$85.30
23992AT	\$149.80
23994AT	\$218.40

RTL Specs end mills  
Cutting Diam +0 / -.002  
Shank Diam +0 / -.0003  
Radius ±.001  
LOC +.030 / -.000  
SFR = Shrink Fit Ready

RTL Specs metric end mills  
Cutting Diam +0.0 / -.05mm  
Shank Diam +0.0 / -.008mm  
Radius ±0.025mm  
LOC +0.76 / -0.0mm  
SFR = Shrink Fit Ready

• Axial depth (Ad) and Radial depth (Rd) are expressed in % of cutter diameter.

• If recommended speed is higher than machine tool's capacity, run at maximum RPM and reduce feed appropriately.



Peripheral milling



Slot milling

Material Hardness	35 - 45 HRC		45 - 55 HRC		55 - 65 HRC		65 - 70 HRC	
Depth of cut Peripheral:	Ad = 1.5xD Rd=.1xD		Ad = 1.0xD Rd=.05xD		Ad = 1.0xD Rd=.03xD		Ad = 1.0xD Rd=.02xD	
Depth of cut Slotting:	Ad = .1xD		Ad = .1xD		Ad = .05xD		Ad = .02xD	
	Speed	Feed	Speed	Feed	Speed	Feed	Speed	Feed
Fractional Mill Diameter	RPM	in/min	RPM	in/min	RPM	in/min	RPM	in/min
1/8"	18,000	85	13,500	48	11,000	33	7,600	21
3/16"	12,000	86	9,000	54	7,500	36	5,000	21
1/4"	9,200	100	7,500	72	5,600	40	3,800	20
5/16"	7,000	05	5,600	74	4,200	50	3,000	27
3/8"	5,600	105	4,300	76	3,500	50	2,500	27
1/2"	3,800	90	3,000	55	2,500	30	1,500	15

Material Hardness	35 - 45 HRC		45 - 55 HRC		55 - 65 HRC		65 - 70 HRC	
Depth of cut Peripheral:	Ad = 1.5xD Rd=.1xD		Ad = 1.0xD Rd=.05xD		Ad = 1.0xD Rd=.03xD		Ad = 1.0xD Rd=.02xD	
Depth of cut Slotting:	Ad = .1xD		Ad = .1xD		Ad = .05xD		Ad = .02xD	
	Speed	Feed	Speed	Feed	Speed	Feed	Speed	Feed
Metric Mill Diameter	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min
3.0 mm	19,500	2,300	14,000	1,280	11,900	900	8,050	600
4.0	14,000	2,600	11,000	1,670	9,000	1,050	6,000	600
5.0	10,750	2,600	7,300	1,550	5,550	1,100	4,400	510
6.0	9,700	2,500	7,600	1,850	6,000	1,280	3,700	510
8.0	7,000	2,700	5,600	1,900	4,200	1,280	2,800	640
10.0	5,600	2,765	4,400	2,000	3,600	1,450	2,250	685
12.0	4,650	2,750	3,700	1,790	3,000	1,150	1,900	500



## DM Series • AT coated heavy core Ball Nose

High strength, high hardness solid carbide ball end mills for  
HSM roughing & finishing of hardened alloys up to 65HRC.



- Designed for milling complex contours and shapes in hard metals
- Proprietary cemented carbide grade, AlTiN coating & edge prep
- Maximum tool life and performance in HSM applications
- Extremely close diameter & radius tolerances
- Order by EDP# or "DM2BAT 1/4L"



	Diam	LOC	LBS	Taper	OAL	Shank	EDP#	Price	EDP#	Price
SE	.032	.032		5°	3"	1/4	24085AT	\$33.00	24485AT	\$33.00
	.040	.040		5°	3"	1/4	24086AT	\$33.00	24486AT	\$33.00
	1/16	1/16		5°	3"	1/4	24088AT	\$33.00	24488AT	\$33.00
	.080	.080		5°	3"	1/4	24090AT	\$33.00	24490AT	\$33.00
	3/32	3/32		5°	3"	1/4	24092AT	\$33.00	24492AT	\$33.00
	1/8	1/8		5°	3"	1/4	24094AT	\$33.00	24494AT	\$33.00
	3/16	3/16		5°	3"	1/4	24097AT	\$33.00	24497AT	\$33.00
	1/4	1/4	1/2		3"	1/4	24100AT	\$33.00	24400AT	\$33.00
	1/4L	1/4		5°	4"	3/8	24101AT	\$68.00	24401AT	\$68.00
	5/16	5/16		5°	4"	3/8	24103AT	\$68.00	24403AT	\$68.00
	3/8	3/8	3/4		4"	3/8	24104AT	\$68.00	24404AT	\$68.00
	3/8L	3/8		5°	5"	1/2	24109AT	\$118.00	24409AT	\$118.00
	1/2	1/2	1"		4"	1/2	24107AT	\$100.00	24407AT	\$100.00
	1/2L	1/2		5°	5"	5/8	24110AT	\$150.00	24410AT	\$150.00



RTL Specs DM Series  
Cutting Diam +0 / -.001  
Shank Diam +0 / -.0003  
Radius ±.0005  
LOC +.030 / -.000  
SFR = Shrink Fit Ready

### Metric sizes



	Diam	LOC	LBS	Taper	OAL	Shank	EDP#	Price	EDP#	Price
SE	0.5mm	0.5		5°	75	6.0	24115AT	\$33.00	24415AT	\$33.00
	1.0	1		5°	75	6.0	24116AT	\$33.00	24416AT	\$33.00
	1.5	1.5		5°	75	6.0	24118AT	\$33.00	24418AT	\$33.00
	2.0	2		5°	75	6.0	24120AT	\$33.00	24420AT	\$33.00
	3.0	3		5°	75	6.0	24122AT	\$33.00	24422AT	\$33.00
	4.0	4		5°	75	6.0	24124AT	\$33.00	24424AT	\$33.00
	5.0	5		5°	75	6.0	24126AT	\$33.00	24426AT	\$33.00
	6.0	6	12		75	6.0	24136AT	\$33.00	24436AT	\$33.00
	6.0	6		5°	100	8.0	24128AT	\$58.00	24428AT	\$58.00
	8.0	8		5°	100	10.0	24130AT	\$76.00	24430AT	\$76.00
	10.0	10	20		100	10.0	24132AT	\$76.00	24432AT	\$76.00
	12.0	12	24		100	12.0	24134AT	\$100.00	24434AT	\$100.00



RTL Specs metric DM  
Cutting Diam +0.0 / -.025mm  
Shank Diam +0.0 / -.008mm  
Radius ±0.012mm  
LOC +0.76 / -.0mm  
SFR = Shrink Fit Ready



35% tighter shank  
tolerance than h6!  
Shrink-Fit Ready!



## DM Series • AT coated heavy core w/ Radius

High strength, high hardness solid carbide radius end mills for  
HSM roughing & finishing of hardened alloys up to 65HRC.



- Designed for milling complex contours and shapes in hard metals
- Proprietary cemented carbide grade, AlTiN coating & edge prep
- Maximum tool life and performance in HSM applications
- Extremely close diameter & radius tolerances
- Order by EDP# or "DM4RAT 1/4L .031"

DM2RAT

DM4RAT

SE	Diam	LOC	LBS	Taper	OAL	Shank
	1/8	1/8		5°	3"	1/4
	3/16	3/16		5°	3"	1/4
	1/4	1/4	1/2		3"	1/4
	1/4L	1/4		5°	4"	3/8
	3/8	3/8	3/4		4"	3/8
	3/8L	3/8		5°	5"	1/2
	1/2	1/2	1"		4"	1/2
	1/2L	1/2		5°	5"	5/8

Radius Size Rad	2 flute DM2RAT EDP#	4 flute DM4RAT EDP#	Radius Size Rad	2 flute DM2RAT EDP#	4 flute DM4RAT EDP#	Radius AT Coated Price
.015	24500AT	24502AT	.020	24501AT	24503AT	\$33.00
.015	24504AT	24506AT	.020	24505AT	24507AT	\$33.00
.020	24508AT	24510AT	.031	24509AT	24511AT	\$33.00
.020	24512AT	24514AT	.031	24513AT	24515AT	\$68.00
.031	24516AT	24518AT	.062	24517AT	24519AT	\$68.00
.031	24520AT	24522AT	.062	24521AT	24523AT	\$118.00
.031	24524AT	24526AT	.062	24525AT	24527AT	\$100.00
.031	24528AT	24530AT	.062	24529AT	24531AT	\$150.00



RTL Specs DM Series  
Cutting Diam +0 / -.001  
Shank Diam +0 / -.0003  
Radius ±.0005  
LOC +.030 / -.000  
SFR = Shrink Fit Ready

### Metric sizes

DM2RAT

DM4RAT

SE	Diam	LOC	LBS	Taper	OAL	Shank
	3.0mm	3		5°	75	6.0
	4.0	4		5°	75	6.0
	5.0	5		5°	75	6.0
	6.0	6	12		75	6.0
	6.0	6		5°	100	8.0
	8.0	8		5°	100	10.0
	10.0	10	20		100	10.0
	12.0	12	24		100	12.0

Radius Size Rad	2 flute DM2RAT EDP#	4 flute DM4RAT EDP#	Radius Size Rad	2 flute DM2RAT EDP#	4 flute DM4RAT EDP#	Radius AT Coated Price
0.3	24532AT	24534AT	0.5	24533AT	24535AT	\$33.00
0.3	24536AT	24538AT	0.5	24537AT	24539AT	\$33.00
0.3	24540AT	24542AT	0.5	24541AT	24543AT	\$33.00
0.5	24544AT	24546AT	0.8	24545AT	24547AT	\$33.00
0.5	24548AT	24550AT	0.8	24549AT	24551AT	\$58.00
0.5	24552AT	24554AT	0.8	24553AT	24555AT	\$76.00
1.0	24556AT	24558AT	1.5	24557AT	24559AT	\$76.00
1.0	24560AT	24562AT	1.5	24561AT	24563AT	\$100.00



RTL Specs metric DM  
Cutting Diam +0.0 / -.025mm  
Shank Diam +0.0 / -.008mm  
Radius ±0.012mm  
LOC +0.76 / -.0mm  
SFR = Shrink Fit Ready

35% tighter shank  
tolerance than h6!  
Shrink-Fit Ready!

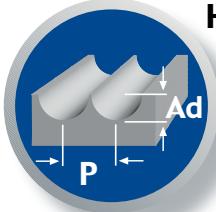






## DM Series • Technical Data

High strength, high hardness solid carbide ball end mills for high-speed machining of hardened alloys up to 65HRc.



- Designed for milling complex contours and shapes
- Proprietary cemented carbide grade and coating
- Maximum tool life and performance in HSM applications
- Pitch (P) and Axial depth (Ad) are expressed in % of cutter diameter
- If recommended speed is higher than machine tool's capacity, run at maximum RPM and reduce feed appropriately



RTL Specs DM Series  
Cutting Diam +0 / -.001  
Shank Diam +0 / -.0003  
Radius ±.0005  
LOC +.030 / -.000  
SFR = Shrink Fit Ready



Material Hardness	30 - 40 HRc		40 - 45 HRc		45 - 55 HRc		55 - 60 HRc		60 - 65 HRc	
Depth of Cut	Ad = .1xD	P = .2xD	Ad = .05xD	P = .2xD	Ad = .03xD	P = .1xD	Ad = .02xD	P = .1xD	Ad = .01xD	P = .1xD
	Speed	Feed	Speed	Feed	Speed	Feed	Speed	Feed	Speed	Feed
Fractional Diameter	RPM	in/min	RPM	in/min	RPM	in/min	RPM	in/min	RPM	in/min
.032	38,800	39	38,800	39	38,800	39	38,800	34	37,600	21
.040	31,040	59	31,040	59	31,040	59	28,000	55	15,550	21
1/16"	31,040	74	31,040	74	31,040	74	28,000	70	15,550	23
.080	31,040	74	31,040	74	31,040	74	28,000	70	15,550	23
3/32"	31,040	74	31,040	74	31,040	74	28,000	70	15,550	23
1/8"	23,925	86	23,925	80	20,925	80	18,925	70	10,425	23
3/16"	14,550	97	14,550	91	12,550	83	11,050	75	6,400	23
1/4"	12,025	97	12,025	85	10,625	83	9,625	75	8,425	25
5/16"	9,300	72	9,300	72	8,100	62	7,300	56	4,100	19
3/8"	7,285	54	7,285	54	6,300	46	5,650	40	3,400	15
7/16"	6,425	49	6,425	49	5,600	43	5,100	39	3,000	14
1/2"	6,125	48	6,125	48	5,325	42	4,775	38	2,675	13

Material Hardness	30 - 40 HRc		40 - 45 HRc		45 - 55 HRc		55 - 60 HRc		60 - 65 HRc	
Depth of Cut	Ad = .1xD	P = .2xD	Ad = .05xD	P = .2xD	Ad = .03xD	P = .1xD	Ad = .02xD	P = .1xD	Ad = .01xD	P = .1xD
	Speed	Feed	Speed	Feed	Speed	Feed	Speed	Feed	Speed	Feed
Metric Mill Diameter	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min
0.50 mm	38,800	991	38,800	991	38,800	991	38,800	864	37,600	533
1.0 mm	31,040	1,499	31,040	1,499	31,040	1,499	28,000	1,397	15,550	533
1.5 mm	31,040	1,880	31,040	1,880	31,040	1,880	28,000	1,778	15,550	584
2.0 mm	31,040	1,880	31,040	1,880	31,040	1,880	28,000	1,778	15,550	584
3.0 mm	31,040	1,880	31,040	1,880	31,040	1,880	28,000	1,778	15,550	584
4.0 mm	23,925	2,184	23,925	2,032	20,925	2,032	18,925	1,778	10,425	584
5.0 mm	14,550	2,464	14,550	2,311	12,550	2,108	11,050	1,905	6,400	584
6.0 mm	12,025	2,464	12,025	2,159	10,625	2,108	9,625	1,905	8,425	635
8.0 mm	9,300	1,829	9,300	1,829	8,100	1,575	7,300	1,422	4,100	483
10.0 mm	7,285	1,372	7,285	1,372	6,300	1,168	5,650	1,016	3,400	381
12.0 mm	6,425	1,245	6,425	1,245	5,600	1,092	5,100	991	3,000	356

35% tighter shank tolerance than h6!  
Shrink-Fit Ready!



