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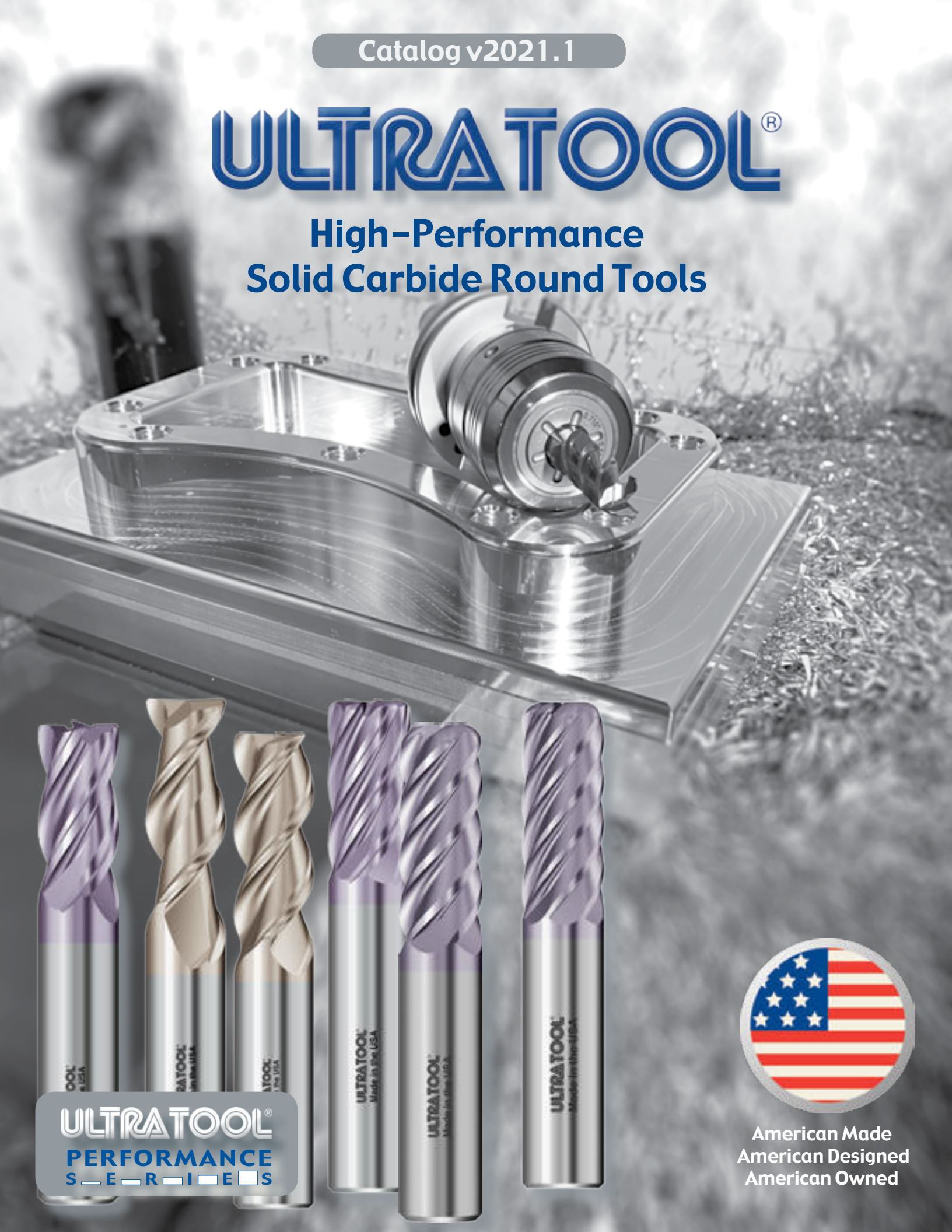
Catalog v2021.1

ULTRATOOL®

High-Performance Solid Carbide Round Tools



ULTRATOOL®
PERFORMANCE
SERIES

American Made
American Designed
American Owned

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American Made
American Designed
American Owned

involve • evolve • resolve
SOLID CARBIDE ULTRA TEAM TOOL HUNTINGTON BEACH
19 72

Creating Value through Efficiency
by utilizing progressive Quality, Manufacturing,
Human Resource & Technological applications.

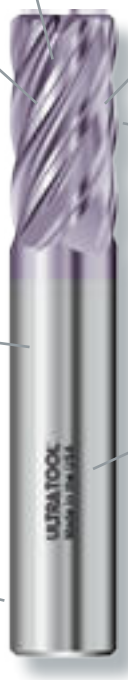
SmoothFlute
Patented Variable Helix design for robust stability in deep axial cuts

SmoothGrind®
Polished cutting surfaces for extreme sharpness and lubricity

SmoothCoat®
Sputter-based SuperNitride PVD coating for superior surface hardness & uniformity

SmoothContricity®
Precision grinding, tool holding, and tolerances for minimized TIR

SmoothEdge®
Surface and edge preparation for lubricity and minimized tool break-in



ULTRA-Grain®
The World's finest, purest sub-micron tungsten carbide powders

Laser etching for permanent tool identification

SFR
Tight tolerance shanks with superior roundness are shrink-fit ready

TA Tool Alliance®

Sales offices in Florida & California
Made in the USA for 49 years
Performance Guaranteed

Process control ID# on product label ensures total traceability

ULTRATOOL® Designed & Manufactured in the USA • ultra-tool.com

USCTI UNITED STATES CUTTING TOOL INSTITUTE
AMT MANUFACTURING TECHNOLOGY
ISA

ULTRATOOL®

sales@ultra-tool.com • (800) 854-2431

Welcome to Ultra-Tool's Catalog Version 2021.1.

The diversity and selection of solid carbide cutting tools contained within this book is quite remarkable. A density of presentation allows us to display within 64 pages what others would use a multiple of that for.

There are few companies in the world offering such a comprehensive assortment. Countless fractional and metric sizes, rads, coatings, edge preps, carbide grades... the list goes on. And we stock and support it all.

Our product approach is actually quite simple; we select the finest materials one can purchase, engineer really great designs, use the best grinding methods, and apply the most advanced coatings available.

The result is a superb product at a great price. Rest assured the value contained within the package reflects a lean manufacturing and efficient operational culture, in contrast to the large, expensive, bureaucratic organizations and sales structures of our multi-national competitors.

Of particular interest, check out our expanded lineup of Monolith end mills. We now offer this incredible design in seven different geometries to meet demanding applications in almost any material.

At Ultra-Tool 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 J. Povich
President

P.S. Make sure to try our other great Tool Alliance brands!

Manufactured in the USA
toolalliance.com

routco® RoundTool® LABORATORIES MILTEC® ULTRATOOL® TUNGSTEN TOOLWORKS.com

Team-Ultra Product Warranty:

Ultra-Tool International, Inc. warrants that products sold by it shall be free from defects in materials and workmanship. Ultra-Tool will replace, repair, or grant a credit for any product which does not comply with this warranty. Please see Terms & Conditions for additional warranty information.

Ultra-Tool® Catalog & Price List Version 2021.1

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ULTRATOOL® Solid Carbide — Page #

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ultra-tool.com

Components of Guaranteed Quality

1 ULTRA-Grain®

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® 1 respectively demonstrate the complexity of the compound we commonly refer to as Cemented Carbide. Taken at magnification of 10,000 X 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.

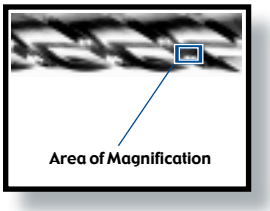
Ultra-Carb® 1
Cobalt Percentage: 6%
Grain Size (µm): ≤ 0.8
Hardness: 93.5 HRa
Fracture Toughness (K_{1c}): 6.6
TRS (GPa): 3.8
Density (gm/cc): 14.90

ULTRA-Carb®

Ultra-Grain® 1
Cobalt Percentage: 10%
Grain Size (µm): ≤ 0.7
Hardness: 92.7 HRa
Fracture Toughness (K_{1c}): 7.9
TRS (GPa): 4.1
Density (gm/cc): 14.30

ULTRA-Grain®

2 SmoothGrind®



SmoothGrind® Competitor's

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 much improved lubricity are just some of the benefits brought to you by the latest solid carbide rotary tooling advances from Tool Alliance. The two photos above display an Ultra-Tool end mill primary relief featuring SmoothGrind (left) versus a major competitor's product (right). To fully demonstrate the difference, the Ultra 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.

3 SmoothContricity®

SFR
Shrink Fit Ready

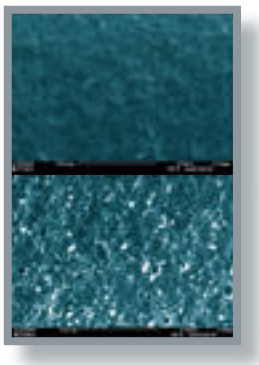
COMPONENT #3: The Tooling Process All the best physical ingredients are wasted unless they are all pulled together in a comprehensive system that maximizes their respective attributes. Tool Alliance calls this process SmoothContricity®. Our customer base represents the leading edge of machine tool utilization, and SmoothContricity ensures that optimum results can be obtained in a variety of ways; minimized 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.

4 SmoothEdge®

.0001 SmoothEdge atop cylindrical margin atop primary relief.

SE

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 on Page #55.



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

SmoothCoat® 5

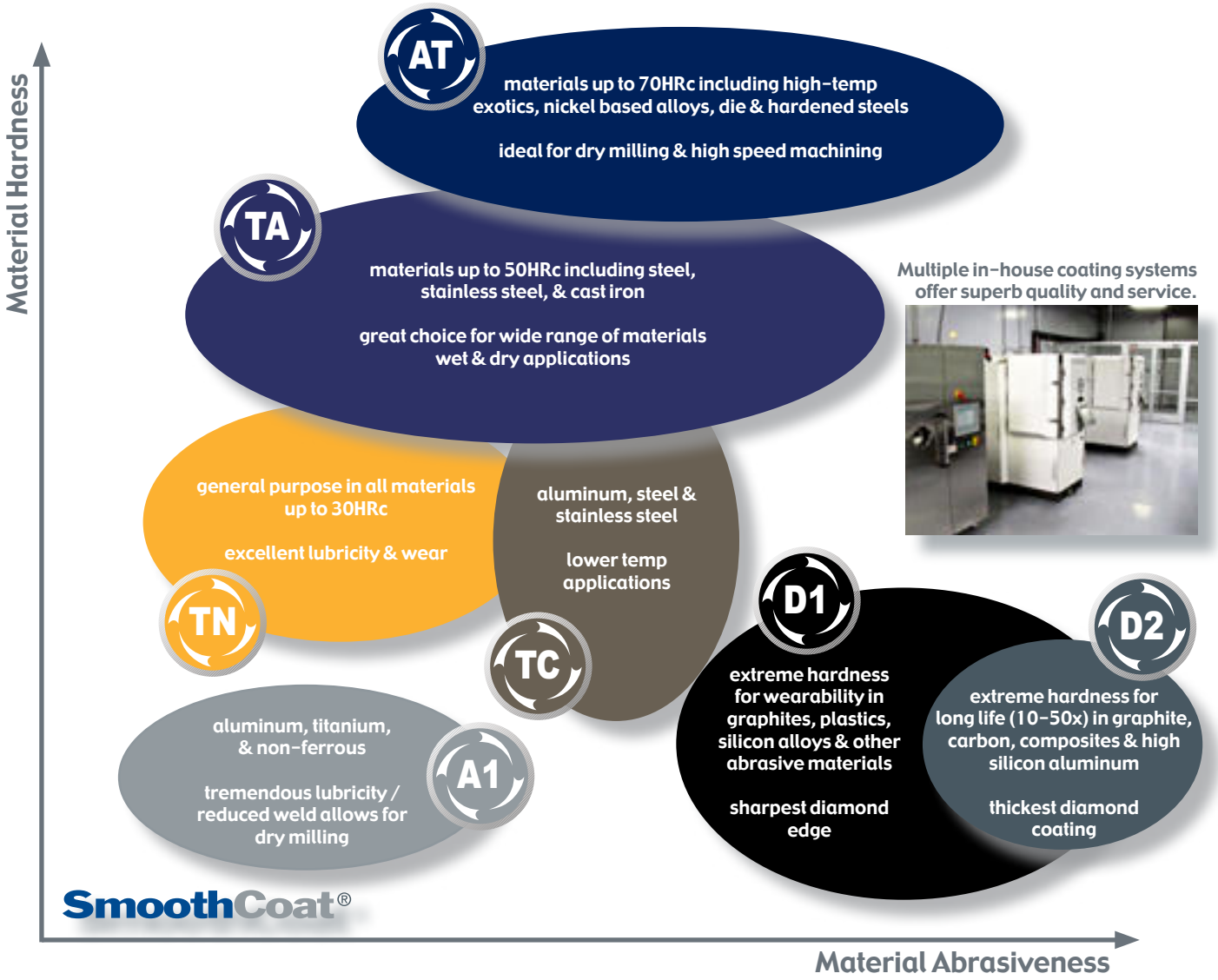
COMPONENT #5: The Coating Process The challenge of finding a coating method to leverage 100% of the inherent assets of our carbide grade and grinding technologies was difficult. What we finally discovered was such a perfect fit and so logical for our product lines that we invested heavily into the process 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.

Coating Availability Order by adding the suffix TA, TN, AT, TC, A1, D1, or D2 to the EDP #.

UC	TA	TN	AT	TC	A1	D1	D2
UnCoated	TiAlN	TiN	AlTiN HSN2	TiCN	TiB2	PVD Diamond	CVD Diamond

Standard Coatings available at "Coated" List Price

Premium Coatings available



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

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Patented SmoothFlute Series 323 Variable Helix End Mills by ULTRATOOL®

33° RHS VARIABLE HELIX

Series 323 Patented SmoothFlute®
Four Flute Variable Helix End Mill
Square, Corner Radius & Ball

Slot up to 150% x diameter: The Ultra-Tool® Series 323 is a revolutionary solid carbide end mill featuring our patented SmoothFlute® geometric design that can rough & finish at incredible speeds and feeds. SmoothFlute + SmoothEdge technology provides extended tool life and excellent work piece finishes by increasing stability and edge integrity. Series 323 is precision ground from Ultra-Grain®1, a premium carbide substrate that couples high hardness with excellent chipping resistance. Choose from Square, Ball, or 7 different standard radii for your roughing or finishing requirements. Includes AT (AlTiN) coating. Application data on page #57.

ULTRATOOL® PERFORMANCE SERIES

SFR

Premium Series EM Specs:
Cutting Diam +.000/-.002
Shank Diam -.0000/-.00025
Radius ±.0005

ULTRA-Grain® SmoothFlute

AT + SE

∅ Diam	LOC	OAL	Shank	Square EDP#	.015R EDP#	.030R EDP#	.060R EDP#	new! .090R EDP#	.125R EDP#	new! .190R EDP#	new! .250R EDP#	Ball EDP#
1/8	3/8	1-1/2	1/8	23100AT	23101AT	23102AT						23105AT
3/16	7/16	2"	3/16	23110AT	23111AT	23112AT						23115AT
1/4	3/8	2"	1/4	23120AT	23015AT	23122AT	23123AT					23125AT
1/4	3/4	2-1/2	1/4	23130AT	23016AT	23132AT	23133AT					23135AT
5/16	13/16	2-1/2	5/16	23140AT	23141AT	23142AT	23143AT					23145AT
3/8	1/2	2-1/2	3/8	23150AT	23151AT	23152AT	23153AT	23246AT	23154AT			23155AT
3/8	1"	2-1/2	3/8	23160AT	23161AT	23162AT	23163AT	23247AT	23164AT			23165AT
7/16	1"	2-3/4	7/16	23170AT	23171AT	23172AT	23173AT	23248AT	23174AT			23175AT
1/2	5/8	2-1/2	1/2	23180AT	23181AT	23031AT	23183AT	23249AT	23184AT			23185AT
1/2	1"	3"	1/2	23190AT	23191AT	23192AT	23193AT	23250AT	23194AT			23195AT
1/2	1-1/4	3"	1/2	23200AT	23201AT	23032AT	23203AT	23251AT	23204AT			23205AT
5/8	1-1/4	3-1/2	5/8	23210AT	23211AT	23040AT	23213AT	23252AT	23214AT			23215AT
5/8	2-5/8	5"	5/8	27655AT	27658AT	27661AT	27664AT	27667AT	27670AT			27677AT
3/4	7/8	4"	3/4	23220AT	23221AT	23047AT	23223AT	23253AT	23224AT	23256AT	23259AT	23225AT
3/4	1-1/2	4"	3/4	23230AT	23231AT	23048AT	23233AT	23254AT	23234AT	23257AT	23260AT	23235AT
3/4	2-5/8	5"	3/4	27656AT	27659AT	27662AT	27665AT	27668AT	27671AT	27673AT	27675AT	27678AT
3/4	4"	7"	3/4	27657AT	27660AT	27663AT	27666AT	27669AT	27672AT	27674AT	27676AT	27679AT
1"	1-1/2	4"	1"	23240AT	23241AT	23064AT	23243AT	23255AT	23244AT	23258AT	23261AT	23245AT

new! Additional Lengths and Radius sizes throughout the range!

The 323 & 365 are designed for maximizing Axial Depth of Cut, and optimizes geometry when used at approximately 75% LOC.

This product is manufactured under U.S. Patent No. 7,284,935. Please see high-performance Speeds & Feeds on page #57.

Metric Sizes: The Ultra-Tool® Series 323 is also available in a limited range of metric sizes, each provided with a popular sized radius. Please see catalog page #16.

SmoothFlute

SmoothFlute® is the latest technology to be integrated within our product line. It's so unique and important that we've not only obtained patent protection in the USA but additionally in all the major industrial countries of the World.

As incorporated into the Series 323, 323ML, 365, 365ML, and 395ML end mills, SmoothFlute allows for outstanding feed rates with incredibly quiet harmonics. The resultant stable and smooth cutting action leads to superb edge integrity for longer lasting tool life and enhanced work piece finishes.

Should you need a diameter, LOC, radius, or other characteristic not offered in our standard product line, SmoothFlute is also available for special tools on our tungstentoolworks.com website.

ULTRATOOL® Patented SmoothFlute Series 323 Monolith™ Series End Mills

Monolith end mills by Ultra-Tool represent a culmination of decades of experience and craftmanship in solid carbide grinding. Extended reach applications are notoriously difficult, but each respective Monolith Series combines the best of SmoothGrind, SmoothContricity, SmoothEdge and SmoothCoat to maximize success. The 323ML holds size and concentricity to a maximum of .0003 deviation, even at a 12" reach! All Monoliths feature SmoothEdge with standard AT hardcoating.

33° RHS VARIABLE HELIX

Series 323ML MONOLITH™

Solid Carbide Extended Reach End Mill for Steels & Exotics • Four Flute • AT Coated • Tight Tolerance • Minimal TIR • Neck • Corner Radius • Variable Helix

This product is manufactured under U.S. Patent No. 7,284,935

AT + SE

SmoothFlute ULTRATOOL® PERFORMANCE SERIES

∅ Diam	LOC	LBS	OAL	Neck	Shank	.015 rad EDP#	.030 rad EDP#	.060 rad EDP#	.090 rad EDP#	.125 rad EDP#	.190 rad EDP#	.250 rad EDP#	Ball EDP#
3/8	1/2	2-1/8	4"	.355	3/8	27000AT	23021AT	27001AT	27002AT				27003AT
3/8	1/2	4-1/8	6"	.355	3/8	27004AT	23022AT	27005AT	27006AT				27007AT
1/2	5/8	2-1/4	4"	.475	1/2	27008AT	23033AT	27009AT	27010AT	27011AT			27012AT
1/2	5/8	4-1/8	6"	.475	1/2	27013AT	23034AT	27014AT	27015AT	27016AT			27017AT
1/2	5/8	5-1/2	8"	.475	1/2	27018AT	23035AT	27019AT	27020AT	27021AT			27022AT
5/8	3/4	2-3/8	4"	.593	5/8		23041AT	27023AT	27024AT	27025AT			27026AT
5/8	3/4	4-1/8	6"	.593	5/8		23042AT	27027AT	27028AT	27029AT			27030AT
5/8	3/4	5-1/2	8"	.593	5/8		23043AT	27031AT	27032AT	27033AT			27034AT
3/4	1"	3-1/4	5"	.712	3/4		27627AT	27631AT	27635AT	27639AT	27643AT	27647AT	27651AT
3/4	1"	4-1/8	6"	.712	3/4		23049AT	27035AT	27036AT	27037AT	27038AT	27039AT	27040AT
3/4	1"	5"	7"	.712	3/4		27628AT	27632AT	27636AT	27640AT	27644AT	27648AT	27652AT
3/4	1"	5-1/2	8"	.712	3/4		23050AT	27041AT	27042AT	27043AT	27044AT	27045AT	27046AT
3/4	1"	8"	12"	.712	3/4		23051AT	27047AT	27048AT	27049AT	27050AT	27051AT	27052AT
1"	1-1/4	3"	5"	.950	1"		27629AT	27633AT	27637AT	27641AT	27645AT	27649AT	27653AT
1"	1-1/4	4-1/8	6"	.950	1"		23065AT	27053AT	27054AT	27055AT	27056AT	27057AT	27058AT
1"	1-1/4	5"	7"	.950	1"		27630AT	27634AT	27638AT	27642AT	27646AT	27650AT	27654AT
1"	1-1/4	5-1/2	8"	.950	1"		23066AT	27059AT	27060AT	27061AT	27062AT	27063AT	27064AT
1"	1-1/4	8"	12"	.950	1"		23067AT	27065AT	27066AT	27067AT	27068AT	27069AT	27070AT
1-1/4	1-1/2	4-1/8	6"	1.20	1-1/4		23068AT		27071AT	27072AT	27073AT	27074AT	27075AT
1-1/4	1-1/2	5-1/2	8"	1.20	1-1/4		23069AT		27076AT	27077AT	27078AT	27079AT	27080AT
1-1/4	1-1/2	8"	12"	1.20	1-1/4		23070AT		27081AT	27082AT	27083AT	27084AT	27085AT
1-1/2	2"	-	6"	-	1-1/4		23071AT						27086AT
1-1/2	2"	-	8"	-	1-1/4		23072AT						27087AT
1-1/2	2"	-	12"	-	1-1/4		23073AT						27088AT

new! Standard Radius sizes throughout the range!

Due to the unique attributes of the **Monolith's** reach & diameters, application recommendations are best done on a custom basis; please contact **sales@ultra-tool.com**

ULTRATOOL® PERFORMANCE SERIES

MONOLITH™

Premium Series EM Specs:
Cutting Diam +.000/-.002
Shank Diam -.0000/-.00025
Radius ±.0005

About the Monolith configuration: Ultra-Tool® has taken the very best of all our technologies and consolidated them within our Monolith end mills. Ultra-Grain, patented and/or unique designs, SmoothGrind, SmoothContricity, SmoothEdge, SmoothFlute and SmoothCoat are all incorporated into a behemoth which showcases the attributes necessary for successful machining in challenging applications. Special blank prep procedures and toolholding guarantee incredible concentricity characteristics. The Monolith is now available within the 323, 365, 355, 377, 395, 330AL, and 333AL Series (designated with the "ML" suffix). These are superb products; you'll find nothing else like them in the industry!

Please use heat-shrink holding for best results.

ULTRA-Grain® + SmoothGrind® + SmoothContricity® + SmoothEdge® + SmoothCoat®

SmoothFlute

Our patented SmoothFlute is included on the 323, 323ML, 365, 365ML, and 395ML

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ultra-tool.com

Patented SmoothFlute Series 365 Variable Helix End Mills by ULTRATOOL®

33° RHS VARIABLE HELIX

Series 365 Patented SmoothFlute™ Six Flute Variable Helix End Mill Square, Corner Radius & Ball Stub, Standard or Long Length

High speed finishing: The Ultra-Tool® Series 365 is a revolutionary solid carbide end mill featuring our patented SmoothFlute™ geometric design that can finish and rough at incredible speeds and feeds. SmoothFlute + SmoothEdge technology provides extended tool life and excellent work piece finishes by increasing stability and edge integrity. Series 365 is precision ground from Ultra-Grain®1, a premium carbide substrate that couples high hardness with excellent chipping resistance. Choose from Square, Ball, or 7 different standard radii for your roughing or finishing requirements, plus standard AT (AlTiN) coating. Application data on page #57.

ULTRATOOL® PERFORMANCE SERIES

SFR

Premium Series EM Specs:
Cutting Diam +.000/-.002
Shank Diam -.0000/-.00025
Radius ±.0005

SmoothEdge® ULTRA-Grain® SmoothFlute

AT + SE

∅ Diam	LOC	OAL	Shank	Square EDP#	.015R EDP#	.030R EDP#	.060R EDP#	new! .090R EDP#	.125R EDP#	new! .190R EDP#	new! .250R EDP#	Ball EDP#
1/4	3/8	2"	1/4	31680AT	31681AT	31682AT	31683AT					31685AT
1/4	3/4	2-1/2	1/4	31690AT	31691AT	31692AT	31693AT					31695AT
1/4	1"	4"	1/4	31700AT	31701AT	31702AT	31703AT					31705AT
5/16	13/16	2-1/2	5/16	31710AT	31711AT	31712AT	31713AT					31715AT
3/8	1/2	2-1/2	3/8	31720AT	31721AT	31722AT	31723AT	27187AT	31724AT			31725AT
3/8	1"	2-1/2	3/8	31730AT	31731AT	31732AT	31733AT	27188AT	31734AT			31735AT
3/8	1-1/2	4"	3/8	31740AT	31741AT	31742AT	31743AT	27189AT	31744AT			31745AT
1/2	5/8	2-1/2	1/2	31750AT	31751AT	31752AT	31753AT	27190AT	31754AT			31755AT
1/2	1"	3"	1/2	31760AT	31761AT	31762AT	31763AT	27191AT	31764AT			31765AT
1/2	1-1/4	3"	1/2	31920AT	31921AT	31922AT	31923AT	27192AT	31924AT			31925AT
1/2	1-3/4	4"	1/2	31770AT	31771AT	31772AT	31773AT	27193AT	31774AT			31775AT
5/8	3/4	3-1/2	5/8	31780AT	31781AT	31782AT	31783AT	27194AT	31784AT			31785AT
5/8	1-1/4	3-1/2	5/8	31790AT	31791AT	31792AT	31793AT	27195AT	31794AT			31795AT
5/8	1-5/8	3-1/2	5/8	31650AT	31651AT	31652AT	31653AT	27196AT	31654AT			31655AT
5/8	2-1/4	5"	5/8	31800AT	31801AT	31802AT	31803AT	27197AT	31804AT			31805AT
3/4	7/8	4"	3/4	31810AT	31811AT	31812AT	31813AT	27198AT	31814AT	27205AT	27212AT	31815AT
3/4	1-1/2	4"	3/4	31820AT	31821AT	31822AT	31823AT	27199AT	31824AT	27206AT	27213AT	31825AT
3/4	2-1/2	6"	3/4	31830AT	31831AT	31832AT	31833AT	27200AT	31834AT	27207AT	27214AT	31835AT
3/4	3-1/4	6"	3/4	31660AT	31661AT	31662AT	31663AT	27201AT	31664AT	27208AT	27215AT	31665AT
1"	1-1/2	4"	1"	31840AT	31841AT	31842AT	31843AT	27202AT	31844AT	27209AT	27216AT	31845AT
1"	2-1/2	6"	1"	31850AT	31851AT	31852AT	31853AT	27203AT	31854AT	27210AT	27217AT	31855AT
1"	3-1/4	6"	1"	31670AT	31671AT	31672AT	31673AT	27204AT	31674AT	27211AT	27218AT	31675AT

new! Standard Radius sizes throughout the range!

Metric Sizes: The Ultra-Tool® Series 365 is also available in a limited range of metric sizes, each provided with a popular sized radius. Please see catalog page #16.

The patented 365 Monolith™ end mill, Flagship of the industry.

100% American Designed American Made American Owned

High Efficiency Milling (HEM) ratio

ULTRATOOL® Patented SmoothFlute Series 365 Monolith™ Series End Mills

Monolith end mills by Ultra-Tool represent a culmination of decades of experience and craftmanship in solid carbide grinding. Extended reach applications are notoriously difficult, but each respective Monolith Series combines the best of SmoothGrind, SmoothContricity, SmoothEdge and SmoothCoat to maximize success. The 365ML holds size and concentricity to a maximum of .0003 deviation, even at a 12" reach! All Monoliths feature SmoothEdge with standard AT hardcoating.

