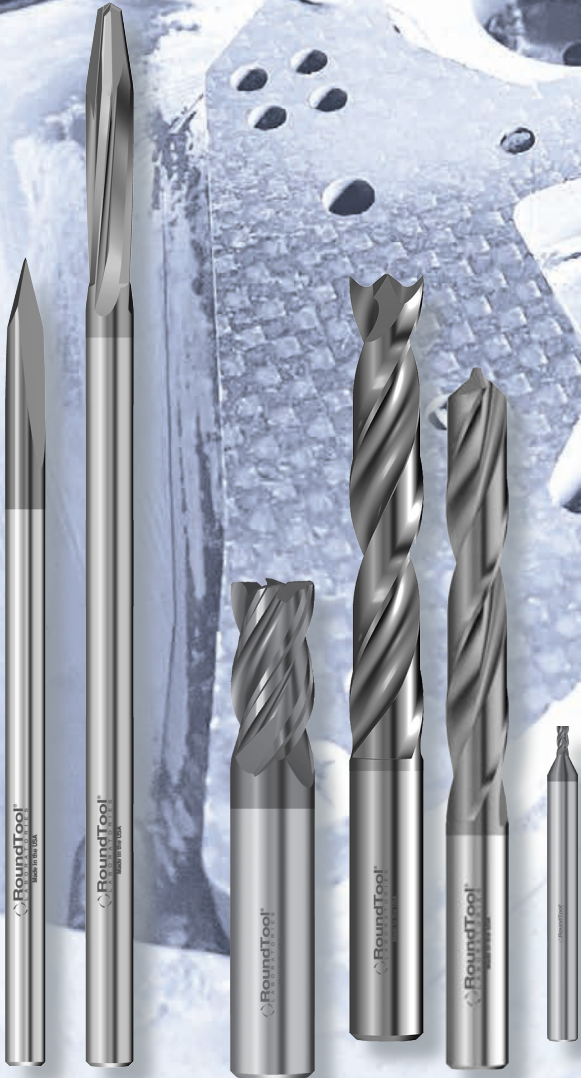


roundtool.com

High-Performance Solid Carbide Diamond Coated Round Tools

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



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

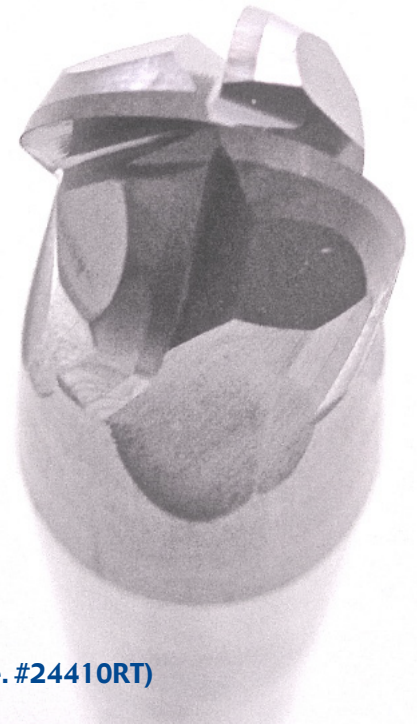
DM4BAT 1/4L

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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RoundTool Laboratories / Tool Alliance
5451 McFadden Avenue
Huntington Beach, CA 92649

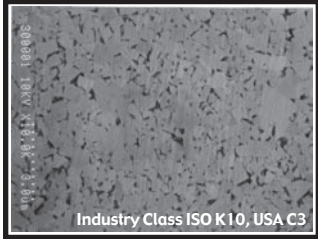


Phone 714 / 898-9224 or 800 / 854-2431 Fax 714 / 891-7816
eMail: sales@roundtool.com Domains: roundtool.com & toolalliance.com
Special note: All RoundTool Laboratories EDP #'s will carry an "RT" suffix within the Tool Alliance database.
Uniform Code Council (UCC) #713646

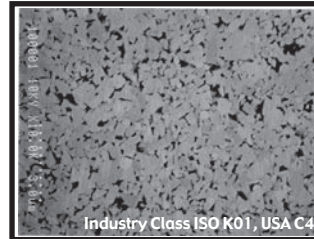
1 **ULTRA-Grain®**

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

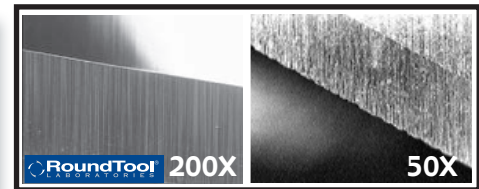
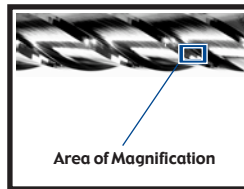


Ultra-Grain® 2
Cobalt Percentage: 8%
Grain Size (µm): ≤ 0.6
Hardness: 93.8 HRA
Fracture Toughness (K1c): 5.8
TRS (GPa): 4.0
Density (gm/cc): 14.6



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.



SmoothGrind® Competitor's

3 **SmoothContricity®**



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.

SFR 35% tighter shank tolerance than h6!



Shrink Fit Ready

4 **SmoothEdge®**

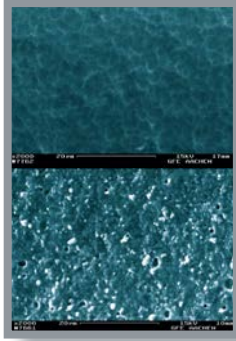


.0001 SmoothEdge atop cylindrical margin atop primary relief.



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.



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

SmoothCoat® 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®. 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

Material Hardness



materials up to 70HRc including high-temp exotics, nickel based alloys, die & hardened steels
ideal for dry milling & high speed machining



materials up to 50HRc including steel, stainless steel, & cast iron
great choice for wide range of materials wet & dry applications

Multiple in-house coating systems offer superb quality and service.



general purpose in all materials up to 30HRc
excellent lubricity & wear

aluminum, steel & stainless steel
lower temp applications



aluminum, titanium, & non-ferrous

tremendous lubricity / reduced weld allows for dry milling



extreme hardness for wearability in graphites, plastics, silicon alloys & other abrasive materials

sharpest diamond edge



extreme hardness for long life (10-50x) in graphite, carbon, composites & high silicon aluminum

thickest diamond coating

SmoothCoat®

Material Abrasiveness

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



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

1/8" shank

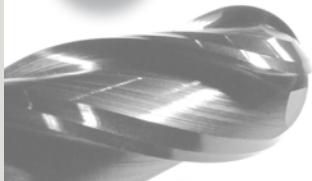
Premium carbide substrate with advanced geometry featuring two different LOC to Diameter ratios and AT or D1 coating.

- Designed for diverse application range
- Match rigidity to app via a choice of 1.5X (MP) or 3.0X (MPL) LOC to Diameter ratios
- Available UnCoated, AT coated, or D1 coated
- Use AT in cobalt chrome, steels, stainless, high-temp alloys, and more
- Use D1 PVD Diamond in graphites, aluminum-silicon alloys, carbon fiber composites, reinforced plastics, & more
- One price for all square & ball end, two & four flute configurations (within same coating category)
- For the MP & MPL Series add the UC, AT, or D1 suffix to the EDP # when ordering (#43254D1).
- 1 1/2" OAL
- 1/8" shank
- Tight diameter tolerance of ± .0005 w/coating

1.5X MP2S / MP2B 2-flute, LOC = 1.5X
MP4S / MP4B 4-flute, LOC = 1.5X

3.0X MPL2S / MPL2B 2-flute, LOC = 3.0X
MPL4S / MPL4B 4-flute, LOC = 3.0X

| Diam | 1.5X | | | | UnCoat | | | ATcoat | | | D1coat | | | |
|------|-------|--------|-------|--------|---------|---------|---------|--------|--------|---------|---------|---------|---------|---------|
| | 2 Sq | 2 Ball | 4 Sq | 4 Ball | 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 | 40772 | 40872 | \$16.50 | \$17.50 | \$20.50 |
| .023 | 43257 | 43357 | 40612 | 40712 | \$13.50 | \$14.50 | \$17.50 | 40022 | 40060 | 40773 | 40873 | \$16.50 | \$17.50 | \$20.50 |
| .024 | 43258 | 43358 | 40613 | 40713 | \$13.50 | \$14.50 | \$17.50 | 40023 | 40061 | 40774 | 40874 | \$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 | 40622 | 40722 | \$13.00 | \$14.00 | \$17.00 | 40649 | 40749 | 40788 | 40888 | \$16.00 | \$17.00 | \$20.00 |
| .045 | 40589 | 40689 | 40623 | 40723 | \$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 ±.0005
Shank Diam +0 / -.0002
Radius ±.0002
LOC +.010 / -.000
SFR = Shrink Fit Ready