RTL Specs metric DM  
Cutting Diam +0.0 / -0.025mm  
Shank Diam +0.0 / -0.008mm  
Radius ±0.012mm  
LOC +0.76 / -0.0mm  
SFR = Shrink Fit Ready

## MD Series • 2 flute precision Micro Drills

**Tight tolerance drills w/4-facet point featuring proprietary SmoothCoat for micro tools.**

- Designed for micro drilling of a wide range of materials • Proprietary cemented carbide grade & SmoothCoat • Use UnCoated for general purpose needs • Use AT coated for high-temp exotics & alloys, die & hardened steels, stainless • Use D1 PVD or D2 CVD Diamond for CFC's, graphite, plastics, and aluminum-silicon alloys • Tight tolerance +.0001/- .0003 includes coating

							<div> <div>1/8" shank</div> <div>MD2PUC</div> <div>UC</div> <div>AT</div> <div>D1</div> <div>D2</div> <div>new!</div> </div>			
Diam	Drill Size	LOC	Point	OAL	Shank	EDP#	UC Price	AT Price	D1 Price	D2 Price
.0040	0.10mm	.070	118°	1-1/2	1/8	50000	\$33.00	\$34.00	\$38.00	
.0050	0.13mm	.070	118°	1-1/2	1/8	50004	\$33.00	\$34.00	\$38.00	
.0059	#97	.120	118°	1-1/2	1/8	50008	\$33.00	\$34.00	\$38.00	
.0063	#96	.120	118°	1-1/2	1/8	50012	\$33.00	\$34.00	\$38.00	
.0067	#95	.150	118°	1-1/2	1/8	50016	\$33.00	\$34.00	\$38.00	
.0071	#94	.150	118°	1-1/2	1/8	50020	\$30.80	\$31.80	\$35.80	
.0075	#93	.150	118°	1-1/2	1/8	50024	\$30.80	\$31.80	\$35.80	
.0079	#92	.150	118°	1-1/2	1/8	50028	\$27.50	\$28.50	\$32.50	
.0083	#91	.150	118°	1-1/2	1/8	50032	\$27.50	\$28.50	\$32.50	
.0087	#90	.150	118°	1-1/2	1/8	50036	\$27.50	\$28.50	\$32.50	
.0091	#89	.220	118°	1-1/2	1/8	50040	\$27.50	\$28.50	\$32.50	
.0095	#88	.220	118°	1-1/2	1/8	50044	\$27.50	\$28.50	\$32.50	
.0098	0.25mm	.220	118°	1-1/2	1/8	50048	\$23.10	\$24.10	\$28.30	
.0100	#87	.220	118°	1-1/2	1/8	50052	\$23.10	\$24.10	\$28.30	
.0105	#86	.220	118°	1-1/2	1/8	50056	\$15.40	\$16.40	\$20.40	
.0110	#85	.220	118°	1-1/2	1/8	50060	\$15.40	\$16.40	\$20.40	
.0115	#84	.220	118°	1-1/2	1/8	50064	\$12.10	\$13.10	\$17.10	
.0118	0.30mm	.280	118°	1-1/2	1/8	50068	\$12.10	\$13.10	\$17.10	
.0120	#83	.280	118°	1-1/2	1/8	50072	\$12.10	\$13.10	\$17.10	
.0125	#82	.280	118°	1-1/2	1/8	50076	\$11.00	\$12.00	\$16.00	
.0130	#81	.280	118°	1-1/2	1/8	50080	\$11.00	\$12.00	\$16.00	
.0135	#80	.280	130°	1-1/2	1/8	50084	\$7.70	\$8.70	\$12.70	
.0138	0.35mm	.280	130°	1-1/2	1/8	50088	\$7.70	\$8.70	\$12.70	
.0145	#79	.280	130°	1-1/2	1/8	50092	\$7.70	\$8.70	\$12.70	
.0156	1/64"	.295	130°	1-1/2	1/8	50096	\$7.70	\$8.70	\$12.70	\$35.70
.0157	0.40mm	.295	130°	1-1/2	1/8	50100	\$7.70	\$8.70	\$12.70	\$35.70
.0160	#78	.295	130°	1-1/2	1/8	50104	\$7.70	\$8.70	\$12.70	\$35.70
.0177	0.45mm	.295	130°	1-1/2	1/8	50108	\$7.70	\$8.70	\$12.70	\$35.70
.0180	#77	.295	130°	1-1/2	1/8	50112	\$7.70	\$8.70	\$12.70	\$35.70
.0197	0.50mm	.310	130°	1-1/2	1/8	50116	\$7.70	\$8.70	\$12.70	\$35.70
.0200	#76	.310	130°	1-1/2	1/8	50120	\$7.70	\$8.70	\$12.70	\$35.70
.0210	#75	.310	130°	1-1/2	1/8	50124	\$7.70	\$8.70	\$12.70	\$35.70
.0217	0.55mm	.340	130°	1-1/2	1/8	50128	\$7.70	\$8.70	\$12.70	\$35.70
.0225	#74	.340	130°	1-1/2	1/8	50132	\$7.70	\$8.70	\$12.70	\$35.70
.0236	0.60mm	.340	130°	1-1/2	1/8	50136	\$7.70	\$8.70	\$12.70	\$35.70
.0240	#73	.340	130°	1-1/2	1/8	50140	\$7.70	\$8.70	\$12.70	\$35.70
.0250	#72	.340	130°	1-1/2	1/8	50144	\$7.70	\$8.70	\$12.70	\$35.70
.0256	0.65mm	.340	130°	1-1/2	1/8	50148	\$7.70	\$8.70	\$12.70	\$35.70
.0260	#71	.340	130°	1-1/2	1/8	50152	\$7.70	\$8.70	\$12.70	\$35.70
.0276	0.70mm	.400	130°	1-1/2	1/8	50156	\$7.70	\$8.70	\$12.70	\$35.70
.0280	#70	.400	130°	1-1/2	1/8	50160	\$6.60	\$7.60	\$11.60	\$34.60
.0292	#69	.400	130°	1-1/2	1/8	50164	\$6.60	\$7.60	\$11.60	\$34.60
.0295	0.75mm	.400	130°	1-1/2	1/8	50168	\$6.60	\$7.60	\$11.60	\$34.60
.0310	#68	.400	130°	1-1/2	1/8	50172	\$6.60	\$7.60	\$11.60	\$34.60
.0312	1/32"	.400	130°	1-1/2	1/8	50176	\$6.60	\$7.60	\$11.60	\$34.60
.0315	0.80mm	.400	130°	1-1/2	1/8	50180	\$6.60	\$7.60	\$11.60	\$34.60
.0320	#67	.400	130°	1-1/2	1/8	50184	\$6.60	\$7.60	\$11.60	\$34.60
.0330	#66	.400	130°	1-1/2	1/8	50188	\$6.60	\$7.60	\$11.60	\$34.60
.0335	0.85mm	.400	130°	1-1/2	1/8	50192	\$6.60	\$7.60	\$11.60	\$34.60
.0350	#65	.400	130°	1-1/2	1/8	50760	\$6.60	\$7.60	\$11.60	\$34.60
.0354	0.90mm	.400	130°	1-1/2	1/8	50196	\$6.60	\$7.60	\$11.60	\$34.60
.0360	#64	.400	130°	1-1/2	1/8	50200	\$6.60	\$7.60	\$11.60	\$34.60
.0370	#63	.400	130°	1-1/2	1/8	50204	\$6.60	\$7.60	\$11.60	\$34.60
.0374	0.95mm	.400	130°	1-1/2	1/8	50208	\$6.60	\$7.60	\$11.60	\$34.60
.0380	#62	.400	130°	1-1/2	1/8	50212	\$6.60	\$7.60	\$11.60	\$34.60
.0390	#61	.400	130°	1-1/2	1/8	50216	\$6.60	\$7.60	\$11.60	\$34.60
.0394	1.00mm	.400	130°	1-1/2	1/8	50220	\$6.60	\$7.60	\$11.60	\$34.60
.0400	#60	.400	130°	1-1/2	1/8	50224	\$6.60	\$7.60	\$11.60	\$34.60
.0410	#59	.400	130°	1-1/2	1/8	50228	\$6.60	\$7.60	\$11.60	\$34.60
.0413	1.05mm	.400	130°	1-1/2	1/8	50232	\$6.60	\$7.60	\$11.60	\$34.60
.0420	#58	.400	130°	1-1/2	1/8	50236	\$6.60	\$7.60	\$11.60	\$34.60
.0430	#57	.400	130°	1-1/2	1/8	50762	\$6.60	\$7.60	\$11.60	\$34.60
.0433	1.10mm	.400	130°	1-1/2	1/8	50240	\$6.60	\$7.60	\$11.60	\$34.60
.0440	1.12mm	.400	130°	1-1/2	1/8	50244	\$6.60	\$7.60	\$11.60	\$34.60
.0453	1.15mm	.400	130°	1-1/2	1/8	50248	\$6.60	\$7.60	\$11.60	\$34.60





**new! MD Series • 2 flute precision Micro Drills (continued)**

Diam	Drill Size	LOC	Point	OAL	Shank	EDP#	UC	AT	D1	D2
1/8" shank										
.0465	#56	.400	130°	1-1/2	1/8	50252	\$6.60	\$7.60	\$11.60	\$34.60
.0469	3/64"	.400	130°	1-1/2	1/8	50256	\$6.60	\$7.60	\$11.60	\$34.60
.0472	1.20mm	.400	130°	1-1/2	1/8	50260	\$6.60	\$7.60	\$11.60	\$34.60
.0492	1.25mm	.400	130°	1-1/2	1/8	50264	\$6.60	\$7.60	\$11.60	\$34.60
.0512	1.30mm	.400	130°	1-1/2	1/8	50268	\$6.60	\$7.60	\$11.60	\$34.60
.0520	#55	.400	130°	1-1/2	1/8	50272	\$6.60	\$7.60	\$11.60	\$34.60
.0531	1.35mm	.400	130°	1-1/2	1/8	50276	\$6.60	\$7.60	\$11.60	\$34.60
.0550	#54	.400	130°	1-1/2	1/8	50280	\$6.60	\$7.60	\$11.60	\$34.60
.0551	1.40mm	.400	130°	1-1/2	1/8	50284	\$6.60	\$7.60	\$11.60	\$34.60
.0571	1.45mm	.400	130°	1-1/2	1/8	50288	\$6.60	\$7.60	\$11.60	\$34.60
.0591	1.50mm	.400	130°	1-1/2	1/8	50292	\$6.60	\$7.60	\$11.60	\$34.60
.0595	#53	.400	130°	1-1/2	1/8	50296	\$6.60	\$7.60	\$11.60	\$34.60
.0610	1.55mm	.400	130°	1-1/2	1/8	50300	\$6.60	\$7.60	\$11.60	\$34.60
.0625	1/16"	.400	130°	1-1/2	1/8	50304	\$6.60	\$7.60	\$11.60	\$34.60
.0630	1.60mm	.400	130°	1-1/2	1/8	50308	\$6.60	\$7.60	\$11.60	\$34.60
.0635	#52	.400	130°	1-1/2	1/8	50312	\$6.60	\$7.60	\$11.60	\$34.60
.0650	1.65mm	.400	130°	1-1/2	1/8	50316	\$6.60	\$7.60	\$11.60	\$34.60
.0669	1.70mm	.400	130°	1-1/2	1/8	50320	\$6.60	\$7.60	\$11.60	\$34.60
.0670	#51	.400	130°	1-1/2	1/8	50324	\$6.60	\$7.60	\$11.60	\$34.60
.0689	1.75mm	.400	130°	1-1/2	1/8	50328	\$6.60	\$7.60	\$11.60	\$34.60
.0700	#50	.400	130°	1-1/2	1/8	50332	\$6.60	\$7.60	\$11.60	\$34.60
.0709	1.80mm	.400	130°	1-1/2	1/8	50336	\$6.60	\$7.60	\$11.60	\$34.60
.0728	1.85mm	.400	130°	1-1/2	1/8	50340	\$6.60	\$7.60	\$11.60	\$34.60
.0730	#49	.400	130°	1-1/2	1/8	50344	\$6.60	\$7.60	\$11.60	\$34.60
.0748	1.90mm	.400	130°	1-1/2	1/8	50348	\$6.60	\$7.60	\$11.60	\$34.60
.0760	#48	.400	130°	1-1/2	1/8	50352	\$6.60	\$7.60	\$11.60	\$34.60
.0768	1.95mm	.400	130°	1-1/2	1/8	50764	\$6.60	\$7.60	\$11.60	\$34.60
.0781	5/64"	.400	130°	1-1/2	1/8	50356	\$6.60	\$7.60	\$11.60	\$34.60
.0785	#47	.400	130°	1-1/2	1/8	50360	\$6.60	\$7.60	\$11.60	\$34.60
.0787	2.00mm	.400	130°	1-1/2	1/8	50364	\$6.60	\$7.60	\$11.60	\$34.60
.0807	2.05mm	.400	130°	1-1/2	1/8	50368	\$6.60	\$7.60	\$11.60	\$34.60
.0810	#46	.400	130°	1-1/2	1/8	50372	\$6.60	\$7.60	\$11.60	\$34.60
.0820	#45	.400	130°	1-1/2	1/8	50376	\$6.60	\$7.60	\$11.60	\$34.60
.0827	2.10mm	.400	130°	1-1/2	1/8	50380	\$6.60	\$7.60	\$11.60	\$34.60
.0846	2.15mm	.400	130°	1-1/2	1/8	50384	\$6.60	\$7.60	\$11.60	\$34.60
.0860	#44	.400	130°	1-1/2	1/8	50388	\$6.60	\$7.60	\$11.60	\$34.60
.0866	2.20mm	.400	130°	1-1/2	1/8	50392	\$6.60	\$7.60	\$11.60	\$34.60
.0886	2.25mm	.400	130°	1-1/2	1/8	50396	\$6.60	\$7.60	\$11.60	\$34.60
.0890	#43	.400	130°	1-1/2	1/8	50400	\$6.60	\$7.60	\$11.60	\$34.60
.0906	2.30mm	.400	130°	1-1/2	1/8	50404	\$6.60	\$7.60	\$11.60	\$34.60
.0925	2.35mm	.400	130°	1-1/2	1/8	50408	\$6.60	\$7.60	\$11.60	\$34.60
.0935	#42	.400	130°	1-1/2	1/8	50412	\$6.60	\$7.60	\$11.60	\$34.60
.0938	3/32"	.400	130°	1-1/2	1/8	50416	\$6.60	\$7.60	\$11.60	\$34.60
.0945	2.40mm	.400	130°	1-1/2	1/8	50420	\$6.60	\$7.60	\$11.60	\$34.60
.0960	#41	.400	130°	1-1/2	1/8	50424	\$6.60	\$7.60	\$11.60	\$34.60
.0965	2.45mm	.400	130°	1-1/2	1/8	50428	\$6.60	\$7.60	\$11.60	\$34.60
.0980	#40	.400	130°	1-1/2	1/8	50432	\$6.60	\$7.60	\$11.60	\$34.60
.0984	2.50mm	.400	130°	1-1/2	1/8	50436	\$6.60	\$7.60	\$11.60	\$34.60
.0995	#39	.400	130°	1-1/2	1/8	50440	\$6.60	\$7.60	\$11.60	\$34.60
.1004	2.55mm	.400	130°	1-1/2	1/8	50444	\$6.60	\$7.60	\$11.60	\$34.60
.1015	#38	.400	130°	1-1/2	1/8	50448	\$6.60	\$7.60	\$11.60	\$34.60
.1024	2.60mm	.400	130°	1-1/2	1/8	50452	\$6.60	\$7.60	\$11.60	\$34.60
.1040	#37	.400	130°	1-1/2	1/8	50456	\$6.60	\$7.60	\$11.60	\$34.60
.1043	2.65mm	.400	130°	1-1/2	1/8	50460	\$6.60	\$7.60	\$11.60	\$34.60
.1063	2.70mm	.400	130°	1-1/2	1/8	50464	\$6.60	\$7.60	\$11.60	\$34.60
.1065	#36	.400	130°	1-1/2	1/8	50468	\$6.60	\$7.60	\$11.60	\$34.60
.1083	2.75mm	.400	130°	1-1/2	1/8	50472	\$6.60	\$7.60	\$11.60	\$34.60
.1094	7/64"	.400	130°	1-1/2	1/8	50476	\$6.60	\$7.60	\$11.60	\$34.60
.1100	#35	.400	130°	1-1/2	1/8	50480	\$6.60	\$7.60	\$11.60	\$34.60
.1110	#34	.400	130°	1-1/2	1/8	50484	\$6.60	\$7.60	\$11.60	\$34.60
.1122	2.85mm	.400	130°	1-1/2	1/8	50488	\$6.60	\$7.60	\$11.60	\$34.60
.1130	#33	.400	130°	1-1/2	1/8	50492	\$6.60	\$7.60	\$11.60	\$34.60
.1142	2.90mm	.400	130°	1-1/2	1/8	50496	\$6.60	\$7.60	\$11.60	\$34.60
.1160	#32	.400	130°	1-1/2	1/8	50500	\$6.60	\$7.60	\$11.60	\$34.60
.1161	2.95mm	.400	130°	1-1/2	1/8	50504	\$6.60	\$7.60	\$11.60	\$34.60
.1181	3.00mm	.400	130°	1-1/2	1/8	50508	\$6.60	\$7.60	\$11.60	\$34.60
.1200	#31	.400	130°	1-1/2	1/8	50512	\$6.60	\$7.60	\$11.60	\$34.60
.1201	3.05mm	.400	130°	1-1/2	1/8	50516	\$6.60	\$7.60	\$11.60	\$34.60
.1220	3.10mm	.400	130°	1-1/2	1/8	50520	\$6.60	\$7.60	\$11.60	\$34.60
.1240	3.15mm	.400	130°	1-1/2	1/8	50524	\$6.60	\$7.60	\$11.60	\$34.60
.1250	1/8"	.400	130°	1-1/2	1/8	50528	\$6.60	\$7.60	\$11.60	\$34.60