Series 365ML MONOLITH™

Solid Carbide Extended Reach End Mill
• Six Flute • AT Coated • Tight Tolerance
• Minimal TIR • Clearance Neck
• Corner Radius • Variable Helix
This product is manufactured under U.S. Patent No. 7,284,935

AT + SE

SmoothFlute ULTRATOOL PERFORMANCE SERIES

∅ Diam	LOC	LBS	OAL	Neck	Shank	.015 rad EDP#	.030 rad EDP#	.060 rad EDP#	.090 rad EDP#	.125 rad EDP#	.190 rad EDP#	.250 rad EDP#	Ball EDP#
3/8	1/2	2-1/8	4"	.355	3/8	31926AT	31856AT	31927AT	31928AT				31929AT
3/8	1/2	4-1/8	6"	.355	3/8	31930AT	31857AT	31931AT	31932AT				31933AT
1/2	5/8	2-1/4	4"	.475	1/2	31934AT	31858AT	31935AT	31936AT	31937AT			31938AT
1/2	5/8	4-1/8	6"	.475	1/2	31939AT	31859AT	31940AT	31941AT	31942AT			31943AT
1/2	5/8	5-1/2	8"	.475	1/2	31944AT	31860AT	31945AT	31946AT	31947AT			31948AT
5/8	3/4	2-3/8	4"	.593	5/8		31861AT	31949AT	31950AT	31951AT			31952AT
5/8	3/4	4-1/8	6"	.593	5/8		31862AT	31953AT	31954AT	31955AT			31956AT
5/8	3/4	5-1/2	8"	.593	5/8		31863AT	31957AT	31958AT	31959AT			31960AT
3/4	1"	3-1/4	5"	.712	3/4		27599AT	27603AT	27607AT	27611AT	27615AT	27619AT	27623AT
3/4	1"	4-1/8	6"	.712	3/4		31864AT	31961AT	31962AT	31963AT	31964AT	31965AT	31966AT
3/4	1"	5"	7"	.712	3/4		27600AT	27604AT	27608AT	27612AT	27616AT	27620AT	27624AT
3/4	1"	5-1/2	8"	.712	3/4		31865AT	31967AT	31968AT	31969AT	31970AT	31971AT	31972AT
3/4	1"	8"	12"	.712	3/4		31866AT	31973AT	31974AT	31975AT	31976AT	31977AT	31978AT
1"	1-1/4	3"	5"	.950	1"		27601AT	27605AT	27609AT	27613AT	27617AT	27621AT	27625AT
1"	1-1/4	4-1/8	6"	.950	1"		31867AT	31979AT	31980AT	31981AT	31982AT	31983AT	31984AT
1"	1-1/4	5"	7"	.950	1"		27602AT	27606AT	27610AT	27614AT	27618AT	27622AT	27626AT
1"	1-1/4	5-1/2	8"	.950	1"		31868AT	31985AT	31986AT	31987AT	31988AT	31989AT	31990AT
1"	1-1/4	8"	12"	.950	1"		31869AT	31991AT	31992AT	31993AT	31994AT	31995AT	31996AT
1-1/4	1-1/2	4-1/8	6"	1.20	1-1/4		31870AT		31997AT	31998AT	31999AT	38988AT	38989AT
1-1/4	1-1/2	5-1/2	8"	1.20	1-1/4		31871AT		38990AT	38991AT	38992AT	38993AT	38994AT
1-1/4	1-1/2	8"	12"	1.20	1-1/4		31872AT		38995AT	38996AT	38997AT	38998AT	38999AT
1-1/2	2"	-	6"	-	1-1/4		31873AT						31916AT
1-1/2	2"	-	8"	-	1-1/4		31874AT						31917AT
1-1/2	2"	-	12"	-	1-1/4		31875AT						31918AT

new! Standard Radius sizes throughout the range!

Due to the unique attributes of the **Monolith's** reach & diameters, application recommendations are best done on a custom basis; please contact **sales@ultra-tool.com**

ULTRATOOL PERFORMANCE SERIES **MONOLITH™**

SFR Premium Series EM Specs:
Cutting Diam +.000/-.002
Shank Diam -.0000/-.00025
Radius ±.0005

About the Monolith configuration: Ultra-Tool® has taken the very best of all our technologies and consolidated them within our Monolith end mills. Ultra-Grain, patented and/or unique designs, SmoothGrind, SmoothContricity, SmoothEdge, SmoothFlute and SmoothCoat are all incorporated into a behemoth which showcases the attributes necessary for successful machining in challenging applications. Special blank prep procedures and toolholding guarantee incredible concentricity characteristics. The Monolith is now available within the 323, 365, 355, 377, 395, 330AL, and 333AL Series (designated with the "ML" suffix). These are superb products; you'll find nothing else like them in the industry!

Please use heat-shrink holding for best results.

ULTRA-Grain® + SmoothGrind® + SmoothContricity® + SmoothEdge® + SmoothCoat®

SmoothFlute

Our patented SmoothFlute is included on the 323, 323ML, 365, 365ML, and 395ML

phone 714.898.9224 / 800.854.2431 / fax 714.891.7816
5451 McFadden Avenue • Huntington Beach, CA 92649
ultra-tool.com

ULTRATOOL® Series 355 and 377 Series End Mills

Series 355

Ultra-Grain® Carbide End Mill
• Five Flute • 45 Degree RH Spiral
• SmoothEdge Honed • Coated

The Ultra-Tool® Series 355 End Mill is designed for the highest efficiency in the milling / finishing of steel, stainless, titanium and high temp alloys. Precision ground from Ultra-Grain®1 for top strength, the 355 features a proprietary OD hone to minimize tool break-in and the latest generation of SmoothCoat® AlTiN PVD coating. S&F's on page #57.

Premium Series EM Specs:
Cutting Diam +.000/-.002
Shank Diam -.0000/-.00025
Radius ±.0005

new! Standard Radius sizes throughout the range!

∅ Diam	LOC	OAL	Shank	Square EDP#	.015R EDP#	.030R EDP#	.060R EDP#	.090R EDP#	.125R EDP#	.190R EDP#	.250R EDP#	Ball EDP#
1/8	1/2	1-1/2	1/8	31550AT	27108AT	27114AT						27169AT
1/8	1"	3"	1/8	27100AT	27109AT	27115AT						27170AT
3/16	5/8	2"	3/16	31551AT	27110AT	27116AT						27171AT
3/16	1-1/4	3"	3/16	27101AT	27111AT	27117AT						27172AT
1/4	3/4	2-1/2	1/4	31552AT	31562AT	27118AT						27173AT
1/4	1"	4"	1/4	27102AT	27112AT	27119AT						27174AT
5/16	13/16	2-1/2	5/16	31553AT	27113AT	27120AT						27175AT
3/8	1"	2-1/2	3/8	31554AT	27502AT	27121AT	27128AT	27139AT	27150AT			27176AT
3/8	2"	4"	3/8	27103AT	27503AT	27122AT	27129AT	27140AT	27151AT			27177AT
7/16	1"	2-3/4	7/16	31555AT	27504AT	27123AT	27130AT	27141AT	27152AT			27178AT
1/2	1-1/4	3"	1/2	27244AT	27505AT	27245AT	27131AT	27142AT	27153AT			27179AT
1/2	2"	4"	1/2	27104AT	27506AT	27124AT	27132AT	27143AT	27154AT			27180AT
5/8	1-1/2	3-1/2	5/8	31557AT	27507AT	31567AT	27133AT	27144AT	27155AT			27181AT
5/8	2-5/8	5"	5/8	27105AT	27508AT	27125AT	27134AT	27145AT	27156AT			27182AT
3/4	1-5/8	4"	3/4	27246AT	27509AT	27247AT	27248AT	27249AT	27250AT	27251AT	27252AT	27253AT
3/4	2-5/8	5"	3/4	27254AT	27510AT	27256AT	27258AT	27260AT	27262AT	27264AT	27266AT	27268AT
3/4	4"	7"	3/4	27106AT	27511AT	27126AT	27136AT	27147AT	27158AT	27162AT	27166AT	27184AT
1"	1-1/2	4"	1"	31559AT	27512AT	31569AT	27137AT	27148AT	27159AT	27163AT	27167AT	27185AT
1"	2-5/8	5"	1"	27255AT	27513AT	27257AT	27259AT	27261AT	27263AT	27265AT	27267AT	27269AT
1"	4"	7"	1"	27107AT	27514AT	27127AT	27138AT	27149AT	27160AT	27164AT	27168AT	27186AT

ULTRATOOL® PERFORMANCE SERIES

High Efficiency Milling (HEM) ratio

SmoothGrind®
SmoothContricity®
SmoothEdge®
SmoothCoat®

Series 355/377 Geometry Enhancements

- ✓ Unequal indexing (variable pitch)
- ✓ Polished radial relief
- ✓ Unmeasurable runout
- ✓ Edge prep
- ✓ Special radius transition
- ✓ Opened free-cutting end cut

Series 377

Ultra-Grain® Carbide End Mill
• Seven Flute • 40 Degree RH Spiral
• SmoothEdge Honed • Coated

new! New 7-flute Series!

The Ultra-Tool® Series 377 End Mill targets the same materials as the 355, yet the seven flute design allows for faster metal removal rates. Precision ground from Ultra-Grain®1 for top strength, the 377 features a proprietary OD hone to minimize tool break-in and the latest generation of SmoothCoat® AlTiN PVD coating. S&F's on page #57.

Premium Series EM Specs:
Cutting Diam +.000/-.002
Shank Diam -.0000/-.00025
Radius ±.0005

new! Standard Radius sizes throughout the range!

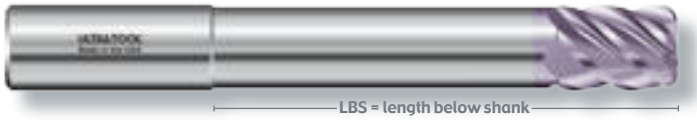
∅ Diam	LOC	OAL	Shank	Square EDP#	.015R EDP#	.030R EDP#	.060R EDP#	.090R EDP#	.125R EDP#	.190R EDP#	.250R EDP#	Ball EDP#
1/4	3/4	2-1/2	1/4	27400AT	27414AT	27416AT						
1/4	1"	4"	1/4	27401AT	27415AT	27417AT						
3/8	1"	2-1/2	3/8	27402AT	27490AT	27418AT	27430AT	27442AT	27454AT			27478AT
3/8	2"	4"	3/8	27403AT	27491AT	27419AT	27431AT	27443AT	27455AT			27479AT
1/2	1-1/4	3"	1/2	27404AT	27492AT	27420AT	27432AT	27444AT	27456AT			27480AT
1/2	2"	4"	1/2	27405AT	27493AT	27421AT	27433AT	27445AT	27457AT			27481AT
5/8	1-1/2	3-1/2	5/8	27406AT	27494AT	27422AT	27434AT	27446AT	27458AT			27482AT
5/8	2-5/8	5"	5/8	27407AT	27495AT	27423AT	27435AT	27447AT	27459AT			27483AT
3/4	1-5/8	4"	3/4	27408AT	27496AT	27424AT	27436AT	27448AT	27460AT	27466AT	27472AT	27484AT
3/4	2-5/8	5"	3/4	27409AT	27497AT	27425AT	27437AT	27449AT	27461AT	27467AT	27473AT	27485AT
3/4	4"	7"	3/4	27410AT	27498AT	27426AT	27438AT	27450AT	27462AT	27468AT	27474AT	27486AT
1"	1-1/2	4"	1"	27411AT	27499AT	27427AT	27439AT	27451AT	27463AT	27469AT	27475AT	27487AT
1"	2-5/8	5"	1"	27412AT	27500AT	27428AT	27440AT	27452AT	27464AT	27470AT	27476AT	27488AT
1"	4"	7"	1"	27413AT	27501AT	27429AT	27441AT	27453AT	27465AT	27471AT	27477AT	27489AT

ULTRATOOL® PERFORMANCE SERIES

High Efficiency Milling (HEM) ratio

ULTRATOOL® Series 355 and 377 Monolith™ Series End Mills

Monolith end mills by Ultra-Tool represent a culmination of decades of experience and craftmanship in solid carbide grinding. Extended reach applications are notoriously difficult, but each respective Monolith Series combines the best of SmoothGrind, SmoothContricity, SmoothEdge and SmoothCoat to maximize success. The 365ML holds size and concentricity to a maximum of .0003 deviation, even at a 12" reach! All Monoliths feature SmoothEdge with standard AT hardcoating.



Series 355ML MONOLITH™

Solid Carbide Extended Reach End Mill
• Five Flute • AT Coated • Tight Tolerance • Minimal TIR • Clearance Neck • Expanded Radius Selection

45° HELIX RHS RHC

AT + SE

new! **Standard Radius sizes throughout the range!**

Diam	LOC	LBS	OAL	Neck	Shank	.015 rad EDP#	.030 rad EDP#	.060 rad EDP#	.090 rad EDP#	.125 rad EDP#	.190 rad EDP#	.250 rad EDP#
3/8	1/2	2-1/8	4"	.355	3/8	27300AT	31876AT	27301AT	27302AT			
3/8	1/2	4-1/8	6"	.355	3/8	27303AT	31877AT	27304AT	27305AT			
1/2	5/8	2-1/4	4"	.475	1/2	27306AT	31878AT	27307AT	27308AT	27309AT		
1/2	5/8	4-1/8	6"	.475	1/2	27310AT	31879AT	27311AT	27312AT	27313AT		
1/2	5/8	5-1/2	8"	.475	1/2	27314AT	31880AT	27315AT	27316AT	27317AT		
5/8	3/4	2-3/8	4"	.593	5/8		31881AT	27318AT	27319AT	27320AT		
5/8	3/4	4-1/8	6"	.593	5/8		31882AT	27321AT	27322AT	27323AT		
5/8	3/4	5-1/2	8"	.593	5/8		31883AT	27324AT	27325AT	27326AT		
3/4	1"	3-1/4	5"	.712	3/4		27575AT	27579AT	27583AT	27587AT	27591AT	27595AT
3/4	1"	4-1/8	6"	.712	3/4		31884AT	27327AT	27328AT	27329AT	27330AT	27331AT
3/4	1"	5"	7"	.712	3/4		27576AT	27580AT	27584AT	27588AT	27592AT	27596AT
3/4	1"	5-1/2	8"	.712	3/4		31885AT	27332AT	27333AT	27334AT	27335AT	27336AT
3/4	1"	8"	12"	.712	3/4		31886AT	27337AT	27338AT	27339AT	27340AT	27341AT
1"	1-1/4	3"	5"	.950	1"		27577AT	27581AT	27585AT	27589AT	27593AT	27597AT
1"	1-1/4	4-1/8	6"	.950	1"		31887AT	27342AT	27343AT	27344AT	27345AT	27346AT
1"	1-1/4	5"	7"	.950	1"		27578AT	27582AT	27586AT	27590AT	27594AT	27598AT
1"	1-1/4	5-1/2	8"	.950	1"		31888AT	27347AT	27348AT	27349AT	27350AT	27351AT
1"	1-1/4	8"	12"	.950	1"		31889AT	27352AT	27353AT	27354AT	27355AT	27356AT
1-1/4	1-1/2	4-1/8	6"	1.20	1-1/4		31890AT		27357AT	27358AT	27359AT	27360AT
1-1/4	1-1/2	5-1/2	8"	1.20	1-1/4		31891AT		27361AT	27362AT	27363AT	27364AT
1-1/4	1-1/2	8"	12"	1.20	1-1/4		31892AT		27365AT	27366AT	27367AT	27368AT
1-1/2	2"	-	6"	-	1-1/4		31893AT					
1-1/2	2"	-	8"	-	1-1/4		31894AT					
1-1/2	2"	-	12"	-	1-1/4		31895AT					

Series 377ML MONOLITH™

Solid Carbide Extended Reach End Mill
• Seven Flute • AT Coated • Tight Tolerance • Minimal TIR • Clearance Neck • New Monolith Series

40° HELIX RHS RHC

AT + SE

new! **Standard Radius sizes throughout the range!**

Diam	LOC	LBS	OAL	Neck	Shank	.015 rad EDP#	.030 rad EDP#	.060 rad EDP#	.090 rad EDP#	.125 rad EDP#	.190 rad EDP#	.250 rad EDP#
3/4	1"	3-1/4	5"	.712	3/4		27515AT	27525AT	27535AT	27545AT	27555AT	27565AT
3/4	1"	4-1/8	6"	.712	3/4		27516AT	27526AT	27536AT	27546AT	27556AT	27566AT
3/4	1"	5"	7"	.712	3/4		27517AT	27527AT	27537AT	27547AT	27557AT	27567AT
3/4	1"	5-1/2	8"	.712	3/4		27518AT	27528AT	27538AT	27548AT	27558AT	27568AT
3/4	1"	8"	12"	.712	3/4		27519AT	27529AT	27539AT	27549AT	27559AT	27569AT
1"	1-1/4	3"	5"	.950	1"		27520AT	27530AT	27540AT	27550AT	27560AT	27570AT
1"	1-1/4	4-1/8	6"	.950	1"		27521AT	27531AT	27541AT	27551AT	27561AT	27571AT
1"	1-1/4	5"	7"	.950	1"		27522AT	27532AT	27542AT	27552AT	27562AT	27572AT
1"	1-1/4	5-1/2	8"	.950	1"		27523AT	27533AT	27543AT	27553AT	27563AT	27573AT
1"	1-1/4	8"	12"	.950	1"		27524AT	27534AT	27544AT	27554AT	27564AT	27574AT

ULTRATOOL PERFORMANCE SERIES

ULTRA-Grain® + SmoothGrind® + SmoothContricity® + SmoothEdge® + SmoothCoat®

Due to the unique attributes of the Monolith's reach & diameters, application recommendations are best done on a custom basis; please contact sales@ultra-tool.com

phone 714.898.9224 / 800.854.2431 / fax 714.891.7816
5451 McFadden Avenue • Huntington Beach, CA 92649
ultra-tool.com

ULTRATOOL® Solid Carbide Roughing End Mills for Steels & Exotics

Series 395
Sinusoidal Roughing End Mill • Four Flutes
30 Degree RH Spiral • Flat on shank

The Ultra-Tool® Rougher Series 395 is a true roughing end mill featuring sinusoidal geometry & radial relief for optimal strength. Designed & engineered for maximum stock removal at very high operating speeds, the 395 is specifically targeted for medium to high tensile steels, stainless, and related high-temperature alloys. Cutting 45° corner chamfer is standard. Coated price includes your choice of TiCN, TiN, AlTiN, or TiAlN.

SFR Ultra-Tool 395 Specs:
Cutting Diam +.0000/-.0035
Shank Diam +.0000/-.0003

FLAT

UC COAT

Diam	LOC	OAL	Shank	EDP#	Available Coating
1/4	3/8	2"	1/4	39780	TA, TN, AT or TC
1/4	3/4	2-1/2	1/4	39703	
5/16	7/16	2-1/2	5/16	39781	
5/16	13/16	2-1/2	5/16	39704	
3/8	1/2	2-1/2	3/8	39782	
3/8	1"	2-1/2	3/8	39705	
1/2	5/8	2-1/2	1/2	39783	
1/2	1"	3"	1/2	39706	
1/2	2"	4"	1/2	39784	
5/8	3/4	3-1/2	5/8	39785	
5/8	1-1/2	3-1/2	5/8	39707	
5/8	2-1/2	5"	5/8	39786	
3/4	7/8	4"	3/4	39787	
3/4	1-1/2	4"	3/4	39708	
3/4	2-1/2	5"	3/4	39788	
1"	1-1/4	4"	1"	39709	
1"	2"	4"	1"	39789	
1"	3-1/4	6"	1"	39790	

Diam	LOC	OAL	Shank	EDP#	Available Coating
6.0mm	19	50	6.0	39791	TA, TN, AT or TC
8.0mm	20	63	8.0	39792	
10.0mm	22	70	10.0	39793	
12.0mm	25	74	12.0	39794	
16.0mm	38	89	16.0	39795	
20.0mm	38	100	20.0	39796	
25.0mm	50	100	25.0	39797	

SFR Ultra-Tool 395 Specs (Metric):
Cutting Diam +0.000/-0.089mm
Shank Diam +0.000/-0.007mm

Series 395ML MONOLITH™ new!
Solid Carbide Extended Reach End Mill
for Steels & Exotics • Four Flute • AT Coated
• Patented SmoothFlute Variable Helix
• Minimal TIR • 45° Chamfer • Neck

LBS = length below shank

SFR Ultra-Tool 395 Specs:
Cutting Diam +.0000/-.0035
Shank Diam +.0000/-.0003

SmoothFlute

AT + SE

Diam	LOC	LBS	OAL	Neck	Cham	Shank	EDP#
3/8	1/2	2-1/8	4"	.355	45°	3/8	31896AT
3/8	1/2	4-1/8	6"	.355	45°	3/8	31897AT
1/2	5/8	2-1/4	4"	.475	45°	1/2	31898AT
1/2	5/8	4-1/8	6"	.475	45°	1/2	31899AT
1/2	5/8	5-1/2	8"	.475	45°	1/2	31900AT
5/8	3/4	2-3/8	4"	.593	45°	5/8	31901AT
5/8	3/4	4-1/8	6"	.593	45°	5/8	31902AT
5/8	3/4	5-1/2	8"	.593	45°	5/8	31903AT
3/4	1"	4-1/8	6"	.712	45°	3/4	31904AT
3/4	1"	5-1/2	8"	.712	45°	3/4	31905AT
3/4	1"	8"	12"	.712	45°	3/4	31906AT
1"	1-1/4	4-1/8	6"	.950	45°	1"	31907AT
1"	1-1/4	5-1/2	8"	.950	45°	1"	31908AT
1"	1-1/4	8"	12"	.950	45°	1"	31909AT
1-1/4	1-1/2	4-1/8	6"	1.20	45°	1-1/4	31910AT
1-1/4	1-1/2	5-1/2	8"	1.20	45°	1-1/4	31911AT
1-1/4	1-1/2	8"	12"	1.20	45°	1-1/4	31912AT
1-1/2	2"	-	6"	1.25	45°	1-1/4	31913AT
1-1/2	2"	-	8"	1.25	45°	1-1/4	31914AT
1-1/2	2"	-	12"	1.25	45°	1-1/4	31915AT

Due to the unique attributes of the Monolith's reach & diameters, application recommendations are best done on a custom basis; please contact sales@ultra-tool.com

ULTRATOOL® Three Flute High Helix End Mill

Series 320-60S
Three Flute • High 60 Degree RHS Helix

The high-helix design is ideal for all peripheral milling applications. In light depths of cut this tool can be used for all materials from aluminum to exotic alloys. The 60° helix will provide an excellent surface finish and reduce cutting loads.

Ultra-Tool® products are Shrink Fit Ready (SFR).

SFR Ultra-Tool End Mill Specs:
Cutting Diam +.000/-.002
Shank Diam +.0000/-.0003

UC COAT

Diam	LOC	OAL	Shank	Flutes	EDP#	Available Coating
1/8	1/2	1-1/2	1/8	3	31008	TA, TN, AT or TC
3/16	5/8	2"	3/16	3	31012	
1/4	3/4	2-1/2	1/4	3	31016	
5/16	13/16	2-1/2	5/16	3	31020	
3/8	7/8	2-1/2	3/8	3	31024	
1/2	1"	3"	1/2	3	31032	
5/8	1-1/2	3-1/2	5/8	3	31036	
3/4	1-1/2	4"	3/4	3	31040	
1"	1-1/2	4"	1"	3	31048	

ULTRATOOL® Two & Three Flute Specialty End Mills for Aluminum

Series 330AL
Ultra-Grain® End Mill
Two Flute • 45 Degree RH Spiral

The Ultra-Tool® Series 330AL End Mill is designed specifically for the highest possible efficiency in the milling of aluminum. The 330AL will allow full machine capacity roughing and close tolerance finishing of aluminum and other non-ferrous materials. SmoothEdge now included with TC coating! See page #59 for application data.

45° HELIX RHS RHC

SE

UC TC A1

330AL Series End Mill Specs:
SFR Cutting Diam +.0000/-.0003
Shank Diam +.0000/-.0003

NECK

Clearance neck available via Express Service

ULTRATOOL PERFORMANCE SERIES

Diam	LOC	OAL	Shank	Square EDP#	.010 Rad EDP#	.020 Rad EDP#	.030 Rad EDP#	.060 Rad EDP#	.090 Rad EDP#	.125 Rad EDP#	.190 Rad (new!) EDP#	.250 Rad (new!) EDP#	Ball EDP#
1/8	1/4	1-1/2	1/8	11104	11747								
1/8	1/2	1-1/2	1/8	11139	11748								11808
3/16	3/8	2"	3/16	11107	11749								
3/16	5/8	2"	3/16	11142	11750								11809
1/4	3/8	2-1/2	1/4	11110		11751	11765	11781					
1/4	1/2	2"	1/4	39750		11752	11766	11782					
1/4	1"	2-1/2	1/4	39710		11753	11767	11783					11810
1/4	2"	4"	1/4	39751		11754	11768	11784					
5/16	1/2	2-1/2	5/16	11113		11755	11769						
5/16	3/4	2-1/2	5/16	11148		11756	11770						11811
5/16	1-3/8	3"	5/16	39752		11757	11771						
3/8	5/8	2-1/2	3/8	11116		11758	11772	11785					
3/8	3/4	2-1/2	3/8	39753		11759	11773	11786					11812
3/8	1-1/8	2-1/2	3/8	39711		11760	11774	11787					
3/8	2"	4"	3/8	39754		11761	11775	11788					
1/2	3/4	3"	1/2	39755		11762	11776	11789					
1/2	1-1/4	3"	1/2	39712		11763	11777	11790					11813
1/2	2"	4"	1/2	39756		11764	11778	11791					
5/8	1-3/4	3-1/2	5/8	39713			11779	11792	11798				11814
5/8	3"	6"	5/8	39757			11780	11793	11799				
3/4	1-3/4	4"	3/4	39714				11794	11800	11804	27219	27223	11815
3/4	3"	6"	3/4	39758				11795	11801	11805	27220	27224	
1"	1-7/8	4"	1"	39715				11796	11802	11806	27221	27225	11816
1"	3"	6"	1"	39759				11797	11803	11807	27222	27226	

Available Coating
TC or A1

new!

TC UC A1

Ultra-Tool offers 2 world class coatings as standard for our aluminum tools!

Simply add a "TC" or "A1" suffix to the EDP#. For UnCoated, either use no suffix or add "UC."

SmoothEdge is included!

Series 333AL
Ultra-Grain® End Mill
Three Flute • 45 Degree RH Spiral

The Ultra-Tool® Series 333AL End Mill is designed specifically for the highest possible efficiency in the milling of aluminum. The 333AL will allow full machine capacity roughing and close tolerance finishing of aluminum and other non-ferrous materials. SmoothEdge now included with TC coating! See page #59 for application data.

45° HELIX RHS RHC

SE

UC TC A1

333AL Series End Mill Specs:
SFR Cutting Diam +.0000/-.0003
Shank Diam +.0000/-.0003

NECK

Clearance neck available via Express Service

ULTRATOOL PERFORMANCE SERIES

Diam	LOC	OAL	Shank	Square EDP#	.010 Rad EDP#	.020 Rad EDP#	.030 Rad EDP#	.060 Rad EDP#	.090 Rad EDP#	.125 Rad EDP#	.190 Rad EDP#	.250 Rad EDP#	Ball EDP#
1/8	1/4	1-1/2	1/8	11544	11640								
1/8	1/2	1-1/2	1/8	11545	11641								27235
3/16	3/8	2"	3/16	11546	11642								
3/16	5/8	2"	3/16	11547	11643								27236
1/4	3/8	2-1/2	1/4	11548		11644	11658	11674					
1/4	1/2	2"	1/4	11549		11645	11659	11675					
1/4	1"	2-1/2	1/4	11550		11646	11660	11676					27237
1/4	2"	4"	1/4	11551		11647	11661	11677					
5/16	1/2	2-1/2	5/16	11552		11648	11662						
5/16	3/4	2-1/2	5/16	11553		11649	11663						27238
5/16	1-3/8	3"	5/16	11554		11650	11664						
3/8	5/8	2-1/2	3/8	11555		11651	11665	11678					
3/8	3/4	2-1/2	3/8	11556		11652	11666	11679					27239
3/8	1-1/8	2-1/2	3/8	11557		11653	11667	11680					
3/8	2"	4"	3/8	11558		11654	11668	11681					
1/2	3/4	3"	1/2	11559		11655	11669	11682					
1/2	1-1/4	3"	1/2	11560		11656	11670	11683					27240
1/2	2"	4"	1/2	11561		11657	11671	11684					
5/8	1-3/4	3-1/2	5/8	11562			11672	11685	11691				27241
5/8	3"	6"	5/8	11563			11673	11686	11692				
3/4	1-3/4	4"	3/4	11564				11687	11693	11697	27227	27231	27242
3/4	3"	6"	3/4	11565				11688	11694	11698	27228	27232	
1"	1-7/8	4"	1"	11566				11689	11695	11699	27229	27233	27243
1"	3"	6"	1"	11567				11690	11696	11700	27230	27234	

Available Coating
TC or A1

phone 714.898.9224 / 800.854.2431 / fax 714.891.7816
5451 McFadden Avenue • Huntington Beach, CA 92649
ultra-tool.com

ULTRATOOL® Monolith™ Series End Mills for Aluminum

Monolith end mills by Ultra-Tool represent a culmination of decades of experience and craftmanship in solid carbide grinding. Extended reach applications are notoriously difficult, but each respective Monolith Series combines the best of SmoothGrind, SmoothContricity, SmoothEdge and SmoothCoat to maximize success. The 330ML and 333ML hold size & concentricity to a max of .0003 deviation, even at a 12" reach! All AL Monoliths feature SE8, with optional TC or A1 hardcoating.