1.5X MP2S / MP2B 2-flute, LOC = 1.5X
MP4S / MP4B 4-flute, LOC = 1.5X



3.0X MPL2S / MPL2B 2-flute, LOC = 3.0X
MPL4S / MPL4B 4-flute, LOC = 3.0X



1/8" shank

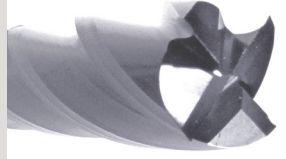
| Diam | 2 Sq | 2 Ball | 4 Sq | 4 Ball | UnCoat | ATcoat | D1coat | 2 Sq | 2 Ball | 4 Sq | 4 Ball | UnCoat | ATcoat | D1coat |
|------|-------|--------|-------|--------|---------|---------|---------|-------|--------|-------|--------|---------|---------|---------|
| .070 | 44002 | 44102 | 45002 | 45102 | \$12.00 | \$13.00 | \$16.00 | 44018 | 44118 | 45018 | 45118 | \$15.00 | \$16.00 | \$19.00 |
| .075 | 44003 | 44103 | 45003 | 45103 | \$12.00 | \$13.00 | \$16.00 | 44019 | 44119 | 45019 | 45119 | \$15.00 | \$16.00 | \$19.00 |
| .078 | 44004 | 44104 | 45004 | 45104 | \$12.00 | \$13.00 | \$16.00 | 44020 | 44120 | 45020 | 45120 | \$15.00 | \$16.00 | \$19.00 |
| .080 | 44005 | 44105 | 45005 | 45105 | \$12.00 | \$13.00 | \$16.00 | 44021 | 44121 | 45021 | 45121 | \$15.00 | \$16.00 | \$19.00 |
| .085 | 44006 | 44106 | 45006 | 45106 | \$12.00 | \$13.00 | \$16.00 | 44022 | 44122 | 45022 | 45122 | \$15.00 | \$16.00 | \$19.00 |
| .090 | 44007 | 44107 | 45007 | 45107 | \$12.00 | \$13.00 | \$16.00 | 44023 | 44123 | 45023 | 45123 | \$15.00 | \$16.00 | \$19.00 |
| .093 | 44008 | 44108 | 45008 | 45108 | \$12.00 | \$13.00 | \$16.00 | 44024 | 44124 | 45024 | 45124 | \$15.00 | \$16.00 | \$19.00 |
| .095 | 44009 | 44109 | 45009 | 45109 | \$12.00 | \$13.00 | \$16.00 | 44025 | 44125 | 45025 | 45125 | \$15.00 | \$16.00 | \$19.00 |
| .100 | 44010 | 44110 | 45010 | 45110 | \$12.00 | \$13.00 | \$16.00 | 44026 | 44126 | 45026 | 45126 | \$15.00 | \$16.00 | \$19.00 |
| .105 | 44011 | 44111 | 45011 | 45111 | \$12.00 | \$13.00 | \$16.00 | 44027 | 44127 | 45027 | 45127 | \$15.00 | \$16.00 | \$19.00 |
| .110 | 44012 | 44112 | 45012 | 45112 | \$12.00 | \$13.00 | \$16.00 | 44028 | 44128 | 45028 | 45128 | \$15.00 | \$16.00 | \$19.00 |
| .115 | 44013 | 44113 | 45013 | 45113 | \$12.00 | \$13.00 | \$16.00 | 44029 | 44129 | 45029 | 45129 | \$15.00 | \$16.00 | \$19.00 |
| .118 | 44014 | 44114 | 45014 | 45114 | \$12.00 | \$13.00 | \$16.00 | 44030 | 44130 | 45030 | 45130 | \$15.00 | \$16.00 | \$19.00 |
| .120 | 44015 | 44115 | 45015 | 45115 | \$12.00 | \$13.00 | \$16.00 | 44031 | 44131 | 45031 | 45131 | \$15.00 | \$16.00 | \$19.00 |

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 ± 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 ±0.012mm
Shank Diam +0.0 / -0.005mm
Radius ±0.005mm
LOC +0.25 / -0.0mm
SFR = Shrink Fit Ready

3.0mm shank



1.5X MP2S / MP2B 2-flute, LOC = 1.5X
MP4S / MP4B 4-flute, LOC = 1.5X



3.0X MPL2S / MPL2B 2-flute, LOC = 3.0X
MPL4S / MPL4B 4-flute, LOC = 3.0X



| Diam | 2 Sq | 2 Ball | 4 Sq | 4 Ball | UnCoat | ATcoat | D1coat | 2 Sq | 2 Ball | 4 Sq | 4 Ball | UnCoat | ATcoat | D1coat |
|--------|-------|--------|-------|--------|---------|---------|---------|-------|--------|-------|--------|---------|---------|---------|
| 0.10mm | 40801 | 40901 | | | \$22.00 | \$23.00 | \$26.00 | 40813 | 40913 | | | \$25.00 | \$26.00 | \$29.00 |
| 0.15 | 40802 | 40902 | | | \$16.00 | \$17.00 | \$20.00 | 40814 | 40914 | | | \$19.00 | \$20.00 | \$26.00 |
| 0.20 | 40803 | 40903 | | | \$16.00 | \$17.00 | \$20.00 | 40815 | 40915 | | | \$19.00 | \$20.00 | \$26.00 |
| 0.25 | 43272 | 43372 | 40804 | 40904 | \$14.00 | \$15.00 | \$18.00 | 40113 | 40139 | 40816 | 40916 | \$17.00 | \$18.00 | \$21.00 |
| 0.30 | 43273 | 43373 | 40805 | 40905 | \$14.00 | \$15.00 | \$18.00 | 40114 | 40140 | 40817 | 40917 | \$17.00 | \$18.00 | \$21.00 |
| 0.35 | 43274 | 43374 | 40806 | 40906 | \$14.00 | \$15.00 | \$18.00 | 40115 | 40141 | 40818 | 40918 | \$17.00 | \$18.00 | \$21.00 |
| 0.40 | 43275 | 43375 | 40807 | 40907 | \$14.00 | \$15.00 | \$18.00 | 40116 | 40142 | 40819 | 40919 | \$17.00 | \$18.00 | \$21.00 |
| 0.45 | 43276 | 43376 | 40808 | 40908 | \$14.00 | \$15.00 | \$18.00 | 40117 | 40143 | 40820 | 40920 | \$17.00 | \$18.00 | \$21.00 |
| 0.50 | 43277 | 43377 | 40809 | 40909 | \$14.00 | \$15.00 | \$18.00 | 40118 | 40144 | 40821 | 40921 | \$17.00 | \$18.00 | \$21.00 |
| 0.55 | 43278 | 43378 | 40810 | 40910 | \$13.50 | \$14.50 | \$17.50 | 40119 | 40145 | 40822 | 40922 | \$16.50 | \$17.50 | \$20.50 |
| 0.60 | 43279 | 43379 | 40811 | 40911 | \$13.50 | \$14.50 | \$17.50 | 40120 | 40146 | 40823 | 40923 | \$16.50 | \$17.50 | \$20.50 |
| 0.65 | 43280 | 43380 | 40812 | 40912 | \$13.50 | \$14.50 | \$17.50 | 40121 | 40147 | 40824 | 40924 | \$16.50 | \$17.50 | \$20.50 |
| 0.70 | 43281 | 43381 | 42281 | 42381 | \$13.50 | \$14.50 | \$17.50 | 40122 | 40148 | 40165 | 40182 | \$16.50 | \$17.50 | \$20.50 |
| 0.75 | 43282 | 43382 | 42282 | 42382 | \$13.50 | \$14.50 | \$17.50 | 40123 | 40149 | 40166 | 40183 | \$16.50 | \$17.50 | \$20.50 |
| 0.80 | 43283 | 43383 | 42283 | 42383 | \$13.00 | \$14.00 | \$17.00 | 40124 | 40150 | 40167 | 40184 | \$16.00 | \$17.00 | \$20.00 |
| 0.85 | 43284 | 43384 | 42284 | 42384 | \$13.00 | \$14.00 | \$17.00 | 40125 | 40151 | 40168 | 40185 | \$16.00 | \$17.00 | \$20.00 |
| 0.90 | 43285 | 43385 | 42285 | 42385 | \$13.00 | \$14.00 | \$17.00 | 40126 | 40152 | 40169 | 40186 | \$16.00 | \$17.00 | \$20.00 |
| 0.95 | 43286 | 43386 | 42286 | 42386 | \$13.00 | \$14.00 | \$17.00 | 40127 | 40153 | 40170 | 40187 | \$16.00 | \$17.00 | \$20.00 |
| 1.00 | 43287 | 43387 | 42287 | 42387 | \$13.00 | \$14.00 | \$17.00 | 40128 | 40154 | 40171 | 40188 | \$16.00 | \$17.00 | \$20.00 |
| 1.05 | 43288 | 43388 | 42288 | 42388 | \$13.00 | \$14.00 | \$17.00 | 40129 | 40155 | 40172 | 40189 | \$16.00 | \$17.00 | \$20.00 |
| 1.10 | 43289 | 43389 | 42289 | 42389 | \$13.00 | \$14.00 | \$17.00 | 40130 | 40156 | 40173 | 40190 | \$16.00 | \$17.00 | \$20.00 |
| 1.15 | 43290 | 43390 | 42290 | 42390 | \$13.00 | \$14.00 | \$17.00 | 40131 | 40157 | 40174 | 40191 | \$16.00 | \$17.00 | \$20.00 |
| 1.20 | 43291 | 43391 | 42291 | 42391 | \$13.00 | \$14.00 | \$17.00 | 40132 | 40158 | 40175 | 40192 | \$16.00 | \$17.00 | \$20.00 |
| 1.25 | 43292 | 43392 | 42292 | 42392 | \$13.00 | \$14.00 | \$17.00 | 40133 | 40159 | 40176 | 40193 | \$16.00 | \$17.00 | \$20.00 |
| 1.30 | 43293 | 43393 | 42293 | 42393 | \$12.00 | \$13.00 | \$16.00 | 40134 | 40160 | 40177 | 40194 | \$15.00 | \$16.00 | \$19.00 |
| 1.35 | 43294 | 43394 | 42294 | 42394 | \$12.00 | \$13.00 | \$16.00 | 40135 | 40161 | 40178 | 40195 | \$15.00 | \$16.00 | \$19.00 |
| 1.40 | 43295 | 43395 | 42295 | 42395 | \$12.00 | \$13.00 | \$16.00 | 40136 | 40162 | 40179 | 40196 | \$15.00 | \$16.00 | \$19.00 |
| 1.45 | 43296 | 43396 | 42296 | 42396 | \$12.00 | \$13.00 | \$16.00 | 40137 | 40163 | 40180 | 40197 | \$15.00 | \$16.00 | \$19.00 |
| 1.50 | 43297 | 43397 | 42297 | 42397 | \$12.00 | \$13.00 | \$16.00 | 40138 | 40164 | 40181 | 40198 | \$15.00 | \$16.00 | \$19.00 |