**ULTRATool®**





**new! FF Series • 2 flute drills with Four Facet Point**

**Tight tolerance drills with 1 18° four facet point featuring D1 or D2 SmoothCoat.**

- Designed for drilling composites, plastics, wood, fiberglass, and more • Tight tolerance  $\pm .0001/- .0003$  • Proprietary cemented carbide grade plus either D1 or D2 SmoothCoat • Use D1 or D2 coated for CFRP & GFRP stacked composites, graphite, plastics, fiberglass, and more • Fractional, Wire Gage, Letter, and Metric size ranges • Features self-centering point

FF2PD1



Drill Specifications  
Cutting Diam  $\pm .0001/- .0003$   
Shank Diam  $\pm 0 / - .0003$   
SFR = Shrink Fit Ready

Diam	Decimal	LOF	OAL	Wire Gage	EDP#	D1 Coat	D2 Coat	Diam	Decimal	LOF	OAL	Wire Gage	EDP#	D1 Coat	D2 Coat
1	.2280	1-3/4	3-1/4		51101	\$34.40	\$91.60	31	.1200	1-1/4	2-1/4		51131	\$21.30	\$40.20
2	.2210	1-3/4	3"		51102	\$33.20	\$90.40	32	.1160	1-1/4	2-1/4		51132	\$21.00	\$39.90
3	.2130	1-3/4	3"		51103	\$31.80	\$89.00	33	.1130	1-1/4	2-1/4		51133	\$20.80	\$39.70
4	.2090	1-3/4	3"		51104	\$31.30	\$88.50	34	.1110	1-1/4	2-1/4		51134	\$20.80	\$39.70
5	.2055	1-3/4	3"		51105	\$30.80	\$88.00	35	.1100	1-1/4	2-1/4		51135	\$20.50	\$39.40
6	.2040	1-3/4	3"		51106	\$30.70	\$87.90	36	.1065	1-1/4	2-1/4		51136	\$20.40	\$39.30
7	.2010	1-3/4	3"		51107	\$29.80	\$87.00	37	.1040	1-1/4	2-1/4		51137	\$20.40	\$39.30
8	.1990	1-3/4	3"		51108	\$29.50	\$86.70	38	.1015	1-1/4	2-1/4		51138	\$20.40	\$39.30
9	.1960	1-3/4	3"		51109	\$29.10	\$86.30	39	.0995	1-1/4	2-1/4		51139	\$20.40	\$39.30
10	.1935	1-5/8	2-3/4		51110	\$28.60	\$85.80	40	.0980	1"	2"		51140	\$17.00	\$38.60
11	.1910	1-5/8	2-3/4		51111	\$28.50	\$85.70	41	.0960	1"	2"		51141	\$16.50	\$38.10
12	.1890	1-5/8	2-3/4		51112	\$28.30	\$85.50	42	.0935	1"	2"		51142	\$16.50	\$38.10
13	.1850	1-5/8	2-3/4		51113	\$27.60	\$72.00	43	.0890	1"	2"		51143	\$16.20	\$37.80
14	.1820	1-5/8	2-3/4		51114	\$27.50	\$71.90	44	.0860	1"	2"		51144	\$16.20	\$37.80
15	.1800	1-5/8	2-3/4		51115	\$27.40	\$71.80	45	.0820	7/8	1-3/4		51145	\$16.20	\$37.80
16	.1770	1-5/8	2-3/4		51116	\$27.20	\$71.60	46	.0810	7/8	1-3/4		51146	\$16.20	\$37.80
17	.1730	1-5/8	2-3/4		51117	\$26.90	\$71.30	47	.0785	7/8	1-3/4		51147	\$16.20	\$37.80
18	.1695	1-5/8	2-3/4		51118	\$26.60	\$71.00	48	.0760	7/8	1-3/4		51148	\$16.20	\$37.80
19	.1660	1-5/8	2-3/4		51119	\$26.50	\$70.90	49	.0730	7/8	1-3/4		51149	\$16.20	\$37.80
20	.1610	1-3/8	2-1/2		51120	\$26.10	\$70.50	50	.0700	7/8	1-3/4		51150	\$16.20	\$37.80
21	.1590	1-3/8	2-1/2		51121	\$25.70	\$70.10	51	.0670	3/4	1-1/2		51151	\$16.20	\$37.80
22	.1570	1-3/8	2-1/2		51122	\$25.60	\$70.00	52	.0635	3/4	1-1/2		51152	\$16.20	\$37.80
23	.1540	1-3/8	2-1/2		51123	\$25.00	\$69.40	53	.0595	3/4	1-1/2		51153	\$16.20	\$37.80
24	.1520	1-3/8	2-1/2		51124	\$24.50	\$68.90	54	.0550	3/4	1-1/2		51154	\$16.20	\$37.80
25	.1495	1-3/8	2-1/2		51125	\$23.90	\$68.30	55	.0520	3/4	1-1/2		51155	\$16.20	\$37.80
26	.1470	1-3/8	2-1/2		51126	\$23.70	\$68.10	56	.0465	3/4	1-1/2		51156	\$16.20	\$37.80
27	.1440	1-3/8	2-1/2		51127	\$23.70	\$68.10	57	.0430	3/4	1-1/2		51157	\$16.20	\$37.80
28	.1405	1-3/8	2-1/2		51128	\$23.30	\$67.70	58	.0420	3/4	1-1/2		51158	\$16.20	\$37.80
29	.1360	1-3/8	2-1/2		51129	\$23.00	\$67.40	59	.0410	3/4	1-1/2		51159	\$16.20	\$37.80
30	.1285	1-3/8	2-1/4		51130	\$22.10	\$66.50	60	.0400	3/4	1-1/2		51160	\$16.20	\$37.80

• To purchase the FF Series equivalent in an UnCoated, TN, TC, or TA coating, please see our Ultra-Tool catalog offering.

ULTRATOOL®



• Please note that due to extreme hardness D2 coated tools are generally unable to be reground or resharpened.

## new! BP Series • 2 flute Brad Point drills

**Tight tolerance drills with brad (spur) point featuring UC, D1, or D2 SmoothCoat.**

• Designed for drilling composites, plastics, wood, fiberglass, and more • Tight tolerance  $\pm .0001/- .0003$  • Proprietary cemented carbide grade plus available D1 or D2 SmoothCoat • Use UnCoated for general purpose needs • Use D1 or D2 coated for graphites & other extremely abrasive non-ferrous alloys • Fractional, Wire Gage, Letter, and Metric size ranges • Features 140° brad point



BP2PUC



Diam	LOF	OAL	Fractional			
			EDP#	UC Price	D1 Coat	D2 Coat
3/64	3/4	1-1/2	61203	\$13.70	\$17.90	\$39.40
1/16	3/4	1-1/2	61204	\$13.70	\$17.90	\$39.40
5/64	7/8	1-3/4	61205	\$13.90	\$18.10	\$39.60
3/32	1"	2"	61206	\$14.30	\$18.50	\$40.00
7/64	1-1/4	2-1/4	61207	\$15.00	\$22.60	\$41.50
1/8	1-1/4	2-1/4	61208	\$15.40	\$23.00	\$41.90
9/64	1-3/8	2-1/2	61209	\$17.60	\$25.70	\$70.10
5/32	1-3/8	2-1/2	61210	\$20.50	\$28.30	\$72.70
11/64	1-5/8	2-3/4	61211	\$22.80	\$30.40	\$74.80
3/16	1-5/8	2-3/4	61212	\$23.00	\$30.60	\$75.00
13/64	1-3/4	3"	61213	\$27.40	\$34.80	\$92.00
7/32	1-3/4	3"	61214	\$30.40	\$37.50	\$94.70
15/64	2"	3-1/4	61215	\$32.90	\$42.30	\$97.00
1/4	2"	3-1/4	61216	\$35.00	\$44.20	\$98.90
17/64	2-1/8	3-1/2	61217	\$40.30	\$49.50	\$125.40
9/32	2-1/8	3-1/2	61218	\$44.10	\$53.00	\$128.90
19/64	2-3/8	3-3/4	61219	\$47.00	\$55.60	\$131.50
5/16	2-3/8	3-3/4	61220	\$50.70	\$59.00	\$134.90
21/64	2-1/2	4"	61221	\$54.60	\$63.50	\$162.20
11/32	2-1/2	4"	61222	\$60.40	\$68.80	\$167.50
23/64	2-3/4	4-1/4	61223	\$67.10	\$82.40	\$173.60
3/8	2-3/4	4-1/4	61224	\$66.10	\$81.50	\$172.70
25/64	2-7/8	4-1/2	61225	\$83.30	\$100.30	\$207.80
13/32	2-7/8	4-1/2	61226	\$89.50	\$106.00	\$213.50
27/64	2-7/8	4-1/2	61227	\$98.60	\$114.20	\$221.70
7/16	2-7/8	4-1/2	61228	\$105.20	\$120.20	\$227.70
29/64	3"	4-3/4	61229	\$115.50	\$132.90	\$252.20
15/32	3"	4-3/4	61230	\$122.20	\$139.00	\$258.30
31/64	3"	4-3/4	61231	\$127.80	\$144.10	\$263.40
1/2	3"	4-3/4	61232	\$124.30	\$140.90	\$206.20
17/32	4"	6"	61233	\$179.90	\$202.40	\$355.30
9/16	4"	6"	61234	\$193.00	\$214.90	\$367.80
19/32	4"	6"	61235	\$221.80	\$245.80	\$395.20
5/8	4"	6"	61236	\$224.30	\$248.20	\$397.60
21/32	4"	6"	61237	\$253.70	\$282.00	\$477.60
11/16	4"	6"	61238	\$258.10	\$286.20	\$481.80
3/4	4"	6"	61239	\$300.90	\$327.00	\$522.60
13/16	4"	6"	61291	\$411.20	\$438.00	\$656.70
7/8	4"	6"	61292	\$436.10	\$461.70	\$680.40
15/16	4"	6"	61293	\$441.00	\$472.90	\$712.30
1"	4"	6"	61294	\$436.20	\$468.30	\$707.70

Diam	LOF	OAL	Letter			
			EDP#	UC Price	D1 Coat	D2 Coat
A	2"	3-1/4	61241	\$34.00	\$43.30	\$98.00
B	2"	3-1/4	61242	\$34.50	\$43.80	\$98.50
C	2"	3-1/4	61243	\$35.40	\$44.60	\$99.30
D	2"	3-1/4	61244	\$36.20	\$45.30	\$100.00
E	2"	3-1/4	61245	\$37.60	\$46.60	\$101.30
F	2"	3-1/2	61246	\$40.30	\$49.50	\$125.40
G	2-1/8	3-1/2	61247	\$40.30	\$49.50	\$125.40
H	2-1/8	3-1/2	61248	\$41.80	\$50.90	\$126.80
I	2-1/8	3-1/2	61249	\$42.60	\$51.60	\$127.50
J	2-1/8	3-1/2	61250	\$43.90	\$52.80	\$128.70
K	2-1/8	3-1/2	61251	\$44.10	\$53.00	\$128.90
L	2-1/8	3-1/2	61252	\$45.70	\$54.40	\$130.30
M	2-3/8	3-3/4	61253	\$47.00	\$55.60	\$131.50
N	2-3/8	3-3/4	61254	\$50.70	\$59.00	\$134.90
O	2-3/8	3-3/4	61255	\$53.80	\$62.80	\$161.50
P	2-3/8	4"	61256	\$54.60	\$63.50	\$162.20
Q	2-1/2	4"	61285	\$59.00	\$67.50	\$166.20
R	2-1/2	4"	61286	\$60.40	\$68.80	\$167.50
S	2-1/2	4"	61287	\$63.60	\$71.70	\$170.40
T	2-3/4	4-1/4	61288	\$67.10	\$82.40	\$173.60
U	2-3/4	4-1/4	61289	\$70.50	\$85.50	\$176.70
V	2-3/4	4-1/4	61290	\$74.50	\$92.10	\$199.80
W	2-7/8	4-1/2	61257	\$74.50	\$92.30	\$199.80
X	2-7/8	4-1/2	61258	\$87.30	\$100.40	\$211.50
Y	2-7/8	4-1/2	61259	\$87.30	\$104.00	\$211.50
Z	2-7/8	4-1/2	61260	\$97.20	\$112.90	\$220.40

Diam	LOF	OAL	Metric			
			EDP#	UC Price	D1 Coat	D2 Coat
1.0mm	13	38	61261	\$13.70	\$17.90	\$39.40
1.5	19	38	61262	\$13.70	\$17.90	\$39.40
2.0	22	44	61263	\$13.90	\$18.10	\$39.60
2.5	25	50	61264	\$15.10	\$19.30	\$40.70
3.0	32	57	61265	\$16.10	\$23.60	\$42.50
3.5	35	63	61266	\$17.60	\$25.70	\$70.10
4.0	35	63	61267	\$21.10	\$28.90	\$73.30
4.5	41	70	61268	\$23.20	\$30.80	\$75.20
5.0	44	76	61269	\$26.00	\$33.50	\$77.70
5.5	44	76	61270	\$29.60	\$39.30	\$94.00
6.0	50	82	61271	\$34.00	\$43.30	\$98.00
6.5	50	82	61272	\$40.00	\$49.30	\$125.20
7.0	54	89	61273	\$43.80	\$52.70	\$128.60
7.5	60	95	61274	\$47.00	\$55.60	\$131.50
8.0	60	95	61275	\$53.80	\$62.90	\$161.50
8.5	63	101	61276	\$59.00	\$67.60	\$166.20
9.0	70	108	61277	\$63.60	\$79.20	\$170.40
9.5	70	108	61278	\$70.50	\$85.50	\$176.70
10.0	73	114	61279	\$83.30	\$100.30	\$207.80
10.5	73	114	61280	\$97.10	\$112.90	\$220.40
11.0	73	114	61281	\$98.60	\$114.20	\$221.70
11.5	76	120	61282	\$115.50	\$132.90	\$252.20
12.0	76	120	61283	\$127.80	\$144.10	\$263.40
12.5	76	120	61284	\$130.10	\$146.20	\$265.50