Series 330ML

Solid Carbide Ext. Reach End Mill for Aluminum

- Two Flutes • Tight Tolerance • Minimal TIR
- Available in Square or Ball End
- Standard Clearance Neck

MONOLITH™

SFR 330AL Series End Mill Specs:
Cutting Diam +.0000/-.0003
Shank Diam +.0000/-.0003

SE TC A1 UC

Diam	LOC	LBS	OAL	Neck	Shank	Square EDP#	.015 rad EDP#	.030 rad EDP#	.060 rad EDP#	.090 rad EDP#	.125 rad EDP#	.190 rad EDP#	.250 rad EDP#	Ball EDP#
3/8	1/2	2-1/8	4"	.355	3/8	11900								11920
3/8	1/2	4-1/8	6"	.355	3/8	11901								11921
1/2	5/8	2-1/4	4"	.475	1/2	11902								11922
1/2	5/8	4-1/8	6"	.475	1/2	11903								11923
1/2	5/8	5-1/2	8"	.475	1/2	11904								11924
5/8	3/4	2-3/8	4"	.593	5/8	11905								11925
5/8	3/4	4-1/8	6"	.593	5/8	11906								11926
5/8	3/4	5-1/2	8"	.593	5/8	11907								11927
3/4	1"	3-1/4	5"	.712	3/4	27680								27684
3/4	1"	4-1/8	6"	.712	3/4	11908								11928
3/4	1"	5"	7"	.712	3/4	27681								27685
3/4	1"	5-1/2	8"	.712	3/4	11909								11929
3/4	1"	8"	12"	.712	3/4	11910								11930
1"	1-1/4	3"	5"	.950	1"	27682								27686
1"	1-1/4	4-1/8	6"	.950	1"	11911								11931
1"	1-1/4	5"	7"	.950	1"	27683								27687
1"	1-1/4	5-1/2	8"	.950	1"	11912								11932
1"	1-1/4	8"	12"	.950	1"	11913								11933
1-1/4	1-1/2	4-1/8	6"	1.20	1-1/4	11914								11934
1-1/4	1-1/2	5-1/2	8"	1.20	1-1/4	11915								11935
1-1/4	1-1/2	8"	12"	1.20	1-1/4	11916								11936
1-1/2	2"	-	6"	-	1-1/4	11917								11937
1-1/2	2"	-	8"	-	1-1/4	11918								11938
1-1/2	2"	-	12"	-	1-1/4	11919								11939

All Rads for 330ML available as quick-turn specials; price on application.

Available Coating
TC or A1

new!

TC UC A1

Ultra-Tool offers 2 world class coatings as standard for our aluminum tools!

Simply add a "TC" or "A1" suffix to the EDP#. For UnCoated, either use no suffix or add "UC."

SmoothEdge is included!

ULTRATOOL® PERFORMANCE SERIES

Due to the unique attributes of the Monolith's reach & diameters, application recommendations are best done on a custom basis; please contact sales@ultra-tool.com

ULTRATOOL® Monolith™ Series End Mills for Aluminum

Monolith end mills by Ultra-Tool represent a culmination of decades of experience and craftmanship in solid carbide grinding. Extended reach applications are notoriously difficult, but each respective Monolith Series combines the best of SmoothGrind, SmoothContricity, SmoothEdge and SmoothCoat to maximize success. The 330ML and 333ML hold size & concentricity to a max of .0003 deviation, even at a 12" reach! All AL Monoliths feature SE8, with optional TC or A1 hardcoating.

Series 333ML

Solid Carbide Ext. Reach End Mill for Aluminum

• Three Flutes • Tight Tolerance • Minimal TIR
• Square, Corner Rad, & Ball End
• Standard Clearance Neck

MONOLITH™

SFR 333AL Series End Mill Specs:
Cutting Diam +.0000/-.0003
Shank Diam +.0000/-.0003

Diam	LOC	LBS	OAL	Neck	Shank	Square EDP#	.015 rad EDP#	.030 rad EDP#	.060 rad EDP#	.090 rad EDP#	.125 rad EDP#	.190 rad EDP#	.250 rad EDP#	Ball EDP#
3/8	1/2	2-1/8	4"	.355	3/8	11940	12000	11960	12001	12002				12003
3/8	1/2	4-1/8	6"	.355	3/8	11941	12004	11961	12005	12006				12007
1/2	5/8	2-1/4	4"	.475	1/2	11942	12008	11962	12009	12010	12011			12012
1/2	5/8	4-1/8	6"	.475	1/2	11943	12013	11963	12014	12015	12016			12017
1/2	5/8	5-1/2	8"	.475	1/2	11944	12018	11964	12019	12020	12021			12022
5/8	3/4	2-3/8	4"	.593	5/8	11945		11965	12023	12024	12025			12026
5/8	3/4	4-1/8	6"	.593	5/8	11946		11966	12027	12028	12029			12030
5/8	3/4	5-1/2	8"	.593	5/8	11947		11967	12031	12032	12033			12034
3/4	1"	3-1/4	5"	.712	3/4	27688		27692	27696	27700	27704	27708	27712	27716
3/4	1"	4-1/8	6"	.712	3/4	11948		11968	12035	12036	12037	12038	12039	12040
3/4	1"	5"	7"	.712	3/4	27689		27693	27697	27701	27705	27709	27713	27717
3/4	1"	5-1/2	8"	.712	3/4	11949		11969	12041	12042	12043	12044	12045	12046
3/4	1"	8"	12"	.712	3/4	11950		11970	12047	12048	12049	12050	12051	12052
1"	1-1/4	3"	5"	.950	1"	27690		27694	27698	27702	27706	27710	27714	27718
1"	1-1/4	4-1/8	6"	.950	1"	11951		11971	12053	12054	12055	12056	12057	12058
1"	1-1/4	5"	7"	.950	1"	27691		27695	27699	27703	27707	27711	27715	27719
1"	1-1/4	5-1/2	8"	.950	1"	11952		11972	12059	12060	12061	12062	12063	12064
1"	1-1/4	8"	12"	.950	1"	11953		11973	12065	12066	12067	12068	12069	12070
1-1/4	1-1/2	4-1/8	6"	1.20	1-1/4	11954		11974		12071	12072	12073	12074	12075
1-1/4	1-1/2	5-1/2	8"	1.20	1-1/4	11955		11975		12076	12077	12078	12079	12080
1-1/4	1-1/2	8"	12"	1.20	1-1/4	11956		11976		12081	12082	12083	12084	12085
1-1/2	2"	-	6"	-	1-1/4	11957		11977						12086
1-1/2	2"	-	8"	-	1-1/4	11958		11978						12087
1-1/2	2"	-	12"	-	1-1/4	11959		11979						12088

Available Coating
TC or A1

new! **Standard Radius sizes throughout the range!**

ULTRATOOL® PERFORMANCE SERVICES

Due to the unique attributes of the **Monolith's** reach & diameters, application recommendations are best done on a custom basis; please contact **sales@ultra-tool.com**

new!

TC UC A1

Ultra-Tool offers 2 world class coatings as standard for our aluminum tools!

Simply add a "TC" or "A1" suffix to the EDP#. For UnCoated, either use no suffix or add "UC."

SmoothEdge is included!

The newest SmoothEdge® for our Aluminum end mills contributes to amazing surface finishes on milled parts.

phone 714.898.9224 / 800.854.2431 / fax 714.891.7816
5451 McFadden Avenue • Huntington Beach, CA 92649
ultra-tool.com

Metric Performance Series' by ULTRATOOL®

new!

SmoothFlute

Patented SmoothFlute® Variable Helix End Mills with standard Corner Radius
DIN Metric sizes

Series 365 Patented SmoothFlute® Six Flute Variable Helix End Mill with standard Corner Radius

Diam	LOC	OAL	Shank	0.5mm Rad EDP#	1.0mm Rad EDP#	1.5mm Rad EDP#	2.0mm Rad EDP#	3.0mm Rad EDP#	4.0mm Rad EDP#
3.0mm	8	57	6.0						
4.0mm	11	57	6.0						
5.0mm	13	57	6.0						
6.0mm	13	57	6.0	27732AT					
6.0mm	25	75	6.0	27733AT					
8.0mm	20	63	8.0	27734AT					
8.0mm	30	75	8.0	27735AT					
10.0mm	22	72	10.0	27736AT	27740AT				
10.0mm	45	100	10.0	27737AT	27741AT				
12.0mm	26	83	12.0	27738AT	27742AT	27750AT			
12.0mm	50	100	12.0	27739AT	27743AT	27751AT	27756AT	27758AT	
12.0mm	75	150	12.0		27744AT				
16.0mm	32	92	16.0		27745AT	27752AT			
16.0mm	57	125	16.0		27746AT	27753AT			
16.0mm	75	150	16.0		27747AT	27754AT			
20.0mm	38	104	20.0		27748AT	27755AT			
20.0mm	85	150	20.0		27749AT		27757AT	27759AT	27760AT

SFR 365 Series End Mill Specs (Metric): Cutting Diam +0.000/-0.051mm Shank Diam -0.000/-0.007mm

Series 323 Patented SmoothFlute® Four Flute Variable Helix End Mill with standard Corner Radius

Diam	LOC	OAL	Shank	0.25mm Rad EDP#	0.5mm Rad EDP#	1.0mm Rad EDP#	1.5mm Rad EDP#	2.0mm Rad EDP#	3.0mm Rad EDP#	4.0mm Rad EDP#
3.0mm	8	57	6.0	27761AT	27766AT					
4.0mm	11	57	6.0	27762AT	27767AT					
5.0mm	13	57	6.0	27763AT	27768AT					
6.0mm	13	57	6.0	27764AT	27769AT					
6.0mm	25	75	6.0	27765AT	27770AT					
8.0mm	20	63	8.0		27771AT	27778AT				
8.0mm	30	75	8.0		27772AT	27779AT				
10.0mm	22	72	10.0		27773AT	27780AT				
10.0mm	45	100	10.0		27774AT	27781AT				
12.0mm	26	83	12.0		27775AT	27782AT	27790AT			
12.0mm	50	100	12.0		27776AT	27783AT	27791AT	27798AT	27801AT	
12.0mm	75	150	12.0		27777AT	27784AT	27792AT	27799AT	27802AT	
16.0mm	32	92	16.0			27785AT	27793AT			
16.0mm	57	125	16.0			27786AT	27794AT			
16.0mm	75	150	16.0			27787AT	27795AT			
20.0mm	38	104	20.0			27788AT	27796AT			
20.0mm	85	150	20.0			27789AT	27797AT	27800AT	27803AT	27804AT

SFR 323 Series End Mill Specs (Metric): Cutting Diam +0.000/-0.051mm Shank Diam -0.000/-0.007mm

new!

TC UC A1

Choose from UnCoated (UC), TiCN (TC), or TiB2 (A1) surface hardcoatings. Simply add the appropriate suffix, UC, TC, or A1, after the EDP#. SmoothEdge is included!

Series 330AL Aluminum End Mill Two Flute • 45 Degree RH Spiral

Diam	LOC	OAL	Shank	Square EDP#	0.5mm Rad EDP#	1.0mm Rad EDP#	3.0mm Rad EDP#	Available Coating
3.0mm	6	38	3.0	11504	11701			TC or A1
3.0mm	12	38	3.0	11525	11702			
4.0mm	9	50	4.0	11507	11703			
4.0mm	12	50	4.0	11528	11704			
5.0mm	9	50	5.0	11510	11705			
5.0mm	14	50	5.0	11531	11706			
6.0mm	12	63	6.0	11513	11707	11720		
6.0mm	25	63	6.0	39760	11708	11721		
6.0mm	50	100	6.0	39761	11709	11722		
8.0mm	14	63	8.0	11516	11710	11723		
8.0mm	25	63	8.0	39716	11711	11724		
8.0mm	50	100	8.0	39762	11712	11725		
10.0mm	16	70	10.0	11519	11713	11726		
10.0mm	30	70	10.0	39717	11714	11727		
10.0mm	50	100	10.0	39763	11715	11728		
12.0mm	19	74	12.0	11522	11716	11729		
12.0mm	32	74	12.0	39718	11717	11730		
12.0mm	50	100	12.0	39764	11718	11731		
14.0mm	44	89	14.0	39765	11719	11732		
16.0mm	44	89	16.0	39719		11733	11740	
16.0mm	64	125	16.0	39766		11734	11741	
18.0mm	50	100	18.0	39767		11735	11742	
20.0mm	50	100	20.0	39720		11736	11743	
20.0mm	76	150	20.0	39768		11737	11744	
25.0mm	50	100	25.0	39721		11738	11745	
25.0mm	76	150	25.0	39769		11739	11746	

Series 333AL Aluminum End Mill Three Flute • 45 Degree RH Spiral

Diam	LOC	OAL	Shank	Square EDP#	0.5mm Rad EDP#	1.0mm Rad EDP#	3.0mm Rad EDP#	Available Coating
3.0mm	6	38	3.0	11568	11594			TC or A1
3.0mm	12	38	3.0	11569	11595			
4.0mm	9	50	4.0	11570	11596			
4.0mm	12	50	4.0	11571	11597			
5.0mm	9	50	5.0	11572	11598			
5.0mm	14	50	5.0	11573	11599			
6.0mm	12	63	6.0	11574	11600	11613		
6.0mm	25	63	6.0	11575	11601	11614		
6.0mm	50	100	6.0	11576	11602	11615		
8.0mm	14	63	8.0	11577	11603	11616		
8.0mm	25	63	8.0	11578	11604	11617		
8.0mm	50	100	8.0	11579	11605	11618		
10.0mm	16	70	10.0	11580	11606	11619		
10.0mm	30	70	10.0	11581	11607	11620		
10.0mm	50	100	10.0	11582	11608	11621		
12.0mm	19	74	12.0	11583	11609	11622		
12.0mm	32	74	12.0	11584	11610	11623		
12.0mm	50	100	12.0	11585	11611	11624		
14.0mm	44	89	14.0	11586	11612	11625		
16.0mm	44	89	16.0	11587		11626	11633	
16.0mm	64	125	16.0	11588		11627	11634	
18.0mm	50	100	18.0	11589		11628	11635	
20.0mm	50	100	20.0	11590		11629	11636	
20.0mm	76	150	20.0	11591		11630	11637	
25.0mm	50	100	25.0	11592		11631	11638	
25.0mm	76	150	25.0	11593		11632	11639	

SFR 330AL Series Specs (Metric): Cutting Diam +0.000/-0.007mm Shank Diam +0.000/-0.007mm

SFR 333AL Series Specs (Metric): Cutting Diam +0.000/-0.007mm Shank Diam +0.000/-0.007mm

ULTRA-Grain® + SmoothGrind® + SmoothContricity® + SmoothEdge® + SmoothCoat®

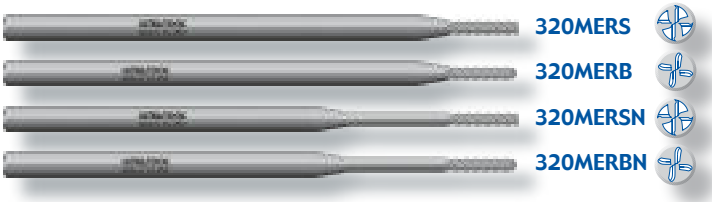
ULTRATOOL® Micro Extended Reach Four Flute End Mills

Leading off our incredible selection of micro tools are the 3" long, 4 flute 320 Micro Extended Reach Square (320MERS) and Ball (320MERB) end mills. Available UnCoated and with 3 different coatings (AT, D1 PVD Diamond, or D2 CVD Diamond) plus an optional clearance neck, these end mills are ideal for applications where precision and reach are important. Diameter tolerance ± .0003 (except for D2 Diamond +.0005/−.001). 1/8" shank. Add "N" for extended clearance neck.

Series 320MERS & 320MERB

Solid Carbide Micro Extended Reach End Mill
Four Flutes • Tight Tolerance • LOC = 5X diameter
Square or Ball End • 3" OAL • 1/8" shank
Standard Clearance Neck with "N" selection

For coating selection add AT, D1, or D2 suffix to EDP#.



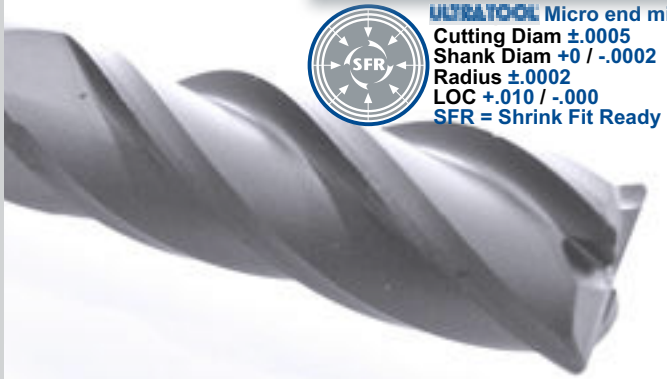
SFR 35% tighter shank tolerance than h6!
Shrink-Fit Ready!

Diam	LOC	LBS	OAL	Shank	Square EDP#	Ball EDP#
.015	.075		3"	1/8	32450	32550
.015N	.075	.150	3"	1/8	32451	32551
.020	.100		3"	1/8	32452	32552
.020N	.100	.200	3"	1/8	32453	32553
.025	.125		3"	1/8	32454	32554
.025N	.125	.250	3"	1/8	32455	32555
.030	.150		3"	1/8	32456	32556
.030N	.150	.300	3"	1/8	32457	32557
.031	.155		3"	1/8	32458	32558
.031N	.155	.310	3"	1/8	32459	32559
.035	.175		3"	1/8	32460	32560
.035N	.175	.350	3"	1/8	32461	32561
.040	.200		3"	1/8	32462	32562
.040N	.200	.400	3"	1/8	32463	32563
.045	.225		3"	1/8	32464	32564
.045N	.225	.450	3"	1/8	32465	32565
.047	.235		3"	1/8	32466	32566
.047N	.235	.500	3"	1/8	32467	32567
.050	.250		3"	1/8	32468	32568
.050N	.250	.500	3"	1/8	32469	32569
.060	.300		3"	1/8	32470	32570
.060N	.300	1.0"	3"	1/8	32471	32571
.062	.310		3"	1/8	32472	32572
.062N	.310	1.0"	3"	1/8	32473	32573
.075	.375		3"	1/8	32474	32574
.075N	.375	1.0"	3"	1/8	32475	32575
.078	.390		3"	1/8	32476	32576
.078N	.390	1.0"	3"	1/8	32477	32577
.090	.450		3"	1/8	32478	32578
.090N	.450	1.0"	3"	1/8	32479	32579
.093	.465		3"	1/8	32480	32580
.093N	.465	1.25"	3"	1/8	32481	32581
.1245	.625		3"	1/8	32482	32582
.1245N	.625	1.5"	3"	1/8	32483	32583

Available Coating
AT, D1 or D2

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

ULTRATOOL PERFORMANCE SERIES



phone 714.898.9224 / 800.854.2431 / fax 714.891.7816
5451 McFadden Avenue • Huntington Beach, CA 92649
ultra-tool.com

Solid Carbide Micro End Mills by ULTRATOOL®

The **Ultra-Tool®** selection of micro solid carbide end mills is unmatched in quality and range. Three different length of cut (LOC) to diameter ratios (**M**icro = 1.5X, **M**icro **L**ong = 3.0X, & **M**icro e**X**tra **L**ong = 5.0X), two & four flute, square & ball nose, plus coated & UnCoated. Square & Ball prices are identical. These tools match great carbide substrate with superb characteristics. 1/8" shank diameter x 1.5" OAL (metric sizes=3.0 x 38mm).

	Series 330MS / 330MB 2-flute 1.5X Series 320MS / 320MB 4-flute 1.5X LOC = 1.5X Diameter					Series 330MLS / 330MLB 2-flute 3X Series 320MLS / 320MLB 4-flute 3X LOC = 3.0X Diameter					Series 330MXLS / 330MXLB 2-flute 5X Series 320MXLS / 320MXLB 4-flute 5X LOC = 5.0X Diameter				
∅	2 sq	2 ball	4 sq	4 ball	Available Coating TA, TN, AT or TC	2 sq	2 ball	4 sq	4 ball	Available Coating TA, TN, AT or TC	2 sq	2 ball	4 sq	4 ball	Available Coating TA, TN, AT or TC
.005	30000	30648				30638	30639				30654	30655			
.006	30001	30649				30640	30641				30656	30657			
.007	30002	30650				30642	30643				30658	30659			
.008	30003	30651				30644	30645				30660	30661			
.009	30004	30652				30646	30647				30662	30663			
.010	33244	33344	30578	30608		30009	30048	30579	30609		30210	30310	30678	30679	
.011	33245	33345	30580	30610		30010	30049	30581	30611		30211	30311	30680	30681	
.012	33246	33346	30582	30612		30011	30050	30583	30613		30212	30312	30682	30683	
.013	33247	33347	30584	30614		30012	30051	30585	30615		30213	30313	30684	30685	
.014	33298	33398	30586	30616		30013	30052	30587	30617		30214	30314	30686	30687	
.015	33249	33349	30588	30618		30014	30053	30589	30619		30215	30315	30688	30689	
.016	33250	33350	30590	30620		30015	30054	30591	30621		30216	30316	30690	30691	
.017	33251	33351	30592	30622		30016	30055	30593	30623		30217	30317	30692	30693	
.018	33252	33352	30594	30624		30017	30056	30595	30625		30218	30318	30694	30695	
.019	33253	33353	30596	30626		30018	30057	30597	30627		30219	30319	30696	30697	
.020	33254	33354	30598	30628		30019	30040	30599	30629		30220	30320	30263	30363	
.021	33255	33355	30600	30630		30020	30058	30601	30631		30221	30321	30698	30699	
.022	33256	33356	30602	30632		30021	30059	30603	30633		30222	30322	30700	30701	
.023	33257	33357	30604	30634		30022	30060	30605	30635		30223	30323	30702	30703	
.024	33258	33358	30606	30636		30023	30061	30607	30637		30224	30324	30704	30705	
.025	33259	33359	32259	32359		30024	30041	30073	30090		30225	30325	30264	30364	
.026	33260	33360	32260	32360		30025	30062	30074	30091		30226	30326	30265	30365	
.027	33261	33361	32261	32361		30026	30063	30075	30092		30227	30327	30266	30366	
.028	33262	33362	32262	32362		30027	30064	30076	30093		30228	30328	30267	30367	
.029	33263	33363	32263	32363		30028	30065	30077	30094		30229	30329	30268	30368	
.030	33264	33364	32264	32364		30029	30042	30078	30095		30230	30330	30269	30369	
.031	33265	33365	32265	32365		30030	30043	30079	30096		30231	30331	30270	30370	
.032	30005	30574	30470	30570		30031	30066	30080	30097		30232	30332	30271	30371	
.033	30706	30796	30748	30838		30707	30797	30749	30839		30233	30333	30272	30372	
.034	30708	30798	30750	30840		30709	30799	30751	30841		30234	30334	30273	30373	
.035	33266	33366	32266	32366		30047	30067	30081	30098		30235	30335	30274	30374	
.036	30710	30800	30752	30842		30711	30801	30753	30843		30236	30336	30275	30375	
.037	30006	30575	30471	30571		30032	30068	30082	30099		30237	30337	30276	30376	
.038	30712	30802	30754	30844		30713	30803	30755	30845		30238	30338	30277	30377	
.039	30714	30804	30756	30846		30715	30805	30757	30847		30239	30339	30278	30378	
.040	33267	33367	32267	32367		30033	30044	30083	30100		30240	30340	30279	30379	
.041	30716	30806	30758	30848		30717	30807	30759	30849		30241	30341	30280	30380	
.042	30718	30808	30760	30850		30719	30809	30761	30851		30242	30342	30281	30381	
.043	30720	30810	30762	30852		30721	30811	30763	30853		30243	30343	30282	30382	
.044	30722	30812	30764	30854		30723	30813	30765	30855		30244	30344	30283	30383	
.045	30724	30814	30766	30856		30725	30815	30767	30857		30245	30345	30284	30384	
.046	30007	30576	30472	30572		30034	30069	30084	30101		30246	30346	30285	30385	
.047	33268	33368	32268	32368		30035	30045	30085	30108		30247	30347	30286	30386	
.048	30726	30816	30768	30858		30727	30817	30769	30859		30248	30348	30287	30387	
.049	30728	30818	30770	30860		30729	30819	30771	30861		30249	30349	30288	30388	
.050	33269	33369	32269	32369		30036	30070	30086	30109		30250	30350	30289	30389	
.051	30730	30820	30778	30862		30731	30821	30779	30863		30251	30351	30290	30390	
.052	30732	30822	30780	30864		30733	30823	30781	30865		30252	30352	30291	30391	
.053	30734	30824	30782	30866		30735	30825	30783	30867		30253	30353	30292	30392	
.054	30736	30826	30784	30868		30737	30827	30785	30869		30254	30354	30293	30393	
.055	33270	33370	32270	32370		30037	30046	30087	30110		30255	30355	30294	30394	
.056	30738	30828	30786	30870		30739	30829	30787	30871		30256	30356	30295	30395	
.057	30008	30577	30473	30573		30038	30071	30088	30111		30257	30357	30296	30396	
.058	30740	30830	30788	30878		30741	30831	30789	30879		30258	30358	30297	30397	

Solid Carbide Micro End Mills by ULTRATOOL®

Series 330MS / 330MB 2-flute 1.5X
Series 320MS / 320MB 4-flute 1.5X

1.5X

Diam	2 sq	2 ball	4 sq	4 ball	Available Coating
.059	30742	30832	30790	30880	TA, TN, AT or TC
.060	33271	33371	32271	32371	
.061	30744	30834	30792	30882	
.062	30746	30836	30794	30884	
.065	30900	30915	30930	30945	
.070	30901	30916	30931	30946	
.075	30902	30917	30932	30947	
.078	30903	30918	30933	30948	
.080	30904	30919	30934	30949	
.085	30905	30920	30935	30950	
.090	30906	30921	30936	30951	
.093	30907	30922	30937	30952	
.095	30908	30923	30938	30953	
.100	30909	30924	30939	30954	
.105	30910	30925	30940	30955	
.110	30911	30926	30941	30956	
.115	30912	30927	30942	30957	
.118	30913	30928	30943	30958	
.120	30914	30929	30944	30959	

Metric Diameters: 1.5X

Diam	2 sq	2 ball	4 sq	4 ball	Available Coating
0.10mm	30477	30480			TA, TN, AT or TC
0.15mm	30478	30481			
0.20mm	30479	30482			
0.25mm	33272	33372	30483	30492	
0.30mm	33273	33373	30484	30493	
0.35mm	33274	33374	30485	30494	
0.40mm	33275	33375	30486	30495	
0.45mm	33276	33376	30487	30496	
0.50mm	33277	33377	30488	30497	
0.55mm	33278	33378	30489	30498	
0.60mm	33279	33379	30490	30499	
0.65mm	33280	33380	30491	30500	
0.70mm	33281	33381	32281	32381	
0.75mm	33282	33382	32282	32382	
0.80mm	33283	33383	32283	32383	
0.85mm	33284	33384	32284	32384	
0.90mm	33285	33385	32285	32385	
0.95mm	33286	33386	32286	32386	
1.00mm	33287	33387	32287	32387	
1.05mm	33288	33388	32288	32388	
1.10mm	33289	33389	32289	32389	
1.15mm	33290	33390	32290	32390	
1.20mm	33291	33391	32291	32391	
1.25mm	33292	33392	32292	32392	
1.30mm	33293	33393	32293	32393	
1.35mm	33294	33394	32294	32394	
1.40mm	33295	33395	32295	32395	
1.45mm	33296	33396	32296	32396	
1.50mm	33297	33397	32297	32397	

Series 330MLS / 330MLB 2-flute 3X
Series 320MLS / 320MLB 4-flute 3X

3.0X

2 sq	2 ball	4 sq	4 ball	Available Coating
30743	30833	30791	30881	TA, TN, AT or TC
30039	30072	30089	30112	
30745	30835	30793	30883	
30747	30837	30795	30885	
30960	31600	31615	31630	
30961	31601	31616	31631	
30962	31602	31617	31632	
30963	31603	31618	31633	
30964	31604	31619	31634	
30965	31605	31620	31635	
30966	31606	31621	31636	
30967	31607	31622	31637	
30968	31608	31623	31638	
30969	31609	31624	31639	
30970	31610	31625	31640	
30971	31611	31626	31641	
30895	31612	31627	31642	
30896	31613	31628	31643	
30897	31614	31629	31644	

Metric Diameters: 3.0X

2 sq	2 ball	4 sq	4 ball	Available Coating
30201	30204			TA, TN, AT or TC
30202	30205			
30203	30206			
30113	30139	30501	30886	
30114	30140	30502	30887	
30115	30141	30503	30888	
30116	30142	30504	30889	
30117	30143	30505	30890	
30118	30144	30506	30891	
30119	30145	30507	30892	
30120	30146	30508	30893	
30121	30147	30509	30894	
30122	30148	30165	30182	
30123	30149	30166	30183	
30124	30150	30167	30184	
30125	30151	30168	30185	
30126	30152	30169	30186	
30127	30153	30170	30187	
30128	30154	30171	30188	
30129	30155	30172	30189	
30130	30156	30173	30190	
30131	30157	30174	30191	
30132	30158	30175	30192	
30133	30159	30176	30193	
30134	30160	30177	30194	
30135	30161	30178	30195	
30136	30162	30179	30196	
30137	30163	30180	30197	
30138	30164	30181	30198	

Series 330MXLS / 330MXLB 2-flute 5X
Series 320MXLS / 320MXLB 4-flute 5X

5.0X

2 sq	2 ball	4 sq	4 ball	Available Coating
30259	30359	30298	30398	TA, TN, AT or TC
30260	30360	30299	30399	
30261	30361	30300	30400	
30262	30362	30308	30408	

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

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

Metric Diameters: 5.0X

2 sq	2 ball	4 sq	4 ball	Available Coating
				TA, TN, AT or TC
30417	30517			
30418	30518			
30419	30519			
30420	30520	30445	30545	
30421	30521	30446	30546	
30422	30522	30447	30547	
30423	30523	30448	30548	
30424	30524	30449	30549	
30425	30525	30450	30550	
30426	30526	30451	30551	
30427	30527	30452	30552	
30428	30528	30453	30553	
30429	30529	30454	30554	
30430	30530	30455	30555	

35% tighter shank tolerance than h6!