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 ± .0005 (with coating)



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



- 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

1/8" shank



| Diam | LOC | OAL | Shank | 2 flute Square | | 2 flute Ball | | 4 flute Square | | 4 flute Ball | | UnCoated | AT Coated | D1 Coated | D2 Coated |
|------|------|-------|-------|----------------|-------|--------------|-------|----------------|------|--------------|--|----------|-----------|-----------|-----------|
| | | | | 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



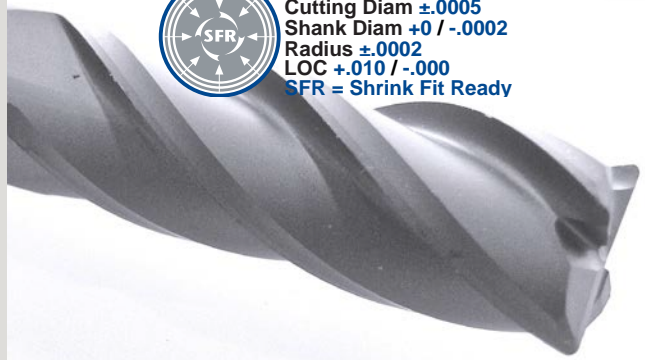
- Designed for machining electrodes & other reach applications • 3" OAL
- Proprietary cemented carbide grade & available AT, D1 or D2 coating
- Use D1 (PVD) or D2 (CVD) Diamond coating for graphite & abrasive non-metals
- Use AT coating for die steels and other hard metals
- Tight diameter tolerance of ± .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 ±.0005
Shank Diam +0 / -.0002
Radius ±.0002
LOC +.010 / -.000
SFR = Shrink Fit Ready



HSM's New Best Friend



SmoothConcricity®

Maximized Tool Concentricity Exclusively by Tool Alliance®



GR Series • fractional 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 end mills
Cutting Diam +0 / -.002
Shank Diam +0 / -.0003
Radius ±.001
LOC +.030 / -.000
SFR = Shrink Fit Ready

| Diam | LOC | OAL | Shank | 2 flute Square | | 4 flute Square | | UnCoated Price | AT Coated Price | D1 Coated Price | D2 Coated Price |
|--------|-------|-------|-------|----------------|-------|----------------|-------|----------------|-----------------|-----------------|-----------------|
| | | | | EDP# | EDP# | EDP# | EDP# | | | | |
| 1/64 | 5/64 | 1-1/2 | 1/8 | 00837 | 00854 | 00871 | 00888 | \$22.30 | \$23.90 | \$26.30 | \$50.20 |
| 1/32 | 5/32 | 1-1/2 | 1/8 | 00838 | 00855 | 00872 | 00889 | \$21.20 | \$22.90 | \$25.20 | \$49.10 |
| 1/32L | 1/16 | 2" | 1/8 | 00839 | 00708 | 11156 | 11175 | \$24.40 | \$26.00 | \$28.40 | \$52.30 |
| 1/32XL | 1/4 | 2" | 1/8 | 00840 | 00007 | 11157 | 11176 | \$28.60 | \$30.20 | \$32.60 | \$56.50 |
| 3/64 | 15/64 | 1-1/2 | 1/8 | 23106 | 23108 | 23100 | 23103 | \$20.10 | \$21.80 | \$24.10 | \$48.00 |
| 1/16 | 5/16 | 1-1/2 | 1/8 | 10054 | 10118 | 10167 | 10216 | \$20.10 | \$21.80 | \$24.10 | \$48.00 |
| 1/16L | 1/4 | 2" | 1/8 | 11099 | 11169 | 11158 | 11177 | \$23.30 | \$25.00 | \$27.30 | \$51.20 |
| 1/16XL | 1/2 | 2" | 1/8 | 11020 | 11032 | 11026 | 11038 | \$28.60 | \$30.20 | \$32.60 | \$56.50 |
| 5/64 | 25/64 | 1-1/2 | 1/8 | 10055 | 10119 | 10168 | 10217 | \$19.10 | \$20.80 | \$23.10 | \$47.00 |
| 3/32 | 15/32 | 1-1/2 | 1/8 | 10056 | 10120 | 10169 | 10218 | \$19.10 | \$20.80 | \$23.10 | \$47.00 |
| 7/64 | 35/64 | 1-1/2 | 1/8 | 10057 | 10121 | 10170 | 10219 | \$19.10 | \$20.80 | \$23.10 | \$47.00 |
| 1/8 | 5/8 | 1-1/2 | 1/8 | 10058 | 10122 | 10171 | 10220 | \$18.00 | \$19.80 | \$22.00 | \$45.90 |
| 1/8L | 1/2 | 3" | 1/8 | 11100 | 11170 | 11159 | 11178 | \$24.40 | \$28.10 | \$31.40 | \$52.30 |
| 1/8XL | 1" | 4" | 1/8 | 11021 | 11033 | 11027 | 11039 | \$33.90 | \$37.40 | \$41.80 | \$61.80 |
| 9/64 | 45/64 | 2" | 3/16 | 10059 | 10123 | 10172 | 10221 | \$24.40 | \$27.60 | \$30.40 | \$78.50 |
| 5/32 | 3/4 | 2" | 3/16 | 10060 | 10124 | 10173 | 10222 | \$24.40 | \$27.60 | \$30.40 | \$78.50 |
| 11/64 | 3/4 | 2" | 3/16 | 10061 | 10125 | 10174 | 10223 | \$24.40 | \$27.60 | \$30.40 | \$78.50 |
| 3/16 | 3/4 | 2" | 3/16 | 10062 | 10126 | 10175 | 10224 | \$24.40 | \$27.60 | \$30.40 | \$78.50 |
| 3/16L | 3/4 | 3" | 3/16 | 11101 | 11171 | 11160 | 11179 | \$30.70 | \$35.40 | \$39.20 | \$84.80 |
| 3/16XL | 1-3/8 | 4" | 3/16 | 11022 | 11034 | 11028 | 11040 | \$42.40 | \$47.80 | \$52.90 | \$96.50 |
| 7/32 | 1" | 2-1/2 | 1/4 | 10063 | 10127 | 10176 | 10225 | \$30.70 | \$35.40 | \$39.50 | \$97.80 |
| 1/4 | 1" | 2-1/2 | 1/4 | 10064 | 10128 | 10177 | 10226 | \$30.70 | \$35.40 | \$39.50 | \$97.80 |
| 1/4L | 1" | 4" | 1/4 | 11023 | 11035 | 11029 | 11041 | \$40.30 | \$46.80 | \$52.70 | \$107.40 |
| 1/4XL | 1-1/2 | 6" | 1/4 | 11102 | 11172 | 11161 | 11180 | \$58.30 | \$66.60 | \$74.30 | \$130.70 |
| 5/16 | 1" | 2-1/2 | 5/16 | 10713 | 10716 | 10719 | 10722 | \$38.20 | \$44.70 | \$48.20 | \$127.00 |
| 3/8 | 1" | 2-1/2 | 3/8 | 10714 | 10717 | 10720 | 10723 | \$47.70 | \$54.10 | \$58.40 | \$160.30 |
| 3/8L | 1-3/8 | 4" | 3/8 | 11024 | 11036 | 11030 | 11042 | \$66.80 | \$74.90 | \$80.80 | \$179.40 |
| 3/8XL | 2" | 6" | 3/8 | 11103 | 11173 | 11167 | 11181 | \$92.20 | \$106.10 | \$113.60 | \$209.40 |
| 7/16 | 1" | 3" | 7/16 | 10997 | 10998 | 11001 | 11002 | \$72.10 | \$81.10 | \$86.20 | \$204.50 |
| 1/2 | 1-1/4 | 3" | 1/2 | 10715 | 10718 | 10721 | 10724 | \$74.20 | \$83.20 | \$88.50 | \$221.40 |
| 1/2L | 1-3/8 | 4" | 1/2 | 11155 | 11174 | 11168 | 11182 | \$89.00 | \$100.90 | \$108.70 | \$236.20 |
| 1/2XL | 2" | 6" | 1/2 | 11025 | 11037 | 11031 | 11043 | \$114.50 | \$131.00 | \$142.40 | \$299.20 |
| 5/8 | 1-3/8 | 3-1/2 | 5/8 | 00851 | 00861 | 00868 | 00874 | \$127.20 | \$140.40 | \$149.30 | \$311.20 |
| 3/4 | 1-3/8 | 4" | 3/4 | 00852 | 00863 | 00869 | 00876 | \$161.10 | \$176.80 | \$187.20 | \$397.10 |
| 1" | 1-3/8 | 4" | 1" | 00859 | 00866 | 00873 | 00878 | \$259.70 | \$280.80 | \$297.20 | \$585.80 |