Drill Specifications  
Cutting Diam  $\pm .0001/- .0003$   
Shank Diam  $\pm 0 / - .0003$   
SFR = Shrink Fit Ready








**new! BP Series • 2 flute Brad Point drills****Tight tolerance drills with brad (spur) point featuring UC, D1, or D2 SmoothCoat.**






• Designed for drilling composites, plastics, wood, fiberglass, and more • Tight tolerance  $+.0001/-0.0003$  • Proprietary cemented carbide grade plus available D1 or D2 SmoothCoat • Use UnCoated for general purpose needs • Use D1 or D2 coated for graphites & other extremely abrasive non-ferrous alloys • Fractional, Wire Gage, Letter, and Metric size ranges • Features 140° brad point



BP2PUC



				Wire Gage				
		LOF	OAL	EDP#	UC Price	D1 Coat	D2 Coat	
1	.2280	1-3/4	3-1/4	61301	\$33.20	\$40.10	\$97.30	
2	.2210	1-3/4	3"	61302	\$31.60	\$38.60	\$95.80	
3	.2130	1-3/4	3"	61303	\$29.60	\$36.80	\$94.00	
4	.2090	1-3/4	3"	61304	\$28.90	\$36.20	\$93.40	
5	.2055	1-3/4	3"	61305	\$28.10	\$35.40	\$92.60	
6	.2040	1-3/4	3"	61306	\$27.80	\$35.20	\$92.40	
7	.2010	1-3/4	3"	61307	\$26.60	\$34.10	\$91.30	
8	.1990	1-3/4	3"	61308	\$26.20	\$33.70	\$90.90	
9	.1960	1-3/4	3"	61309	\$25.50	\$33.10	\$90.30	
10	.1935	1-5/8	2-3/4	61310	\$25.00	\$32.60	\$89.80	
11	.1910	1-5/8	2-3/4	61311	\$24.90	\$32.50	\$89.70	
12	.1890	1-5/8	2-3/4	61312	\$24.50	\$32.20	\$89.40	
13	.1850	1-5/8	2-3/4	61313	\$23.80	\$31.30	\$75.70	
14	.1820	1-5/8	2-3/4	61314	\$23.70	\$31.20	\$75.60	
15	.1800	1-5/8	2-3/4	61315	\$23.40	\$31.00	\$75.40	
16	.1770	1-5/8	2-3/4	61316	\$23.20	\$30.80	\$75.20	
17	.1730	1-5/8	2-3/4	61317	\$23.00	\$30.60	\$75.00	
18	.1695	1-5/8	2-3/4	61318	\$22.40	\$30.10	\$74.50	
19	.1660	1-5/8	2-3/4	61319	\$22.20	\$29.90	\$74.30	
20	.1610	1-3/8	2-1/2	61320	\$21.60	\$29.30	\$73.70	
21	.1590	1-3/8	2-1/2	61321	\$21.20	\$29.00	\$73.40	
22	.1570	1-3/8	2-1/2	61322	\$21.10	\$28.90	\$73.30	
23	.1540	1-3/8	2-1/2	61323	\$20.20	\$28.10	\$72.50	
24	.1520	1-3/8	2-1/2	61324	\$19.30	\$27.20	\$71.60	
25	.1495	1-3/8	2-1/2	61325	\$18.80	\$26.80	\$71.20	
26	.1470	1-3/8	2-1/2	61326	\$18.40	\$26.40	\$70.80	
27	.1440	1-3/8	2-1/2	61327	\$18.40	\$26.40	\$70.80	
28	.1405	1-3/8	2-1/2	61328	\$17.60	\$25.70	\$70.10	
29	.1360	1-3/8	2-1/2	61329	\$17.40	\$25.50	\$69.90	
30	.1285	1-3/8	2-1/4	61330	\$16.60	\$24.80	\$69.20	

				Wire Gage				
 Diam	 Decimal	LOF	OAL	EDP#	UC Price	D1 Coat	D2 Coat	
31	.1200	1-1/4	2-1/4	61331	\$16.30	\$23.80	\$42.70	
32	.1160	1-1/4	2-1/4	61332	\$16.10	\$23.60	\$42.50	
33	.1130	1-1/4	2-1/4	61333	\$15.50	\$23.10	\$42.00	
34	.1110	1-1/4	2-1/4	61334	\$15.50	\$23.10	\$42.00	
35	.1100	1-1/4	2-1/4	61335	\$15.20	\$22.80	\$41.70	
36	.1065	1-1/4	2-1/4	61336	\$15.00	\$22.60	\$41.50	
37	.1040	1-1/4	2-1/4	61337	\$15.00	\$22.60	\$41.50	
38	.1015	1-1/4	2-1/4	61338	\$15.00	\$22.60	\$41.50	
39	.0995	1-1/4	2-1/4	61339	\$15.00	\$22.60	\$41.50	
40	.0980	1"	2"	61340	\$14.70	\$19.10	\$40.70	
41	.0960	1"	2"	61341	\$14.30	\$18.70	\$40.00	
42	.0935	1"	2"	61342	\$14.30	\$18.70	\$40.00	
43	.0890	1"	2"	61343	\$13.90	\$18.30	\$39.60	
44	.0860	1"	2"	61344	\$13.90	\$18.30	\$39.60	
45	.0820	7/8	1-3/4	61345	\$13.90	\$18.30	\$39.60	
46	.0810	7/8	1-3/4	61346	\$13.90	\$18.30	\$39.60	
47	.0785	7/8	1-3/4	61347	\$13.90	\$18.30	\$39.60	
48	.0760	7/8	1-3/4	61348	\$13.70	\$18.10	\$39.60	
49	.0730	7/8	1-3/4	61349	\$13.70	\$18.10	\$39.60	
50	.0700	7/8	1-3/4	61350	\$13.70	\$18.10	\$39.60	
51	.0670	3/4	1-1/2	61351	\$13.70	\$18.10	\$39.60	
52	.0635	3/4	1-1/2	61352	\$13.70	\$18.10	\$39.60	
53	.0595	3/4	1-1/2	61353	\$13.70	\$18.10	\$39.60	
54	.0550	3/4	1-1/2	61354	\$13.70	\$18.10	\$39.60	
55	.0520	3/4	1-1/2	61355	\$13.70	\$18.10	\$39.60	
56	.0465	3/4	1-1/2	61356	\$13.70	\$18.10	\$39.60	
57	.0430	3/4	1-1/2	61357	\$13.70	\$18.10	\$39.60	
58	.0420	3/4	1-1/2	61358	\$13.70	\$18.10	\$39.60	
59	.0410	3/4	1-1/2	61359	\$13.70	\$18.10	\$39.60	
60	.0400	3/4	1-1/2	61360	\$13.70	\$18.10	\$39.60	



Drill Specifications  
Cutting Diam  $+.0001/-0.0003$   
Shank Diam  $+0 / -.0003$   
SFR = Shrink Fit Ready



## new! HS Series • Helical S point Extension drills

**Tight tolerance extended jobber drills featuring UC, AT, D1 or D2 SmoothCoat.**

- Designed for drilling clean, accurate holes in a wide application range including aluminum & copper alloys, composites, green ceramics, graphite, plastics, fiberglass, steels (AT coated) and more • Proprietary 135° Helical S style point
- Tight tolerance  $\pm .0001 / - .0003$  with SmoothGrind® polished finishes • For shallow to standard drilling depths
- Proprietary cemented carbide grade available UnCoated (UC) plus either AT, D1 or D2 SmoothCoat®
- Extension drill lengths (4" and 6" OAL) in popular hole & fastener size diameters
- 4" OAL features LOC of 3X diameter, 6" OAL features LOC of 5X diameter

HS2PL4UC



HS2PL6UC



Drill Specifications  
Cutting Diam  $\pm .0001 / - .0003$   
Shank Diam  $\pm 0 / - .0003$   
SFR = Shrink Fit Ready

4" OAL  
LOC 3x  
Diameter

Ø Diam	Ø Decimal	LOF	OAL	4" OAL	UC Price	AT Coat	D1 Coat	D2 Coat
3/32	.0938	.282	4"	41000	\$16.10	\$18.70	\$24.10	\$44.00
#40	.0980	.295	4"	41001	\$17.70	\$20.30	\$25.70	\$45.60
1/8	.1250	.375	4"	41002	\$18.20	\$20.80	\$26.20	\$46.10
#30	.1285	.386	4"	41003	\$19.10	\$22.60	\$29.60	\$73.20
#26	.1470	.441	4"	41004	\$21.40	\$24.90	\$31.90	\$75.50
5/32	.1563	.469	4"	41005	\$21.70	\$25.20	\$32.20	\$75.80
#21	.1590	.477	4"	41006	\$23.10	\$26.60	\$33.60	\$77.20
#20	.1610	.483	4"	41007	\$24.40	\$27.90	\$34.90	\$78.50
11/64	.1712	.514	4"	41008	\$25.20	\$28.70	\$35.70	\$79.30
3/16	.1875	.563	4"	41009	\$25.60	\$29.10	\$36.10	\$79.70
#11	.1910	.573	4"	41010	\$26.70	\$31.50	\$39.10	\$93.80
#10	.1935	.581	4"	41011	\$26.90	\$31.70	\$39.30	\$94.00
#9	.1960	.588	4"	41012	\$27.40	\$32.20	\$39.80	\$94.50
#8	.1990	.597	4"	41013	\$27.80	\$32.60	\$40.20	\$94.90
#7	.2010	.603	4"	41014	\$28.40	\$33.20	\$40.80	\$95.50
13/64	.2031	.610	4"	41015	\$28.80	\$33.60	\$41.20	\$95.90
7/32	.2188	.657	4"	41016	\$31.10	\$35.90	\$43.50	\$98.20
#1	.2280	.684	4"	41017	\$33.00	\$37.80	\$45.40	\$100.10
15/64	.2344	.704	4"	41018	\$34.00	\$38.80	\$46.40	\$101.10
1/4	.2500	.750	4"	41019	\$36.10	\$40.90	\$48.50	\$103.20
5/16	.3125	.938	4"	41020	\$48.00	\$53.90	\$60.90	\$136.80
3/8	.3750	1.125	4"	41021	\$59.10	\$65.50	\$73.00	\$171.70

The HS Series features a proprietary Helical S point that perfectly compliments the long lengths with excellent self-centering and free cutting properties.

6" OAL  
LOC 5x  
Diameter

Ø Diam	Ø Decimal	LOF	OAL	6" OAL	UC Price	AT Coat	D1 Coat	D2 Coat
3/32	.0938	.469	6"	41022	\$24.10	\$27.70	\$36.60	\$55.00
#40	.0980	.490	6"	41023	\$26.50	\$31.10	\$39.00	\$57.40
1/8	.1250	.625	6"	41024	\$27.30	\$30.90	\$39.80	\$58.20
#30	.1285	.643	6"	41025	\$28.60	\$33.40	\$44.10	\$86.70
#26	.1470	.735	6"	41026	\$32.10	\$36.90	\$47.60	\$90.20
5/32	.1563	.782	6"	41027	\$32.50	\$37.30	\$48.00	\$90.60
#21	.1590	.795	6"	41028	\$34.60	\$39.40	\$50.10	\$92.70
#20	.1610	.805	6"	41029	\$36.60	\$41.40	\$52.10	\$94.70
11/64	.1712	.856	6"	41030	\$37.80	\$42.60	\$53.30	\$95.90
3/16	.1875	.938	6"	41031	\$38.40	\$43.20	\$53.90	\$96.50
#11	.1910	.955	6"	41032	\$40.00	\$46.30	\$56.20	\$114.10
#10	.1935	.968	6"	41033	\$40.30	\$46.60	\$56.50	\$114.40
#9	.1960	.980	6"	41034	\$41.10	\$47.40	\$57.30	\$115.20
#8	.1990	.995	6"	41035	\$41.70	\$48.00	\$57.90	\$115.80
#7	.2010	1.005	6"	41036	\$42.60	\$48.90	\$58.80	\$116.70
13/64	.2031	1.016	6"	41037	\$43.20	\$49.50	\$59.40	\$117.30
7/32	.2188	1.094	6"	41038	\$46.70	\$53.00	\$62.90	\$120.80
#1	.2280	1.140	6"	41039	\$49.50	\$55.80	\$65.70	\$123.60
15/64	.2344	1.178	6"	41040	\$51.00	\$57.30	\$67.20	\$125.10
1/4	.2500	1.250	6"	41041	\$54.10	\$60.40	\$70.30	\$128.20
5/16	.3125	1.563	6"	41042	\$72.00	\$80.20	\$89.90	\$167.80
3/8	.3750	1.875	6"	41043	\$88.60	\$98.50	\$110.00	\$211.20





**new! BPE Series • 2 flute Brad Point Extension drills**

**Tight tolerance drills with brad (spur) point featuring UC, D1, or D2 SmoothCoat.**

- Designed for drilling clean holes in fibrous composites, plastics, wood, fiberglass, and more • Tight tolerance  $+.0001/-0.0003$
- Proprietary cemented carbide grade available UnCoated (UC) plus D1 or D2 Diamond SmoothCoat®
- Use UnCoated for general purpose needs • Use D1 or D2 coated for graphites & other extremely abrasive materials
- Extension drill lengths (4" and 6" OAL) in popular fastener size diameters • Features 140° brad point
- 4" OAL features LOC of 3X diameter, 6" OAL features LOC of 5X diameter

BPE2PL4UC



BPE2PL6UC



Drill Specifications  
Cutting Diam  $+.0001/-0.0003$   
Shank Diam  $+.0 / -.0003$   
SFR = Shrink Fit Ready

4" OAL  
LOC 3x  
Diameter

Ø Diam	Ø Decimal	LOF	OAL	4" OAL EDP#	UC Price	D1 Coat	D2 Coat
3/32	.0938	.282	4"	41100	\$16.10	\$24.10	\$44.00
#40	.0980	.295	4"	41101	\$17.70	\$25.70	\$45.60
1/8	.1250	.375	4"	41102	\$18.20	\$26.20	\$46.10
#30	.1285	.386	4"	41103	\$19.10	\$29.60	\$73.20
#26	.1470	.441	4"	41104	\$21.40	\$31.90	\$75.50
5/32	.1563	.469	4"	41105	\$21.70	\$32.20	\$75.80
#21	.1590	.477	4"	41106	\$23.10	\$33.60	\$77.20
#20	.1610	.483	4"	41107	\$24.40	\$34.90	\$78.50
11/64	.1712	.514	4"	41108	\$25.20	\$35.70	\$79.30
3/16	.1875	.563	4"	41109	\$25.60	\$36.10	\$79.70
#11	.1910	.573	4"	41110	\$26.70	\$39.10	\$93.80
#10	.1935	.581	4"	41111	\$26.90	\$39.30	\$94.00
#9	.1960	.588	4"	41112	\$27.40	\$39.80	\$94.50
#8	.1990	.597	4"	41113	\$27.80	\$40.20	\$94.90
#7	.2010	.603	4"	41114	\$28.40	\$40.80	\$95.50
13/64	.2031	.610	4"	41115	\$28.80	\$41.20	\$95.90
7/32	.2188	.657	4"	41116	\$31.10	\$43.50	\$98.20
#1	.2280	.684	4"	41117	\$33.00	\$45.40	\$100.10
15/64	.2344	.704	4"	41118	\$34.00	\$46.40	\$101.10
1/4	.2500	.750	4"	41119	\$36.10	\$48.50	\$103.20
5/16	.3125	.938	4"	41120	\$48.00	\$60.90	\$136.80
3/8	.3750	1.125	4"	41121	\$59.10	\$73.00	\$171.70