Micro End Mills have a 1/8" (3.0mm for metric) shank diameter.

UC TA TN TC

In addition to UnCoated (UC) our micro end mills are available with these standard coatings.

phone 714.898.9224 / 800.854.2431 / fax 714.891.7816
5451 McFadden Avenue • Huntington Beach, CA 92649
ultra-tool.com

Fractional Corner Radius End Mills by ULTRATOOL®

The Ultra-Tool® Series 330R, 362R, and 320R are tough workhorses with Radii that can handle the vast majority of demanding applications. These tools are precision ground from Ultra-Grain®, a premium carbide substrate that couples high hardness with excellent chipping resistance. Choose from 8 different standard radii for your roughing or finishing requirements. Crank up the feed rates even more by adding one of our in-house SmoothCoat® PVD hardcoatings, and / or add SmoothEdge® to eliminate tool break-in. Note the new LOC's and OAL's on the 320R Series!

ULTRATOOL® PERFORMANCE

Series 330R

30° HELIX RHS RHC

Corner Radius End Mills
Two Flute • Standard Length

Diam	LOC	OAL	Shank	.010" EDP#	.015" EDP#	.020" EDP#	.030" EDP#	.045" EDP#	.060" EDP#	.090" EDP#	.125" EDP#
1/8	1/2	1-1/2	1/8	31050	31164	31165	31166	31167			
3/16	5/8	2"	3/16	31051	31168	31169	31170	31171	31172		
1/4	3/4	2-1/2	1/4	31052	31173	31174	31175	31176	31177	31178	
5/16	13/16	2-1/2	5/16	31053	31179	31180	31181	31182	31183	31184	31185
3/8	1"	2-1/2	3/8	31054	31186	31187	31188	31189	31190	31191	31192
1/2	1"	3"	1/2	31055	31193	31194	31195	31196	31197	31198	31199
5/8	1-1/2	3-1/2	5/8	31056	31200	31201	31202	31203	31204	31205	31206
3/4	1-1/2	4"	3/4	31057	31207	31208	31209	31210	31211	31212	31213
1"	1-1/2	4"	1"	31058	31214	31215	31217	31218	31219	31220	31221

Available Coating
TA, TN, AT or TC

RAD Specifications:
Cutting Diam +.000/-.002
Shank Diam +.0000/-.0003
Radius ±.001

ULTRA-Grain®

Series 362R

30° HELIX RHS RHC

Corner Radius End Mills
Three Flute • Standard Length

Diam	LOC	OAL	Shank	.010" EDP#	.015" EDP#	.020" EDP#	.030" EDP#	.045" EDP#	.060" EDP#	.090" EDP#	.125" EDP#
1/8	1/2	1-1/2	1/8	31060	31419	31420	31421	31422			
3/16	5/8	2"	3/16	31061	31423	31424	31425	31426	31427		
1/4	3/4	2-1/2	1/4	31062	31428	31429	31430	31431	31432	31433	
5/16	13/16	2-1/2	5/16	31063	31434	31435	31436	31437	31438	31439	31440
3/8	1"	2-1/2	3/8	31064	31441	31442	31443	31444	31445	31446	31447
1/2	1"	3"	1/2	31065	31448	31449	31450	31451	31452	31453	31454
5/8	1-1/2	3-1/2	5/8	31066	31456	31457	31458	31459	31460	31461	31462
3/4	1-1/2	4"	3/4	31067	31463	31464	31465	31466	31467	31468	31469
1"	1-1/2	4"	1"	31068	31470	31471	31472	31473	31474	31475	31476

Available Coating
TA, TN, AT or TC

RAD Specifications:
Cutting Diam +.000/-.002
Shank Diam +.0000/-.0003
Radius ±.001

ULTRA-Grain®

Series 320R

30° HELIX RHS RHC

Corner Radius End Mills
Four Flute • Std & Ext Length

new! new LOC's and OAL's!

Diam	LOC	OAL	Shank	.010" EDP#	.015" EDP#	.020" EDP#	.030" EDP#	.045" EDP#	.060" EDP#	.090" EDP#	.125" EDP#
1/8	1/2	1-1/2	1/8	31070	31101	31110	31119	31128			
1/8	1"	3"	1/8	34101	34110	34119	34128	34137			
3/16	5/8	2"	3/16	31071	31102	31111	31120	31129	31138		
3/16	1-1/4	3"	3/16	34102	34111	34120	34129	34138	34146		
1/4	3/4	2-1/2	1/4	31072	31103	31112	31121	31130	31139	31148	
1/4	1-1/2	4"	1/4	34103	34112	34121	34130	34139	34147	34154	
5/16	13/16	2-1/2	5/16	31073	31104	31113	31122	31131	31140	31149	31158
5/16	1-5/8	4"	5/16	34104	34113	34122	34131	34140	34148	34155	34161
3/8	1"	2-1/2	3/8	31074	31105	31114	31123	31132	31141	31150	31159
3/8	2"	4"	3/8	34105	34114	34123	34132	34141	34149	34156	34162
1/2	1"	3"	1/2	31075	31106	31115	31124	31133	31142	31151	31160
1/2	2"	4"	1/2	34106	34115	34124	34133	34142	34150	34157	34163
5/8	1-1/2	3-1/2	5/8	31076	31107	31116	31125	31134	31143	31152	31161
5/8	3"	6"	5/8	34107	34116	34125	34134	34143	34151	34158	34164
3/4	1-1/2	4"	3/4	31077	31108	31117	31126	31135	31144	31153	31162
3/4	3"	6"	3/4	34108	34117	34126	34135	34144	34152	34159	34165
1"	1-1/2	4"	1"	31078	31109	31118	31127	31136	31145	31154	31163
1"	3"	6"	1"	34109	34118	34127	34136	34145	34153	34160	34166

Available Coating
TA, TN, AT or TC

RAD Specifications:
Cutting Diam +.000/-.002
Shank Diam +.0000/-.0003
Radius ±.001

ULTRA-Grain®

new!

New LOC's and OAL's in 320R Series!

Metric Corner Radius End Mills by ULTRATOOL®

ULTRATOOL® PERFORMANCE

The Ultra-Tool® Series Metric 330R, 362R, and 320R are tough workhorses with Radii that can handle the vast majority of demanding applications. These tools are precision ground from Ultra-Grain®, a premium carbide substrate that couples high hardness with excellent chipping resistance. Choose from 8 different standard radii for your roughing or finishing requirements. Crank up the feed rates even more by adding one of our in-house SmoothCoat® PVD hardcoatings, and / or add SmoothEdge® to eliminate tool break-in.

Metric Series 330R

30° HELIX RHS RHC

Corner Radius End Mills
Two Flute • Standard Length

MRAD Specifications:
Cutting Diam +0.000/-0.051mm
Shank Diam +0.000/-0.008mm
Radius ±0.025mm

ULTRA-Grain®

Diam	LOC	OAL	Shank	0.2mm EDP#	0.3mm EDP#	0.5mm EDP#	1.0mm EDP#	1.5mm EDP#	2.0mm EDP#	2.5mm EDP#	3.0mm EDP#
3.0mm	12	38	3.0	31292	31293	31294	31295				
4.0mm	14	50	4.0	31296	31297	31298	31299	31300			
5.0mm	16	50	5.0	31301	31302	31303	31304	31305	31306		
6.0mm	19	50	6.0	31307	31308	31309	31310	31311	31312	31313	
8.0mm	20	63	8.0	31314	31315	31316	31317	31318	31319	31320	31321
10.0mm	22	70	10.0	31322	31323	31324	31325	31326	31327	31328	31329
12.0mm	25	74	12.0	31330	31331	31332	31333	31334	31335	31336	31337
16.0mm	38	89	16.0	31338	31339	31340	31341	31342	31343	31344	31345
20.0mm	38	100	20.0	31346	31347	31348	31349	31350	31351	31352	31353
25.0mm	38	100	25.0	31354	31355	31356	31357	31358	31359	31360	31361

Available Coating
TA, TN, AT or TC

Metric Series 362R

30° HELIX RHS RHC

Corner Radius End Mills
Three Flute • Standard Length

MRAD Specifications:
Cutting Diam +0.000/-0.051mm
Shank Diam +0.000/-0.008mm
Radius ±0.025mm

ULTRA-Grain®

Diam	LOC	OAL	Shank	0.2mm EDP#	0.3mm EDP#	0.5mm EDP#	1.0mm EDP#	1.5mm EDP#	2.0mm EDP#	2.5mm EDP#	3.0mm EDP#
3.0mm	12	38	3.0	31477	31478	31479	31480				
4.0mm	14	50	4.0	31481	31482	31483	31484	31485			
5.0mm	16	50	5.0	31486	31487	31488	31489	31490	31491		
6.0mm	19	50	6.0	31492	31493	31494	31495	31496	31497	31498	
8.0mm	20	63	8.0	31499	31500	31501	31502	31503	31504	31505	31506
10.0mm	22	70	10.0	31507	31508	31509	31510	31511	31512	31513	31514
12.0mm	25	74	12.0	31515	31516	31517	31518	31519	31520	31521	31522
16.0mm	38	89	16.0	31523	31524	31525	31526	31527	31528	31529	31530
20.0mm	38	100	20.0	31531	31532	31533	31534	31535	31536	31537	31538
25.0mm	38	100	25.0	31539	31540	31541	31542	31543	31544	31545	31546

Available Coating
TA, TN, AT or TC

Metric Series 320R

30° HELIX RHS RHC

Corner Radius End Mills
Four Flute • Standard Length

MRAD Specifications:
Cutting Diam +0.000/-0.051mm
Shank Diam +0.000/-0.008mm
Radius ±0.025mm

ULTRA-Grain®

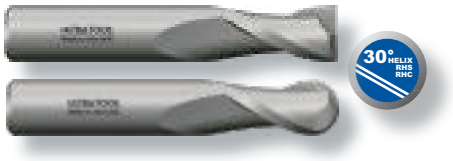
Diam	LOC	OAL	Shank	0.2mm EDP#	0.3mm EDP#	0.5mm EDP#	1.0mm EDP#	1.5mm EDP#	2.0mm EDP#	2.5mm EDP#	3.0mm EDP#
3.0mm	12	38	3.0	31222	31223	31224	31225				
4.0mm	14	50	4.0	31226	31227	31228	31229	31230			
5.0mm	16	50	5.0	31231	31232	31233	31234	31235	31236		
6.0mm	19	50	6.0	31237	31238	31239	31240	31241	31242	31243	
8.0mm	20	63	8.0	31244	31245	31246	31247	31248	31249	31250	31251
10.0mm	22	70	10.0	31252	31253	31254	31255	31256	31257	31258	31259
12.0mm	25	74	12.0	31260	31261	31262	31263	31264	31265	31266	31267
16.0mm	38	89	16.0	31268	31269	31270	31271	31272	31273	31274	31275
20.0mm	38	100	20.0	31276	31277	31278	31279	31280	31281	31282	31283
25.0mm	38	100	25.0	31284	31285	31286	31287	31288	31289	31290	31291

Available Coating
TA, TN, AT or TC

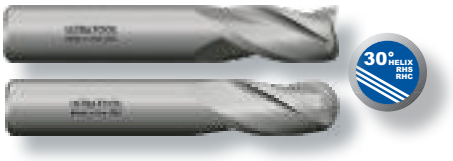
phone 714.898.9224 / 800.854.2431 / fax 714.891.7816
5451 McFadden Avenue • Huntington Beach, CA 92649
ultra-tool.com

Single End Standard Length End Mills by ULTRATOOL®

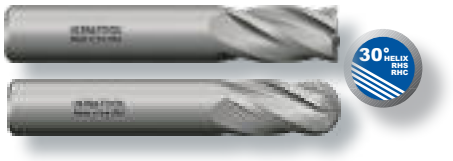
Series 330S Square End
330B Ball End • Two Flute



Series 362S Square End
362B Ball End • Three Flute



Series 320S Square End
320B Ball End • Four Flute



The **Ultra-Tool®** Series 330, 362, and 320 represents the industry's best value in a general purpose design. These end mills are more than capable of handling 75% of milling applications due to robust geometry, quality craftsmanship, and best-in-class carbide substrate. Most importantly, the Series 330, 362, and 320 all benefit from the Tool Alliance® duo of proprietary & value-added features: SmoothGrind® & SmoothContricity®, with SmoothCoat® and SmoothEdge® available individually for an extra charge. Additionally, special radii and clearance necks can quickly be added to any size.

Detailed Speeds and Feeds instructions can be located on Page #58.

Standard features:
SmoothGrind® SmoothContricity®
Available options:
SmoothCoat® SmoothEdge®

ULTRA-Grain®

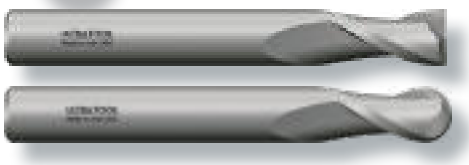
SFR Ultra-Tool End Mill Specs:
Cutting Diam +.000/-.002
Shank Diam +.0000/-.0003

Diam	LOC	OAL	Shank	330S EDP#	330B EDP#	362S EDP#	362B EDP#	320S EDP#	320B EDP#
1/64	3/64	1-1/2	1/8	33001	33101	36201	36301	32001	32101
1/32	3/32	1-1/2	1/8	33002	33102	36202	36302	32002	32102
3/64	3/16	1-1/2	1/8	33003	33103	36203	36303	32003	32103
1/16	3/16	1-1/2	1/8	33004	33104	36204	36304	32004	32104
5/64	1/4	1-1/2	1/8	33005	33105	36205	36305	32005	32105
3/32	3/8	1-1/2	1/8	33006	33106	36206	36306	32006	32106
7/64	1/2	1-1/2	1/8	33007	33107	36207	36307	32007	32107
1/8	1/2	1-1/2	1/8	33008	33108	36208	36308	32008	32108
9/64	1/2	2"	3/16	33009	33109	36209	36309	32009	32109
5/32	9/16	2"	3/16	33010	33110	36210	36310	32010	32110
11/64	9/16	2"	3/16	33011	33111	36211	36311	32011	32111
3/16	5/8	2"	3/16	33012	33112	36212	36312	32012	32112
13/64	5/8	2-1/2	1/4	33013	33113	36213	36313	32013	32113
7/32	5/8	2-1/2	1/4	33014	33114	36214	36314	32014	32114
15/64	3/4	2-1/2	1/4	33015	33115	36215	36315	32015	32115
1/4	3/4	2-1/2	1/4	33016	33116	36216	36316	32016	32116
17/64	3/4	2-1/2	5/16	33017	33117	36217	36317	32017	32117
9/32	3/4	2-1/2	5/16	33018	33118	36218	36318	32018	32118
19/64	13/16	2-1/2	5/16	33019	33119	36219	36319	32019	32119
5/16	13/16	2-1/2	5/16	33020	33120	36220	36320	32020	32120
21/64	13/16	2-1/2	3/8	33021	33121	36221	36321	32021	32121
11/32	13/16	2-1/2	3/8	33022	33122	36222	36322	32022	32122
23/64	1"	2-1/2	3/8	33023	33123	36223	36323	32023	32123
3/8	1"	2-1/2	3/8	33024	33124	36224	36324	32024	32124
25/64	1"	2-3/4	7/16	33025	33125	36225	36325	32025	32125
13/32	1"	2-3/4	7/16	33026	33126	36226	36326	32026	32126
27/64	1"	2-3/4	7/16	33027	33127	36227	36327	32027	32127
7/16	1"	2-3/4	7/16	33028	33128	36228	36328	32028	32128
29/64	1"	3"	1/2	33029	33129	36229	36329	32029	32129
15/32	1"	3"	1/2	33030	33130	36230	36330	32030	32130
31/64	1"	3"	1/2	33031	33131	36231	36331	32031	32131
1/2	1"	3"	1/2	33032	33132	36232	36332	32032	32132
9/16	1-1/4	3-1/2	9/16	33034	33134	36234	36334	32034	32134
5/8	1-1/2	3-1/2	5/8	33036	33136	36236	36336	32036	32136
11/16	1-1/2	4"	3/4	33038	33138	36238	36338	32038	32138
3/4	1-1/2	4"	3/4	33040	33140	36240	36340	32040	32140
7/8	1-1/2	4"	7/8	33044	33144	36244	36344	32044	32144
1"	1-1/2	4"	1"	33048	33148	36248	36348	32048	32148
1-1/4	2"	4-1/2	1-1/4	33080	33180	36280	36380	32080	32180

Available Coating
TA, TN, AT or TC

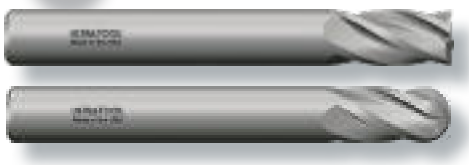
Long & Extra Long End Mills by ULTRATOOL®

Series 382S Square End
382B Ball End • Two Flute



Series 383S Square End
383B Ball End • Three Flute

Series 384S Square End
384B Ball End • Four Flute



The **Ultra-Tool®** Series 382, 383, and 384 represents the industry's best value in a extended length or extended reach design. These end mills are more than capable of handling 75% of milling applications due to robust geometry, quality craftsmanship, and best-in-class carbide substrate. Most importantly, the Series 382, 383, and 384 all benefit from the Tool Alliance® duo of proprietary & value-added features: SmoothGrind® & SmoothContricity®, with SmoothCoat® and SmoothEdge® available individually for an extra charge. Additionally, special radii and clearance necks can be quickly added to any size.

Detailed Speeds and Feeds instructions can be located on Page #58.

Standard features:
SmoothGrind® SmoothContricity®
Available options:
SmoothCoat® SmoothEdge®

ULTRA-Grain®

SFR Ultra-Tool End Mill Specs:
Cutting Diam +.000/-.002
Shank Diam +.0000/-.0003

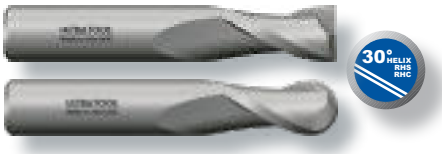
Diam	LOC	OAL	Shank	382S EDP#	382B EDP#	383S EDP#	383B EDP#	384S EDP#	384B EDP#
1/8	3/4	2"	1/8	38207	38307	38007	38107	38407	38507
1/8	1"	3"	1/8	38208	38308	38008	38108	38408	38508
3/16	1-1/4	3"	3/16	38212	38312	38012	38112	38412	38512
3/16	1"	4"	3/16	38213	38313	38013	38113	38413	38513
1/4	1-1/8	3"	1/4	38215	38315	38015	38115	38415	38515
1/4	1"	4"	1/4	38218	38318	38018	38118	38418	38518
1/4	1-1/2	4"	1/4	38216	38316	38016	38116	38416	38516
1/4	1-1/2	6"	1/4	38217	38317	38017	38117	38417	38517
5/16	1-1/8	3"	5/16	38219	38319	38019	38119	38419	38519
5/16	1-5/8	4"	5/16	38220	38320	38020	38120	38420	38520
5/16	1-1/2	6"	5/16	38221	38321	38021	38121	38421	38521
3/8	1-1/8	3"	3/8	38223	38323	38023	38123	38423	38523
3/8	1"	4"	3/8	38222	38322	38022	38122	38422	38522
3/8	2"	4"	3/8	38224	38324	38024	38124	38424	38524
3/8	1-1/2	6"	3/8	38225	38325	38025	38125	38425	38525
3/8	3"	6"	3/8	38226	38326	38026	38126	38426	38526
7/16	2"	4"	7/16	38228	38328	38028	38128	38428	38528
7/16	1-1/2	6"	7/16	38229	38329	38029	38129	38429	38529
7/16	3"	6"	7/16	38249	38349	38049	38149	38449	38549
1/2	1"	4"	1/2	38230	38330	38030	38130	38430	38530
1/2	1-1/2	4"	1/2	38231	38331	38031	38131	38431	38531
1/2	2"	4"	1/2	38232	38332	38032	38132	38432	38532
1/2	1-1/2	6"	1/2	38233	38333	38033	38133	38433	38533
1/2	3"	6"	1/2	38250	38350	38050	38150	38450	38550
9/16	3"	6"	9/16	38235	38335	38035	38135	38435	38535
5/8	2-1/2	5"	5/8	38236	38336	38036	38136	38436	38536
5/8	1-1/2	6"	5/8	38237	38337	38037	38137	38437	38537
5/8	3"	6"	5/8	38251	38351	38051	38151	38451	38551
3/4	2-1/2	5"	3/4	38240	38340	38040	38140	38440	38540
3/4	1-1/2	6"	3/4	38241	38341	38041	38141	38441	38541
3/4	3"	6"	3/4	38252	38352	38052	38152	38452	38552
1"	2-1/2	5"	1"	38245	38345	38045	38145	38445	38545
1"	2"	6"	1"	38246	38346	38046	38146	38446	38546
1"	3"	6"	1"	38248	38348	38048	38148	38448	38548
1"	4"	6"	1"	38253	38353	38053	38153	38453	38553
1"	4"	7"	1"	38254	38354	38054	38154	38454	38554
1"	3"	8"	1"	38255	38355	38055	38155	38455	38555
1-1/4	3"	6"	1-1/4	38280	38380	38080	38180	38480	38580

Available Coating
TA, TN, AT or TC

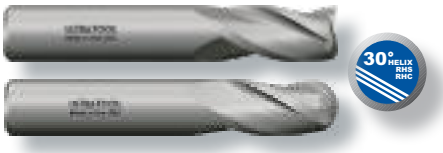
phone 714.898.9224 / 800.854.2431 / fax 714.891.7816
5451 McFadden Avenue • Huntington Beach, CA 92649
ultra-tool.com

Metric Standard Length End Mills by ULTRATOOL®

Metric Series 330S Square End 330B Ball End • Two Flute



Metric Series 362S Square End 362B Ball End • Three Flute



Metric Series 320S Square End 320B Ball End • Four Flute

Detailed Speeds and Feeds instructions can be located on Page #58.

SFR Ultra-Tool End Mill Specs (Metric):
Cutting Diam +0.000/-0.051mm
Shank Diam +0.000/-0.008mm

Diam	LOC	OAL	Shank	330S EDP#	330B EDP#	362S EDP#	362B EDP#	320S EDP#	320B EDP#
1.0mm	3	38	3.0	33056	33156	36256	36356	32056	32156
1.5mm	4.5	38	3.0	33058	33158	36258	36358	32058	32158
2.0mm	6.3	38	3.0	33060	33160	36260	36360	32060	32160
2.5mm	9.5	38	3.0	33062	33162	36262	36362	32062	32162
3.0mm	12	38	3.0	33064	33164	36264	36364	32064	32164
3.5mm	12	50	4.0	33065	33165	36265	36365	32065	32165
4.0mm	14	50	4.0	33066	33166	36266	36366	32066	32166
4.5mm	16	50	5.0	33067	33167	36267	36367	32067	32167
5.0mm	16	50	5.0	33068	33168	36268	36368	32068	32168
6.0mm	19	50	6.0	33070	33170	36270	36370	32070	32170
7.0mm	20	60	7.0	30872	30972	36472	36572	30672	30772
8.0mm	20	63	8.0	33074	33174	36274	36374	32074	32174
9.0mm	22	63	9.0	30876	30976	36476	36576	30676	30776
10.0mm	22	70	10.0	33078	33178	36278	36378	32078	32178
12.0mm	25	74	12.0	33082	33182	36282	36382	32082	32182
14.0mm	32	89	14.0	33086	33186	36286	36386	32086	32186
16.0mm	38	89	16.0	33088	33188	36288	36388	32088	32188
18.0mm	38	100	18.0	33090	33190	36290	36390	32090	32190
20.0mm	38	100	20.0	33092	33192	36292	36392	32092	32192
22.0mm	38	100	22.0	33094	33194	36294	36394	32094	32194
25.0mm	38	100	25.0	33097	33197	36297	36397	32097	32197

Available Coating
TA, TN, AT or TC

Metric Extra Long End Mills by ULTRATOOL®

Metric Series 382S Square End 382B Ball End • Two Flute

Metric Series 383S Square End 383B Ball End • Three Flute

Metric Series 384S Square End 384B Ball End • Four Flute

SFR Ultra-Tool End Mill Specs (Metric):
Cutting Diam +0.000/-0.051mm
Shank Diam +0.000/-0.008mm

Diam	LOC	OAL	Shank	382S EDP#	382B EDP#	383S EDP#	383B EDP#	384S EDP#	384B EDP#
3.0mm	25	75	3.0	82003	82103	83003	83103	81003	81103
4.0mm	28	75	4.0	82004	82104	83004	83104	81004	81104
5.0mm	32	75	5.0	82005	82105	83005	83105	81005	81105
6.0mm	38	75	6.0	82006	82106	83006	83106	81006	81106
8.0mm	40	100	8.0	82008	82108	83008	83108	81008	81108
10.0mm	50	100	10.0	82010	82110	83010	83110	81010	81110
12.0mm	50	100	12.0	82012	82112	83012	83112	81012	81112
12.0mm	76	150	12.0	82013	82113	83013	83113	81013	81113
14.0mm	76	150	14.0	82014	82114	83014	83114	81014	81114
16.0mm	64	125	16.0	82016	82116	83016	83116	81016	81116
16.0mm	76	150	16.0	82017	82117	83017	83117	81017	81117
18.0mm	76	150	18.0	82018	82118	83018	83118	81018	81118
20.0mm	76	150	20.0	82020	82120	83020	83120	81020	81120
25.0mm	76	150	25.0	82025	82125	83025	83125	81025	81125

Available Coating
TA, TN, AT or TC

Slow Helix Upcut and Downcut Solid Carbide End Mills by ULTRATOOL®

Series 321S Square End
Four Flute • Slow Helix
Upcut Milling • Standard Length

Ultra's new Series 321 Slow Helix end mill is designed for materials that tear or shred when milling with a standard higher helix design, like composites and CFRP's. Accordingly, we offer this end mill with application specific coatings that are ideal for extending life in these abrasive materials.

ULTRA-Carb®

SFR Ultra-Tool End Mill Specs:
Cutting Diam +.000/-.002
Shank Diam +.0000/-.0003

Diam	LOC	OAL	Shank	Square EDP#
1/16	5/16	1-1/2	1/8	32925
1/8	5/8	1-1/2	1/8	32926
3/16	3/4	2"	3/16	32927
1/4	1"	2-1/2	1/4	32928
5/16	1"	2-1/2	5/16	32929
3/8	1"	2-1/2	3/8	32930
7/16	1"	3"	7/16	32931
1/2	1-1/4	3"	1/2	32932
5/8	1-3/8	3-1/2	5/8	32933
3/4	1-3/8	4"	3/4	32934
1"	1-3/8	4"	1"	32935

Available Coating
AT, D1 or D2

Series 329S Square End
Four Flute • Left Hand Helix / RHC
Downcut Milling • Standard Length

Ultra's new Series 329 is for apps where the work piece needs to be "pushed down" during milling via a left hand spiral / right hand cut downcut design. Again, for composite materials and CFRP's, we've provided the ideal SmoothCoat options to extend tool life.