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



GR Series • fractional end mills with Radius

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



RTL Specs end mills
Cutting Diam +0 / -0.002
Shank Diam +0 / -0.003
Radius ±.001
LOC +.030 / -.000
SFR = Shrink Fit Ready

- 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

| Diam | LOC | OAL | Shank | .015 Rad | | .031 Rad | | .062 Rad | | 2 or 4 flute available | | | |
|--------|-------|-------|-------|--------------|--------------|--------------|--------------|--------------|--------------|------------------------|-----------------|-----------------|-----------------|
| | | | | 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 |



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.



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

- 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

| Diam | LOC | OAL | Shank | 4 flute metric rads | | | | | | | | 2 or 4 flute available | | | |
|-------|-----|-----|-------|---------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|------------------------|-----------------|-----------------|-----------------|
| | | | | 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 EDP# | 2 flute Ball EDP# | 4 flute Square EDP# | 4 flute Ball EDP# | UC Price | AT Price | D1 Price | D2 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.

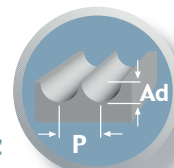


CBN2BUC



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 \emptyset | 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 ± 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

- Designed for finishing of tough ferrous materials • Tight tolerance ± .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



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



| Diam | LOC | OAL | Shank | EDP# | UC | AT | D1 | D2 |
|-------|------|-------|-------|-------|----------------|-----------------|-----------------|-----------------|
| | | | | | UnCoated Price | AT Coated Price | D1 Coated Price | D2 Coated Price |
| .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

- Designed for finishing of tough ferrous materials • Tight tolerance ± .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



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



| Diam | LOC | OAL | Shank | EDP# | UC | AT | D1 | D2 |
|-------|------|-------|-------|-------|----------------|-----------------|-----------------|-----------------|
| | | | | | UnCoated Price | AT Coated Price | D1 Coated Price | D2 Coated Price |
| .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.

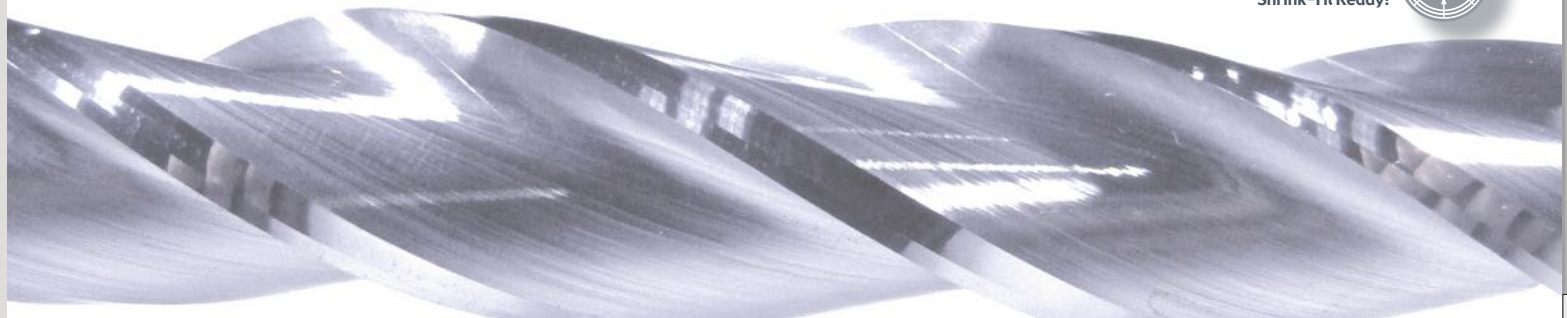
- Designed for cavity milling of a wide range of materials • Tight tolerance $\pm .0005$
- Proprietary cemented carbide grade with 3 different SmoothCoat micro coatings
- Features three flutes @ 30° helix & reduced neck for clearance
- LOC = 1.5X cutting diameter • Total length below shank (LBS) = 5X.
- 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

 shank

 **RTL Specs Micro end mills**
Cutting Diam $\pm .0005$
Shank Diam $+0 / -.0002$
Radius $\pm .0002$
LOC $+0.10 / -.000$
SFR = Shrink Fit Ready

| 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

1/8" shank

RTL Specs Micro end mills
Cutting Diam $\pm .0005$
Shank Diam $+0 / -.0002$
Radius $\pm .0002$
LOC $+0.10 / -.000$
SFR = Shrink Fit Ready

| Diam | End | LOC | LBS | OAL | Shank | EDP# | UC | AT | D1 | D2 |
|-------|----------|------|------|-------|-------|-------|----------------|-----------------|-----------------|-----------------|
| | | | | | | | 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.



LR12X3UC (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

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

| Diam | End | LOC | LBS | OAL | Shank | EDP# | UC | AT | D1 | D2 |
|-------|----------|------|-------|-------|-------|-------|----------------|-----------------|-----------------|-----------------|
| | | | | | | | 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



Grinding centers



CNC grinder control

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 | Radius |
|---------|----------|--------|
| 23900AT | \$22.40 | .010 |
| 23902AT | \$26.00 | .010 |
| 23904AT | \$32.20 | .010 |
| 23906AT | \$39.50 | .010 |
| 23908AT | \$51.00 | .030 |
| 23910AT | \$78.00 | .030 |
| 23912AT | \$141.40 | .030 |
| 23914AT | \$187.20 | .030 |
| 23916AT | \$291.20 | .030 |

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

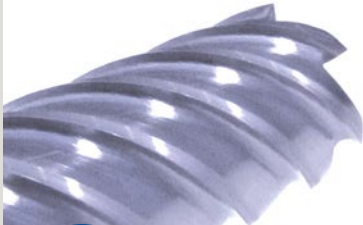
| Diam | LOC | OAL | Shank | Flutes | EDP# | Price | Radius |
|-------|-----|-----|-------|--------|---------|----------|--------|
| 3.0mm | 12 | 38 | 3.0 | 6 | 23960AT | \$22.40 | 0.3 |
| 4.0 | 14 | 50 | 4.0 | 6 | 23962AT | \$25.00 | 0.3 |
| 5.0 | 16 | 50 | 5.0 | 6 | 23964AT | \$26.00 | 0.3 |
| 6.0 | 19 | 63 | 6.0 | 6 | 23966AT | \$32.20 | 0.3 |
| 8.0 | 20 | 63 | 8.0 | 6 | 23968AT | \$39.50 | 0.3 |
| 10.0 | 25 | 70 | 10.0 | 6 | 23970AT | \$64.50 | 0.3 |
| 12.0 | 30 | 74 | 12.0 | 6 | 23972AT | \$78.00 | 0.3 |
| 16.0 | 32 | 89 | 16.0 | 8 | 23974AT | \$141.40 | 0.3 |
| 20.0 | 38 | 100 | 20.0 | 8 | 23976AT | \$208.00 | 0.3 |

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 |



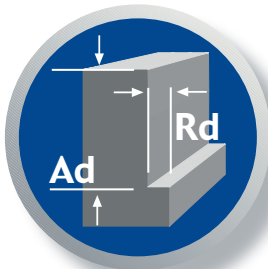
RTL Specs end mills
Cutting Diam +0 / -.002
Shank Diam +0 / -.0003
Radius ±.001
LOC +.030 / -.000
SFR = Shrink Fit Ready



RTL Specs metric end mills
Cutting Diam +0.0 / -0.05mm
Shank Diam +0.0 / -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 |

phone 714.898.9224 / 800.854.2431 / fax 714.891.7816
5451 McFadden Avenue • Huntington Beach, CA 92649

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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"