6" OAL  
LOC 5x  
Diameter

Ø Diam	Ø Decimal	LOF	OAL	6" OAL EDP#	UC Price	D1 Coat	D2 Coat
3/32	.0938	.469	6"	41122	\$24.10	\$36.60	\$55.00
#40	.0980	.490	6"	41123	\$26.50	\$39.00	\$57.40
1/8	.1250	.625	6"	41124	\$27.30	\$39.80	\$58.20
#30	.1285	.643	6"	41125	\$28.60	\$44.10	\$86.70
#26	.1470	.735	6"	41126	\$32.10	\$47.60	\$90.20
5/32	.1563	.782	6"	41127	\$32.50	\$48.00	\$90.60
#21	.1590	.795	6"	41128	\$34.60	\$50.10	\$92.70
#20	.1610	.805	6"	41129	\$36.60	\$52.10	\$94.70
11/64	.1712	.856	6"	41130	\$37.80	\$53.30	\$95.90
3/16	.1875	.938	6"	41131	\$38.40	\$53.90	\$96.50
#11	.1910	.955	6"	41132	\$40.00	\$56.20	\$114.10
#10	.1935	.968	6"	41133	\$40.30	\$56.50	\$114.40
#9	.1960	.980	6"	41134	\$41.10	\$57.30	\$115.20
#8	.1990	.995	6"	41135	\$41.70	\$57.90	\$115.80
#7	.2010	1.005	6"	41136	\$42.60	\$58.80	\$116.70
13/64	.2031	1.016	6"	41137	\$43.20	\$59.40	\$117.30
7/32	.2188	1.094	6"	41138	\$46.70	\$62.90	\$120.80
#1	.2280	1.140	6"	41139	\$49.50	\$65.70	\$123.60
15/64	.2344	1.178	6"	41140	\$51.00	\$67.20	\$125.10
1/4	.2500	1.250	6"	41141	\$54.10	\$70.30	\$128.20
5/16	.3125	1.563	6"	41142	\$72.00	\$89.90	\$167.80
3/8	.3750	1.875	6"	41143	\$88.60	\$110.00	\$211.20

## new! DD Series • D1 & D2 coated dagger drills

### Tight tolerance drills featuring D1 or D2 SmoothCoat.

- Designed for drilling clean, accurate holes in CFRP & GFRP composites, plastics, fiberglass, and more
- Tight tolerance  $+ .0001 / - .0003$  with SmoothGrind® polished finishes • For thinner, unbacked workpiece applications
- Proprietary cemented carbide grade available UnCoated (UC) plus either D1 or D2 SmoothCoat®
- Available in popular hole / fastener diameters with both 4" or 6" OAL.

DD2PL4UC



DD2PL6UC



Drill Specifications  
Cutting Diam  $+ .0001 / - .0003$   
Shank Diam  $+0 / - .0003$   
SFR = Shrink Fit Ready

4" OAL

Diam	Decimal	LOF	OAL	EDP#	UC Price	D1 Coat	D2 Coat
3/32	.0938	.480	4"	41200	\$14.50	\$22.50	\$42.40
#40	.0980	.500	4"	41201	\$16.00	\$24.00	\$43.90
1/8	.1250	.630	4"	41202	\$16.40	\$24.40	\$44.30
#30	.1285	.650	4"	41203	\$17.20	\$27.70	\$71.30
#26	.1470	.750	4"	41204	\$19.40	\$29.60	\$73.50
5/32	.1563	.790	4"	41205	\$19.70	\$30.20	\$73.80
#21	.1590	.810	4"	41206	\$21.10	\$31.60	\$75.20
#20	.1610	.820	4"	41207	\$22.40	\$32.90	\$76.50
11/64	.1712	.870	4"	41208	\$23.20	\$33.70	\$77.30
3/16	.1875	.950	4"	41209	\$23.60	\$34.10	\$77.70
#11	.1910	.970	4"	41210	\$25.70	\$38.10	\$92.80
#10	.1935	.980	4"	41211	\$25.90	\$38.30	\$93.00
#9	.1960	.990	4"	41212	\$26.40	\$38.80	\$93.50
#8	.1990	1.01	4"	41213	\$26.80	\$39.20	\$93.90
#7	.2010	1.02	4"	41214	\$27.40	\$39.80	\$94.50
13/64	.2031	1.03	4"	41215	\$27.80	\$40.20	\$94.90
7/32	.2188	1.11	4"	41216	\$30.10	\$42.50	\$97.20
#1	.2280	1.15	4"	41217	\$32.00	\$44.40	\$99.10
15/64	.2344	1.19	4"	41218	\$33.00	\$45.40	\$100.10
1/4	.2500	1.28	4"	41219	\$34.10	\$46.50	\$101.20
5/16	.3125	1.63	4"	41220	\$46.00	\$58.90	\$134.80
3/8	.3750	1.96	4"	41221	\$57.10	\$71.00	\$169.70

6" OAL

Diam	Decimal	LOF	OAL	EDP#	UC Price	D1 Coat	D2 Coat
3/32	.0938	.480	6"	41222	\$18.00	\$30.50	\$48.90
#40	.0980	.500	6"	41223	\$19.80	\$32.30	\$50.70
1/8	.1250	.630	6"	41224	\$20.30	\$32.80	\$51.20
#30	.1285	.650	6"	41225	\$21.30	\$36.80	\$79.40
#26	.1470	.750	6"	41226	\$24.10	\$39.60	\$82.20
5/32	.1563	.790	6"	41227	\$24.40	\$39.90	\$82.50
#21	.1590	.810	6"	41228	\$26.20	\$41.70	\$84.30
#20	.1610	.820	6"	41229	\$27.80	\$43.30	\$85.90
11/64	.1712	.870	6"	41230	\$28.80	\$44.30	\$86.90
3/16	.1875	.950	6"	41231	\$29.30	\$44.80	\$87.40
#11	.1910	.970	6"	41232	\$31.90	\$48.10	\$106.00
#10	.1935	.980	6"	41233	\$32.10	\$48.30	\$106.20
#9	.1960	.990	6"	41234	\$32.70	\$48.90	\$106.80
#8	.1990	1.01	6"	41235	\$33.20	\$49.40	\$107.30
#7	.2010	1.02	6"	41236	\$34.00	\$50.20	\$108.10
13/64	.2031	1.03	6"	41237	\$34.50	\$50.70	\$108.60
7/32	.2188	1.11	6"	41238	\$37.30	\$53.50	\$111.40
#1	.2280	1.15	6"	41239	\$39.70	\$55.90	\$113.80
15/64	.2344	1.19	6"	41240	\$40.90	\$57.10	\$115.00
1/4	.2500	1.28	6"	41241	\$42.30	\$58.50	\$116.40
5/16	.3125	1.63	6"	41242	\$57.00	\$74.90	\$152.80
3/8	.3750	1.96	6"	41243	\$70.80	\$92.20	\$193.40

**new! DR Series • D1 & D2 coated dreamer drills****Tight tolerance drill / reamer with featuring D1 or D2 SmoothCoat.**

- Designed for drilling clean, accurate holes in CFRP & GFRP stacked composites, graphite, plastics, fiberglass, and more
- Tight tolerance +.0001/- .0003 with SmoothGrind® polished finishes • For thicker, stacked material applications
- Proprietary cemented carbide grade available UnCoated (UC) plus either D1 or D2 SmoothCoat®
- Available in popular hole / fastener diameters with both 4" or 6" OAL • All diameters have 1.5" LOF

DR4PL4UC



DR4PL6UC



Drill Specifications  
Cutting Diam +.0001/- .0003  
Shank Diam +0/- .0003  
SFR = Shrink Fit Ready

4" OAL

Ø Diam	Ø Decimal	LOF	OAL	4" OAL	UC Price	D1 Coat	D2 Coat
EDP#							
3/32	.0938	1-1/2	4"	41300	\$19.30	\$27.30	\$47.20
#40	.0980	1-1/2	4"	41301	\$21.40	\$29.40	\$49.30
1/8	.1250	1-1/2	4"	41302	\$21.80	\$29.80	\$49.70
#30	.1285	1-1/2	4"	41303	\$22.90	\$33.40	\$77.00
#26	.1470	1-1/2	4"	41304	\$25.40	\$35.90	\$79.50
5/32	.1563	1-1/2	4"	41305	\$25.70	\$36.20	\$79.80
#21	.1590	1-1/2	4"	41306	\$27.10	\$37.60	\$81.20
#20	.1610	1-1/2	4"	41307	\$28.40	\$38.90	\$82.50
11/64	.1712	1-1/2	4"	41308	\$29.20	\$39.70	\$83.30
3/16	.1875	1-1/2	4"	41309	\$29.50	\$40.00	\$83.60
#11	.1910	1-1/2	4"	41310	\$30.20	\$42.60	\$97.30
#10	.1935	1-1/2	4"	41311	\$30.40	\$42.80	\$97.50
#9	.1960	1-1/2	4"	41312	\$30.90	\$43.30	\$98.00
#8	.1990	1-1/2	4"	41313	\$31.10	\$43.50	\$98.20
#7	.2010	1-1/2	4"	41314	\$31.40	\$43.80	\$98.50
13/64	.2031	1-1/2	4"	41315	\$31.80	\$44.20	\$98.90
7/32	.2188	1-1/2	4"	41316	\$33.10	\$45.50	\$100.20
#1	.2280	1-1/2	4"	41317	\$35.00	\$47.40	\$102.10
15/64	.2344	1-1/2	4"	41318	\$36.00	\$48.40	\$103.10
1/4	.2500	1-1/2	4"	41319	\$37.10	\$49.50	\$104.20
5/16	.3125	1-1/2	4"	41320	\$49.00	\$61.90	\$137.80
3/8	.3750	1-1/2	4"	41321	\$60.10	\$74.00	\$172.70

6" OAL

Ø Diam	Ø Decimal	LOF	OAL	6" OAL	UC Price	D1 Coat	D2 Coat
EDP#							
3/32	.0938	1-1/2	6"	41322	\$27.00	\$39.50	\$57.90
#40	.0980	1-1/2	6"	41323	\$30.00	\$42.50	\$60.90
1/8	.1250	1-1/2	6"	41324	\$30.50	\$43.00	\$61.40
#30	.1285	1-1/2	6"	41325	\$32.10	\$47.60	\$90.20
#26	.1470	1-1/2	6"	41326	\$35.60	\$51.10	\$93.70
5/32	.1563	1-1/2	6"	41327	\$36.00	\$51.50	\$94.10
#21	.1590	1-1/2	6"	41328	\$37.90	\$53.40	\$96.00
#20	.1610	1-1/2	6"	41329	\$39.80	\$55.30	\$97.90
11/64	.1712	1-1/2	6"	41330	\$40.90	\$56.40	\$99.00
3/16	.1875	1-1/2	6"	41331	\$41.30	\$56.80	\$99.40
#11	.1910	1-1/2	6"	41332	\$42.30	\$58.50	\$116.40
#10	.1935	1-1/2	6"	41333	\$42.60	\$58.80	\$116.70
#9	.1960	1-1/2	6"	41334	\$43.30	\$59.50	\$117.40
#8	.1990	1-1/2	6"	41335	\$43.50	\$59.70	\$117.60
#7	.2010	1-1/2	6"	41336	\$44.00	\$60.20	\$118.10
13/64	.2031	1-1/2	6"	41337	\$44.50	\$60.70	\$118.60
7/32	.2188	1-1/2	6"	41338	\$46.30	\$62.50	\$120.40
#1	.2280	1-1/2	6"	41339	\$49.00	\$65.20	\$123.10
15/64	.2344	1-1/2	6"	41340	\$50.40	\$66.60	\$124.50
1/4	.2500	1-1/2	6"	41341	\$51.90	\$68.10	\$126.00
5/16	.3125	1-1/2	6"	41342	\$68.60	\$86.50	\$164.40
3/8	.3750	1-1/2	6"	41343	\$84.10	\$105.50	\$206.70



## SD Series: Spotting Drills

Spot drilling fibrous materials can reduce material breakout. Spot a hole diameter slightly larger than the drill diameter to create a pre-chamfer, beneficial for both entry and exit points.

Short Length • 25° RH Helix • Two Flute  
82° • 90° • 120° • 140° • 150° included angles  
Four Facet Point • Constant Web • No OD Clearance • Produces True Centers



**new!**  
Diamond coated  
Spotting Drills!

Diam	LOF	OAL	82° EDP#	90° EDP#	120° EDP#	140° EDP#	150° EDP#	D1 Coated	D2 Coated
1/8	1/2	2"	52135	52580	52581	52582	52143	\$14.80	\$38.40
3/16	5/8	2"	52136	52585	52586	52587	52144	\$19.00	\$67.20
1/4	3/4	2-1/2	52137	52516	52515	52514	52145	\$23.30	\$83.30
5/16	3/4	2-1/2	52138	52590	52591	52592	52146	\$29.70	\$110.40
3/8	1"	2-1/2	52139	52524	52525	52526	52147	\$31.80	\$136.00
1/2	1"	3"	52140	52532	52533	52534	52148	\$54.30	\$187.60
5/8	1-1/4	3-1/2	52141	52540	52541	52542	52149	\$98.20	\$261.30
3/4	1-1/2	4"	52142	52548	52549	52550	52150	\$147.80	\$358.30

SFR Drill Specifications:  
Diameter +0.000/-0.003  
Point Angle ±1°

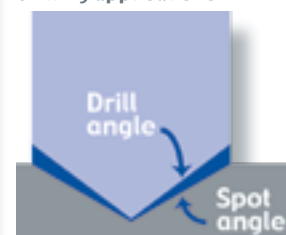
### SD Series Metric Sizes



SFR Drill Specifications (mm):  
Diameter +0.000/-0.008mm  
Point Angle ±1°

Diam	LOF	OAL	82° EDP#	90° EDP#	120° EDP#	140° EDP#	150° EDP#	D1 Coated	D2 Coated
3.0mm	12	57	52151	52588	52589	52594	52159	\$14.80	\$38.40
5.0mm	16	63	52152	52595	52596	52593	52160	\$19.00	\$67.20
6.0mm	19	63	52153	52506	52507	52505	52161	\$23.30	\$83.30
8.0mm	19	63	52154	52508	52509	52504	52162	\$29.70	\$110.40
10.0mm	25	70	52155	52510	52511	52503	52163	\$48.90	\$168.90
12.0mm	25	74	52156	52512	52513	52502	52164	\$54.30	\$187.60
16.0mm	32	89	52157	52517	52518	52519	52165	\$98.20	\$261.30
20.0mm	38	100	52158	52521	52522	52523	52166	\$147.80	\$358.30

Now RoundTool offers 5 different angles of dedicated spotting drills. For true spot drilling, use a 525 with an angle slightly larger than the following finishing drill. The 525 Series can also be used for countersinking and is typically faster than traditional center drilling applications.



• To purchase these products in an UnCoated, TN, TC, or TA coating, please see our Ultra-Tool catalog offering.