ULTRA-Carb®

SFR Ultra-Tool End Mill Specs:
Cutting Diam +.000/-.002
Shank Diam +.0000/-.0003

Diam	LOC	OAL	Shank	Square EDP#
1/16	5/16	1-1/2	1/8	32936
1/8	5/8	1-1/2	1/8	32937
3/16	3/4	2"	3/16	32938
1/4	1"	2-1/2	1/4	32939
5/16	1"	2-1/2	5/16	32940
3/8	1"	2-1/2	3/8	32941
7/16	1"	3"	7/16	32942
1/2	1-1/4	3-1/2	1/2	32943
5/8	1-3/8	3-1/2	5/8	32944
3/4	1-3/8	4"	3/4	32945
1"	1-3/8	4"	1"	32946

Available Coating
AT, D1 or D2

N/C Tolerance Solid Carbide End Mills by ULTRATOOL®

Series 170S Square End
Series 170B Ball End
N/C Tolerance +.001 / -.000
Two Flute • Standard Length

ULTRA-Grain®

Series 180S Square End
Series 180B Ball End
N/C Tolerance +.001 / -.000
Four Flute • Standard Length

SFR Ultra-Tool N/C Specs:
Cutting Diam +.001/-.000
Shank Diam +.0000/-.0003

Diam	LOC	OAL	Shank	170S EDP#	170B EDP#	180S EDP#	180B EDP#
1/32	3/32	1-1/2	1/8	17002	17102	18002	18102
3/64	3/16	1-1/2	1/8	17003	17103	18003	18103
1/16	3/16	1-1/2	1/8	17004	17104	18004	18104
5/64	1/4	1-1/2	1/8	17005	17105	18005	18105
3/32	3/8	1-1/2	1/8	17006	17106	18006	18106
1/8	1/2	1-1/2	1/8	17008	17108	18008	18108
5/32	9/16	2"	3/16	17010	17110	18010	18110
3/16	5/8	2"	3/16	17012	17112	18012	18112
7/32	5/8	2-1/2	1/4	17014	17114	18014	18114
1/4	3/4	2-1/2	1/4	17016	17116	18016	18116
9/32	3/4	2-1/2	5/16	17018	17118	18018	18118
5/16	13/16	2-1/2	5/16	17020	17120	18020	18120
3/8	1"	2-1/2	3/8	17024	17124	18024	18124
7/16	1"	2-3/4	7/16	17028	17128	18028	18128
1/2	1"	3"	1/2	17032	17132	18032	18132
9/16	1-1/4	3-1/2	9/16	17034	17134	18034	18134
5/8	1-1/2	3-1/2	5/8	17036	17136	18036	18136
3/4	1-1/2	4"	3/4	17040	17140	18040	18140
1"	1-1/2	4"	1"	17048	17148	18048	18148

Available Coating
TA, TN, AT or TC

phone 714.898.9224 / 800.854.2431 / fax 714.891.7816
5451 McFadden Avenue • Huntington Beach, CA 92649
ultra-tool.com

Stub Length End Mills by ULTRATOOL®

Series 332S Square End 332B Ball End • Stub Two Flute

ULTRA-Grain®

Series 322S Square End 322B Ball End • Stub Four Flute


Detailed Speeds and Feeds instructions can be located on Page #58.

SFR Ultra-Tool End Mill Specs:
Cutting Diam +.000/-.002
Shank Diam +.0000/-.0003

Diam	LOC	OAL	Shank	332S EDP#	332B EDP#	322S EDP#	322B EDP#
1/32	1/16	1-1/2	1/8	33202	33302	32202	32302
3/64	1/8	1-1/2	1/8	33203	33303	32203	32303
1/16	1/8	1-1/2	1/8	33204	33304	32204	32304
5/64	1/8	1-1/2	1/8	33205	33305	32205	32305
3/32	3/16	1-1/2	1/8	33206	33306	32206	32306
7/64	3/16	1-1/2	1/8	33207	33307	32207	32307
1/8	1/4	1-1/2	1/8	33208	33308	32208	32308
5/32	3/8	2"	3/16	33210	33310	32210	32310
3/16	3/8	2"	3/16	33212	33312	32212	32312
7/32	7/16	2"	1/4	33214	33314	32214	32314
1/4	1/2	2"	1/4	33216	33316	32216	32316
5/16	1/2	2"	5/16	33220	33320	32220	32320
3/8	5/8	2-1/2	3/8	33224	33324	32224	32324
7/16	3/4	2-1/2	7/16	33228	33328	32228	32328
1/2	3/4	2-1/2	1/2	33232	33332	32232	32332
5/8	3/4	3-1/2	5/8	33236	33336	32236	32336
3/4	1"	4"	3/4	33240	33340	32240	32340
1"	1"	4"	1"	33248	33348	32248	32348

Available Coating
TA, TN, AT or TC

Double End Stub Length End Mills by ULTRATOOL®

Series 336S Square End 336B Ball End • Stub Two Flute DE

ULTRA-Grain®

Series 326S Square End 326B Ball End • Stub Four Flute DE


Detailed Speeds and Feeds instructions can be located on Page #58.

SFR Ultra-Tool End Mill Specs:
Cutting Diam +.000/-.002
Shank Diam +.0000/-.0003

Diam	LOC	OAL	Shank	336S EDP#	336B EDP#	326S EDP#	326B EDP#
1/32	3/32	1-1/2	1/8	33602	33702	32602	32702
3/64	1/8	1-1/2	1/8	33603	33703	32603	32703
1/16	1/8	1-1/2	1/8	33604	33704	32604	32704
5/64	1/8	1-1/2	1/8	33605	33705	32605	32705
3/32	3/16	1-1/2	1/8	33606	33706	32606	32706
7/64	3/16	1-1/2	1/8	33607	33707	32607	32707
1/8	1/4	1-1/2	1/8	33608	33708	32608	32708
9/64	5/16	2"	3/16	33609	33709	32609	32709
5/32	5/16	2"	3/16	33610	33710	32610	32710
11/64	5/16	2"	3/16	33611	33711	32611	32711
3/16	3/8	2"	3/16	33612	33712	32612	32712
13/64	1/2	2-1/2	1/4	33613	33713	32613	32713
7/32	1/2	2-1/2	1/4	33614	33714	32614	32714
15/64	1/2	2-1/2	1/4	33615	33715	32615	32715
1/4	1/2	2-1/2	1/4	33616	33716	32616	32716
5/16	1/2	2-1/2	5/16	33620	33720	32620	32720
3/8	9/16	2-1/2	3/8	33624	33724	32624	32724
7/16	5/8	2-3/4	7/16	33628	33728	32628	32728
1/2	5/8	3"	1/2	33632	33732	32632	32732
5/8	3/4	3-1/2	5/8	33636	33736	32636	32736
3/4	1"	4"	3/4	33640	33740	32640	32740

Available Coating
TA, TN, AT or TC

Double End Standard Length End Mills by ULTRATOOL®

Series 334S Square End • Standard Length
334B Ball End • Two Flute Double End

Series 324S Square End • Standard Length
324B Ball End • Four Flute Double End

Ultra-Tool End Mill Specs:
Cutting Diam +.000/-.002
Shank Diam +.0000/-.0003

Diam	LOC	OAL	Shank	334S EDP#	334B EDP#	324S EDP#	324B EDP#
1/32	3/32	2"	1/8	33402	33502	32402	32502
3/64	1/8	2"	1/8	33403	33503	32403	32503
1/16	3/16	2"	1/8	33404	33504	32404	32504
3/32	3/8	2"	1/8	33406	33506	32406	32506
1/8	3/8	2"	1/8	33408	33508	32408	32508
5/32	7/16	3"	3/16	33410	33510	32410	32510
3/16	1/2	3"	3/16	33412	33512	32412	32512
7/32	9/16	3"	1/4	33414	33514	32414	32514
1/4	5/8	3"	1/4	33416	33516	32416	32516
9/32	11/16	3"	5/16	33418	33518	32418	32518
5/16	3/4	3"	5/16	33420	33520	32420	32520
11/32	3/4	4"	3/8	33422	33522	32422	32522
3/8	1"	4"	3/8	33424	33524	32424	32524
7/16	1"	4"	7/16	33428	33528	32428	32528
1/2	1"	4"	1/2	33432	33532	32432	32532
9/16	1-1/4	6"	9/16	33434	33534	32434	32534
5/8	1-1/2	6"	5/8	33436	33536	32436	32536
3/4	1-1/2	6"	3/4	33440	33540	32440	32540
7/8	1-1/2	6"	7/8	33444	33544	32444	32544
1"	1-1/2	6"	1"	33448	33548	32448	32548

Available Coating
TA, TN, AT or TC

Double End 3/8" Shank End Mills by ULTRATOOL®

Series 338S Square End • Standard Length
338B Ball End • Two Flute Double End
3/8" common shank with flat

Series 328S Square End • Standard Length
328B Ball End • Four Flute Double End
3/8" common shank with flat

Ultra-Tool End Mill Specs:
Cutting Diam +.000/-.002
Shank Diam +.0000/-.0003

Diam	LOC	OAL	Shank	338S EDP#	338B EDP#	328S EDP#	328B EDP#
1/8	3/8	3"	3/8	33808	33908	32808	32908
5/32	7/16	3"	3/8	33810	33910	32810	32910
3/16	1/2	3"	3/8	33812	33912	32812	32912
7/32	9/16	3"	3/8	33814	33914	32814	32914
1/4	5/8	3"	3/8	33816	33916	32816	32916
9/32	11/16	4"	3/8	33818	33918	32818	32918
5/16	3/4	4"	3/8	33820	33920	32820	32920
11/32	3/4	4"	3/8	33822	33922	32822	32922
3/8	3/4	4"	3/8	33824	33924	32824	32924

Available Coating
TA, TN, AT or TC

Detailed Speeds and Feeds instructions can be located on Page #58.

Standard features:
SmoothGrind® SmoothContricity®

Available options:
SmoothCoat® SmoothEdge®

phone 714.898.9224 / 800.854.2431 / fax 714.891.7816
5451 McFadden Avenue • Huntington Beach, CA 92649
ultra-tool.com

ULTRATOOL® Solid Carbide Chamfer Mills

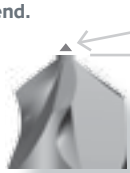
Series 362CH

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

new! New flute count, helical configuration, and flat end.

30° HELIX RHS RHC

UC TC AT D1



Available Coating
TC, AT or D1

∅ Diam	OAL	∅ Tip	30° EDP#	40° EDP#	60° EDP#	90° EDP#	100° EDP#	120° EDP#	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	.159/.075	.117/.055	.074/.036	.043/.021	.036/.017	.025/.012
3/16	2"	.050	36601	36609	36617	36625	36641	36633	.257/.093	.189/.069	.119/.045	.069/.026	.058/.021	.040/.015
1/4	2-1/2	.060	36602	36610	36618	36626	36642	36634	.355/.112	.261/.082	.165/.054	.095/.031	.080/.025	.055/.018
5/16	2-1/2	.065	36603	36611	36619	36627	36643	36635	.462/.121	.340/.089	.214/.056	.124/.033	.104/.027	.071/.019
3/8	2-1/2	.070	36604	36612	36620	36628	36644	36636	.569/.131	.419/.096	.264/.062	.153/.036	.128/.029	.088/.021
1/2	3"	.080	36605	36613	36621	36629	36645	36637	.784/.149	.577/.110	.364/.071	.210/.041	.176/.034	.121/.024
5/8	3"	.090	36606	36614	36622	36630	36646	36638	.998/.168	.735/.124	.463/.080	.268/.046	.224/.038	.154/.027
3/4	3"	.100	36607	36615	36623	36631	36647	36639	1.213/.187	.893/.137	.563/.088	.325/.051	.273/.042	.188/.029
1"	4"	.120	36648	36649	36650	36651	36652	36653	1.642/.224	1.209/.165	.762/.104	.440/.060	.369/.050	.254/.035

Series 330CH

Two Flute Solid Carbide Chamfer Mill
Pointed End w/web • 5 included angles

0° HELIX RHC

∅ Diam	OAL	30° EDP#	40° EDP#	60° EDP#	82° EDP#	90° EDP#	120° EDP#
1/8	1-1/2	36137	36149	39259	39284	39289	36161
3/16	2"	36138	36150	39260	39285	39290	36162
1/4	2-1/2	36139	36151	39261	39281	39291	36163
5/16	2-1/2	36140	36152	39264	39286	39294	36164
3/8	2-1/2	36141	36153	39262	39282	39292	36165
1/2	3"	36142	36154	39263	39283	39293	36166
Metric							
3.0mm	38	36143	36155	39265		39295	36167
4.0mm	50	36144	36156	39266		39296	36168
6.0mm	50	36145	36157	39267		39297	36169
8.0mm	63	36146	36158	39268		39298	36170
10.0mm	70	36147	36159	39269		39299	36171
12.0mm	74	36148	36160	39270		39300	36172

Available Coating
TA, TN, AT or TC

Standard coating selections.

Series 320CH

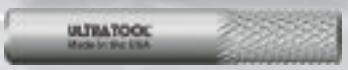
Four Flute Solid Carbide Chamfer Mill
Pointed End w/web • 5 included angles

0° HELIX RHC

∅ Diam	OAL	30° EDP#	40° EDP#	60° EDP#	82° EDP#	90° EDP#	120° EDP#
1/8	1-1/2	36173	36185	39459	39472	39489	36197
3/16	2"	36174	36186	39460	39473	39490	36198
1/4	2-1/2	36175	36187	39461	39481	39491	36199
5/16	2-1/2	36176	36188	39464	39474	39494	36200
3/8	2-1/2	36177	36189	39462	39482	39492	36249
1/2	3"	36178	36190	39463	39483	39493	36250
Metric							
3.0mm	38	36179	36191	39465		39495	36251
4.0mm	50	36180	36192	39466		39496	36252
6.0mm	50	36181	36193	39467		39497	36253
8.0mm	63	36182	36194	39468		39498	36254
10.0mm	70	36183	36195	39469		39499	36255
12.0mm	74	36184	36196	39470		39500	36257

Available Coating
TA, TN, AT or TC

Solid Carbide Fiberglass Routers by ULTRATOOL®



Series 220 No End Cut | **Series 221** Burr Style End | **Series 222** End Mill Style | **Series 223** 135° Drill Point | **Series 224** Fish Tail Cut

∅ Diam	LOC	OAL	Shank	220 EDP#	221 EDP#	222 EDP#	223 EDP#	224 EDP#
1/8	1/2	1-1/2	1/8	22001	22101	22201	22301	22401
3/16	5/8	2"	3/16	22002	22102	22202	22302	22402
1/4	3/4	2-1/2	1/4	22003	22103	22203	22303	22403
1/4A	1"	3"	1/4	22007	22107	22207	22307	22407
5/16	1"	2-1/2	5/16	22004	22104	22204	22304	22404
3/8	1"	2-1/2	3/8	22005	22105	22205	22305	22405
1/2	1"	3"	1/2	22006	22106	22206	22306	22406
Metric Diameters								
6.0mm	19	63	6.0mm	22008	22108	22208	22308	22408
6.0mm	25	75	6.0mm	22009	22109	22209	22309	22409
8.0mm	25	63	8.0mm	22010	22110	22210	22310	22410
10.0mm	25	70	10.0mm	22011	22111	22211	22311	22411
12.0mm	25	74	12.0mm	22012	22112	22212	22312	22412

Available Coating: D1

Ultra's D1 PVD Diamond coating is the perfect compliment for routing abrasive materials with our 220 Series. 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 as a suffix to the EDP #.

SFR Router Specifications:
Cutting Diam +.000/-.005
Shank Diam +.0000/-.0003

SFR Router Specifications (Metric):
Cutting Diam +0.000/-0.127mm
Shank Diam +0.000/-0.007

Solid Carbide Single Flute Plastic Routers by ULTRATOOL®

Series 301
Single Flute Upcut Router
Solid Carbide • RHS

Polished, high-shear RHS • RHC design for upcut plastic routing.

Diam	LOC	OAL	Shank	Square EDP#
1/8	5/8	2"	1/8	34380
3/16	3/4	2"	3/16	34381
1/4	3/4	2-1/2	1/4	34382
1/4L	1-1/4	3"	1/4	34383
3/8	1-1/8	3"	3/8	34384
1/2	1-1/2	4"	1/2	34385

Available Coating: D1

Series 302
Single Flute Downcut Router
Solid Carbide • LHS

Polished, high-shear LHS • RHC design for downcut plastic routing.

Diam	LOC	OAL	Shank	Square EDP#
1/8	1/2	2"	1/8	34390
3/16	5/8	2"	3/16	34391
1/4	3/4	2-1/2	1/4	34392
1/4L	1-1/4	3"	1/4	34393
3/8	1-1/8	3"	3/8	34394
1/2	1-1/2	4"	1/2	34395

Available Coating: D1

Solid Carbide Compression Routers by ULTRATOOL®

Series 2+2
Carbide Compression Router
Two Flute RH + Two Flute LH

Series 4+4
Carbide Compression Router
Four Flute RH + Four Flute LH

ULTRA-Carb®

ULTRATOOL PERFORMANCE SERIES

∅ Diam	Style	LOC	Upshear	OAL	Shank	Square EDP#
1/4	2+2	3/4	.285	2-1/2	1/4	34355
1/4	2+2	1"	.285	2-1/2	1/4	34356
1/4	4+4	.905	.250	2-1/2	1/4	34357
1/4L	4+4	1-1/4	.250	2-1/2	1/4	34358
3/8	2+2	1"	.435	3"	3/8	34359
3/8	2+2	1-1/8	.435	3"	3/8	34360
1/2	2+2	1"	.435	3"	1/2	34361
1/2	2+2	1-1/8	.435	3"	1/2	34362
1/2	2+2	1-1/8	.435	4"	1/2	34363
1/2	2+2	1-3/8	.435	3"	1/2	34364
1/2	2+2	1-3/8	.435	4"	1/2	34365
1/2	2+2	1-5/8	.435	4"	1/2	34366
5/8	2+2	1-5/8	.735	4"	5/8	34367
5/8	2+2	1-7/8	.735	5"	5/8	34368
5/8	2+2	2-1/4	.735	5"	5/8	34369
3/4	2+2	1-5/8	.860	4"	3/4	34370
3/4	2+2	2-1/2	.985	5"	3/4	34371

Available Coating: D1 or D2

These routers are designed for compression routing of a wide range of materials. Our polished SmoothGrind cutting edges shears the work piece with a super sharp primary relief. Use our thin, smooth, and hard D1 PVD diamond for plastics, woods, composites, CFRP's, honeycombs, and other abrasive materials. Use our hard & thick D2 CVD diamond for long-running jobs in the same materials.

phone 714.898.9224 / 800.854.2431 / fax 714.891.7816
5451 McFadden Avenue • Huntington Beach, CA 92649
ultra-tool.com

ULTRATOOL® Corner Rounding End Mills

Series 233
Solid Carbide Radius Mills
Double-Ended • 3 Straight Flutes • RH Cutting

Radius Mill Specifications:
Radius ±.0005
Pilot Diameter ±.0005

Features 5° top & bottom flare-out to avoid workpiece contact.

Radius Dec	Radius Frac/Metric	Pilot Diam	Shank Diam	OAL	EDP#
.010	-	.100	1/8	2"	23316
.0156	1/64	.090	1/8	2"	23317
.020	-	.080	1/8	2"	23318
.025	-	.070	1/8	2"	23319
.0312	1/32	.060	1/8	2"	23320
.035	-	.140	1/4	2-1/2	23321
.0394	1.0mm	.140	1/4	2-1/2	23322
.0469	3/64	.140	1/4	2-1/2	23323
.050	-	.140	1/4	2-1/2	23324
.055	-	.090	1/4	2-1/2	23325
.0591	1.5mm	.090	1/4	2-1/2	23326
.0625	1/16	.090	1/4	2-1/2	23327
.070	-	.090	1/4	2-1/2	23328
.075	-	.090	1/4	2-1/2	23329
.0781	5/64	.115	3/8	2-1/2	23330
.0787	2.0mm	.115	3/8	2-1/2	23331
.0938	3/32	.115	3/8	2-1/2	23332
.0984	2.5mm	.115	3/8	2-1/2	23333
.1094	7/64	.115	3/8	2-1/2	23334
.1181	3.0mm	.115	3/8	2-1/2	23335
.125	1/8	.115	3/8	2-1/2	23336
.1406	9/64	.120	1/2	3"	23337
.1562	5/32	.120	1/2	3"	23338
.1575	4.0mm	.120	1/2	3"	23339
.1718	11/64	.120	1/2	3"	23340
.1875	3/16	.120	1/2	3"	23341
.1969	5.0mm	.120	5/8	3-1/2	23342
.2031	13/64	.120	5/8	3-1/2	23343
.2188	7/32	.120	5/8	3-1/2	23344
.2344	15/64	.120	5/8	3-1/2	23345
.2362	6.0mm	.120	5/8	3-1/2	23346
.250	1/4	.120	5/8	3-1/2	23347
.2812	9/32	.120	3/4	4"	23348
.2969	19/64	.120	3/4	4"	23349
.3125	5/16	.120	3/4	4"	23350

Available Coating
TA, TN, AT or TC

Series 235
Carbide Radius Mills
Single End • 4 Straight Flutes • RH Cutting

Features 5° top and bottom flare-out to avoid workpiece contact.

Radius Decimal	Radius Fract	Pilot Diam	Body Diam	Shank Diam	OAL	EDP#
.0312	1/32	1/8	3/16	3/16	2"	23500
.0625	1/16	1/8	1/4	1/4	2-1/2	23501
.0938	3/32	3/16	3/8	3/8	2-1/2	23502
.125	1/8	1/4	1/2	1/2	3"	23503
.1562*	5/32	7/16	3/4	3/8	3"	23514
.1875*	3/16	3/8	3/4	3/8	3"	23504
.250*	1/4	1/2	1"	1/2	3"	23505
.3125*	5/16	3/8	1"	1/2	3"	23515
.375*	3/8	1/2	1-1/4	3/4	3"	23506

Available Coating
TA, TN, AT or TC

*Two-piece brazed construction; solid-carbide head w/steel shank.

Counterbores by ULTRATOOL®

Series 232S
Solid Carbide Counterbores
Square Flat Bottom • 4 Slow Helix RHS Flutes • Center Cutting

These true counterbores have a cylindrical, non-cutting OD margin, center cutting flat bottom, and incredible OD tolerance of +.0000 / -.0003 (before coating). Use the 232S to spot face irregular surfaces, counter bore, mill a flat bottom, or straighten a misaligned hole. Available in all standard SmoothCoat choices.

ULTRA-Grain®

Diam	LOC	OAL	Shank	EDP#
1/8	1/2	1-1/2	1/8	32950
3/16	5/8	2"	3/16	32951
1/4	3/4	2-1/2	1/4	32952
5/16	13/16	2-1/2	5/16	32953
3/8	1"	2-1/2	3/8	32954
7/16	1"	2-3/4	7/16	32955
1/2	1"	3"	1/2	32956
5/8	1-1/2	3-1/2	5/8	32957
3/4	1-1/2	4"	3/4	32958
1"	1-1/2	4"	1"	32959

Available Coating
TA, TN, AT or TC

SmoothFlute

SmoothFlute® is the latest technology to be integrated within our product line. It's so unique and important that we've not only obtained patent protection in the USA but additionally in all the major industrial countries of the World.

As incorporated into the Series 323, 323ML, 365, 365ML, and 395ML end mills, SmoothFlute allows for outstanding feed rates with incredibly quiet harmonics. The resultant stable and smooth cutting action leads to superb edge integrity for longer lasting tool life and enhanced work piece finishes.

Should you need a diameter, LOC, radius, or other characteristic not offered in our standard product line, SmoothFlute is also available for special tools on our tungstentoolworks.com website.

Japanese Patent issued for SmoothFlute® technology.

ULTRATOOL® Carbide Countersinks

ULTRA-Grain®

Series 910
Carbide Six Flute Countersinks
For use in hardened materials

Use the 910 for steels, stainless, heat treated, high temp alloys, plus similar materials

*Set 910 consists of 1/4, 3/8, 1/2, 5/8, and 3/4" sizes in a custom-made, reusable steel index.

Diam	Shank	OAL	60°EDP#	82°EDP#	90°EDP#	100°EDP#
1/8	1/8	1-1/2	91008	91708	91808	91864
3/16	3/16	2"	91012	91712	91812	91860
1/4	1/4	2"	91016	91716	91816	91865
5/16	1/4	2-5/8	91020	91720	91820	91819
3/8	1/4	2-5/8	91024	91724	91824	91863
1/2	1/4	2-5/8	91032	91732	91832	91866
5/8	3/8	2-3/4	91036	91736	91836	91867
3/4	3/8	2-3/4	91040	91740	91840	91868
1"	1/2	3"	91048	91748	91848	91855
1-1/4	3/4	3-1/4	91050	91750	91850	91856
1-1/2	3/4	3-1/4	91054	91754	91854	91857
Set*	5-piece		80360	80382	80390	80392

Available Coating
TA, TN, AT or TC

Series 911
Carbide Single Flute Countersinks
For use in soft materials

Use the 911 for aluminum, non-ferrous, non-metals, plus similar materials

*Set 911 consists of 1/4, 3/8, 1/2, 5/8, and 3/4" sizes in a custom-made, reusable steel index.

Diam	Shank	OAL	60°EDP#	82°EDP#	90°EDP#	100°EDP#
1/8	1/8	1-1/2	91108	91508	91608	91869
3/16	3/16	2"	91112	91512	91612	91870
1/4	1/4	2"	91116	91516	91616	91871
5/16	1/4	2-5/8	91120	91520	91620	91818
3/8	1/4	2-5/8	91124	91524	91624	91872
1/2	1/4	2-5/8	91132	91532	91632	91873
5/8	3/8	2-3/4	91136	91536	91636	91874
3/4	3/8	2-3/4	91140	91540	91640	91875
1"	1/2	3"	91148	91548	91648	91876
1-1/4	3/4	3-1/4	91150	91550	91650	91877
Set*	5-piece		80460	80482	80490	80492

Available Coating
TA, TN, AT or TC

Series 912
Carbide Three Flute Countersinks
For use in general purpose materials

Use the 912 for a wide variety of modestly hard to modestly soft materials

*Set 912 consists of 1/4, 3/8, 1/2, 5/8, and 3/4" sizes in a custom-made, reusable steel index.

Diam	Shank	OAL	60°EDP#	82°EDP#	90°EDP#	100°EDP#
1/8	1/8	1-1/2	91208	91308	91408	91878
3/16	3/16	2"	91212	91312	91412	91879
1/4	1/4	2"	91216	91316	91416	91880
5/16	1/4	2-5/8	91220	91320	91420	91817
3/8	1/4	2-5/8	91224	91324	91424	91881
1/2	1/4	2-5/8	91232	91332	91432	91882
5/8	3/8	2-3/4	91236	91336	91436	91883
3/4	3/8	2-3/4	91240	91340	91440	91884
1"	1/2	3"	91248	91348	91448	91885
1-1/4	3/4	3-1/4	91250	91350	91450	91886
Set*	5-piece		80560	80582	80590	80592

Available Coating
TA, TN, AT or TC

All countersinks 5/16" and larger are two-piece construction; carbide head induction-brazed to hardened steel shank. Note OAL may vary slightly due to angle differences.

ULTRATOOL® Carbide Center Laps

Series 913
Carbide Center Laps w/60° Included Angle
High flute count for fine finishes

Diam	Shank	OAL	Flutes	EDP#
1/4	1/4	2"	8	90016
5/16	1/4	2-5/8	8	90020
3/8	1/4	2-5/8	8	90024
1/2	1/4	2-5/8	8	90032
5/8	3/8	2-3/4	10	90040
3/4	3/8	2-3/4	10	90048

Available Coating
TA, TN, AT or TC

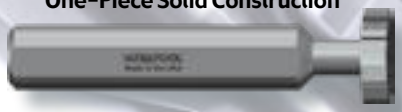
5/16" and larger are two-piece construction; solid carbide head w/ steel shank.

Ultra-Tool® countersink sets consist of 1/4" • 3/8" • 1/2" • 5/8" • 3/4" sizes in a custom-made index.

phone 714.898.9224 / 800.854.2431 / fax 714.891.7816
5451 McFadden Avenue • Huntington Beach, CA 92649
ultra-tool.com

Solid Carbide ULTRATOOL® Keyseat Cutters

Series 610
Carbide Keyseat Cutters
One-Piece Solid Construction



Ultra's Series 610 Keyseat Cutter is all solid, all the time. Not only is there no braze joint to fail, but we use a premium carbide grade with superb Transverse Rupture Strength to mitigate breakage. Utilizing our Express Service, we offer special face widths, radii, extended necks, reduced shanks and more with extremely quick turnaround times. Plus, the Series 610 is now available with any of our SmoothCoat standard coatings at one low price.