DM2BAT

DM4BAT

| Diam | LOC | LBS | Taper | OAL | Shank | 2 flute Ball AT DM2BAT | | 4 flute Ball AT DM4BAT | |
|------|------|-----|-------|-----|-------|------------------------|----------|------------------------|----------|
| | | | | | | EDP# | Price | EDP# | Price |
| .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

DM2BAT

DM4BAT

| Diam | LOC | LBS | Taper | OAL | Shank | 2 flute Ball AT DM2BAT | | 4 flute Ball AT DM4BAT | |
|-------|-----|-----|-------|-----|-------|------------------------|----------|------------------------|----------|
| | | | | | | EDP# | Price | EDP# | Price |
| 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 / -0.025mm
Shank Diam +0.0 / -0.008mm
Radius ±0.012mm
LOC +0.76 / -0.0mm
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"



| 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

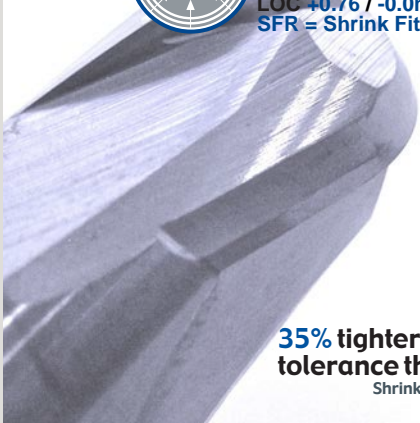


| SE | ∅ | Diam | LOC | LBS | Taper | OAL | Shank |
|----|---|-------|-----|-----|-------|-----|-------|
| | | 3.0mm | 3 | | 5° | 75 | 6.0 |
| | | 4.0 | 4 | | 5° | 75 | 6.0 |
| | | 5.0 | 5 | | 5° | 75 | 6.0 |
| | | 6.0 | 6 | 12 | | 75 | 6.0 |
| | | 6.0 | 6 | | 5° | 100 | 8.0 |
| | | 8.0 | 8 | | 5° | 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 |



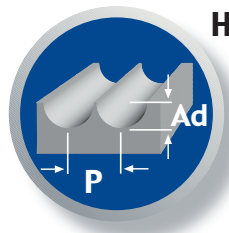
RTL Specs metric DM
Cutting Diam +0.0 / -.025mm
Shank Diam +0.0 / -.008mm
Radius ±0.012mm
LOC +0.76 / -.0mm
SFR = Shrink Fit Ready



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



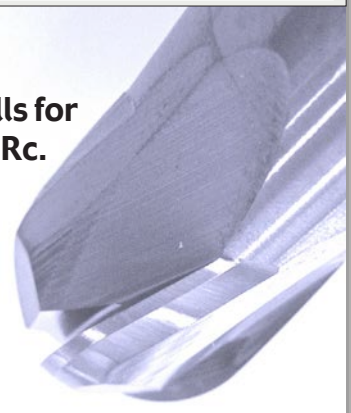
Welcome to the Tool Alliance® Family of World-Class Cutting Tools



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 | |
|----------------------------|-------------|----------|-------------|----------|-------------|----------|-------------|----------|-------------|----------|
| | Ad = .1xD | P = .2xD | Ad = .05xD | P = .2xD | Ad = .03xD | P = .1xD | Ad = .02xD | P = .1xD | Ad = .01xD | P = .1xD |
| Depth of Cut | Speed | Feed | Speed | Feed | Speed | Feed | Speed | Feed | Speed | Feed |
| | RPM | in/min | RPM | in/min | RPM | in/min | RPM | in/min | RPM | in/min |
| Fractional Diameter | | | | | | | | | | |
| .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 | |
|-----------------------------|-------------|----------|-------------|----------|-------------|----------|-------------|----------|-------------|----------|
| | Ad = .1xD | P = .2xD | Ad = .05xD | P = .2xD | Ad = .03xD | P = .1xD | Ad = .02xD | P = .1xD | Ad = .01xD | P = .1xD |
| Depth of Cut | Speed | Feed | Speed | Feed | Speed | Feed | Speed | Feed | Speed | Feed |
| | RPM | mm/min | RPM | mm/min | RPM | mm/min | RPM | mm/min | RPM | mm/min |
| Metric Mill Diameter | | | | | | | | | | |
| 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

1/8" shank

MD2PUC



UC

AT

D1

D2

new!

| Diam | Drill Size | LOC | Point | OAL | Shank | EDP# | UC Price | ATPrice | D1Price | 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 | |
|------------|------------|--------|-------|-------|-------|-------|---------|----------|----------|----------|---------|
| | | | | | | | UCPrice | AT Price | D1 Price | D2 Price | |
| 1/8" shank | MD2PUC | | | | | | | | | | |
| | .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 | |

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

Tight tolerance drills with 118° four facet point featuring D1 or D2 SmoothCoat.

- Designed for drilling composites, plastics, wood, fiberglass, and more • Tight tolerance +.0001/-0.0003 • 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 +.0001/-0.0003
Shank Diam +0 / -0.0003
SFR = Shrink Fit Ready

| Diam | Decimal | LOF | OAL | Fractional EDP# | Coating | |
|-------|---------|-------|-------|--------------------|----------|----------|
| | | | | | D1 Coat | D2 Coat |
| 1/64 | .0156 | 1/4 | 1-1/4 | 51001 | \$21.60 | \$43.10 |
| 1/32 | .0312 | 5/16 | 1-1/4 | 51002 | \$16.20 | \$37.70 |
| 3/64 | .0469 | 3/4 | 1-1/2 | 51003 | \$16.20 | \$37.70 |
| 1/16 | .0625 | 3/4 | 1-1/2 | 51004 | \$15.80 | \$37.30 |
| 5/64 | .0781 | 7/8 | 1-3/4 | 51005 | \$16.10 | \$37.60 |
| 3/32 | .0938 | 1" | 2" | 51006 | \$16.40 | \$37.90 |
| 7/64 | .1094 | 1-1/4 | 2-1/4 | 51007 | \$20.20 | \$39.10 |
| 1/8 | .1250 | 1-1/4 | 2-1/4 | 51008 | \$20.40 | \$39.30 |
| 9/64 | .1406 | 1-3/8 | 2-1/2 | 51009 | \$22.70 | \$67.10 |
| 5/32 | .1562 | 1-3/8 | 2-1/2 | 51010 | \$24.70 | \$69.10 |
| 11/64 | .1719 | 1-5/8 | 2-3/4 | 51011 | \$26.30 | \$70.70 |
| 3/16 | .1875 | 1-5/8 | 2-3/4 | 51012 | \$26.50 | \$70.90 |
| 13/64 | .2031 | 1-3/4 | 3" | 51013 | \$29.70 | \$86.90 |
| 7/32 | .2188 | 1-3/4 | 3" | 51014 | \$31.80 | \$89.00 |
| 15/64 | .2344 | 2" | 3-1/4 | 51015 | \$36.00 | \$90.70 |
| 1/4 | .2500 | 2" | 3-1/4 | 51016 | \$37.50 | \$92.20 |
| 17/64 | .2656 | 2-1/8 | 3-1/2 | 51017 | \$42.20 | \$118.10 |
| 9/32 | .2812 | 2-1/8 | 3-1/2 | 51018 | \$45.00 | \$120.90 |
| 19/64 | .2969 | 2-3/8 | 3-3/4 | 51019 | \$47.10 | \$123.00 |
| 5/16 | .3125 | 2-3/8 | 3-3/4 | 51020 | \$49.60 | \$125.50 |
| 21/64 | .3281 | 2-1/2 | 4" | 51021 | \$53.40 | \$152.10 |
| 11/32 | .3438 | 2-1/2 | 4" | 51022 | \$57.40 | \$156.10 |
| 23/64 | .3594 | 2-3/4 | 4-1/4 | 51023 | \$69.60 | \$160.80 |
| 3/8 | .3750 | 2-3/4 | 4-1/4 | 51024 | \$69.00 | \$160.20 |
| 25/64 | .3906 | 2-7/8 | 4-1/2 | 51025 | \$85.30 | \$192.80 |
| 13/32 | .4062 | 2-7/8 | 4-1/2 | 51026 | \$89.70 | \$197.20 |
| 27/64 | .4219 | 2-7/8 | 4-1/2 | 51027 | \$96.00 | \$203.50 |
| 7/16 | .4375 | 2-7/8 | 4-1/2 | 51028 | \$100.80 | \$208.30 |
| 29/64 | .4531 | 3" | 4-3/4 | 51029 | \$111.30 | \$230.60 |
| 15/32 | .4688 | 3" | 4-3/4 | 51030 | \$115.90 | \$235.20 |
| 31/64 | .4844 | 3" | 4-3/4 | 51031 | \$119.80 | \$239.10 |
| 1/2 | .5000 | 3" | 4-3/4 | 51032 | \$115.80 | \$235.10 |
| 17/32 | .5312 | 4" | 6" | 51033 | \$173.40 | \$326.30 |
| 9/16 | .5625 | 4" | 6" | 51034 | \$183.90 | \$336.80 |
| 19/32 | .5938 | 4" | 6" | 51035 | \$210.00 | \$359.40 |
| 5/8 | .6250 | 4" | 6" | 51036 | \$212.10 | \$361.50 |
| 21/32 | .6562 | 4" | 6" | 51037 | \$241.10 | \$436.70 |
| 11/16 | .6875 | 4" | 6" | 51038 | \$244.50 | \$440.10 |
| 3/4 | .7500 | 4" | 6" | 51039 | \$278.60 | \$474.20 |
| 13/16 | .8125 | 4" | 6" | 51181 | \$371.90 | \$590.60 |
| 7/8 | .8750 | 4" | 6" | 51182 | \$391.40 | \$610.10 |
| 15/16 | .9375 | 4" | 6" | 51183 | \$401.90 | \$641.30 |
| 1" | 1.000 | 4" | 6" | 51184 | \$373.40 | \$612.80 |