ULTRATOOL<sup>®</sup>

## CS Series: CounterSinks

60° • 82° • 90° • 100° included angles • Single or Six Flute  
Solid carbide thru 1/4" • Carbide head w/steel shank 5/16"+

ULTRA Grain<sup>®</sup>

### Series CS6

Carbide Six Flute Countersinks  
For use in abrasive materials



Use the CS6 for materials that will be powdered during machining

Diam	Shank	OAL	60° EDP#	82° EDP#	90° EDP#	100° EDP#	D1 Coated	D2 Coated
1/8	1/8	1-1/2	91008	91708	91808	91864	\$12.80	\$36.40
3/16	3/16	2"	91012	91712	91812	91860	\$14.90	\$63.10
1/4	1/4	2"	91016	91716	91816	91865	\$19.50	\$79.50
5/16	1/4	2-5/8	91020	91720	91820	91819	\$25.50	
3/8	1/4	2-5/8	91024	91724	91824	91863	\$28.50	
1/2	1/4	2-5/8	91032	91732	91832	91866	\$42.50	
5/8	3/8	2-3/4	91036	91736	91836	91867	\$63.30	
3/4	3/8	2-3/4	91040	91740	91840	91868	\$82.20	
1"	1/2	3"	91048	91748	91848	91855	\$122.80	
1-1/4	3/4	3-1/4	91050	91750	91850	91856	\$233.40	
1-1/2	3/4	3-1/4	91054	91754	91854	91857	\$327.80	

### Series CS1

Carbide Single Flute Countersinks  
For use in soft materials



Use the CS1 for materials that produce a stringy, elongated chip

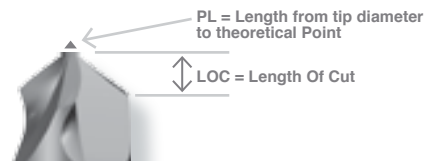
Diam	Shank	OAL	60° EDP#	82° EDP#	90° EDP#	100° EDP#	D1 Coated	D2 Coated
1/8	1/8	1-1/2	91108	91508	91608	91869	\$12.80	\$36.40
3/16	3/16	2"	91112	91512	91612	91870	\$14.90	\$63.10
1/4	1/4	2"	91116	91516	91616	91871	\$19.50	\$79.50
5/16	1/4	2-5/8	91120	91520	91620	91818	\$25.50	
3/8	1/4	2-5/8	91124	91524	91624	91872	\$28.50	
1/2	1/4	2-5/8	91132	91532	91632	91873	\$42.50	
5/8	3/8	2-3/4	91136	91536	91636	91874	\$63.30	
3/4	3/8	2-3/4	91140	91540	91640	91875	\$82.20	
1"	1/2	3"	91148	91548	91648	91876	\$122.80	
1-1/4	3/4	3-1/4	91150	91550	91650	91877	\$233.40	



new!

Helical configuration, flat end,  
and diamond coatings

## CM Series: Chamfer Mills

Three Flute Helical Chamfer Mill with Flat Tip  
Solid Carbide • 6 included angles

Ø Diam	OAL	Tip	30° EDP#	40° EDP#	60° EDP#	90° EDP#	100° EDP#	120° EDP#	UnCoated Price	D1 Coated	D2 Coated	30° LOC/PL	40° LOC/PL	60° LOC/PL	90° LOC/PL	100° LOC/PL	120° LOC/PL
1/8	1-1/2	.040	36600	36608	36616	36624	36640	36632	\$9.00	\$13.40	\$36.90	.159/.075	.117/.055	.074/.036	.043/.021	.036/.017	.025/.012
3/16	2"	.050	36601	36609	36617	36625	36641	36633	\$14.90	\$20.80	\$69.00	.257/.093	.189/.069	.119/.045	.069/.026	.058/.021	.040/.015
1/4	2-1/2	.060	36602	36610	36618	36626	36642	36634	\$18.60	\$25.70	\$85.70	.355/.112	.261/.082	.165/.054	.095/.031	.080/.025	.055/.018
5/16	2-1/2	.065	36603	36611	36619	36627	36643	36635	\$25.50	\$34.10	\$114.30	.462/.121	.340/.089	.214/.056	.124/.033	.104/.027	.071/.019
3/8	2-1/2	.070	36604	36612	36620	36628	36644	36636	\$29.30	\$38.60	\$141.90	.569/.131	.419/.096	.264/.062	.153/.036	.128/.029	.088/.021
1/2	3"	.080	36605	36613	36621	36629	36645	36637	\$46.10	\$59.80	\$193.30	.784/.149	.577/.110	.364/.071	.210/.041	.176/.034	.121/.024
5/8	3"	.090	36606	36614	36622	36630	36646	36638	\$84.50	\$105.20	\$268.50	.998/.168	.735/.124	.463/.080	.268/.046	.224/.038	.154/.027
3/4	3"	.100	36607	36615	36623	36631	36647	36639	\$117.10	\$142.80	\$353.10	1.213/.187	.893/.137	.563/.088	.325/.051	.273/.042	.188/.029
1"	4"	.120	36648	36649	36650	36651	36652	36653	\$202.50	\$237.40	\$495.80	1.642/.224	1.209/.165	.762/.104	.440/.060	.369/.050	.254/.035

## FR Series: Fiberglass Routers

Large routers with various end styles for a wide material range.

- Designed for routing of a wide range of materials
- Plain, Burr, End Mill, Drill point, and Fish Tail end features
- Proprietary cemented carbide grade with 2 different SmoothCoat coatings
- Use UnCoated for general purpose routing needs
- Use D1 PVD diamond coated for composites, CFRP's, honeycombs, plastics, woods & other abrasive materials • Use hard & thick D2 CVD diamond coating for long-run jobs in composites, CFRP's, honeycombs & other abrasive materials

D1 PVD Diamond coating is the perfect compliment for routing abrasive materials. The smoothness of our sputter based process helps evacuate the material up and out of the cut with superb lubricity. The hardness of D1's multi-layered surface lends outstanding wear characteristics when routing in the types of material for which the Series is designed. Add D1 (or D2 for even more wear resistance) as a suffix to the EDP #.



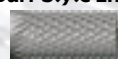
FRNOUC

No End Cut



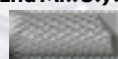
FRNO

Burr Style End



FRBS

End Mill Style



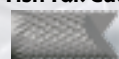
FREM

135° Drill Point



FRDP

Fish Tail Cut



FRFT

new!

Ø Diam	LOC	OAL	Shank	FRNO EDP#	UC Price	D1 Price	D2 Price	FRBS EDP#	FREM EDP#	FRDP EDP#	FRFT EDP#	UC Price	D1 Price	D2 Price
1/8	1/2	1-1/2	1/8	32001	\$7.40	\$12.30	\$35.30	32101	32201	32301	32401	\$8.70	\$13.60	\$36.60
3/16	5/8	2"	3/16	32002	\$10.90	\$16.50	\$56.00	32102	32202	32302	32402	\$13.70	\$19.30	\$58.80
1/4	3/4	2-1/2	1/4	32003	\$12.40	\$19.50	\$73.50	32103	32203	32303	32403	\$15.40	\$22.50	\$76.50
1/4L	1"	3"	1/4	32007	\$15.60	\$23.10	\$77.10	32107	32207	32307	32407	\$18.90	\$26.40	\$80.40
5/16	1"	2-1/2	5/16	32004	\$20.70	\$29.20	\$102.20	32104	32204	32304	32404	\$26.20	\$34.70	\$107.70
3/8	1"	2-1/2	3/8	32005	\$24.20	\$33.70	\$129.70	32105	32205	32305	32405	\$29.70	\$39.20	\$135.20
1/2	1"	3"	1/2	32006	\$40.00	\$51.80	\$169.30	32106	32206	32306	32406	\$46.90	\$58.70	\$176.20
Metric Diameters														
6.0mm	19	63	6.0	32008	\$12.40	\$19.50	\$73.50	32108	32208	32308	32408	\$15.40	\$22.50	\$76.50
6.0	25	76	6.0	32009	\$15.40	\$22.90	\$76.90	32109	32209	32309	32409	\$18.70	\$26.20	\$80.20
8.0	25	63	8.0	32010	\$20.70	\$29.20	\$102.20	32110	32210	32310	32410	\$26.20	\$34.70	\$107.70
10.0	25	70	10.0	32011	\$29.70	\$42.10	\$146.60	32111	32211	32311	32411	\$38.10	\$50.50	\$155.00
12.0	25	75	12.0	32012	\$40.00	\$51.80	\$169.30	32112	32212	32312	32412	\$46.90	\$58.70	\$176.20



## new! Specialty diamond coated routers & end mills

### CUD Series: Compression Up/Down square end routers featuring 2+2 or 4+4 design

- Designed for compression routing of a wide range of materials
- Proprietary cemented carbide grade with sharp & polished SmoothGrind cutting edges plus available SmoothCoat
- Use UnCoated for general purpose routing needs
- Use thin, smooth, & hard D1 PVD diamond for plastics, woods, composites, CFRP's, honeycombs & other abrasive materials
- Use hard & thick D2 CVD diamond coating for long-run jobs in composites, CFRP's, honeycombs & other abrasive materials



CUD2SUC

CUD4SUC

Ø Diam	Style	LOC	Upshear	OAL	Shank	EDP#	CUD UnCoated Price	CUD D1 Coated Price	CUD D2 Coated Price
1/4	2+2	3/4	.285	2-1/2	1/4	30416	\$37.10	\$45.60	\$99.60
1/4	2+2	1"	.285	2-1/2	1/4	58361	\$40.30	\$48.80	\$102.80
1/4	4+4	.905	.250	2-1/2	1/4	40418	\$41.30	\$49.80	\$103.80
1/4L	4+4	1-1/4	.250	2-1/2	1/4	40417	\$44.50	\$53.00	\$107.00
3/8	2+2	1"	.435	3"	3/8	58210	\$55.10	\$64.60	\$160.60
3/8	2+2	1-1/8	.435	3"	3/8	58362	\$55.10	\$64.60	\$160.60
1/2	2+2	1"	.435	3"	1/2	58363	\$62.00	\$75.50	\$193.00
1/2	2+2	1-1/8	.435	3"	1/2	58221	\$63.10	\$76.60	\$194.10
1/2	2+2	1-1/8	.435	4"	1/2	58220	\$78.40	\$95.40	\$208.40
1/2	2+2	1-3/8	.435	3"	1/2	58190	\$65.20	\$78.70	\$196.20
1/2	2+2	1-3/8	.435	4"	1/2	58230	\$81.60	\$98.60	\$211.60
1/2	2+2	1-5/8	.435	4"	1/2	58240	\$83.70	\$100.70	\$287.70
5/8	2+2	1-5/8	.735	4"	5/8	58250	\$154.20	\$175.20	\$407.70
5/8	2+2	1-7/8	.735	5"	5/8	58260	\$171.70	\$204.20	\$424.70
5/8	2+2	2-1/4	.735	5"	5/8	53864	\$179.70	\$212.20	\$432.70
3/4	2+2	1-5/8	.860	4"	3/4	58270	\$174.90	\$198.90	\$522.90
3/4	2+2	2-1/2	.985	5"	3/4	58280	\$218.40	\$256.90	\$566.40

### OU & OD Series: Single flute high polish & sharp edge for plastics in both UpCut and DownCut

- RHS/RHC high-shear UpCut
- LHS/RHC high-shear DownCut
- OU1SUC, OU1SD1 or OU1SD2
- OD1SUC, OD1SD1 or OD1SD2



- Use Base EDP and add UC, D1 or D2 suffix for coating selection

Diam	LOC	OAL	Shank	OU1S UpCut EDP#	OD1S DownCut EDP#	UnCoated Price	D1 Price	D2 Price
1/8	5/8	2"	1/8	24685	24695	\$17.40	\$21.70	\$45.30
3/16	3/4	2"	3/16	24686	24696	\$18.80	\$23.80	\$72.90
1/4	3/4	2-1/2	1/4	24687	24697	\$20.80	\$27.20	\$87.90
1/4L	1-1/4	3"	1/4	24688	24698	\$26.70	\$33.40	\$95.80
3/8	1-1/8	3"	3/8	24689	24699	\$41.00	\$50.30	\$153.60
1/2	1-1/2	4"	1/2	24690	24700	\$71.50	\$86.20	\$218.70

### SU & SD Series: Slow Helix 4 flute

For materials that easily tear or shred during routing / milling featuring both UpCut (upshear) & DownCut (downshear) geometry.

- Use Base EDP and add UC, AT, D1 or D2 suffix for coating selection



SU4SUC

SD4SUC

### GRD Series: Downshear 4 flute

Solid carbide square end mills featuring left-hand helix / right-hand cut "downshear" cutting geometry.

- GRD4S features faster helix and less aggressive cutting edge than the SD4S Series



GRD4SUC



RTL Specs end mills  
Cutting Diam +0 / -.002  
Shank Diam +0 / -.0003  
Radius ±.001  
LOC +.030 / -.000  
SFR = Shrink Fit Ready

Diam	LOC	OAL	Shank	SU4S UpCut EDP#	SD4S DownCut EDP#	UnCoated Price	AT Price	D1 Price	D2 Price	GRD4S DownCut EDP#	UnCoated Price	AT Price	D1 Price	D2 Price
1/16	5/16	1-1/2	1/8	24645	24665	\$15.90	\$17.40	\$20.40	\$44.90	24600	\$20.10	\$21.80	\$24.10	\$48.00
1/8	5/8	1-1/2	1/8	24646	24666	\$14.80	\$16.30	\$19.30	\$42.80	24604	\$18.00	\$19.80	\$22.00	\$45.90
3/16	3/4	2"	3/16	24647	24667	\$22.30	\$24.30	\$27.30	\$76.40	24608	\$24.40	\$27.60	\$30.40	\$78.50
1/4	1"	2-1/2	1/4	24648	24668	\$26.50	\$29.50	\$33.50	\$93.60	24612	\$30.70	\$35.40	\$39.50	\$97.80
5/16	1"	2-1/2	5/16	24649	24669	\$33.90	\$37.90	\$41.90	\$122.70	24616	\$38.20	\$44.70	\$48.20	\$127.00
3/8	1"	2-1/2	3/8	24650	24670	\$43.50	\$47.50	\$52.50	\$156.10	24620	\$47.70	\$54.10	\$58.40	\$160.30
7/16	1"	3"	7/16	24651	24671	\$63.60	\$69.60	\$75.60	\$195.70	24624	\$72.10	\$81.10	\$86.20	\$204.50
1/2	1-1/4	3"	1/2	24652	24672	\$68.90	\$74.90	\$80.90	\$216.60	24628	\$74.20	\$83.20	\$88.50	\$221.40
5/8	1-3/8	3-1/2	5/8	24653	24673	\$114.50	\$126.50	\$136.50	\$298.50	24632	\$127.20	\$140.40	\$149.30	\$311.20
3/4	1-3/8	4"	3/4	24654	24674	\$145.20	\$158.20	\$170.20	\$381.30	24636	\$161.10	\$176.30	\$187.20	\$397.10
1"	1-3/8	4"	1"	24655	24675	\$222.60	\$242.60	\$262.60	\$547.90	24640	\$259.70	\$280.80	\$297.20	\$585.80





## new! RM Series: D1 & D2 coated reamers

Tight tolerance reamers with 45° lead chamfer featuring D1 or D2 SmoothCoat.