FLAT

Shank Diameter= 1/2" (12.7mm)
Neck length = 1/4" (6.3mm)

ULTRA-Grain®

Diam	Face Width	Face Width	ASA#	Flutes	Neck Diam	OAL	EDP#	Available Coating
3/8	.0312	1/32	-	8	13/64	2-1/32	61030	TA, TN, AT or TC
3/8	.0469	3/64	-	8	13/64	2-3/64	61031	
3/8	.0625	1/16	203	8	13/64	2-1/16	61029	
3/8	.0938	3/32	303	8	13/64	2-3/32	61001	
3/8	.1250	1/8	403	8	13/64	2-1/8	61002	
1/2	.0312	1/32	-	10	1/4	2-1/32	61032	
1/2	.0469	3/64	-	10	1/4	2-3/64	61033	
1/2	.0625	1/16	204	10	1/4	2-1/16	61034	
1/2	.0781	5/64	-	10	1/4	2-5/64	61035	
1/2	.0938	3/32	304	10	1/4	2-3/32	61003	
1/2	.1094	7/64	-	10	1/4	2-7/64	61036	
1/2	.1250	1/8	404	10	1/4	2-1/8	61004	
5/8	.0312	1/32	-	10	9/32	2-1/32	61037	
5/8	.0469	3/64	-	10	9/32	2-3/64	61038	
5/8	.0625	1/16	-	10	9/32	2-1/16	61039	
5/8	.0781	5/64	-	10	9/32	2-5/64	61040	
5/8	.0938	3/32	305	10	9/32	2-3/32	61005	
5/8	.1094	7/64	-	10	9/32	2-7/64	61041	
5/8	.1250	1/8	405	10	9/32	2-1/8	61006	
5/8	.1406	9/64	-	10	9/32	2-9/64	61042	
5/8	.1562	5/32	505	10	9/32	2-5/32	61007	
5/8	.1875	3/16	605	10	9/32	2-3/16	61008	
3/4	.0312	1/32	-	10	9/32	2-1/32	61043	
3/4	.0469	3/64	-	10	9/32	2-3/64	61044	
3/4	.0625	1/16	-	10	9/32	2-1/16	61045	
3/4	.0781	5/64	-	10	9/32	2-5/64	61046	
3/4	.0938	3/32	-	10	9/32	2-3/32	61047	
3/4	.1094	7/64	-	10	9/32	2-7/64	61048	
3/4	.1250	1/8	406	10	9/32	2-1/8	61009	
3/4	.1406	9/64	-	10	9/32	2-9/64	61049	
3/4	.1562	5/32	506	10	9/32	2-5/32	61010	
3/4	.1875	3/16	606	10	9/32	2-3/16	61011	
3/4	.2031	13/64	-	10	9/32	2-13/64	61050	
3/4	.2188	7/32	-	10	9/32	2-7/32	61051	
3/4	.2344	15/64	-	10	9/32	2-15/64	61052	
3/4	.2500	1/4	806	10	9/32	2-1/4	61012	
7/8	.0625	1/16	-	12	9/32	2-1/16	61053	
7/8	.1250	1/8	-	12	9/32	2-1/8	61054	
7/8	.1562	5/32	507	12	9/32	2-5/32	61013	
7/8	.1875	3/16	607	12	9/32	2-3/16	61014	
7/8	.2188	7/32	707	12	9/32	2-7/32	61015	
7/8	.2500	1/4	807	12	9/32	2-1/4	61016	
1"	.0312	1/32	-	12	9/32	2-1/32	61055	
1"	.0469	3/64	-	12	9/32	2-3/64	61056	
1"	.0625	1/16	-	12	9/32	2-1/16	61057	
1"	.0781	5/64	-	12	9/32	2-5/64	61058	
1"	.0938	3/32	-	12	9/32	2-3/32	61059	
1"	.1250	1/8	-	12	9/32	2-1/8	61060	
1"	.1562	5/32	-	12	9/32	2-5/32	61061	
1"	.1875	3/16	608	12	9/32	2-3/16	61017	
1"	.2188	7/32	708	12	9/32	2-7/32	61018	
1"	.2500	1/4	808	12	9/32	2-1/4	61019	

Keyseat Specifications:
Head Diam (3/8" to 3/4") +.010/+.015
Head Diam (7/8" to 1-1/2") +.012/+.017
Face Width +.0000/-.0005 Neck Length 1/4"

Diam	Face Width	Face Width	ASA#	Flutes	Neck Diam	OAL	EDP#	Available Coating
1-1/8	.1250	1/8	-	14	9/32	2-1/8	61062	TA, TN, AT or TC
1-1/8	.1875	3/16	609	14	9/32	2-3/16	61020	
1-1/8	.2188	7/32	709	14	9/32	2-7/32	61021	
1-1/8	.2500	1/4	809	14	9/32	2-1/4	61022	
1-1/4	.0312	1/32	-	14	9/32	2-1/32	61063	
1-1/4	.0625	1/16	-	14	9/32	2-1/16	61064	
1-1/4	.0938	3/32	-	14	9/32	2-3/32	61065	
1-1/4	.1250	1/8	-	14	9/32	2-1/8	61066	
1-1/4	.1562	5/32	-	14	9/32	2-5/32	61067	
1-1/4	.1875	3/16	610	14	9/32	2-3/16	61023	
1-1/4	.2188	7/32	710	14	9/32	2-7/32	61024	
1-1/4	.2500	1/4	810	14	9/32	2-1/4	61025	
1-1/2	.0312	1/32	-	16	5/16	2-1/32	61068	
1-1/2	.0625	1/16	-	16	5/16	2-1/16	61069	
1-1/2	.0938	3/32	-	16	5/16	2-3/32	61070	
1-1/2	.1250	1/8	-	16	5/16	2-1/8	61071	
1-1/2	.1875	3/16	-	16	5/16	2-3/16	61072	
1-1/2	.2500	1/4	812	16	5/16	2-1/4	61026	
1-1/2	.3125	5/16	1012	16	5/16	2-5/16	61027	
1-1/2	.3750	3/8	1212	16	5/16	2-3/8	61028	

Metric Widths

Diam	Face Width	Face Width	Flutes	Neck Diam	OAL	EDP#	Available Coating
9.5mm	1.0mm	.0394	8	5.2	52	61100	TA, TN, AT or TC
9.5mm	2.0mm	.0787	8	5.2	53	61104	
9.5mm	3.0mm	.1181	8	5.2	54	61108	
12.7mm	2.0mm	.0787	10	6.3	53	61112	
12.7mm	3.0mm	.1181	10	6.3	54	61116	
15.9mm	2.0mm	.0787	10	7.1	53	61120	
15.9mm	3.0mm	.1181	10	7.1	54	61124	
15.9mm	4.0mm	.1575	10	7.1	55	61128	
19.1mm	3.0mm	.1181	10	7.1	54	61132	
19.1mm	4.0mm	.1575	10	7.1	55	61136	
19.1mm	5.0mm	.1969	10	7.1	56	61140	
19.1mm	6.0mm	.2362	10	7.1	57	61144	
22.2mm	3.0mm	.1181	12	7.1	54	61148	
22.2mm	4.0mm	.1575	12	7.1	55	61152	
22.2mm	5.0mm	.1969	12	7.1	56	61156	
22.2mm	6.0mm	.2362	12	7.1	57	61160	
25.4mm	4.0mm	.1575	12	7.1	55	61164	
25.4mm	5.0mm	.1969	12	7.1	56	61168	
25.4mm	6.0mm	.2362	12	7.1	57	61172	
28.6mm	4.0mm	.1575	14	7.1	55	61176	
28.6mm	5.0mm	.1969	14	7.1	56	61180	
28.6mm	6.0mm	.2362	14	7.1	57	61184	
31.8mm	4.0mm	.1575	14	7.1	55	61188	
31.8mm	5.0mm	.1969	14	7.1	56	61192	
31.8mm	6.0mm	.2362	14	7.1	57	61196	
38.1mm	6.0mm	.2362	16	7.9	57	61200	
38.1mm	7.0mm	.2756	16	7.9	58	61204	
38.1mm	8.0mm	.3150	16	7.9	59	61208	

Keyseat Specifications (Metric):
Head Diam (9.5mm to 19.1mm) +0.25/+0.38mm
Head Diam (22.2 to 38.1mm) +0.30/+0.43mm
Face Width +0.000/-0.013mm Neck Length 6.3mm

Solid Carbide Saws by ULTRATOOL®

Ordering our Series 620 Solid Carbide Saws has never been easier. Size ranges and quantity breaks have been consolidated; simply note the semi-blank EDP# for the diameter of your need and specify the decimal thickness. Pricing inclusive of our in-house SmoothCoat® PVD hardcoating is also listed. All Ultra-Tool® saws are manufactured in our factories featuring 100% CNC generated fluting and relief angles. Available via Ultra's Express Service for fast delivery. Alterations for radii, chamfers, hubs, and angles also available. Special sizes, thicknesses, ID's, keyways, etc. are available upon quotation request.

Series 620 Solid Carbide Saws

ULTRA-Carb®

Saw Specifications:
Diameter ±.015 Thickness ±.00025
Hole (ID) +.0005/-.0000

Diam	Thickness Range	ID	# Teeth	Blank EDP#
3/4	.008 - .125	1/4	18	63001
1"	.010 - .125	3/8	20	62019
1-1/4	.010 - .125	1/2	24	63005
1-1/2	.010 - .125	1/2	36	62029
1-3/4	.010 - .125	1/2	38	63010
2"	.010 - .125	1/2	40	62039
2"	.010 - .125	1"	40	63015
2-1/4	.010 - .125	5/8	44	63020
2-1/2	.010 - .125	1"	48	62049
2-3/4	.010 - .125	1"	60	63025
3"	.010 - .125	1"	72	62059
3"	.126 - .250	1"	72	62064
4"	.020 - .125	1"	80	62069
4"	.126 - .250	1"	80	62074

Available Coating
TA, TN, AT or TC

Metric Sizes

Diam	Thickness Range	ID	# Teeth	Blank EDP#
20.0mm	0.20 - 3.15	5.0	20	63050
25.0mm	0.25 - 3.15	8.0	24	63055
32.0mm	0.25 - 3.15	8.0	30	63060
40.0mm	0.25 - 3.15	10.0	36	63065
50.0mm	0.25 - 3.15	13.0	40	63070
63.0mm	0.25 - 3.15	16.0	48	63075
80.0mm	0.35 - 3.15	22.0	60	63080
100.0mm	0.50 - 3.15	22.0	72	63085

Available Coating
TA, TN, AT or TC

Saw Specifications (Metric):
Diameter ±0.38mm Thickness ±0.006mm
Hole (ID) +0.013/-0.000mm

ULTRATOOL® Carbide Grinding Tools

Series 290

45° Lead Chamfer & End-Cutting • RH Cut
Reduced Neck Diameter for Clearance
Solid Carbide Construction

Diam	LOC	Shank	Neck Length	OAL	Tool#	EDP#
1/16	3/32	1/8	3/8	1-1/2	XA	29001
3/32	3/32	1/8	3/8	1-1/2	XB	29002
1/8	1/8	1/8	1/2	1-1/2	XC	29003
5/32	3/16	3/16	5/8	2"	XD	29004
3/16	3/16	3/16	5/8	2"	XF	29005
7/32	7/32	1/4	3/4	2"	XH	29006
1/4	1/4	1/4	3/4	2"	XE	29007

Available Coating
TA, TN, AT or TC

ULTRATOOL® Carbide Boring Bars

Series 471

Solid Carbide Jig Boring Tool
Straight Flute • Straight Shank • RH Cut

Tool #	Min Hole Diam	Max Hole Depth	OAL	Shank Diam	EDP#
F-O	.090	1/2	1-1/2	1/8	47100
F-1	.120	5/8	1-1/2	1/8	47101
F-2	.150	3/4	2"	3/16	47102
F-3	.180	1"	2"	3/16	47103
F-4	.210	1-1/4	2-1/2	1/4	47104
F-5	.240	1-1/4	2-1/2	1/4	47105
F-6	.270	1-1/4	2-1/2	5/16	47106
F-7	.300	1-1/4	2-1/2	5/16	47107
F-8	.330	1-1/2	2-1/2	3/8	47108
F-9	.360	1-1/2	2-1/2	3/8	47109

Available Coating
TA, TN, AT or TC

phone 714.898.9224 / 800.854.2431 / fax 714.891.7816
5451 McFadden Avenue • Huntington Beach, CA 92649
ultra-tool.com

ULTRATOOL® Standard Length Solid Carbide Reamers

Series 410
Standard Length • Straight Flute • RH Cut

Series 410R
Standard Length • RH Spiral • RH Cut

Series 410L
Standard Length • LH Spiral • RH Cut

TA — Now it's easier than ever to purchase the Ultra-Tool® line of precision carbide reamers (featuring the industry's tightest tolerances). We've eliminated all quantity breaks and published one low price. Best of all, finished UnCoated reamers are available to ship via Ultra Express Service as quick as the following business day. We've even added a pricing column for SmoothCoat TA, our most versatile TiAlN coating. Performed in-house, TA will add only 1 business day to delivery and includes SmoothEdge 1 edge prep.

Decimal Sizes

Reamer Specs: 45° Lead
Cutting Diam +.0002/-.0000
Shank Diam +.0005/-.0005

Group	Diam Range	LOC	OAL	Flutes	Shank
1	.0312 - .0394	1/2	1-1/2	4	.0312
2	.0395 - .0484	1/2	1-1/2	4	.0312
3	.0485 - .0574	1/2	1-1/2	4	.0469
4	.0575 - .0654	1/2	1-1/2	4	.0469
5	.0655 - .0804	1/2	2"	4	.0625
6	.0805 - .0964	1/2	2"	4	.0781
7	.0965 - .1124	5/8	2-1/4	4	.0938
8	.1125 - .1284	5/8	2-1/4	4	.1094
9	.1285 - .1444	3/4	2-1/2	4	.1250
10	.1445 - .1594	3/4	2-1/2	4	.1406
11	.1595 - .1744	7/8	2-3/4	4	.1562
12	.1745 - .1914	7/8	2-3/4	4	.1719
13	.1915 - .2234	1"	3"	6	.1875
14	.2235 - .2544	1"	3"	6	.2188
15	.2545 - .2844	1-1/8	3-1/4	6	.2500
16	.2845 - .3164	1-1/8	3-1/4	6	.2812
17	.3165 - .3484	1-1/4	3-1/2	6	.3125
18	.3485 - .3794	1-1/4	3-1/2	6	.3438
19	.3795 - .4104	1-1/2	4"	6	.3750
20	.4105 - .4414	1-1/2	4"	6	.4062
21	.4415 - .4724	1-1/2	4"	6	.4375
22	.4725 - .5054	1-1/2	4"	6	.4688

Available Coating
TA, TN, AT or TC

Metric Sizes

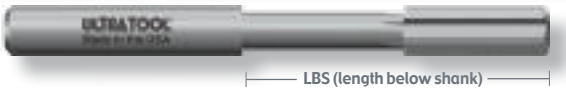
Reamer Specs (Metric): 45° Lead
Cutting Diam +0.005/-0.000mm
Shank Diam +0.013/-0.013mm

Shank	Flutes	OAL	LOC	Diam Range	Group
0.7mm	4	38	9	0.80 - 1.00mm	1
0.7mm	4	38	9	1.01 - 1.23mm	2
1.0mm	4	38	9	1.24 - 1.46mm	3
1.0mm	4	38	9	1.47 - 1.66mm	4
1.5mm	4	51	12	1.67 - 2.04mm	5
1.5mm	4	51	12	2.05 - 2.45mm	6
2.2mm	4	57	16	2.46 - 2.85mm	7
2.5mm	4	57	16	2.86 - 3.26mm	8
3.0mm	4	63	19	3.27 - 3.67mm	9
3.5mm	4	63	19	3.68 - 4.05mm	10
3.5mm	4	70	22	4.06 - 4.43mm	11
4.0mm	4	70	22	4.44 - 4.86mm	12
4.5mm	6	76	25	4.87 - 5.67mm	13
5.0mm	6	76	25	5.68 - 6.46mm	14
6.3mm	6	82	28	6.47 - 7.22mm	15
7.1mm	6	82	28	7.23 - 8.04mm	16
7.1mm	6	89	32	8.05 - 8.85mm	17
8.0mm	6	89	32	8.86 - 9.64mm	18
8.0mm	6	101	38	9.65 - 10.42mm	19
10.0mm	6	101	38	10.43 - 11.21mm	20
10.0mm	6	101	38	11.22 - 12.00mm	21
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.

Solid Carbide Economy Reamers by ULTRATOOL®

Series 411 • Decimal Sizes
Economy Reamers • Straight Flute • RH Cut
Oversized Shanks with Neck Clearance



The 411 Series is ground from an oversized, common shank diameter to offer superb reaming capabilities at a lower price point than typical "reduced shank" type reamers ground between centers. Solid carbide construction. Available with TA coating. Flute length equals one-half length of reach.

SFR — 411 Reamer Specs: 45° Lead
Cutting Diam +.0002/-.0000
Shank Diam +.0000/-.0003

Group	Diam Range	LBS	OAL	Flutes	Shank
1	.0470 - .0622	3/4	1-1/2	4	1/16
2	.0623 - .0778	1"	2"	4	5/64
3	.0779 - .0935	1-1/4	2-1/4	4	3/32
4	.0936 - .1091	1-1/4	2-1/4	4	7/64
5	.1092 - .1247	1-1/4	2-1/4	4	1/8
6	.1248 - .1403	1-1/2	2-1/2	4	9/64
7	.1404 - .1559	1-1/2	2-1/2	4	5/32
8	.1560 - .1716	1-3/4	2-3/4	4	11/64
9	.1717 - .1872	1-3/4	2-3/4	4	3/16
10	.1873 - .2028	2"	3"	4	13/64
11	.2029 - .2185	2"	3"	4	7/32
12	.2186 - .2341	2"	3"	4	15/64
13	.2342 - .2497	2"	3"	4	1/4
14	.2498 - .2653	2-1/4	3-1/2	6	17/64
15	.2654 - .2809	2-1/4	3-1/2	6	9/32

Available Coating
TA, TN, AT or TC

Group	Diam Range	LBS	OAL	Flutes	Shank
16	.2810 - .2966	2-1/4	3-3/4	6	19/64
17	.2967 - .3122	2-1/4	3-3/4	6	5/16
18	.3123 - .3278	2-3/8	4"	6	21/64
19	.3279 - .3435	2-3/8	4"	6	11/32
20	.3436 - .3591	2-3/8	4"	6	23/64
21	.3592 - .3747	2-3/8	4"	6	3/8
22	.3748 - .3903	2-7/8	4"	6	25/64
23	.3904 - .4059	2-7/8	4"	6	13/32
24	.4060 - .4216	2-7/8	4"	6	27/64
25	.4217 - .4372	2-7/8	4"	6	7/16
26	.4373 - .4528	2-7/8	4"	6	29/64
27	.4529 - .4685	2-7/8	4"	6	15/32
28	.4686 - .4841	2-7/8	4"	6	31/64
29	.4842 - .4997	2-7/8	4"	6	1/2

LOR equals flute length (1/2 LOR) plus neck clearance (1/2 LOR).

Long Length • Steel Shank / Carbide Head Reamers by ULTRATOOL®

Series 453
Long Length • Straight Flute • RH Cut

0° HELIX RHC 4, 6, or 8 Flutes

Series 453R
Long Length • RH Spiral • RH Cut

12° HELIX RHS/RHC 4, 6, or 8 Flutes

Series 453L
Long Length • LH Spiral • RH Cut

12° HELIX LHS/RHC 4, 6, or 8 Flutes

TA

Now it's easier than ever to purchase the Ultra-Tool® line of precision carbide reamers (featuring the industry's tightest tolerances). We've eliminated all quantity breaks and published one low price. Best of all, finished UnCoated reamers are available to ship via Ultra Express Service as quick as the following business day. We've even added a pricing column for SmoothCoat TA, our most versatile TiAlN coating. Performed in-house, TA will add only 1 business day to delivery and includes SmoothEdge 1 edge prep.

Decimal Sizes

Reamer Specs: 45° Lead
Cutting Diam +.0002/-.0000
Shank Diam +.0005/-.0005

Group	Diam Range	LOC	OAL	Flutes	Shank
1*	.1105 - .1284	7/8	3-1/2	4	.1094
2*	.1285 - .1444	7/8	4"	4	.1250
3*	.1445 - .1594	1"	4"	4	.1406
4*	.1595 - .1744	1"	4-1/2	4	.1562
5*	.1745 - .1914	1"	4-1/2	4	.1719
6	.1915 - .2234	1-1/4	5"	6	.1875
7	.2235 - .2544	1-1/4	6"	6	.2188
8	.2545 - .2844	1-1/4	6"	6	.2344
9	.2845 - .3164	1-1/2	6"	6	.2500
10	.3165 - .3484	1-1/2	6"	6	.2969
11	.3485 - .3794	1-1/2	7"	6	.3125
12	.3795 - .4104	1-3/4	7"	6	.3438
13	.4105 - .4414	1-3/4	7"	6	.3750
14	.4415 - .4724	1-3/4	8"	6	.4062
15	.4725 - .5054	1-3/4	8"	6	.4375
16	.5055 - .5670	1-7/8	9"	6	.4844
17	.5671 - .6300	1-7/8	9"	6	.5312
18	.6301 - .6930	2"	9-1/2	6	.5625
19	.6931 - .7560	2"	9-1/2	6	.6250
20	.7561 - .7870	2"	10"	8	.6250
21	.7871 - .8190	2"	10"	8	.7500
22	.8191 - .8500	2"	10"	8	.7500
23	.8501 - .8820	2"	10"	8	.7500
24	.8821 - .9120	2"	10"	8	.7500
25	.9121 - .9440	2"	10"	8	.7500
26	.9441 - .9760	2"	10"	8	.7500
27	.9761 - 1.010	2"	10"	8	.7500

Available Coating
TA, TN, AT or TC

Metric Sizes

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

Shank	Flutes	OAL	LOC	Diam Range	Group
2.5mm	4	89	22	2.81 - 3.26mm	1*
3.0mm	4	102	22	3.27 - 3.67mm	2*
3.5mm	4	102	25	3.68 - 4.05mm	3*
3.5mm	4	114	25	4.06 - 4.43mm	4*
4.0mm	4	114	25	4.44 - 4.86mm	5*
4.5mm	6	127	32	4.87 - 5.67mm	6
5.5mm	6	152	32	5.68 - 6.46mm	7
6.0mm	6	152	32	6.47 - 7.22mm	8
6.0mm	6	152	32	7.23 - 8.04mm	9
7.5mm	6	152	38	8.05 - 8.85mm	10
8.0mm	6	178	38	8.86 - 9.64mm	11
8.0mm	6	178	44	9.65 - 10.42mm	12
9.5mm	6	178	44	10.43 - 11.21mm	13
10.0mm	6	203	44	11.22 - 12.00mm	14
11.0mm	6	203	44	12.01 - 12.84mm	15
12.0mm	6	229	48	12.85 - 14.40mm	16
13.5mm	6	229	48	14.41 - 16.00mm	17
14.0mm	6	241	51	16.01 - 17.60mm	18
15.0mm	6	241	51	17.61 - 19.20mm	19
15.0mm	8	254	51	19.21 - 19.99mm	20
18.0mm	8	254	51	20.00 - 20.80mm	21
18.0mm	8	254	51	20.81 - 21.59mm	22
18.0mm	8	254	51	21.60 - 22.40mm	23
18.0mm	8	254	51	22.41 - 23.16mm	24
18.0mm	8	254	51	23.17 - 23.98mm	25
18.0mm	8	254	51	23.99 - 24.79mm	26
18.0mm	8	254	51	24.80 - 25.65mm	27

*Solid Carbide construction on these sizes only; All 453, 453R, & 453L Series feature female-centers on both ends.

ULTRATOOL® Extra-Long Small Diameter Solid Carbide Reamers

The Ultra-Tool® Series 453XL is a 6" overall extra-long reamer. Precision ground with 6 straight flutes, the 453XL allows increased reach and tight tolerances on smaller hole diameters. Available with TA coating.

0° HELIX RHC

Reamer Specs: 45° Lead
Cutting Diam +.0002/-.0000
Shank Diam +.0005/-.0005

Series 453XL
Extra-Long Length • Straight Flute • RH Cut

Decimal Sizes

Group	Diam Range	LOC	OAL	Flutes	Shank
1	.0395 - .0484	7/8	6"	6	.0312
2	.0485 - .0574	7/8	6"	6	.0469
3	.0575 - .0654	7/8	6"	6	.0469
4	.0655 - .0804	7/8	6"	6	.0625
5	.0805 - .0964	7/8	6"	6	.0781
6	.0965 - .1124	7/8	6"	6	.0938
7	.1125 - .1284	7/8	6"	6	.1094
8	.1285 - .1444	7/8	6"	6	.1250
9	.1445 - .1594	1"	6"	6	.1406
10	.1595 - .1744	1"	6"	6	.1562
11	.1745 - .1914	1"	6"	6	.1719
12	.1915 - .2234	1-1/4	6"	6	.1875

Solid carbide construction with male centers.

Available Coating
TA, TN, AT or TC

Metric Sizes

Shank	Flutes	OAL	LOC	Diam Range	Group
0.7mm	6	152	22	1.00 - 1.23mm	1
1.0mm	6	152	22	1.24 - 1.45mm	2
1.0mm	6	152	22	1.46 - 1.66mm	3
1.5mm	6	152	22	1.67 - 2.04mm	4
1.9mm	6	152	22	2.05 - 2.45mm	5
2.2mm	6	152	22	2.46 - 2.85mm	6
2.5mm	6	152	22	2.86 - 3.26mm	7
3.0mm	6	152	22	3.27 - 3.66mm	8
3.5mm	6	152	25	3.67 - 4.05mm	9
3.5mm	6	152	25	4.06 - 4.43mm	10
4.0mm	6	152	25	4.44 - 4.86mm	11
4.5mm	6	152	32	4.87 - 5.67mm	12

phone 714.898.9224 / 800.854.2431 / fax 714.891.7816
5451 McFadden Avenue • Huntington Beach, CA 92649
ultra-tool.com

ULTRATOOL® Fractional & Metric-Sized Reamers

Series 400 • Fractional Sizes

Standard Length • Straight Flute • RH Cut
Solid Carbide

ULTRA-Carb®

Diam	LOC	OAL	Flutes	Shank	EDP#
1/32	1/2	1-1/2	4	1/32	40002
3/64	1/2	1-1/2	4	1/32	40003
1/16	1/2	1-1/2	4	3/64	40004
5/64	1/2	2"	4	1/16	40005
3/32	1/2	2"	4	5/64	40006
7/64	5/8	2-1/4	4	3/32	40007
1/8	5/8	2-1/4	4	7/64	40008
9/64	3/4	2-1/2	4	1/8	40009
5/32	3/4	2-1/2	4	9/64	40010
11/64	7/8	2-3/4	4	5/32	40011
3/16	7/8	2-3/4	4	11/64	40012
13/64	1"	3"	6	3/16	40013
7/32	1"	3"	6	3/16	40014
15/64	1"	3"	6	7/32	40015
1/4	1"	3"	6	7/32	40016
17/64	1-1/8	3-1/4	6	1/4	40017
9/32	1-1/8	3-1/4	6	1/4	40018
19/64	1-1/8	3-1/4	6	9/32	40019
5/16	1-1/8	3-1/4	6	9/32	40020
21/64	1-1/4	3-1/2	6	5/16	40021
11/32	1-1/4	3-1/2	6	5/16	40022
23/64	1-1/4	3-1/2	6	11/32	40023
3/8	1-1/4	3-1/2	6	11/32	40024
25/64	1-1/2	4"	6	3/8	40025
13/32	1-1/2	4"	6	3/8	40026
27/64	1-1/2	4"	6	13/32	40027
7/16	1-1/2	4"	6	13/32	40028
29/64	1-1/2	4"	6	7/16	40029
15/32	1-1/2	4"	6	7/16	40030
31/64	1-1/2	4"	6	15/32	40031
1/2	1-1/2	4"	6	15/32	40032

Available Coating
TA, TN, AT or TC

Series 400 • Metric Sizes

Diam	LOC	OAL	Flutes	Shank	EDP#
1.0mm	12	38	4	0.7mm	40050
1.5mm	12	38	4	1.0mm	40051
2.0mm	12	51	4	1.5mm	40052
2.5mm	16	57	4	2.2mm	40053
3.0mm	16	57	4	2.5mm	40054
3.5mm	19	63	4	3.0mm	40055
4.0mm	19	63	4	3.5mm	40056
4.5mm	25	70	4	4.0mm	40057
5.0mm	25	76	6	4.5mm	40058
5.5mm	25	76	6	4.5mm	40059
6.0mm	25	76	6	5.0mm	40060
6.5mm	28	76	6	6.3mm	40061
7.0mm	28	82	6	6.3mm	40062
7.5mm	28	82	6	7.1mm	40063
8.0mm	28	82	6	7.1mm	40064
8.5mm	32	89	6	7.1mm	40065
9.0mm	32	89	6	8.0mm	40066
9.5mm	32	89	6	8.0mm	40067
10.0mm	38	101	6	8.0mm	40068
10.5mm	38	101	6	10.0mm	40069
11.0mm	38	101	6	10.0mm	40070
11.5mm	38	101	6	10.0mm	40071
12.0mm	38	101	6	10.0mm	40072
12.5mm	38	101	6	10.0mm	40073

Available Coating
TA, TN, AT or TC

Series 450 • Fractional Sizes

Long Length • Straight Flute • RH Cut
Steel Shank w/Carbide Head

Diam	LOC	OAL	Flutes	Shank	EDP#
1/8*	7/8	3-1/2	4	7/64	45008
9/64*	7/8	4"	4	1/8	45009
5/32*	1"	4"	4	9/64	45010
11/64*	1"	4-1/2	4	5/32	45011
3/16*	1"	4-1/2	4	11/64	45012
13/64	1-1/4	5"	6	3/16	45013
7/32	1-1/4	5"	6	3/16	45014
15/64	1-1/4	6"	6	7/32	45015
1/4	1-1/4	6"	6	7/32	45016
17/64	1-1/4	6"	6	15/64	45017
9/32	1-1/4	6"	6	15/64	45018
19/64	1-1/2	6"	6	1/4	45019
5/16	1-1/2	6"	6	1/4	45020
21/64	1-1/2	6"	6	19/64	45021
11/32	1-1/2	6"	6	19/64	45022
23/64	1-1/2	7"	6	5/16	45023
3/8	1-1/2	7"	6	5/16	45024
25/64	1-3/4	7"	6	11/32	45025
13/32	1-3/4	7"	6	11/32	45026
27/64	1-3/4	7"	6	3/8	45027
7/16	1-3/4	7"	6	3/8	45028
29/64	1-3/4	8"	6	13/32	45029
15/32	1-3/4	8"	6	13/32	45030
31/64	1-3/4	8"	6	7/16	45031
1/2	1-3/4	8"	6	7/16	45032
9/16	1-7/8	9"	6	31/64	45034
5/8	1-7/8	9"	6	17/32	45036
11/16	2"	9-1/2	6	9/16	45038
3/4	2"	9-1/2	6	5/8	45040
7/8	2"	10"	8	3/4	45044
1"	2"	10"	8	3/4	45048

Available Coating
TA, TN, AT or TC

Series 450 • Metric Sizes

Diam	LOC	OAL	Flutes	Shank	EDP#
3.0mm*	22	89	4	2.5mm	45049
4.0mm*	25	101	4	3.5mm	45050
5.0mm	32	127	6	4.5mm	45051
6.0mm	32	152	6	5.5mm	45052
7.0mm	32	152	6	6.0mm	45053
8.0mm	38	152	6	6.0mm	45054
9.0mm	38	178	6	8.0mm	45055
10.0mm	44	178	6	8.0mm	45056
11.0mm	44	178	6	9.5mm	45057
12.0mm	44	203	6	10.0mm	45058
14.0mm	47	228	6	12.0mm	45059
16.0mm	47	228	6	13.5mm	45060
18.0mm	50	241	6	15.0mm	45061
20.0mm	50	254	8	18.0mm	45062
25.0mm	50	254	8	18.0mm	45063

Available Coating
TA, TN, AT or TC

*Solid Carbide, one-piece construction

Reamer Specs: 45° Lead
Cutting Diam +.0002/-.0000
Shank Diam +.0005/-.0005

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

new!
Available with TA coating!