| Diam | Decimal | LOF | OAL | Letter EDP# | Coating | |
|------|---------|-------|-------|----------------|---------|----------|
| | | | | | D1 Coat | D2 Coat |
| A | .2340 | 2" | 3-1/4 | 51041 | \$38.70 | \$93.40 |
| B | .2380 | 2" | 3-1/4 | 51042 | \$39.00 | \$93.70 |
| C | .2420 | 2" | 3-1/4 | 51043 | \$39.60 | \$94.30 |
| D | .2460 | 2" | 3-1/4 | 51044 | \$40.20 | \$94.90 |
| E | .2500 | 2" | 3-1/4 | 51045 | \$41.10 | \$95.80 |
| F | .2570 | 2" | 3-1/2 | 51046 | \$43.40 | \$119.30 |
| G | .2610 | 2-1/8 | 3-1/2 | 51047 | \$43.40 | \$119.30 |
| H | .2660 | 2-1/8 | 3-1/2 | 51048 | \$44.60 | \$120.50 |
| I | .2720 | 2-1/8 | 3-1/2 | 51049 | \$45.10 | \$121.00 |
| J | .2770 | 2-1/8 | 3-1/2 | 51050 | \$46.00 | \$121.90 |
| K | .2810 | 2-1/8 | 3-1/2 | 51051 | \$46.10 | \$122.00 |
| L | .2900 | 2-1/8 | 3-1/2 | 51052 | \$47.30 | \$123.20 |
| M | .2950 | 2-3/8 | 3-3/4 | 51053 | \$48.20 | \$124.10 |
| N | .3020 | 2-3/8 | 3-3/4 | 51054 | \$50.80 | \$126.70 |
| O | .3160 | 2-3/8 | 3-3/4 | 51055 | \$53.90 | \$152.60 |
| P | .3230 | 2-3/8 | 4" | 51056 | \$54.50 | \$153.20 |
| Q | .3320 | 2-1/2 | 4" | 51085 | \$57.60 | \$156.30 |
| R | .3390 | 2-1/2 | 4" | 51086 | \$58.40 | \$157.10 |
| S | .3480 | 2-1/2 | 4" | 51087 | \$60.90 | \$159.60 |
| T | .3580 | 2-3/4 | 4-1/4 | 51088 | \$70.80 | \$162.00 |
| U | .3680 | 2-3/4 | 4-1/4 | 51089 | \$73.10 | \$164.30 |
| V | .3770 | 2-3/4 | 4-1/4 | 51090 | \$79.00 | \$186.70 |
| W | .3860 | 2-7/8 | 4-1/2 | 51057 | \$79.20 | \$186.70 |
| X | .3970 | 2-7/8 | 4-1/2 | 51058 | \$88.20 | \$195.70 |
| Y | .4040 | 2-7/8 | 4-1/2 | 51059 | \$88.20 | \$195.70 |
| Z | .4130 | 2-7/8 | 4-1/2 | 51060 | \$95.10 | \$202.60 |

| Diam | Decimal | LOF | OAL | Metric EDP# | Coating | |
|--------|---------|-----|-----|----------------|----------|----------|
| | | | | | D1 Coat | D2 Coat |
| 1.0mm | .0394 | 13 | 38 | 51061 | \$15.50 | \$37.00 |
| 1.5mm | .0591 | 19 | 38 | 51062 | \$15.20 | \$36.70 |
| 2.0mm | .0787 | 22 | 44 | 51063 | \$15.40 | \$37.00 |
| 2.5mm | .0984 | 25 | 50 | 51064 | \$16.20 | \$37.80 |
| 3.0mm | .1181 | 32 | 57 | 51065 | \$20.30 | \$39.20 |
| 3.5mm | .1378 | 35 | 63 | 51066 | \$22.10 | \$66.50 |
| 4.0mm | .1575 | 35 | 63 | 51067 | \$24.50 | \$68.90 |
| 4.5mm | .1772 | 41 | 70 | 51068 | \$26.20 | \$70.60 |
| 5.0mm | .1969 | 44 | 76 | 51069 | \$28.20 | \$72.40 |
| 5.5mm | .2165 | 44 | 76 | 51070 | \$33.20 | \$87.90 |
| 6.0mm | .2362 | 50 | 82 | 51071 | \$36.20 | \$90.90 |
| 6.5mm | .2559 | 50 | 82 | 51072 | \$41.10 | \$117.00 |
| 7.0mm | .2756 | 54 | 89 | 51073 | \$43.50 | \$119.40 |
| 7.5mm | .2953 | 60 | 95 | 51074 | \$45.90 | \$121.80 |
| 8.0mm | .3150 | 60 | 95 | 51075 | \$51.70 | \$150.30 |
| 8.5mm | .3346 | 63 | 101 | 51076 | \$55.40 | \$154.00 |
| 9.0mm | .3543 | 70 | 108 | 51077 | \$66.10 | \$157.30 |
| 9.5mm | .3740 | 70 | 108 | 51078 | \$70.80 | \$162.00 |
| 10.0mm | .3937 | 73 | 114 | 51079 | \$83.10 | \$190.60 |
| 10.5mm | .4134 | 73 | 114 | 51080 | \$92.80 | \$200.30 |
| 11.0mm | .4331 | 73 | 114 | 51081 | \$93.80 | \$201.30 |
| 11.5mm | .4528 | 76 | 120 | 51082 | \$108.90 | \$228.20 |
| 12.0mm | .4724 | 76 | 120 | 51083 | \$117.50 | \$236.80 |
| 12.5mm | .4921 | 76 | 120 | 51084 | \$119.30 | \$238.60 |

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

ULTRATOOL®

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

Tight tolerance drills with 118° four facet point featuring D1 or D2 SmoothCoat.

- Designed for drilling composites, plastics, wood, fiberglass, and more • Tight tolerance +.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 +.0001/- .0003
Shank Diam +0 / -.0003
SFR = Shrink Fit Ready



| Diam | Decimal | LOF | OAL | Wire Gage EDP# | Wire Gage | | Diam | Decimal | LOF | OAL | Wire Gage EDP# | Wire Gage | |
|------|---------|-------|-------|-------------------|-----------|---------|------|---------|-------|-------|-------------------|-----------|---------|
| | | | | | D1 Coat | D2 Coat | | | | | | 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®

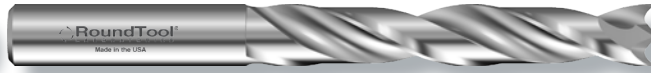


• Please note that due to extreme hardness D2 coated tools are generally unable to be reground or resharpened.

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 $+.0001/-0.0003$ • 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

| Diam | LOF | OAL | Coating | | | |
|-------|-------|-------|-----------------|----------|----------|----------|
| | | | 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 | Coating | | | |
|------|-------|-------|-------------|----------|----------|----------|
| | | | 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 | Coating | | | |
|-------|-----|-----|-------------|----------|----------|----------|
| | | | 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 |



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


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

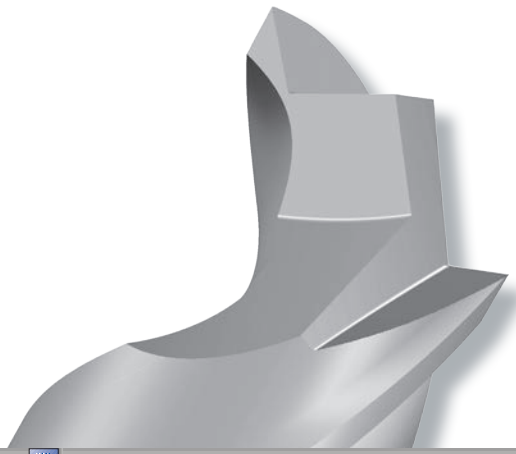
- Designed for drilling composites, plastics, wood, fiberglass, and more
- Tight tolerance $+.0001/-0.0003$
- Proprietary cemented carbide grade plus available D1 or D2 SmoothCoat
- Use UnCoated for general purpose needs
- Use D1 or D2 coated for graphites & other extremely abrasive non-ferrous alloys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