- Designed for reaming CFRP & GFRP composites, graphite, plastics, fiberglass, and more • Tight tolerance  $\pm .0002/- .0000$
- Proprietary cemented carbide grade plus either D1 or D2 SmoothCoat • Choose from Straight, RHS, or LHS (each RHS)
- To order specify Series and decimal or metric size within stated range • Delivery up to 1 week on D1 or up to 4 weeks on D2

### RMS Series

Straight Flute • Right Hand Cut



### RMR Series

Right Hand Spiral • Right Hand Cut



### RML Series

Left Hand Spiral • Right Hand Cut



#### Decimal Sizes



Reamer Specs: 45° Lead  
Cutting Diam  $\pm .0002/- .0000$   
Shank Diam  $\pm .0005/- .0005$



#### Metric Sizes



Reamer Specs (Metric): 45° Lead  
Cutting Diam  $\pm 0.005/- 0.000$ mm  
Shank Diam  $\pm 0.013/- 0.013$ mm

Group	Diam Range	LOC	OAL	Flutes	Shank	D1 price	D2 price	Shank	Flutes	OAL	LOC	Diam Range	Group
1	.0312 - .0394	1/2	1-1/2	4	.0312	\$35.30	\$55.30	0.7mm	4	38	9	0.80 - 1.00mm	1
2	.0395 - .0484	1/2	1-1/2	4	.0312	\$35.10	\$56.10	0.7mm	4	38	9	1.01 - 1.23mm	2
3	.0485 - .0574	1/2	1-1/2	4	.0469	\$36.50	\$56.50	1.0mm	4	38	9	1.24 - 1.46mm	3
4	.0575 - .0654	1/2	1-1/2	4	.0469	\$36.90	\$56.90	1.0mm	4	38	9	1.47 - 1.66mm	4
5	.0655 - .0804	1/2	2"	4	.0625	\$37.80	\$57.80	1.5mm	4	51	12	1.67 - 2.04mm	5
6	.0805 - .0964	1/2	2"	4	.0781	\$38.40	\$58.40	1.5mm	4	51	12	2.05 - 2.45mm	6
7	.0965 - .1124	5/8	2-1/4	4	.0938	\$41.80	\$60.80	2.2mm	4	57	16	2.46 - 2.85mm	7
8	.1125 - .1284	5/8	2-1/4	4	.1094	\$42.00	\$79.50	2.5mm	4	57	16	2.86 - 3.26mm	8
9	.1285 - .1444	3/4	2-1/2	4	.1250	\$47.50	\$83.00	3.0mm	4	63	19	3.27 - 3.67mm	9
10	.1445 - .1594	3/4	2-1/2	4	.1406	\$49.40	\$84.90	3.5mm	4	63	19	3.68 - 4.05mm	10
11	.1595 - .1744	7/8	2-3/4	4	.1562	\$55.00	\$89.50	3.5mm	4	70	22	4.06 - 4.43mm	11
12	.1745 - .1914	7/8	2-3/4	4	.1719	\$56.30	\$108.80	4.0mm	4	70	22	4.44 - 4.86mm	12
13	.1915 - .2234	1"	3"	6	.1875	\$63.00	\$113.50	4.5mm	6	76	25	4.87 - 5.67mm	13
14	.2235 - .2544	1"	3"	6	.2188	\$64.30	\$136.30	5.0mm	6	76	25	5.68 - 6.46mm	14
15	.2545 - .2844	1-1/8	3-1/4	6	.2500	\$74.60	\$142.60	6.3mm	6	82	28	6.47 - 7.22mm	15
16	.2845 - .3164	1-1/8	3-1/4	6	.2812	\$86.00	\$175.50	7.1mm	6	82	28	7.23 - 8.04mm	16
17	.3165 - .3484	1-1/4	3-1/2	6	.3125	\$95.50	\$184.00	7.1mm	6	89	32	8.05 - 8.85mm	17
18	.3485 - .3794	1-1/4	3-1/2	6	.3438	\$104.30	\$204.80	8.0mm	6	89	32	8.86 - 9.64mm	18
19	.3795 - .4104	1-1/2	4"	6	.3750	\$114.50	\$215.00	8.0mm	6	101	38	9.65 - 10.42mm	19
20	.4105 - .4414	1-1/2	4"	6	.4062	\$122.80	\$234.80	10.0mm	6	101	38	10.43 - 11.21mm	20
21	.4415 - .4724	1-1/2	4"	6	.4375	\$125.80	\$237.80	10.0mm	6	101	38	11.22 - 12.00mm	21
22	.4725 - .5054	1-1/2	4"	6	.4688	\$135.10	\$276.50	10.0mm	6	101	38	12.01 - 12.84mm	22

Group ranges 1 - 7 feature male-centers on both ends. Group ranges 8 - 22 feature female-centers on both ends.

## new! RMX Series: Extra Long D1 & D2 coated reamers

Tight tolerance reamers with 45° lead chamfer featuring D1 or D2 SmoothCoat.

- Designed for reaming CFRP & GFRP composites, graphite, plastics, fiberglass, and more • Tight tolerance  $\pm .0002/- .0000$
- Proprietary cemented carbide grade plus either D1 or D2 SmoothCoat • Straight flute only / Right Hand Cut
- Specify any decimal or metric size within stated range • Delivery up to 1 week on D1 or up to 4 weeks on D2

### RMX Series

Extra-Long Length • Straight Flute • RH Cut



Reamer Specs: 45° Lead  
Cutting Diam  $\pm .0002/- .0000$   
Shank Diam  $\pm .0005/- .0005$

RMX6UC



Decimal Sizes								Metric Sizes					
Group	Diam Range	LOC	OAL	Flutes	Shank	D1 Price	D2 price	Shank	Flutes	OAL	LOC	Diam Range	Group
1	.0395 - .0484	7/8	6"	6	.0312	\$85.90	\$102.90	0.7mm	6	152	22	1.00 - 1.23mm	1
2	.0485 - .0574	7/8	6"	6	.0469	\$84.40	\$101.40	1.0mm	6	152	22	1.24 - 1.45mm	2
3	.0575 - .0654	7/8	6"	6	.0469	\$84.40	\$101.40	1.0mm	6	152	22	1.46 - 1.66mm	3
4	.0655 - .0804	7/8	6"	6	.0625	\$82.80	\$99.80	1.5mm	6	152	22	1.67 - 2.04mm	4
5	.0805 - .0964	7/8	6"	6	.0781	\$82.80	\$99.80	1.9mm	6	152	22	2.05 - 2.45mm	5
6	.0965 - .1124	7/8	6"	6	.0938	\$81.20	\$98.20	2.2mm	6	152	22	2.46 - 2.85mm	6
7	.1125 - .1284	7/8	6"	6	.1094	\$79.50	\$112.50	2.5mm	6	152	22	2.86 - 3.26mm	7
8	.1285 - .1444	7/8	6"	6	.1250	\$85.40	\$120.40	3.0mm	6	152	22	3.27 - 3.66mm	8
9	.1445 - .1594	1"	6"	6	.1406	\$92.40	\$126.40	3.5mm	6	152	25	3.67 - 4.05mm	9
10	.1595 - .1744	1"	6"	6	.1562	\$97.00	\$130.00	3.5mm	6	152	25	4.06 - 4.43mm	10
11	.1745 - .1914	1"	6"	6	.1719	\$101.50	\$149.50	4.0mm	6	152	25	4.44 - 4.86mm	11
12	.1915 - .2234	1-1/4	6"	6	.1875	\$104.60	\$152.60	4.5mm	6	152	32	4.87 - 5.67mm	12

Solid carbide construction with male centers.

## Technical Data: GR Diamond Coated Series / D1 & D2

### Speeds and Feeds for milling graphite and abrasive materials.

Use maximum spindle RPM to achieve up to 3000 SFPM.

- D1 & D2 coated GR Series will likely utilize your maximum possible spindle speed
- For reference, the chart below displays your achievable SFPM based upon your machining center
- Tool life should be 10–50 times that of uncoated carbide with improved accuracy and finish
- Long life allows unattended machining and part completion without tooling change
- Premium carbide substrate and special material preparation increases coating adhesion

Diam	mm	100 SFPM	250 SFPM	500 SFPM	3000 SFPM	Roughing Feed Rate CPT	Finishing Feed Rate CPT	Roughing Feed mm per tooth	Finishing Feed mm per tooth
		30 M/min	75 M/min	150 M/min	900 M/min				
1/64	0.4	24000	60000	max rpm	max rpm	.0002 – .0005	.0002 – .0003	0.005 – 0.013	0.005 – 0.008
1/32	0.8	12000	30000	60000	max rpm	.0005 – .001	.0003 – .0006	0.013 – 0.025	0.008 – 0.015
1/16	1.5	6100	15300	30500	max rpm	.0008 – .002	.0005 – .0013	0.203 – 0.051	0.013 – 0.033
3/32	2.5	4100	10200	20400	max rpm	.001 – .0022	.0008 – .0015	0.025 – 0.056	0.020 – 0.038
1/8	3.0	3050	7640	15300	max rpm	.001 – .0025	.001 – .002	0.025 – 0.064	0.025 – 0.051
3/16	4.5	2050	5100	10200	61000	.002 – .0035	.001 – .0025	0.051 – 0.090	0.025 – 0.064
1/4	6.0	1500	3820	7640	45800	.0025 – .0045	.001 – .0035	0.064 – 0.114	0.025 – 0.090
5/16	8.0	1220	3050	6120	36700	.003 – .005	.001 – .004	0.076 – 0.127	0.025 – 0.102
3/8	10.0	1020	2550	5100	30500	.003 – .006	.001 – .004	0.076 – 0.152	0.025 – 0.102
7/16	11.0	875	2200	4365	26200	.004 – .008	.001 – .005	0.102 – 0.203	0.025 – 0.127
1/2	12.0	765	1900	3820	23000	.005 – .012	.001 – .006	0.127 – 0.305	0.025 – 0.152

Metric dimensions and recommendations displayed in blue type. M/min = surface meters per minute. SFPM = surface feet per minute. Feed rates displayed in chip load per tooth.

### Typical Applications for D1 & D2 Diamond:

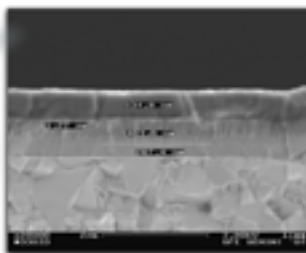
- Graphites • Aluminum–Silicon Alloys • Carbon Fiber Composites • Plastics • Green Ceramics
- Copper Alloys • Brass Magnesium • Hard Carbons • Fiberglass • High Silicon Aluminum
- Composite CFRP's • Metal Matrix Composites • Wood Composites
- Delrin • Kevlar • PEEK • Glass–Filled Composites



## About our D1 & D2 Diamond Coatings

RoundTool Laboratories Diamond Coated End Mill Series are a perfect match on graphite molds for EDM. Our D1 and D2 coatings offer industry leading wear resistance when subjected to the abrasive properties of EDM graphite parts. RoundTool offers two versions of diamond; D1 is a PVD applied diamond while our D2 is a CVD application. Supporting both Series is a carbide end mill specially designed and manufactured with graphite milling in mind. While other companies simply coat standard off-the-shelf end mills, the GR-D1 and GR-D2 represent customized engineering featuring higher helix & heavier core, which in turn offer freer cutting and less deflection. These two series have also achieved great success in other applications featuring highly abrasive materials.

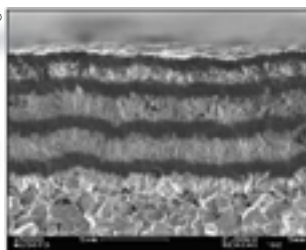
### SmoothCoat®



**SmoothCoat® D1:** RoundTool Lab's new generation of D1 raises the bar on PVD diamond coatings. D1 PVD Diamond is a smooth amorphous diamond coating that also maintains an extremely upsharp cutting edge. D1 offers the highest value proposition in a large majority of applications. Short, medium, and long running jobs all benefit from D1's unique attributes, and small diameter end mills particularly are complimented by the smooth & thin coating structure. These end mills will produce the finest finish and most accurate cut of our diamond selection. D1 end mills also have a quick turnaround time with our in-house coating facility.

Type: PVD Color: Shiny Black Thickness per side: 1.75 – 2.5 microns

### SmoothCoat®



**SmoothCoat® D2:** RoundTool Lab's new generation of D2 is a "grown on" CVD diamond coating that offers the highest wear resistance in machining graphite and abrasive non-metals. Tool life can be increased by up to 50x that of standard uncoated carbide end mills. With long tool life and minimal wear, D2 coated end mills improve part accuracy and workpiece tolerance levels. D2 end mills have a longer lead time due to the amount of time spent in the coating vessel physically growing the diamond crystalline structure.

Type: CVD Color: Flat Dark Grey Thickness per side: 3–9 microns



• Please note that due to extreme hardness D2 coated tools are generally unable to be reground or resharpened.



**new!**

## Technical Data • MP, GR, SS, NF & LRX Series

### Speeds and Feeds for a variety of materials.

**35% tighter shank tolerance than h6!**  
Shrink-Fit Ready!





**Peripheral Milling:** Full length of cut possible if radial depth  $\leq 10\%$  of tool diameter.





**Slot Milling:** Based on axial depth  $< 20\%$  of tool diameter.

- Data is for UnCoated (UC) condition of tool
- For coated tools, increase SFM by at least 25%
- For D1 and D2 coatings please refer to their separate Data sheet on page #33
- If recommended speed is higher than machine tool's capacity, run at maximum RPM and reduce feed rate accordingly

#### Fractional Data

Fractional Data		Peripheral Milling SFPM		Slotting SFPM	Feed Per Tooth based on End Mill Diameter							
					<.010	1/64"	1/32"	1/16"	1/8"	3/16"	1/4"	3/8"
Non-Ferrous												
6061 T6 Aluminum	up to 2000	up to 1500	.0001	.00015	.0002	.0004	.0008	.0012	.0015	.002	.003	
Copper, Brass, Bronze	up to 1200	up to 1000	.0001	.00015	.0002	.0004	.0008	.0012	.0015	.002	.003	
Plastics	up to 2000	up to 1500	.00015	.0002	.0003	.0006	.001	.002	.003	.004	.005	
Steels												
1018, 1020	150 to 300	125 to 250	.0001	.00015	.0002	.00025	.0005	.001	.0015	.002	.0025	
4140, 4340, P20	125 to 250	125 to 225	.00007	.0001	.00015	.00025	.0005	.0007	.001	.0015	.002	
A2, D2, H13 ≤ 32HRC	125 to 225	100 to 150	.00007	.0001	.00015	.00025	.0005	.0007	.001	.0015	.002	
A2, D2, H13 ≥ 32HRC	100 to 125	100 to 125	.0001	.00015	.0001	.00015	.0003	.0005	.0008	.0010	.0015	
Stainless Steels												
15-5, 17-4 ≤ 32HRC	150 to 350	100 to 225	.00007	.0001	.00015	.00025	.0005	.0007	.001	.0015	.002	
15-5, 17-4 ≥ 32HRC	100 to 125	100 to 150	.00005	.00008	.0001	.00015	.0003	.0005	.0008	.0010	.0015	
303, 304, 316	150 to 300	125 to 225	.00007	.0001	.00015	.00025	.0005	.0007	.001	.0012	.0015	
420, 440C	150 to 250	125 to 225	.00007	.0001	.00015	.00025	.0005	.0007	.001	.0015	.0015	
High Temp Alloys												
Inconel 625	75 to 150	75 to 125	.00005	.00008	.0001	.00015	.0005	.0007	.001	.0015	.002	
Inconel 718	50 to 120	50 to 110	.00005	.00008	.0001	.00013	.0003	.0005	.001	.0015	.0015	
6Al-4V Titanium	100 to 150	75 to 125	.00005	.00008	.0001	.00015	.0005	.0007	.001	.001	.0015	
Cast Iron												
Gray Iron ≤ 32HRC	150 to 300	125 to 250	.0001	.00015	.0002	.00025	.0005	.0007	.001	.0015	.002	
Ductile Iron	150 to 250	125 to 250	.0001	.00015	.0002	.00025	.0005	.0007	.001	.0015	.002	