ULTRATOOL® Spotting Drills

Series 525

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

Available Coating
TA, TN, AT or TC

Diam	LOF	OAL	82° EDP#	90° EDP#	120° EDP#	140° EDP#	150° EDP#
1/8	1/2	2"	52135	52580	52581	52582	52143
3/16	5/8	2"	52136	52585	52586	52587	52144
1/4	3/4	2-1/2	52137	52516	52515	52514	52145
5/16	3/4	2-1/2	52138	52590	52591	52592	52146
3/8	1"	2-1/2	52139	52524	52525	52526	52147
1/2	1"	3"	52140	52532	52533	52534	52148
5/8	1-1/4	3-1/2	52141	52540	52541	52542	52149
3/4	1-1/2	4"	52142	52548	52549	52550	52150

SFR Drill Specifications:
Diameter +.0000/-.0003
Point Angle ±1°

Series 525 Metric Sizes

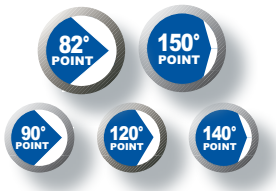
Diam	LOF	OAL	82° EDP#	90° EDP#	120° EDP#	140° EDP#	150° EDP#
3.0mm	12	57	52151	52588	52589	52594	52159
5.0mm	16	63	52152	52595	52596	52593	52160
6.0mm	19	63	52153	52506	52507	52505	52161
8.0mm	19	63	52154	52508	52509	52504	52162
10.0mm	25	70	52155	52510	52511	52503	52163
12.0mm	25	74	52156	52512	52513	52502	52164
16.0mm	32	89	52157	52517	52518	52519	52165
20.0mm	38	100	52158	52521	52522	52523	52166

Available Coating
TA, TN, AT or TC

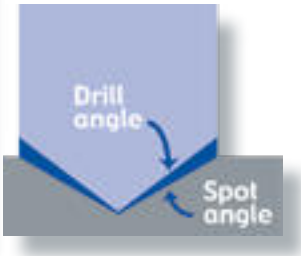
SFR Drill Specifications (mm):
Diameter +0.000/-0.008mm
Point Angle ±1°

new!

Additional sizes and included angles!



Now Ultra-Tool 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.



Combined Drill & Countersink Center Drills by ULTRATOOL®

Series 560

Combined Drill & Countersink • Two Flute
Double End • 60°/ 82°/ 90° Incl. Angle • RH Cut

The solid carbide Ultra-Tool® Series 560 Combined Drill & Countersink is the high-productivity alternative to equivalent HSS centerdrilling designs, featuring a slight helix for great chip evacuation. Available in 3 different angles.

Available Coating
TA, TN, AT or TC

Tool	Body Diam	Drill Diam	OAL	60°	82°	90°
#00	1/8	.025	1-1/2	56099	56199	56299
#0	1/8	1/32	1-1/2	56000	56100	56200
#1	1/8	3/64	1-1/2	56001	56101	56201
#2	3/16	5/64	2"	56002	56102	56202
#3	1/4	7/64	2"	56003	56103	56203
#4	5/16	1/8	2-1/2	56004	56104	56204
#5	7/16	3/16	2-3/4	56005	56105	56205
#6	1/2	7/32	3"	56006	56106	56206
#7	5/8	1/4	3-1/2	56007	56107	56207
#8	3/4	5/16	4"	56008	56108	56208

Series 750 – Sets

Combined Drill & Countersink Sets
Includes 1 ea. 560 #1 • #2 • #3 • #4 • #5 • #6

Included Angle	EDP#	Price	Coated
60°	76060	$183.20	$221.90
82°	76082	$183.20	$221.90
90°	76090	$183.20	$221.90

Series 560L

new!

Long Length Combined Drill & Countersink
Double End • 60°/ 82°/ 90° Incl. Angle • RH Cut • Two Flute

The 560L is also solid carbide, double-ended, and features an extended overall length for reach applications. Choose from 3 different countersinking angle and either UnCoated or our standard SmoothCoat PVD hardcoatings.

Available Coating
TA, TN, AT or TC

Tool	Body Diam	Drill Diam	OAL	60°	82°	90°
#00L	1/8	.025	4"	55399	55199	55299
#0L	1/8	1/32	4"	55300	55100	55200
#1L	1/8	3/64	4"	55301	55101	55201
#2L	3/16	5/64	4"	55302	55102	55202
#3L	1/4	7/64	4"	55303	55103	55203
#4L	5/16	1/8	6"	55304	55104	55204
#5L	7/16	3/16	6"	55305	55105	55205
#6L	1/2	7/32	6"	55306	55106	55206
#7L	5/8	1/4	6"	55307	55107	55207
#8L	3/4	5/16	6"	55308	55108	55208

SFR Center Drill Specifications:
Body Diameter +.0000/-.0003
Drill Diameter +.003/-.000
Point / C'sink Angle ±1°

118° POINT

phone 714.898.9224 / 800.854.2431 / fax 714.891.7816
5451 McFadden Avenue • Huntington Beach, CA 92649
ultra-tool.com

Twist Drills by ULTRATOOL®

Series 510 • Two Flute
Jobbers Length • 25° Helix
118° Four Facet Point

Fractional

Diam	LOF	OAL	EDP#
1/64	1/4	1-1/4	51001
1/32	5/16	1-1/4	51002
3/64	3/4	1-1/2	51003
1/16	3/4	1-1/2	51004
5/64	7/8	1-3/4	51005
3/32	1″	2″	51006
7/64	1-1/4	2-1/4	51007
1/8	1-1/4	2-1/4	51008
9/64	1-3/8	2-1/2	51009
5/32	1-3/8	2-1/2	51010
11/64	1-5/8	2-3/4	51011
3/16	1-5/8	2-3/4	51012
13/64	1-3/4	3″	51013
7/32	1-3/4	3″	51014
15/64	2″	3-1/4	51015
1/4	2″	3-1/4	51016
17/64	2-1/8	3-1/2	51017
9/32	2-1/8	3-1/2	51018
19/64	2-3/8	3-3/4	51019
5/16	2-3/8	3-3/4	51020
21/64	2-1/2	4″	51021
11/32	2-1/2	4″	51022
23/64	2-3/4	4-1/4	51023
3/8	2-3/4	4-1/4	51024
25/64	2-7/8	4-1/2	51025
13/32	2-7/8	4-1/2	51026
27/64	2-7/8	4-1/2	51027
7/16	2-7/8	4-1/2	51028
29/64	3″	4-3/4	51029
15/32	3″	4-3/4	51030
31/64	3″	4-3/4	51031
1/2	3″	4-3/4	51032
17/32	4″	6″	51033
9/16	4″	6″	51034
19/32	4″	6″	51035
5/8	4″	6″	51036
21/32	4″	6″	51037
11/16	4″	6″	51038
3/4	4″	6″	51039
13/16	4″	6″	51181
7/8	4″	6″	51182
15/16	4″	6″	51183
1″	4″	6″	51184

Available Coating
TA, TN, AT or TC

Wire Gage
Series 510

Diam	LOF	OAL	EDP#
1	1-3/4	3-1/4	51101
2	1-3/4	3″	51102
3	1-3/4	3″	51103
4	1-3/4	3″	51104
5	1-3/4	3″	51105
6	1-3/4	3″	51106
7	1-3/4	3″	51107
8	1-3/4	3″	51108
9	1-3/4	3″	51109
10	1-5/8	2-3/4	51110
11	1-5/8	2-3/4	51111
12	1-5/8	2-3/4	51112
13	1-5/8	2-3/4	51113
14	1-5/8	2-3/4	51114
15	1-5/8	2-3/4	51115
16	1-5/8	2-3/4	51116
17	1-5/8	2-3/4	51117
18	1-5/8	2-3/4	51118
19	1-5/8	2-3/4	51119
20	1-3/8	2-1/2	51120
21	1-3/8	2-1/2	51121
22	1-3/8	2-1/2	51122
23	1-3/8	2-1/2	51123
24	1-3/8	2-1/2	51124
25	1-3/8	2-1/2	51125
26	1-3/8	2-1/2	51126
27	1-3/8	2-1/2	51127
28	1-3/8	2-1/2	51128
29	1-3/8	2-1/2	51129
30	1-3/8	2-1/4	51130
31	1-1/4	2-1/4	51131
32	1-1/4	2-1/4	51132
33	1-1/4	2-1/4	51133
34	1-1/4	2-1/4	51134
35	1-1/4	2-1/4	51135
36	1-1/4	2-1/4	51136
37	1-1/4	2-1/4	51137
38	1-1/4	2-1/4	51138
39	1-1/4	2-1/4	51139
40	1″	2″	51140
41	1″	2″	51141
42	1″	2″	51142
43	1″	2″	51143
44	1″	2″	51144
45	7/8	1-3/4	51145
46	7/8	1-3/4	51146
47	7/8	1-3/4	51147
48	7/8	1-3/4	51148
49	7/8	1-3/4	51149
50	7/8	1-3/4	51150
51	3/4	1-3/4	51151
52	3/4	1-1/2	51152
53	3/4	1-1/2	51153
54	3/4	1-1/2	51154
55	3/4	1-1/2	51155
56	3/4	1-1/2	51156
57	3/4	1-1/2	51157
58	3/4	1-1/2	51158
59	3/4	1-1/2	51159
60	3/4	1-1/2	51160
61	5/8	1-1/2	51161
62	5/8	1-1/2	51162
63	5/8	1-1/2	51163
64	5/8	1-1/2	51164
65	5/8	1-1/2	51165
66	5/16	1-1/4	51166
67	5/16	1-1/4	51167
68	5/16	1-1/4	51168
69	5/16	1-1/4	51169
70	5/16	1-1/4	51170
71	5/16	1-1/4	51171
72	5/16	1-1/4	51172
73	1/4	1-1/4	51173
74	1/4	1-1/4	51174
75	1/4	1-1/4	51175
76	1/4	1-1/4	51176
77	1/4	1-1/4	51177
78	1/4	1-1/4	51178
79	1/4	1-1/4	51179
80	1/4	1-1/4	51180

Available Coating
TA, TN, AT or TC

Letter Sizes
Series 510

Diam	LOF	OAL	EDP#
A	2″	3-1/4	51041
B	2″	3-1/4	51042
C	2″	3-1/4	51043
D	2″	3-1/4	51044
E	2″	3-1/4	51045
F	2″	3-1/2	51046
G	2-1/8	3-1/2	51047
H	2-1/8	3-1/2	51048
I	2-1/8	3-1/2	51049
J	2-1/8	3-1/2	51050
K	2-1/8	3-1/2	51051
L	2-1/8	3-1/2	51052
M	2-3/8	3-3/4	51053
N	2-3/8	3-3/4	51054
O	2-3/8	3-3/4	51055
P	2-3/8	4″	51056
Q	2-1/2	4″	51085
R	2-1/2	4″	51086
S	2-1/2	4″	51087
T	2-3/4	4-1/4	51088
U	2-3/4	4-1/4	51089
V	2-3/4	4-1/4	51090
W	2-7/8	4-1/2	51057
X	2-7/8	4-1/2	51058
Y	2-7/8	4-1/2	51059
Z	2-7/8	4-1/2	51060

Available Coating
TA, TN, AT or TC

Metric
Series 510

Diam	LOF	OAL	EDP#
1.0mm	13	38	51061
1.5mm	19	38	51062
2.0mm	22	44	51063
2.5mm	25	50	51064
3.0mm	32	57	51065
3.5mm	35	63	51066
4.0mm	35	63	51067
4.5mm	41	70	51068
5.0mm	44	76	51069
5.5mm	44	76	51070
6.0mm	50	82	51071
6.5mm	50	82	51072
7.0mm	54	89	51073
7.5mm	60	95	51074
8.0mm	60	95	51075
8.5mm	63	101	51076
9.0mm	70	108	51077
9.5mm	70	108	51078
10.0mm	73	114	51079
10.5mm	73	114	51080
11.0mm	73	114	51081
11.5mm	76	120	51082
12.0mm	76	120	51083
12.5mm	76	120	51084

Available Coating
TA, TN, AT or TC

Series 700 • Drill Sets
Series 510 Drills In Metal Indexes

Set	EDP#	Available Coating
#1	51185	TA, TN, AT or TC
	6 Tools • 1/16, 1/8, 3/16, 1/4, 5/16, 3/8	
#2	51186	
	21 Tools • 1/16 to 3/8 by 1/64ths	
#3	51187	
	60 Tools • #1 to #60	
#4	51188	
	15 Tools • 1/16 to 1/2 by 1/32nds	

ULTRATOOL® Brad Point Drills

Series 510BR • Two Flute

Jobbers Length • 25° Helix w/ 140° Brad Point
for wood, plastics, composites, fiberglass

Fractional

Diam	LOF	OAL	EDP#	Available Coating
3/64	3/4	1-1/2	51203	D1
1/16	3/4	1-1/2	51204	
5/64	7/8	1-3/4	51205	
3/32	1"	2"	51206	
7/64	1-1/4	2-1/4	51207	
1/8	1-1/4	2-1/4	51208	
9/64	1-3/8	2-1/2	51209	
5/32	1-3/8	2-1/2	51210	
11/64	1-5/8	2-3/4	51211	
3/16	1-5/8	2-3/4	51212	
13/64	1-3/4	3"	51213	
7/32	1-3/4	3"	51214	
15/64	2"	3-1/4	51215	
1/4	2"	3-1/4	51216	
17/64	2-1/8	3-1/2	51217	
9/32	2-1/8	3-1/2	51218	
19/64	2-3/8	3-3/4	51219	
5/16	2-3/8	3-3/4	51220	
21/64	2-1/2	4"	51221	
11/32	2-1/2	4"	51222	
23/64	2-3/4	4-1/4	51223	
3/8	2-3/4	4-1/4	51224	
25/64	2-7/8	4-1/2	51225	
13/32	2-7/8	4-1/2	51226	
27/64	2-7/8	4-1/2	51227	
7/16	2-7/8	4-1/2	51228	
29/64	3"	4-3/4	51229	
15/32	3"	4-3/4	51230	
31/64	3"	4-3/4	51231	
1/2	3"	4-3/4	51232	
17/32	4"	6"	51233	
9/16	4"	6"	51234	
19/32	4"	6"	51235	
5/8	4"	6"	51236	
21/32	4"	6"	51237	
11/16	4"	6"	51238	
3/4	4"	6"	51239	
13/16	4"	6"	51291	
7/8	4"	6"	51292	
15/16	4"	6"	51293	
1"	4"	6"	51294	

Ultra's D1 PVD Diamond coating is the perfect compliment for drilling abrasive and soft materials with our special brad style point. The smoothness of our sputter based process helps evacuate the material up and out of the hole with superb lubricity. The hardness of D1's multi-layered surface lends outstanding wear characteristics when making holes in the types of material for which the brad point is designed. Add D1 as a suffix to the EDP #.

Series 510BR • Wire Gage

Diam	LOF	OAL	EDP#	Available Coating
1	1-3/4	3-1/4	51301	D1
2	1-3/4	3"	51302	
3	1-3/4	3"	51303	
4	1-3/4	3"	51304	
5	1-3/4	3"	51305	
6	1-3/4	3"	51306	
7	1-3/4	3"	51307	
8	1-3/4	3"	51308	
9	1-3/4	3"	51309	
10	1-5/8	2-3/4	51310	
11	1-5/8	2-3/4	51311	
12	1-5/8	2-3/4	51312	
13	1-5/8	2-3/4	51313	
14	1-5/8	2-3/4	51314	
15	1-5/8	2-3/4	51315	
16	1-5/8	2-3/4	51316	
17	1-5/8	2-3/4	51317	
18	1-5/8	2-3/4	51318	
19	1-5/8	2-3/4	51319	
20	1-3/8	2-1/2	51320	
21	1-3/8	2-1/2	51321	
22	1-3/8	2-1/2	51322	
23	1-3/8	2-1/2	51323	
24	1-3/8	2-1/2	51324	
25	1-3/8	2-1/2	51325	
26	1-3/8	2-1/2	51326	
27	1-3/8	2-1/2	51327	
28	1-3/8	2-1/2	51328	
29	1-3/8	2-1/2	51329	
30	1-3/8	2-1/4	51330	
31	1-1/4	2-1/4	51331	
32	1-1/4	2-1/4	51332	
33	1-1/4	2-1/4	51333	
34	1-1/4	2-1/4	51334	
35	1-1/4	2-1/4	51335	
36	1-1/4	2-1/4	51336	
37	1-1/4	2-1/4	51337	
38	1-1/4	2-1/4	51338	
39	1-1/4	2-1/4	51339	
40	1"	2"	51340	
41	1"	2"	51341	
42	1"	2"	51342	
43	1"	2"	51343	
44	1"	2"	51344	
45	7/8	1-3/4	51345	
46	7/8	1-3/4	51346	
47	7/8	1-3/4	51347	
48	7/8	1-3/4	51348	
49	7/8	1-3/4	51349	
50	7/8	1-3/4	51350	
51	3/4	1-3/4	51351	
52	3/4	1-1/2	51352	
53	3/4	1-1/2	51353	
54	3/4	1-1/2	51354	
55	3/4	1-1/2	51355	
56	3/4	1-1/2	51356	
57	3/4	1-1/2	51357	
58	3/4	1-1/2	51358	
59	3/4	1-1/2	51359	
60	3/4	1-1/2	51360	

Series 510BR • Letter Sizes

Diam	LOF	OAL	EDP#	Available Coating
A	2"	3-1/4	51241	D1
B	2"	3-1/4	51242	
C	2"	3-1/4	51243	
D	2"	3-1/4	51244	
E	2"	3-1/4	51245	
F	2"	3-1/2	51246	
G	2-1/8	3-1/2	51247	
H	2-1/8	3-1/2	51248	
I	2-1/8	3-1/2	51249	
J	2-1/8	3-1/2	51250	
K	2-1/8	3-1/2	51251	
L	2-1/8	3-1/2	51252	
M	2-3/8	3-3/4	51253	
N	2-3/8	3-3/4	51254	
O	2-3/8	3-3/4	51255	
P	2-3/8	4"	51256	
Q	2-1/2	4"	51285	
R	2-1/2	4"	51286	
S	2-1/2	4"	51287	
T	2-3/4	4-1/4	51288	
U	2-3/4	4-1/4	51289	
V	2-3/4	4-1/4	51290	
W	2-7/8	4-1/2	51257	
X	2-7/8	4-1/2	51258	
Y	2-7/8	4-1/2	51259	
Z	2-7/8	4-1/2	51260	

SFR Drill Specifications:
Diameter +.0000/-.0003
Point Angle ±1°

Series 510BR • Metric

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

Diam	LOF	OAL	EDP#	Available Coating
1.0mm	13	38	51261	D1
1.5mm	19	38	51262	
2.0mm	22	44	51263	
2.5mm	25	50	51264	
3.0mm	32	57	51265	
3.5mm	35	63	51266	
4.0mm	35	63	51267	
4.5mm	41	70	51268	
5.0mm	44	76	51269	
5.5mm	44	76	51270	
6.0mm	50	82	51271	
6.5mm	50	82	51272	
7.0mm	54	89	51273	
7.5mm	60	95	51274	
8.0mm	60	95	51275	
8.5mm	63	101	51276	
9.0mm	70	108	51277	
9.5mm	70	108	51278	
10.0mm	73	114	51279	
10.5mm	73	114	51280	
11.0mm	73	114	51281	
11.5mm	76	120	51282	
12.0mm	76	120	51283	
12.5mm	76	120	51284	

phone 714.898.9224 / 800.854.2431 / fax 714.891.7816
5451 McFadden Avenue • Huntington Beach, CA 92649
ultra-tool.com

3 Flute Drills by ULTRATOOL®

Series 540

Three Flute • Jobbers Length
150° Drill Point • 30° RH Helix

Ultra's 540 Series makes exceptionally straight holes with excellent finishes in steels, stainless, cast iron & high temp alloys (not recommended for aluminum & lighter materials). Spot drilling (selection on page #37) prior to use is beneficial.

ULTRA-Grain®

150° POINT

Fractional

Diam	LOF	OAL	EDP#	Available Coating
1/16	3/4	1-1/2	54004	TA, TN, AT or TC
5/64	7/8	1-3/4	54005	
3/32	1"	2"	54006	
7/64	1-1/4	2-1/4	54007	
1/8	1-1/4	2-1/4	54008	
9/64	1-3/8	2-1/2	54009	
5/32	1-3/8	2-1/2	54010	
11/64	1-5/8	2-3/4	54011	
3/16	1-5/8	2-3/4	54012	
13/64	1-3/4	3"	54013	
7/32	1-3/4	3"	54014	
15/64	2"	3-1/4	54015	
1/4	2"	3-1/4	54016	
17/64	2-1/8	3-1/2	54017	
9/32	2-1/8	3-1/2	54018	
19/64	2-3/8	3-3/4	54019	
5/16	2-3/8	3-3/4	54020	
21/64	2-1/2	4"	54021	
11/32	2-1/2	4"	54022	
23/64	2-3/4	4-1/4	54023	
3/8	2-3/4	4-1/4	54024	
25/64	2-7/8	4-1/2	54025	
13/32	2-7/8	4-1/2	54026	
27/64	2-7/8	4-1/2	54027	
7/16	2-7/8	4-1/2	54028	
29/64	3"	4-3/4	54029	
15/32	3"	4-3/4	54030	
31/64	3"	4-3/4	54031	
1/2	3"	4-3/4	54032	
17/32	4"	6"	54034	
9/16	4"	6"	54036	
19/32	4"	6"	54038	
5/8	4"	6"	54040	
21/32	4"	6"	54042	
11/16	4"	6"	54044	
3/4	4"	6"	54048	
13/16	4"	6"	54052	
7/8	4"	6"	54056	
15/16	4"	6"	54060	
1"	4"	6"	54064	

SFR Drill Specifications:
Diameter +.0000/-.0003
Point Angle ±1°

Series 540 • Wire Gage

Diam	LOF	OAL	EDP#	Available Coating
1	1-3/4	3-1/4	54101	TA, TN, AT or TC
2	1-3/4	3"	54102	
3	1-3/4	3"	54103	
4	1-3/4	3"	54104	
5	1-3/4	3"	54105	
6	1-3/4	3"	54106	
7	1-3/4	3"	54107	
8	1-3/4	3"	54108	
9	1-3/4	3"	54109	
10	1-5/8	2-3/4	54110	
11	1-5/8	2-3/4	54111	
12	1-5/8	2-3/4	54112	
13	1-5/8	2-3/4	54113	
14	1-5/8	2-3/4	54114	
15	1-5/8	2-3/4	54115	
16	1-5/8	2-3/4	54116	
17	1-5/8	2-3/4	54117	
18	1-5/8	2-3/4	54118	
19	1-5/8	2-3/4	54119	
20	1-3/8	2-1/2	54120	
21	1-3/8	2-1/2	54121	
22	1-3/8	2-1/2	54122	
23	1-3/8	2-1/2	54123	
24	1-3/8	2-1/2	54124	
25	1-3/8	2-1/2	54125	
26	1-3/8	2-1/2	54126	
27	1-3/8	2-1/2	54127	
28	1-3/8	2-1/2	54128	
29	1-3/8	2-1/2	54129	
30	1-3/8	2-1/4	54130	
31	1-1/4	2-1/4	54131	
32	1-1/4	2-1/4	54132	
33	1-1/4	2-1/4	54133	
34	1-1/4	2-1/4	54134	
35	1-1/4	2-1/4	54135	
36	1-1/4	2-1/4	54136	
37	1-1/4	2-1/4	54137	
38	1-1/4	2-1/4	54138	
39	1-1/4	2-1/4	54139	
40	1"	2"	54140	
41	1"	2"	54141	
42	1"	2"	54142	
43	1"	2"	54143	
44	1"	2"	54144	
45	7/8	1-3/4	54145	
46	7/8	1-3/4	54146	
47	7/8	1-3/4	54147	
48	7/8	1-3/4	54148	
49	7/8	1-3/4	54149	
50	7/8	1-3/4	54150	
51	3/4	1-3/4	54151	
52	3/4	1-1/2	54152	

Series 540 • Letter Sizes

Diam	LOF	OAL	EDP#	Available Coating
A	2"	3-1/4	54174	TA, TN, AT or TC
B	2"	3-1/4	54175	
C	2"	3-1/4	54176	
D	2"	3-1/4	54177	
E	2"	3-1/4	54178	
F	2"	3-1/2	54179	
G	2-1/8	3-1/2	54180	
H	2-1/8	3-1/2	54181	
I	2-1/8	3-1/2	54182	
J	2-1/8	3-1/2	54183	
K	2-1/8	3-1/2	54184	
L	2-1/8	3-1/2	54185	
M	2-3/8	3-3/4	54186	
N	2-3/8	3-3/4	54187	
O	2-3/8	3-3/4	54188	
P	2-3/8	4"	54189	
Q	2-1/2	4"	54190	
R	2-1/2	4"	54191	
S	2-1/2	4"	54192	
T	2-3/4	4-1/4	54193	
U	2-3/4	4-1/4	54194	
V	2-3/4	4-1/4	54195	
W	2-7/8	4-1/2	54196	
X	2-7/8	4-1/2	54197	
Y	2-7/8	4-1/2	54198	
Z	2-7/8	4-1/2	54199	

Series 540 • Metric

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

Diam	LOF	OAL	EDP#	Available Coating
1.5mm	19	38	54215	TA, TN, AT or TC
2.0mm	22	44	54220	
2.5mm	25	50	54225	
3.0mm	32	57	54230	
3.5mm	35	63	54235	
4.0mm	35	63	54240	
4.5mm	41	70	54245	
5.0mm	44	76	54250	
5.5mm	44	76	54255	
6.0mm	50	82	54260	
6.5mm	50	82	54265	
7.0mm	54	89	54270	
7.5mm	60	95	54275	
8.0mm	60	95	54280	
8.5mm	63	101	54285	
9.0mm	70	108	54290	
9.5mm	70	108	54295	
10.0mm	73	114	54300	
10.5mm	73	114	54305	
11.0mm	73	114	54310	
11.5mm	76	120	54315	
12.0mm	76	120	54320	
12.5mm	76	120	54325	

Solid Carbide Straight Flute Drills by ULTRATOOL®

Series 570
Two Flute Micro Hole Drill
135° Four Facet Point

Fractional

Diam	LOF	OAL	EDP#	Available Coating
3/64	3/8	1-1/2	57003	TA, TN, AT or TC
1/16	3/8	1-1/2	57004	
5/64	1/2	2"	57005	
3/32	1/2	2"	57006	
7/64	5/8	2-1/4	57007	
1/8	5/8	2-1/4	57008	
9/64	5/8	2-1/2	57009	
5/32	3/4	2-1/2	57010	
11/64	3/4	2-1/2	57011	
3/16	3/4	2-1/2	57012	
13/64	1"	2-1/2	57013	
7/32	1"	2-1/2	57014	
15/64	1"	2-1/2	57015	
1/4	1"	2-1/2	57016	
17/64	1"	2-1/2	57017	
9/32	1"	2-1/2	57018	
19/64	1-1/4	2-1/2	57019	
5/16	1-1/4	2-1/2	57020	
21/64	1-1/4	3"	57021	
11/32	1-1/4	3"	57022	
23/64	1-1/4	3"	57023	
3/8	1-1/4	3"	57024	
25/64	1-1/4	3"	57025	
13/32	1-1/4	3"	57026	
27/64	1-1/4	3"	57027	
7/16	1-1/4	3"	57028	
29/64	1-1/4	3"	57029	
15/32	1-1/4	3"	57030	
31/64	1-1/4	3"	57031	
1/2	1-1/4	3"	57032	
9/16	1-1/2	3-1/2	57034	
5/8	1-1/2	3-1/2	57036	
3/4	1-1/2	4"	57040	