BP2PUC

| | | | | Wire Gage | | | | Wire Gage | | | | | | | |
|------|---------|-------|-------|-----------|----------|---------|---------|-----------|---------|-------|-------|-------|----------|---------|---------|
| | | | | UC | D1 | D2 | | | UC | D1 | D2 | | | | |
| Diam | Decimal | LOF | OAL | EDP# | UC Price | D1 Coat | D2 Coat | Diam | Decimal | LOF | OAL | EDP# | UC Price | D1 Coat | D2 Coat |
| 1 | .2280 | 1-3/4 | 3-1/4 | 61301 | \$33.20 | \$40.10 | \$97.30 | 31 | .1200 | 1-1/4 | 2-1/4 | 61331 | \$16.30 | \$23.80 | \$42.70 |
| 2 | .2210 | 1-3/4 | 3" | 61302 | \$31.60 | \$38.60 | \$95.80 | 32 | .1160 | 1-1/4 | 2-1/4 | 61332 | \$16.10 | \$23.60 | \$42.50 |
| 3 | .2130 | 1-3/4 | 3" | 61303 | \$29.60 | \$36.80 | \$94.00 | 33 | .1130 | 1-1/4 | 2-1/4 | 61333 | \$15.50 | \$23.10 | \$42.00 |
| 4 | .2090 | 1-3/4 | 3" | 61304 | \$28.90 | \$36.20 | \$93.40 | 34 | .1110 | 1-1/4 | 2-1/4 | 61334 | \$15.50 | \$23.10 | \$42.00 |
| 5 | .2055 | 1-3/4 | 3" | 61305 | \$28.10 | \$35.40 | \$92.60 | 35 | .1100 | 1-1/4 | 2-1/4 | 61335 | \$15.20 | \$22.80 | \$41.70 |
| 6 | .2040 | 1-3/4 | 3" | 61306 | \$27.80 | \$35.20 | \$92.40 | 36 | .1065 | 1-1/4 | 2-1/4 | 61336 | \$15.00 | \$22.60 | \$41.50 |
| 7 | .2010 | 1-3/4 | 3" | 61307 | \$26.60 | \$34.10 | \$91.30 | 37 | .1040 | 1-1/4 | 2-1/4 | 61337 | \$15.00 | \$22.60 | \$41.50 |
| 8 | .1990 | 1-3/4 | 3" | 61308 | \$26.20 | \$33.70 | \$90.90 | 38 | .1015 | 1-1/4 | 2-1/4 | 61338 | \$15.00 | \$22.60 | \$41.50 |
| 9 | .1960 | 1-3/4 | 3" | 61309 | \$25.50 | \$33.10 | \$90.30 | 39 | .0995 | 1-1/4 | 2-1/4 | 61339 | \$15.00 | \$22.60 | \$41.50 |
| 10 | .1935 | 1-5/8 | 2-3/4 | 61310 | \$25.00 | \$32.60 | \$89.80 | 40 | .0980 | 1" | 2" | 61340 | \$14.70 | \$19.10 | \$40.70 |
| 11 | .1910 | 1-5/8 | 2-3/4 | 61311 | \$24.90 | \$32.50 | \$89.70 | 41 | .0960 | 1" | 2" | 61341 | \$14.30 | \$18.70 | \$40.00 |
| 12 | .1890 | 1-5/8 | 2-3/4 | 61312 | \$24.50 | \$32.20 | \$89.40 | 42 | .0935 | 1" | 2" | 61342 | \$14.30 | \$18.70 | \$40.00 |
| 13 | .1850 | 1-5/8 | 2-3/4 | 61313 | \$23.80 | \$31.30 | \$75.70 | 43 | .0890 | 1" | 2" | 61343 | \$13.90 | \$18.30 | \$39.60 |
| 14 | .1820 | 1-5/8 | 2-3/4 | 61314 | \$23.70 | \$31.20 | \$75.60 | 44 | .0860 | 1" | 2" | 61344 | \$13.90 | \$18.30 | \$39.60 |
| 15 | .1800 | 1-5/8 | 2-3/4 | 61315 | \$23.40 | \$31.00 | \$75.40 | 45 | .0820 | 7/8 | 1-3/4 | 61345 | \$13.90 | \$18.30 | \$39.60 |
| 16 | .1770 | 1-5/8 | 2-3/4 | 61316 | \$23.20 | \$30.80 | \$75.20 | 46 | .0810 | 7/8 | 1-3/4 | 61346 | \$13.90 | \$18.30 | \$39.60 |
| 17 | .1730 | 1-5/8 | 2-3/4 | 61317 | \$23.00 | \$30.60 | \$75.00 | 47 | .0785 | 7/8 | 1-3/4 | 61347 | \$13.90 | \$18.30 | \$39.60 |
| 18 | .1695 | 1-5/8 | 2-3/4 | 61318 | \$22.40 | \$30.10 | \$74.50 | 48 | .0760 | 7/8 | 1-3/4 | 61348 | \$13.70 | \$18.10 | \$39.60 |
| 19 | .1660 | 1-5/8 | 2-3/4 | 61319 | \$22.20 | \$29.90 | \$74.30 | 49 | .0730 | 7/8 | 1-3/4 | 61349 | \$13.70 | \$18.10 | \$39.60 |
| 20 | .1610 | 1-3/8 | 2-1/2 | 61320 | \$21.60 | \$29.30 | \$73.70 | 50 | .0700 | 7/8 | 1-3/4 | 61350 | \$13.70 | \$18.10 | \$39.60 |
| 21 | .1590 | 1-3/8 | 2-1/2 | 61321 | \$21.20 | \$29.00 | \$73.40 | 51 | .0670 | 3/4 | 1-1/2 | 61351 | \$13.70 | \$18.10 | \$39.60 |
| 22 | .1570 | 1-3/8 | 2-1/2 | 61322 | \$21.10 | \$28.90 | \$73.30 | 52 | .0635 | 3/4 | 1-1/2 | 61352 | \$13.70 | \$18.10 | \$39.60 |
| 23 | .1540 | 1-3/8 | 2-1/2 | 61323 | \$20.20 | \$28.10 | \$72.50 | 53 | .0595 | 3/4 | 1-1/2 | 61353 | \$13.70 | \$18.10 | \$39.60 |
| 24 | .1520 | 1-3/8 | 2-1/2 | 61324 | \$19.30 | \$27.20 | \$71.60 | 54 | .0550 | 3/4 | 1-1/2 | 61354 | \$13.70 | \$18.10 | \$39.60 |
| 25 | .1495 | 1-3/8 | 2-1/2 | 61325 | \$18.80 | \$26.80 | \$71.20 | 55 | .0520 | 3/4 | 1-1/2 | 61355 | \$13.70 | \$18.10 | \$39.60 |
| 26 | .1470 | 1-3/8 | 2-1/2 | 61326 | \$18.40 | \$26.40 | \$70.80 | 56 | .0465 | 3/4 | 1-1/2 | 61356 | \$13.70 | \$18.10 | \$39.60 |
| 27 | .1440 | 1-3/8 | 2-1/2 | 61327 | \$18.40 | \$26.40 | \$70.80 | 57 | .0430 | 3/4 | 1-1/2 | 61357 | \$13.70 | \$18.10 | \$39.60 |
| 28 | .1405 | 1-3/8 | 2-1/2 | 61328 | \$17.60 | \$25.70 | \$70.10 | 58 | .0420 | 3/4 | 1-1/2 | 61358 | \$13.70 | \$18.10 | \$39.60 |
| 29 | .1360 | 1-3/8 | 2-1/2 | 61329 | \$17.40 | \$25.50 | \$69.90 | 59 | .0410 | 3/4 | 1-1/2 | 61359 | \$13.70 | \$18.10 | \$39.60 |
| 30 | .1285 | 1-3/8 | 2-1/4 | 61330 | \$16.60 | \$24.80 | \$69.20 | 60 | .0400 | 3/4 | 1-1/2 | 61360 | \$13.70 | \$18.10 | \$39.60 |

 Drill Specifications
Cutting Diam $+.0001/-0.0003$
Shank Diam $+0 / -0.003$
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 +.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 +.0001/- .0003
Shank Diam +0 / - .0003
SFR = Shrink Fit Ready

4" OAL
LOC 3x
Diameter

| Diam | Decimal | LOF | OAL | 4" OAL | | | | |
|-------|---------|-------|-----|--------|----------|---------|---------|----------|
| | | | | EDP# | 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.

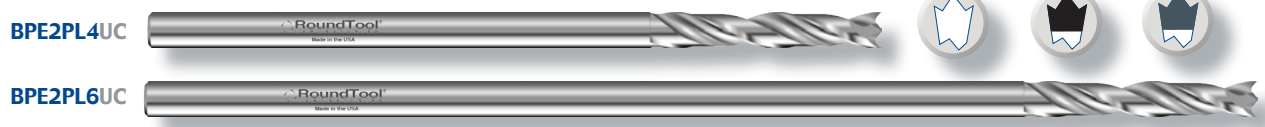
6" OAL
LOC 5x
Diameter

| Diam | Decimal | LOF | OAL | 6" OAL | | | | |
|-------|---------|-------|-----|--------|----------|---------|----------|----------|
| | | | | EDP# | 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/- .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







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

4" OAL
LOC 3x
Diameter

| Diam | 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

| Diam | 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 | 4" 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 | 6" 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

| Diam | Decimal | LOF | OAL | 4" OAL | | | |
|-------|---------|-------|-----|--------|----------|---------|----------|
| | | | | EDP# | UC Price | D1 Coat | D2 Coat |
| 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 |

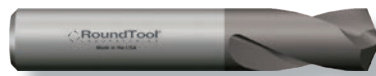
6" OAL

| Diam | Decimal | LOF | OAL | 6" OAL | | | |
|-------|---------|-------|-----|--------|----------|----------|----------|
| | | | | EDP# | UC Price | D1 Coat | D2 Coat |
| 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

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

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.



new!
Diamond coated Spotting Drills!