#### Metric Data

Metric Data	 Peripheral Milling M/Min	 Slotting M/Min	Feed Per Tooth based on End Mill Diameter								
			< 1.0mm	2.0 mm	3.0 mm	4.0 mm	5.0 mm	6.0 mm	8.0 mm	10 mm	12 mm
Non-Ferrous											
6061 T6 Aluminum	up to 600	up to 450	0.005	0.007	0.025	0.025	0.030	0.038	0.050	0.050	0.076
Copper, Brass, Bronze	up to 365	up to 300	0.005	0.007	0.025	0.025	0.030	0.038	0.050	0.050	0.076
Plastics	up to 600	up to 450	0.0075	0.009	0.025	0.025	0.050	0.076	0.100	0.100	0.130
Steels											
1018, 1020	45 to 90	38 to 76	0.005	0.005	0.015	0.018	0.025	0.038	0.050	0.050	0.065
4140, 4340, P20	38 to 76	38 to 68	0.004	0.005	0.012	0.014	0.018	0.025	0.038	0.038	0.050
A2, D2, H13 ≤ 32HRC	38 to 68	30 to 45	0.004	0.005	0.012	0.014	0.018	0.025	0.038	0.038	0.050
A2, D2, H13 ≥ 32HRC	30 to 38	30 to 38	0.005	0.005	0.010	0.010	0.012	0.020	0.025	0.025	0.038
Stainless Steels											
15-5, 17-4 ≤ 32HRC	45 to 110	30 to 68	0.004	0.005	0.012	0.014	0.018	0.025	0.038	0.038	0.050
15-5, 17-4 ≥ 32HRC	30 to 38	30 to 45	0.0025	0.005	0.010	0.010	0.012	0.020	0.025	0.025	0.038
303, 304, 316	45 to 90	38 to 68	0.004	0.005	0.012	0.014	0.018	0.025	0.030	0.030	0.038
420, 440C	45 to 76	38 to 68	0.004	0.005	0.012	0.014	0.018	0.025	0.038	0.038	0.038
High Temp Alloys											
Inconel 625	22 to 45	22 to 38	0.0025	0.005	0.012	0.012	0.018	0.025	0.038	0.038	0.050
Inconel 718	15 to 36	15 to 34	0.0025	0.005	0.010	0.010	0.012	0.025	0.038	0.038	0.038
6Al-4V Titanium	30 to 45	22 to 38	0.0025	0.005	0.012	0.012	0.018	0.025	0.025	0.025	0.038
Cast Iron											
Gray Iron ≤ 32HRC	45 to 90	38 to 76	0.005	0.007	0.012	0.014	0.018	0.025	0.038	0.038	0.050
Ductile Iron	45 to 76	38 to 76	0.005	0.007	0.012	0.014	0.018	0.025	0.038	0.038	0.050





## Terms & Conditions

**Our goal is to delight our customers.**

**Ordering Information:** All RoundTool® products have a Series-Size designator and EDP number. Both should be used when entering orders via e-mail, fax, phone, or postal mail communications. RoundTool EDP numbers bear an "RT" suffix to differentiate themselves from other Tool Alliance product lines. This suffix is not displayed in the catalog but will be printed on all official correspondence.

**Availability:** RoundTool® products are available mostly through select Industrial Distributors worldwide. Locally, your Industrial Distributor can provide communication, technical assistance, and inventory support. Standard products are subject to prior sale.

**Pricing:** All prices shown are effective March 1, 2021, supersede and cancel all previous listed prices, and are subject to change without notice. The amount of any present or future sales tax, value-added tax, or similar tax applicable to the products listed herein shall be added to the purchase price and paid by the customer. All sales made at list price less standard applicable distributor discount. Contract pricing must be obtained in writing via current quotation, with stated pricing, effective date, and expiration date, to be valid.

**Shipping:** Preferred carriers are Federal Express 'Express Saver' (Guaranteed 3-Day), and Federal Express premium services. Prices quoted herein are F.O.B. our Factory in Huntington Beach, California, U.S.A.

**Terms:** Domestic and Export Net 30 Days.

**Minimum Charge:** \$50.00 Net (U.S. Dollar).

**Returned Items:** Current catalog items ordered within the prior 12 months may be returnable subject to a 25% handling charge and approval by the RoundTool® Inspection Department. Credit cannot be issued for any product that has in any way been modified, machined, altered, coated, marked, or displaying other characteristics that render it in a "used" condition. A Return Authorization (RA) number must be obtained from the RoundTool® Sales Department prior to return. Returned product must be sent to the Factory for credit; consignment locations are not capable of issuing either RA's or credit memos. Special tools are not returnable.

**Specials Policy:** We reserve the right to overship or undership and invoice special tools up to a 10% variance per item. Quantities under 10 are subject to a one-piece variance. Any variations to this policy must be stated in advance as it will effect pricing upon quotation. Special orders cannot be cancelled without prior approval and proper consideration.

**Product Warranty:** RoundTool® warrants that products sold by it shall be free from defects in materials and workmanship. RoundTool Labs will replace, repair, or grant credit for any product which does not comply with this warranty. This warranty does not apply to any products which have been in any way modified, machined, misused, subjected to accident, or used beyond normal life. Warranty claims should be made through the distributor from whom the product was purchased. There are no other warranties, expressed or implied, made by us except as expressed above, and we neither assume nor authorize any other firm or person to assume for it any other obligation or liability in connection with our products.

**Safety Notice:** Always wear appropriate PPE (safety glasses, masks, gloves, etc.) when using rotary cutting tools. Machine tools should be fully guarded. Technical data provided should be considered advisory only as machining conditions will vary based on app. Our packages carry a safety warning label. RoundTool® is not responsible for damages or accidents caused by modifying or altering our products without prior written consent.

**Cooperative Advertising:** RoundTool® does not participate in any coop advertising programs with either industrial distributors or Mfg Reps. This policy allows us to avoid any possible favoritism or conflicts of interest, and keeps costs and sales prices as low as possible.



is friendly to the environment. All paper products are separated for reuse and shredded for packaging materials.

Shipping boxes are reused when possible. Conservation programs are in place for reduced energy use (additionally, our coastal location eliminates the need for artificial heating or cooling on most days). All displaced materials during the manufacturing process are collected, separated, and returned to a materials recycler. Coolants are recycled when appropriate. Mop water is evaporated and resultant sediment is properly disposed. Skylights provide natural lighting and reduce electricity usage.

**Visit our factories** on your next trip to the greater Los Angeles / San Diego, CA or Fort Myers / Naples, FL area. View our automated facilities, meet our Associates, and tell us how we can better grow our relationship together. Huntington Beach is officially "Surf City" with miles of open beach on the Pacific Ocean, and we're minutes away from attractions such as Disneyland, Knott's, Universal Studios, Reagan and Nixon Presidential Libraries, Getty Museum, Dodger Stadium, Staples Center, Angel Stadium, Honda Center, The Tool Alliance Club, and the list goes on. The closest airport is Orange County (SNA), followed by Long Beach (LGB), Los Angeles (LAX), and then Ontario (ONT). Fort Myers (airport code RSW) and Punta Gorda (PGD) are on the beautiful Gulf of Mexico coast, a recreational haven, home to Major League Baseball spring training, and within a 3-hour drive to Orlando, Tampa Bay, Sarasota, Miami, Fort Lauderdale, the Everglades, and more.



Fort Myers, Florida



Huntington Beach, California



Huntington Beach, California



Huntington Beach, California

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80 .0135	1/8 .1250	19/64 .2969	47/64 .7344
79 .0145	30 .1285	N .3020	.7480 19.0mm
1/64 .0156	29 .1360	5/16 .3125	3/4 .7500
78 .0160	.1378 3.5mm	.3150 8.0mm	49/64 .7656
77 .0180	28 .1405	O .3160	.7677 19.5mm
.0197 0.5mm	9/64 .1406	P .3230	25/32 .7812
76 .0200	27 .1440	21/64 .3281	.7874 20.0mm
75 .0210	26 .1470	Q .3320	51/64 .7969
74 .0225	25 .1495	.3346 8.5mm	.8071 20.5mm
73 .0240	24 .1520	R .3390	13/16 .8125
72 .0250	23 .1540	11/32 .3438	.8268 21.0mm
71 .0260	5/32 .1562	S .3480	53/64 .8281
70 .0280	22 .1570	.3543 9.0mm	27/32 .8438
69 .0292	.1575 4.0mm	T .3580	.8465 21.5mm
68 .0310	21 .1590	23/64 .3594	55/64 .8594
1/32 .0312	20 .1610	U .3680	.8661 22.0mm
67 .0320	19 .1660	.3740 9.5mm	7/8 .8750
66 .0330	18 .1695	3/8 .3750	.8858 22.5mm
65 .0350	11/64 .1719	V .3770	57/64 .8906
64 .0360	17 .1730	W .3860	.9055 23.0mm
63 .0370	16 .1770	25/64 .3906	29/32 .9062
62 .0380	.1772 4.5mm	.3937 10.0mm	59/64 .9219
61 .0390	15 .1800	X .3970	.9252 23.5mm
.0394 1.0mm	14 .1820	Y .4040	15/16 .9375
60 .0400	13 .1850	13/32 .4062	.9449 24.0mm
59 .0410	3/16 .1875	Z .4130	61/64 .9531
58 .0420	12 .1890	.4134 10.5mm	.9646 24.5mm
57 .0430	11 .1910	27/64 .4219	31/32 .9688
56 .0465	10 .1935	.4331 11.0mm	.9843 25.0mm
3/64 .0469	9 .1960	7/16 .4375	63/64 .9844
55 .0520	.1969 5.0mm	.4528 11.5mm	1" 1.000 25.4mm
54 .0550	8 .1990	29/64 .4531	
.0591 1.5mm	7 .2010	15/32 .4688	
53 .0595	13/64 .2031	.4724 12.0mm	
1/16 .0625	6 .2040	31/64 .4844	
52 .0635	5 .2055	.4921 12.5mm	
51 .0670	4 .2090	1/2 .5000	
50 .0700	3 .2130	.5118 13.0mm	
49 .0730	.2165 5.5mm	33/64 .5156	
48 .0760	7/32 .2188	17/32 .5312	
5/64 .0781	2 .2210	.5315 13.5mm	
47 .0785	1 .2280	35/64 .5469	
.0787 2.0mm	A .2340	.5512 14.0mm	
46 .0810	15/64 .2344	9/16 .5625	
45 .0820	.2362 6.0mm	.5709 14.5mm	
44 .0860	B .2380	37/64 .5781	
43 .0890	C .2420	.5906 15.0mm	
42 .0935	D .2460	19/32 .5938	
3/32 .0938	E .2500	39/64 .6094	
41 .0960	1/4 .2500	.6102 15.5mm	
40 .0980	.2559 6.5mm	5/8 .6250	
.0984 2.5mm	F .2570	.6299 16.0mm	
39 .0995	G .2610	41/64 .6406	
38 .1015	17/64 .2656	.6496 16.5mm	
37 .1040	H .2660	21/32 .6562	
36 .1065	I .2720	.6693 17.0mm	
7/64 .1094	.2756 7.0mm	43/64 .6719	
35 .1100	J .2770	11/16 .6875	
34 .1110	K .2810	.6890 17.5mm	
33 .1130	9/32 .2812	45/64 .7031	
32 .1160	L .2900	.7087 18.0mm	
.1181 3.0mm	M .2950	23/32 .7188	
31 .1200	.2953 7.5mm	.7283 18.5mm	

#### Conversion Formulas

inches to millimeters:  
multiply by 25.4

millimeters to inches:  
multiply by .03937



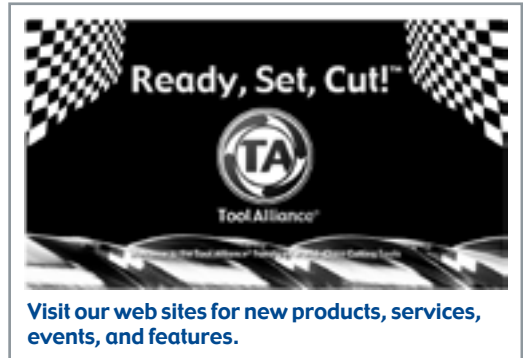
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American Designed  
American Owned



toolalliance.com

## RoundTool Laboratories® sales features

- The Company has a well known brand, superb quality reputation, and a 49 year operating history.
- Tool Alliance is dedicated solely to the solid carbide rotary tooling industry.
- We are privately held, operate with long-term focus and goals, and manufacture our products within our USA-based company-owned factories.
- Our substrate, geometry, and coating are specially selected for each application and Series.
- Our cutting tools have extremely accurate diameter, radius, and concentricity characteristics.
- All RoundTool products are "SFR" (Shrink-Fit Ready).
- Our grinding method and coating process yields an extremely sharp and long lasting cutting edge.
- We offer a full line of standard tools including "hard to find" items.
- We offer proprietary coatings such as PVD Diamond (D1), CVD Diamond (D2), TiB2 (A1) and HSN<sup>2</sup> (AT).
- We can stock firm blanket orders.
- We offer quick turnaround on special blueprint items.
- We have a great mix of Automation and Craftsmanship.
- Both fractional and metric size ranges are offered.
- We have sales offices in both coastal time zones (Florida and California).
- We strongly support traditional Industrial Distribution.
- We have large standard inventories and excellent service levels.



## About the technology of RoundTool® and Tool Alliance®

We obsess over details that create the finest cutting tools available. Our reward is customer satisfaction via increasing their factory productivity. We cannot be the best without thinking differently, so over a 49 year operating history we've developed proprietary technologies that yield significant characteristics of cutting tools unlike any you'll find elsewhere:

- SmoothGrind® = Polished cutting edges for extreme sharpness and lubricity.
- SmoothConcricity® = Precision grinding, tool holding, and tolerances for minimized TIR.
- SmoothCoat® = Sputter-based SuperNitride PVD coating for superior surface hardness & uniformity.
- SmoothEdge® = Surface and edge preparations for lubricity and minimized break-in.



Sharpness & Lubricity.  
No wonder it works better.

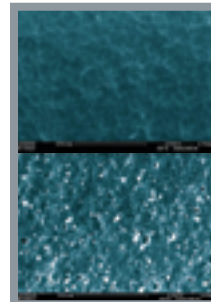
**SmoothGrind®**

Tight tolerances.  
Minimized run-out.



**SmoothConcricity®**

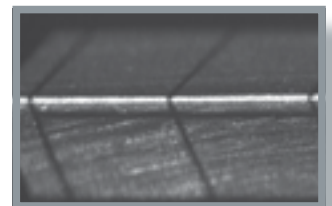
Our coating @ 2,000X (top).  
Everybody else's (bottom).



**SmoothCoat®**

Edge Integrity.  
Runs great on the first pass.

RoundTool end mill cutting edge  
magnified to display SE4 hone.



**SmoothEdge®**



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