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.

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

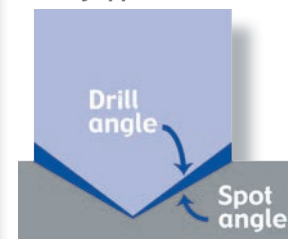
SD Series Metric Sizes



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 |
|------|-------|-------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------|-----------|
| 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 |

| 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 |



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

ULTRATOOL

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

Series CS6

Carbide Six Flute Countersinks
For use in abrasive materials



Use the CS6 for materials that will be powdered during machining

Series CS1

Carbide Single Flute Countersinks
For use in soft materials



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

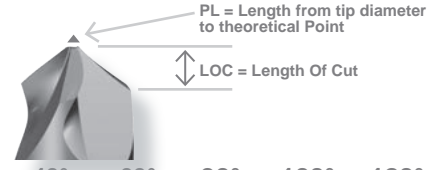
| Diam | Shank | OAL | 60° EDP# | 82° EDP# | 90° EDP# | 100° EDP# | D1 Coated | D2 Coated |
|-------|-------|-------|-----------------------|-----------------------|-----------------------|-----------------------|-----------|-----------|
| 1/8 | 1/8 | 1-1/2 | 91008 | 91708 | 91808 | 91864 | \$12.80 | \$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 | |

| 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



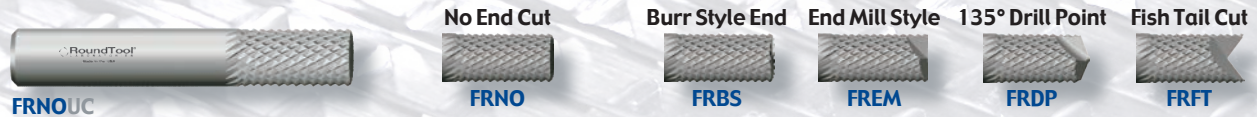
| Diam | OAL | Tip | Angles | | | | | | UnCoated Price | Coatings | | LOC/PL | | | | | |
|------|-------|------|-----------------------|-----------------------|-----------------------|-----------------------|-----------|-----------------------|----------------|-----------|-----------|------------|------------|------------|------------|-------------|-------------|
| | | | 30° EDP# | 40° EDP# | 60° EDP# | 90° EDP# | 100° EDP# | 120° EDP# | | 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 #.



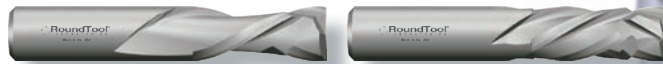
new!

| Diam | LOC | OAL | Shank | Coatings | | | | End Styles | | | | | | |
|-------------------------|-----|-------|-------|-----------------------|----------|----------|----------|-----------------------|-----------------------|-----------------------|-----------------------|----------|----------|----------|
| | | | | 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

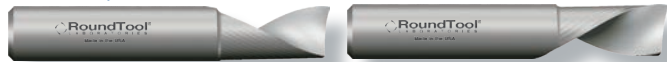
- Designed for compression routing of a wide range of materials
- Proprietary cemented carbide grade with sharp & polished SmoothGrind cutting edges plus available SmoothCoat
- Use UnCoated for general purpose routing needs
- Use thin, smooth, & hard D1 PVD diamond for plastics, woods, composites, CFRP's, 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 | | | | | |
|------|-----|--------------|---------------|---------------|-----|-------|----------|----------|----------|
| | | CUD UnCoated | CUD D1 Coated | CUD D2 Coated | | | | | |
| | | | | | | | | | |
| | | Price | Price | 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

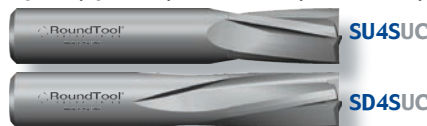


- Use Base EDP and add UC, D1 or D2 suffix for coating selection

| | | OU1S | OD1S | UC | D1 | D2 | | |
|------|-------|-------|---------|----------|-------|---------|---------|----------|
| | | UpCut | DownCut | UnCoated | D1 | D2 | | |
| | | EDP# | EDP# | Price | Price | 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

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



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

| | | SU4S | SD4S | UC | AT | D1 | D2 | GRD4S | UC | AT | D1 | D2 | | |
|------|-------|-------|---------|----------|-------|----------|----------|----------|----------|-------|----------|----------|----------|----------|
| | | UpCut | DownCut | UnCoated | AT | D1 | D2 | DownCut | UnCoated | AT | D1 | D2 | | |
| | | EDP# | EDP# | Price | Price | Price | Price | EDP# | Price | Price | Price | 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 +.0002/- .0000
- Proprietary cemented carbide grade plus either D1 or D2 SmoothCoat • Choose from Straight, RHS, or LHS (each RHC)
- 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 +.0002/- .0000
Shank Diam +.0005/- .0005



Metric Sizes

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



| 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 +.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 +.0002/- .0000
Shank Diam +.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:

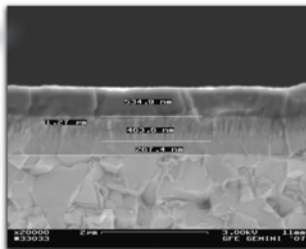
- Graphites • Aluminum–Silicon Alloys • Carbon Fiber Composites • Plastics • Green Ceramics
- Copper Alloys • Brass Magnesium • Hard Carbons • Fiberglass • High Silicon Aluminum
- Composite CFRP's • Metal Matrix Composites • Wood Composites
- Delrin • Kevlar • PEEK • Glass–Filled Composites



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.

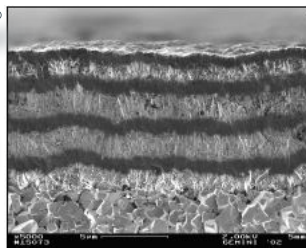
SmoothCoat®



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 | 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" | 1/2" |
| 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 \leq 32HRC | 125 to 225 | 100 to 150 | .00007 | .0001 | .00015 | .00025 | .0005 | .0007 | .001 | .0015 | .002 |
| A2, D2, H13 \geq 32HRC | 100 to 125 | 100 to 125 | .0001 | .00015 | .0001 | .00015 | .0003 | .0005 | .0008 | .0010 | .0015 |
| Stainless Steels | | | | | | | | | | | |
| 15-5, 17-4 \leq 32HRC | 150 to 350 | 100 to 225 | .00007 | .0001 | .00015 | .00025 | .0005 | .0007 | .001 | .0015 | .002 |
| 15-5, 17-4 \geq 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 \leq 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 | 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 \leq 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 \geq 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 \leq 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 \geq 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 \leq 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 Nix-on 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



American Made
American Designed
American Owned



toolalliance.com

RoundTool
LABORATORIES

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 HSN² (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.



Ready, Set, Cut![™]

Tool Alliance®

Welcome to the Tool Alliance® Family of World-Class Cutting Tools

Visit our web sites for new products, services, events, and features.

About the technology of RoundTool® and Tool Alliance®

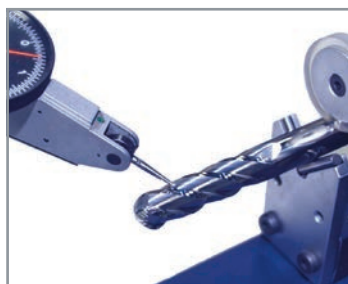
We obsess over details that create the finest cutting tools available. Our reward is customer satisfaction via increasing their factory productivity. We cannot be the best without thinking differently, so over a 49 year operating history we've developed proprietary technologies that yield significant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

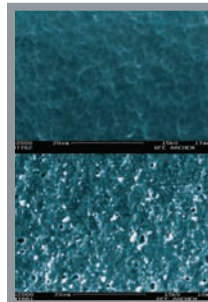
SmoothGrind®



Tight tolerances.
Minimized run-out.

SmoothConcricity®

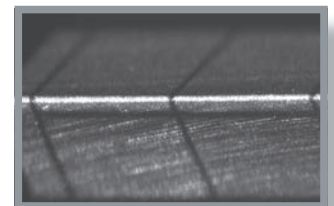
Our coating @ 2,000X (top).
Everybody else's (bottom).



SmoothCoat®

Edge Integrity.
Runs great on the first pass.

RoundTool end mill cutting edge magnified to display SE4 hone.



SmoothEdge®



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