SFR Drill Specifications:
Diameter +.0000/-.0003
Point Angle ±1°

Series 570 • Wire Gage

Diam	LOF	OAL	EDP#	Available Coating
1	1"	2-1/2	57101	TA, TN, AT or TC
2	1"	2-1/2	57102	
3	1"	2-1/2	57103	
4	1"	2-1/2	57104	
5	1"	2-1/2	57105	
6	1"	2-1/2	57106	
7	1"	2-1/2	57107	
8	1"	2-1/2	57108	
9	1"	2-1/2	57109	
10	3/4	2-1/2	57110	
11	3/4	2-1/2	57111	
12	3/4	2-1/2	57112	
13	3/4	2-1/2	57113	
14	3/4	2-1/2	57114	
15	3/4	2-1/2	57115	
16	3/4	2-1/2	57116	
17	3/4	2-1/2	57117	
18	3/4	2-1/2	57118	
19	3/4	2-1/2	57119	
20	3/4	2-1/2	57120	
21	3/4	2-1/2	57121	
22	3/4	2-1/2	57122	
23	5/8	2-1/2	57123	
24	5/8	2-1/2	57124	
25	5/8	2-1/2	57125	
26	5/8	2-1/2	57126	
27	5/8	2-1/2	57127	
28	5/8	2-1/2	57128	
29	5/8	2-1/2	57129	
30	5/8	2-1/4	57130	
31	5/8	2-1/4	57131	
32	5/8	2-1/4	57132	
33	5/8	2-1/4	57133	
34	5/8	2-1/4	57134	
35	5/8	2-1/4	57135	
36	5/8	2-1/4	57136	
37	5/8	2-1/4	57137	
38	5/8	2-1/4	57138	
39	5/8	2-1/4	57139	
40	1/2	2"	57140	
41	1/2	2"	57141	
42	1/2	2"	57142	
43	1/2	2"	57143	
44	1/2	2"	57144	
45	1/2	2"	57145	
46	1/2	2"	57146	
47	1/2	2"	57147	
48	1/2	2"	57148	
49	3/8	2"	57149	
50	3/8	2"	57150	
51	3/8	1-3/4	57151	
52	3/8	1-1/2	57152	
53	3/8	1-1/2	57153	
54	3/8	1-1/2	57154	
55	3/8	1-1/2	57155	
56	3/8	1-1/2	57156	
57	3/8	1-1/2	57157	
58	3/8	1-1/2	57158	
59	3/8	1-1/2	57159	
60	3/8	1-1/2	57160	

Series 570 • Letter Sizes

Diam	LOF	OAL	EDP#	Available Coating
A	1"	2-1/2	57161	TA, TN, AT or TC
B	1"	2-1/2	57162	
C	1"	2-1/2	57163	
D	1"	2-1/2	57164	
E	1"	2-1/2	57165	
F	1"	2-1/2	57166	
G	1"	2-1/2	57167	
H	1"	2-1/2	57168	
I	1"	2-1/2	57169	
J	1"	2-1/2	57170	
K	1"	2-1/2	57171	
L	1"	2-1/2	57172	
M	1"	2-1/2	57173	
N	1-1/4	2-1/2	57174	
O	1-1/4	2-1/2	57175	
P	1-1/4	2-1/2	57176	
Q	1-1/4	3"	57177	
R	1-1/4	3"	57178	
S	1-1/4	3"	57179	
T	1-1/4	3"	57180	
U	1-1/4	3"	57181	
V	1-1/4	3"	57182	
W	1-1/4	3"	57183	
X	1-1/4	3"	57184	
Y	1-1/4	3"	57185	
Z	1-1/4	3"	57186	

Series 570 • Metric Sizes

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

Diam	LOF	OAL	EDP#	Available Coating
1.0mm	9.5	38	57061	TA, TN, AT or TC
1.5mm	9.5	38	57062	
2.0mm	12	50	57063	
2.5mm	12	50	57064	
3.0mm	16	57	57065	
3.5mm	16	63	57066	
4.0mm	19	63	57067	
4.5mm	19	63	57068	
5.0mm	25	63	57069	
5.5mm	25	63	57070	
6.0mm	25	63	57071	
6.5mm	25	63	57072	
7.0mm	25	63	57073	
7.5mm	25	63	57074	
8.0mm	32	63	57075	
8.5mm	32	75	57076	
9.0mm	32	75	57077	
9.5mm	32	75	57078	
10.0mm	32	75	57079	
10.5mm	32	75	57080	
11.0mm	32	75	57081	
11.5mm	32	75	57082	
12.0mm	32	75	57083	
12.5mm	32	75	57084	
14.0mm	38	89	57085	
16.0mm	38	89	57086	
20.0mm	38	100	57088	

Ultra-Tool® Drills are manufactured to a diameter tolerance 40% tighter than industry standards, feature unique high-productivity geometry with SmoothGrind® finishes, and are precision ground from an exclusive Ultra-Carb® material with superb wear characteristics .

phone 714.898.9224 / 800.854.2431 / fax 714.891.7816
5451 McFadden Avenue • Huntington Beach, CA 92649
ultra-tool.com

Stub Length Drills

Series 520
Short Length • 25° RH Helix
Two Flute • 118° Four Facet Point

SFR Drill Specifications:
Diameter +.0000/-.0003
Point Angle ±1°

Diam	LOF	OAL	EDP#	Available Coating
1/8	5/8	2″	52008	TA, TN, AT or TC
9/64	5/8	2-1/2	52009	
5/32	3/4	2-1/2	52010	
11/64	3/4	2-1/2	52011	
3/16	3/4	2-1/2	52012	
13/64	3/4	2-1/2	52013	
7/32	1″	2-1/2	52014	
15/64	1″	2-1/2	52015	
1/4	1″	2-1/2	52016	
17/64	1″	2-1/2	52017	
9/32	1″	2-1/2	52018	
19/64	1-1/4	2-3/4	52019	
5/16	1-1/4	2-3/4	52020	
21/64	1-1/4	2-3/4	52021	
11/32	1-1/4	3″	52022	
23/64	1-1/4	3″	52023	
3/8	1-1/4	3″	52024	
25/64	1-1/4	3″	52025	
13/32	1-1/4	3″	52026	
27/64	1-1/4	3″	52027	
7/16	1-1/4	3″	52028	
29/64	1-1/4	3″	52029	
15/32	1-1/4	3″	52030	
31/64	1-1/4	3″	52031	
1/2	1-1/4	3″	52032	

Series 520 • Metric Sizes

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

Diam	LOF	OAL	EDP#	Available Coating
3.0mm	16	50	52064	TA, TN, AT or TC
3.5mm	16	63	52065	
4.0mm	19	63	52066	
4.5mm	19	63	52067	
5.0mm	19	63	52068	
5.5mm	19	63	52069	
6.0mm	25	63	52070	
6.5mm	25	63	52071	
7.0mm	25	63	52072	
7.5mm	32	70	52073	
8.0mm	32	70	52074	
8.5mm	32	70	52075	
9.0mm	32	75	52076	
9.5mm	32	75	52077	
10.0mm	32	75	52078	
10.5mm	32	75	52079	
11.0mm	32	75	52080	
11.5mm	32	75	52081	
12.0mm	32	75	52082	
12.5mm	32	75	52083	

Specialty Drills

Series 530
Short Length • Flat Spade Drill
Two Flute • 118° Point

SFR Drill Specifications:
Diameter +.0000/-.0003
Point Angle ±1°

Diam	LOF	OAL	EDP#	Available Coating
1/16	3/8	1-1/2	53004	TA, TN, AT or TC
3/32	7/16	1-1/2	53006	
1/8	1/2	1-1/2	53008	
5/32	9/16	2″	53010	
3/16	11/16	2″	53012	
7/32	11/16	2″	53014	
1/4	13/16	2″	53016	
9/32	7/8	2″	53018	
5/16	7/8	2-1/2	53020	
11/32	15/16	2-1/2	53022	
3/8	1-1/8	2-1/2	53024	
13/32	1-1/8	2-1/2	53026	
7/16	1-3/16	2-3/4	53028	
15/32	1-3/16	3″	53030	
1/2	1-5/16	3″	53032	

Metric Diam	LOF	OAL	EDP#
3.0mm	13	38	53064
4.0mm	17	50	53066
5.0mm	17	50	53068
6.0mm	21	50	53070
7.0mm	22	50	53072
8.0mm	24	63	53074
9.0mm	28	63	53076
10.0mm	28	63	53078
11.0mm	30	70	53080
12.0mm	32	75	53082

Series 550
15° Slow RH Helix • Thick Web
Two Flute • 135° Four Facet Point

SFR Drill Specifications:
Diameter +.0000/-.0003
Point Angle ±1°

Diam	LOF	OAL	EDP#	Available Coating
1/8	7/8	2″	55008	TA, TN, AT or TC
9/64	7/8	2″	55009	
5/32	1″	2″	55010	
11/64	1″	2″	55011	
3/16	1-1/8	2-1/2	55012	
13/64	1-1/8	2-1/2	55013	
7/32	1-1/4	2-1/2	55014	
15/64	1-1/4	2-1/2	55015	
1/4	1-3/8	2-1/2	55016	
9/32	1-1/2	3″	55018	
5/16	1-5/8	3″	55020	
11/32	1-3/4	3″	55022	
3/8	1-3/4	3″	55024	
13/32	2″	3-1/2	55026	
7/16	2-1/8	3-1/2	55028	
15/32	2-1/8	4″	55030	
1/2	2-1/4	4″	55032	

Specialty Drills

Series 555
Parabolic Drill
Two Flutes • 118° Four Facet Point • 33° Helix

Diam	LOF	OAL	EDP#	Available Coating
1/16	3/4	1-1/2	15501	TA, TN, AT or TC
3/32	1″	2″	15503	
1/8	1-1/4	3″	15505	
5/32	1-1/2	3″	15507	
3/16	2″	4″	15509	
7/32	2-1/2	4″	15511	
1/4	3″	4-1/2	15513	
9/32	3-1/4	4-1/2	15514	
5/16	3-1/4	4-3/4	15515	
11/32	4″	6″	15516	
3/8	4″	6″	15517	
13/32	4″	6″	15518	
7/16	4″	6″	15519	
15/32	4″	6″	15520	
1/2	4″	6″	15521	

The Ultra Series 555 Parabolic Drill is ideal for heavy feed drilling in most materials. The open fluting, thick web construction, and fast helix design makes for deep hole drilling results.

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

SFR Drill Specifications:
Diameter +.0000/-.0003
Point Angle ±1°

Series 585
Quad Drill
Two Straight Flutes • Four Margins • 135° Point

Diam	LOF	OAL	EDP#	Available Coating
1/8	7/8	2″	15852	TA, TN, AT or TC
5/32	1″	2″	15855	
3/16	1″	2-1/2	15858	
7/32	1-1/4	2-1/2	15861	
1/4	1-3/8	2-1/2	15865	
9/32	1-1/2	3″	15878	
5/16	1-5/8	3″	15881	
11/32	1-3/4	3″	15884	
3/8	1-7/8	3″	15887	
13/32	2″	3-1/2	15890	
7/16	2-1/8	4″	15893	
15/32	2-1/8	4″	15896	
1/2	2-1/4	4″	15899	

The Ultra Series 585 Quad Drill features four lands that create a burnishing action for unsurpassed hole straightness and concentricity. Provided with a self-centering point designed for steel and cast iron.

ULTRATOOL® Solid Carbide Drill Mills

SFR Drill-Mill Specifications:
Diameter +.000/-.002
Point Angle ±1°

Series 535
Two Flute Drill Mill
Four Facet Point • 4 included angles

∅ Diam	LOF	OAL	60° EDP#	82° EDP#	90° EDP#	120° EDP#	Available Coating
1/8	1/2	1-1/2	53083	53091	53508	53099	TA, TN, AT or TC
3/16	5/8	2″	53084	53092	53512	53100	
1/4	3/4	2-1/2	53085	53093	53516	53101	
5/16	13/16	2-1/2	53086	53094	53520	53102	
3/8	1″	2-1/2	53087	53095	53524	53103	
1/2	1″	3″	53088	53096	53532	53104	
5/8	1-1/2	3-1/2	53089	53097	53536	53105	
3/4	1-1/2	4″	53090	53098	53540	53106	

new!
Additional sizes and included angles!

Series 536
Four Flute Drill Mill
Four Facet Point • 4 included angles

∅ Diam	LOF	OAL	60° EDP#	82° EDP#	90° EDP#	120° EDP#	Available Coating
1/8	1/2	1-1/2	53107	53115	53608	53123	TA, TN, AT or TC
3/16	5/8	2″	53108	53116	53612	53124	
1/4	3/4	2-1/2	53109	53117	53616	53125	
5/16	13/16	2-1/2	53110	53118	53620	53126	
3/8	1″	2-1/2	53111	53119	53624	53127	
1/2	1″	3″	53112	53120	53632	53128	
5/8	1-1/2	3-1/2	53113	53121	53636	53129	
3/4	1-1/2	4″	53114	53122	53640	53130	

Our manufacturing system is designed to give our customers consistency in product from order to order, and application to application.

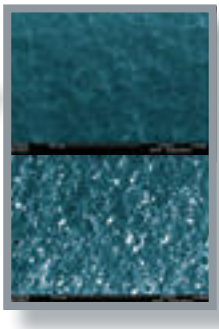
Coating Spotlight • SmoothCoat TA

Ultra's TiAlN coating is the all-around workhorse of our SmoothCoat selections. First, a brief word regarding the two types of PVD coating, "sputter" and "arc." SmoothCoat is a sputter-based process and, unlike arc, the materials to be deposited on the tools are not melted down, but rather transferred directly from a solid to a gaseous state. This means that zero "droplets" (bead-shaped macro particals) form on the tool surface, leading to the smoothest surface possible. Why doesn't everyone use sputter technology? The answer is it takes longer (i.e. more expense, and toll coaters can't do as many loads in a day).

Classified as a Supernitride type of PVD, our TA nanocomposite coating has low residual stress which provides excellent adhesion and stability. Even with thickness of 3-4 microns, sharpness is retained on the cutting edge with corresponding low friction at the work piece material level. This true performance coating can withstand application temperatures of 1000°C, has a microhardness of over 3500HV, and can be used wet or dry over a wide variety of applications and materials. SmoothCoat TA is available standard on thousands of items in this catalog... try it today!

'SECRET MENU' ITEM: TA is so smooth with such great adhesion and low stress levels that we can effectively "double-up" the thickness level to 6-8 microns! We call this "A2" and use it in special applications, primarily within our Mil-Tec indexable carbide product line. However, with our SmoothGrind so sharp and our sputter technology so precise on layering the underlying tool, we can retain an amazingly precise cutting edge feature. Consider A2 in heavy wear apps and roughing cuts where chip load per tooth is maximized. Ask your inside sales rep for it by name.

SmoothCoat®



Our coating magnified to 2,000X (top). Everybody else's (bottom).
Our sputter technology has no droplets and features a smooth, clean surface.

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ultra-tool.com

Tool Alliance®: Ready, Set, Cut!™

About the brands of Tool Alliance® For more info contact sales@toolalliance.com

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

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Proven daily by the linear foot.™

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About the technology partners of Tool Alliance®

Our technology partners are second to none. We find premier 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 factory buildings and equipment base promise long-term stability & consistency in delivering Performance & Solutions to carbide rotary tooling consumers everywhere.

5-axis VMC control

Substrate, abrasive, coolants & workholding

Grinding centers

Coating systems

Robotics

CNC grinder control

ULTRATOOL® Carbide Rotary Files (Burrs)

Cut Style #1

Standard Cut is a general purpose style designed for cast iron, steel, other ferrous materials. It will achieve very high material removal rates and good workpiece finishes. The second most popular style after Dura-Cut.

☆ Stocked Inventory

#2

Fine Cut improves finishes on hardened steel, stainless steel, and cast iron. Operator control is improved. The excellent finish, however, comes with reduced stock removal rates.

#3

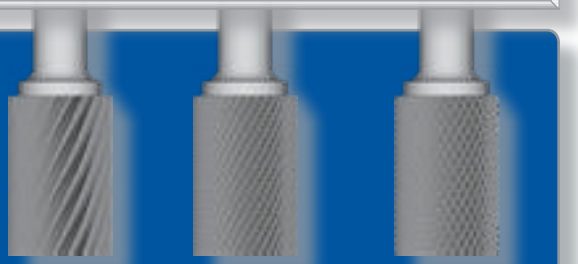
Coarse Cut is recommended for use on soft material such as copper, brass, aluminum, plastics, and rubber, where chip loading is a problem, and the rapid stock removal rates of Fast-Mill is not practical.

Available by Special Order

#4

Dura-Cut allows for rapid stock removal in harder materials. The addition of left hand flutes reduces the pulling action, allowing better operator control. It reduces the size of the chips and can be used at slower than normal speeds.

☆ Stocked Inventory



#5

Coarse-Dura Cut is for fast stock removal in soft materials, with improved operator control over Coarse Cut. The addition of the left-hand Dura also reduces chip size.

#6

Fine-Dura Cut is very effective in heat treated and tough alloy steels. The Dura addition reduces the size of the chips and offers excellent operator control and surface finish.

#8

Diamond Cut is very effective in heat treated and tough alloy steels, making extremely small, powder-like chips. It offers very good operator control and stock removal at the sacrifice of some finish and tool life characteristics.

Available by Special Order

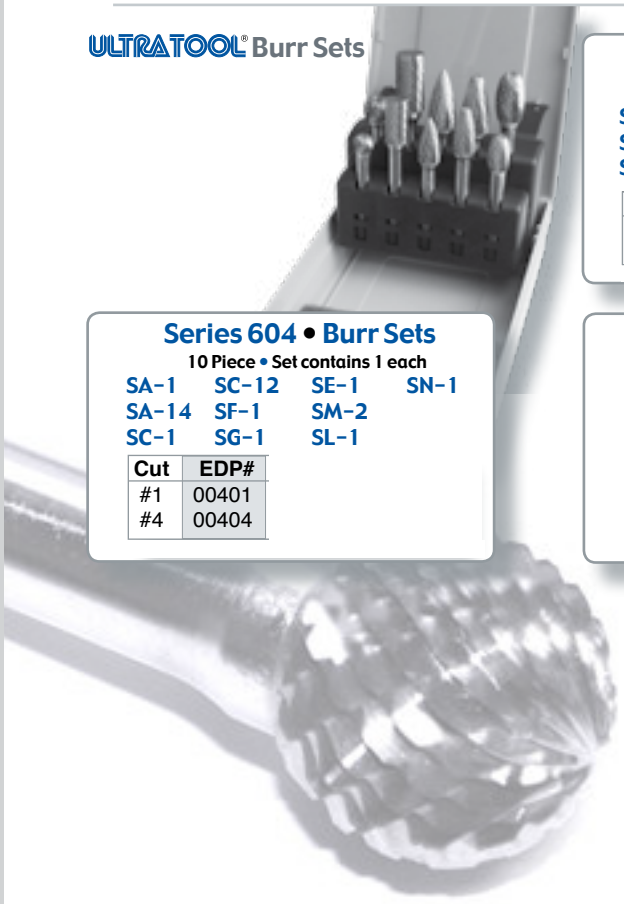
new! TA

Only Ultra-Tool® offers a full range of cut styles for your specific application needs. Primary stocking styles are #1 Standard and #4 Dura-Cut; other styles available upon quotation / POA. All styles are precision CNC ground to the best quality standards for a truly high-end product. Now available with TA coating as standard.

ULTRATOOL® BURRS & SETS ALSO AVAILABLE IN METRIC CONFIGURATION:
Furnished on 6mm or 3mm shanks. Add 70000 to displayed EDP# (#04001 becomes #74001). Add "M" to Style description (SA-5 becomes MSA-5). Two-piece construction burrs retain fractional head diameters & LOC.

OAL Information for Series 40 thru 53: All burrs with body diameter of greater than 1/4" have Ultra-Carb heads brazed to a 1.75" or 2" hardened steel shank with a 1/4" or 6mm diameter unless otherwise noted. All burrs with a body diameter of 1/4" or less are manufactured from solid Ultra-Carb and are 2-inch (51mm) overall length.

ULTRATOOL® Burr Sets



Series 600 • Burr Sets

12 Piece • Set contains 1 each

SA-43 SA-42 SC-42 SD-42
SE-41 SF-42 SF-41 SG-41
SM-43 SH-41 SN-42 SL-41

Cut	EDP#
#1	00001
#4	00004

Series 601 • Burr Sets

9 Piece • Set contains 1 each

SA-51 SB-51 SC-51
SD-51 SE-51 SF-51
SG-51 SM-51 SN-51

Cut	EDP#
#1	00101
#4	00104

Series 604 • Burr Sets

10 Piece • Set contains 1 each

SA-1 SC-12 SE-1 SN-1
SA-14 SF-1 SM-2
SC-1 SG-1 SL-1

Cut	EDP#
#1	00401
#4	00404

Series 605 • Burr Sets

9 Piece • Set contains 1 each

SA-1 SC-1 SF-1
SA-3 SC-3 SF-3
SA-5 SC-5 SF-5

Cut	EDP#
#1	00501
#4	00504

Series 606 • Burr Sets

10 Piece • Set contains 1 each

SA-5 SF-5 SG-3 SD-5
SC-5 SF-3 SE-3
SC-3 SG-5 SL-4

Cut	EDP#
#1	00601
#4	00604

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ultra-tool.com

ULTRATOOL® Carbide Rotary Files (Burrs)

Series 40

SB Style: Cylindrical Shape with End Cut

Burr Specifications:
Shank Diameter 1/4"
Add "M" for 6mm shank

Tool Name	Diam	LOC	#1 Standard EDP#	#4 DuraCut EDP#
SB-12	1/8	5/8	04001	04049
SB-14	3/16	5/8	04002	04050
SB-1	1/4	5/8	04003	04051
SB-1A	1/4	1"	04004	04052
SB-2	5/16	3/4	04005	04053
SB-2A	5/16	1"	04006	04054
SB-3	3/8	3/4	04007	04055
SB-3A	3/8	1"	04008	04056
SB-3B	3/8	1-1/2	04009	04057
SB-4	7/16	1"	04010	04058
SB-5	1/2	1"	04011	04059
SB-6	5/8	1"	04012	04060
SB-15	3/4	1/2	04013	04061
SB-16	3/4	3/4	04014	04062
SB-7	3/4	1"	04015	04063
SB-9	1"	1"	04016	04064

Series 41

SA Style: Cylindrical Shape

Burr Specifications:
Shank Diameter 1/4"
Add "M" for 6mm shank

Tool Name	Diam	LOC	#1 Standard EDP#	#4 DuraCut EDP#
SA-12	1/8	5/8	04101	04149
SA-14	3/16	5/8	04102	04150
SA-1	1/4	5/8	04103	04151
SA-1A	1/4	1"	04104	04152
SA-2	5/16	3/4	04105	04153
SA-2A	5/16	1"	04106	04154
SA-3	3/8	3/4	04107	04155
SA-3A	3/8	1"	04108	04156
SA-3B	3/8	1-1/2	04109	04157
SA-4	7/16	1"	04110	04158
SA-5	1/2	1"	04111	04159
SA-6	5/8	1"	04112	04160
SA-15	3/4	1/2	04113	04161
SA-16	3/4	3/4	04114	04162
SA-7	3/4	1"	04115	04163
SA-9	1"	1"	04116	04164

Series 42

SC Style: Cylindrical Ball Nose Shape

Burr Specifications:
Shank Diameter 1/4"
Add "M" for 6mm shank

Tool Name	Diam	LOC	#1 Standard EDP#	#4 DuraCut EDP#
SC-12	1/8	5/8	04201	04249
SC-14	3/16	5/8	04202	04250
SC-1	1/4	5/8	04203	04251
SC-1A	1/4	1"	04204	04252
SC-2	5/16	3/4	04205	04253
SC-2A	5/16	1"	04206	04254
SC-3	3/8	3/4	04207	04255
SC-3A	3/8	1"	04208	04256
SC-3B	3/8	1-1/2	04209	04257
SC-4	7/16	1"	04210	04258
SC-5	1/2	1"	04211	04259
SC-6	5/8	1"	04212	04260
SC-7	3/4	1"	04215	04263

Series 43

SD Style: Ball Shape

Burr Specifications:
Shank Diameter 1/4"
Add "M" for 6mm shank

Tool Name	Diam	LOC	#1 Standard EDP#	#4 DuraCut EDP#
SD-12	1/8	7/64	04301	04349
SD-14	3/16	11/64	04302	04350
SD-1	1/4	7/32	04303	04351
SD-2	5/16	17/64	04305	04353
SD-3	3/8	5/16	04307	04355
SD-4	7/16	3/8	04310	04358
SD-5	1/2	7/16	04311	04359
SD-6	5/8	17/32	04312	04360
SD-7	3/4	21/32	04315	04363
SD-9	1"	29/32	04316	04364

Series 44

SE Style: Egg Shape

Burr Specifications:
Shank Diameter 1/4"
Add "M" for 6mm shank

Tool Name	Diam	LOC	#1 Standard EDP#	#4 DuraCut EDP#
SE-11	3/16	5/16	04402	04450
SE-1	1/4	3/8	04403	04451
SE-3	3/8	5/8	04407	04455
SE-5	1/2	7/8	04411	04459
SE-6	5/8	1"	04412	04460
SE-7	3/4	1"	04415	04463

Series 45

SF Style: Round Tree Shape

Burr Specifications:
Shank Diameter 1/4"
Add "M" for 6mm shank

Tool Name	Diam	LOC	#1 Standard EDP#	#4 DuraCut EDP#
SF-1	1/4	5/8	04503	04551
SF-3	3/8	3/4	04507	04555
SF-13	1/2	3/4	04510	04558
SF-5	1/2	1"	04511	04559
SF-6	5/8	1"	04512	04560
SF-7	3/4	1"	04515	04563
SF-14	3/4	1-1/4	04516	04564
SF-15	3/4	1-1/2	04517	04565

Series 46

SG Style: Pointed Tree Shape

Burr Specifications:
Shank Diameter 1/4"
Add "M" for 6mm shank

Tool Name	Diam	LOC	#1 Standard EDP#	#4 DuraCut EDP#
SG-1	1/4	5/8	04603	04651
SG-2	5/16	3/4	04605	04653
SG-3	3/8	5/8	04607	04655
SG-13	1/2	3/4	04610	04658
SG-5	1/2	1"	04611	04659
SG-6	5/8	1"	04612	04660
SG-7	3/4	1"	04615	04663
SG-15	3/4	1-1/2	04617	04665

Series 47

SM Style: Cone Shape

Burr Specifications:
Shank Diameter 1/4"
Add "M" for 6mm shank

Tool Name	Diam	Inc Ang	LOC	#1 Standard EDP#	#4 DuraCut EDP#
SM-1	1/4	22°	1/2	04703	04751
SM-2	1/4	14°	3/4	04705	04753
SM-3	1/4	10°	1"	04707	04755
SM-3A	1/4	8°	1-1/4	04710	04758
SM-4	3/8	28°	5/8	04711	04759
SM-5	1/2	28°	7/8	04712	04760
SM-6	5/8	31°	1"	04715	04763

Series 48

SL Style: 14° Included Angle Shape

Burr Specifications:
Shank Diameter 1/4"
Add "M" for 6mm shank

Tool Name	Diam	LOC	#1 Standard EDP#	#4 DuraCut EDP#
SL-1	1/4	5/8	04802	04850
SL-2	5/16	7/8	04803	04851
SL-3	3/8	1-1/16	04807	04855
SL-4	1/2	1-1/8	04811	04859
SL-6	5/8	1-5/16	04812	04860
SL-7	3/4	1-1/2	04815	04863

Series 49

SH Style: Flame Shape

Burr Specifications:
Shank Diameter 1/4"
Add "M" for 6mm shank

Tool Name	Diam	LOC	#1 Standard EDP#	#4 DuraCut EDP#
SH-1	1/4	5/8	04902	04950
SH-2	5/16	3/4	04903	04951
SH-5	1/2	1-1/4	04907	04955
SH-6	5/8	1-7/16	04911	04959
SH-7	3/4	1-5/8	04912	04960

Series 50

SK Style: 90° Included Angle Shape

Burr Specifications:
Shank Diameter 1/4"
Add "M" for 6mm shank

Tool Name	Diam	LOC	#1 Standard EDP#	#4 DuraCut EDP#
SK-1	1/4	1/8	05003	05051
SK-2	5/16	5/32	05005	05053
SK-3	3/8	3/16	05007	05055
SK-5	1/2	1/4	05010	05058
SK-6	5/8	5/16	05011	05059
SK-7	3/4	3/8	05012	05060
SK-8	7/8	7/16	05015	05063
SK-9	1"	1/2	05017	05065

Series 51

SJ Style: 60° Included Angle Shape

Burr Specifications:
Shank Diameter 1/4"
Add "M" for 6mm shank

Tool Name	Diam	LOC	#1 Standard EDP#	#4 DuraCut EDP#
SJ-1	1/4	3/16	05103	05151
SJ-2	5/16	1/4	05105	05153
SJ-3	3/8	1/4	05107	05155
SJ-5	1/2	7/16	05110	05158
SJ-6	5/8	1/2	05111	05159
SJ-7	3/4	5/8	05112	05160
SJ-8	7/8	3/4	05115	05163
SJ-9	1"	3/4	05117	05165

Series 52

SN Style: Inverted Cone Shape

Burr Specifications:
Shank Diameter 1/4"
Add "M" for 6mm shank

Tool Name	Diam	LOC	#1 Standard EDP#	#4 DuraCut EDP#
SN-1	1/4	5/16	05202	05250
SN-2	3/8	3/8	05203	05251
SN-3	1/2	1/2	05207	05255
SN-6	5/8	3/4	05211	05259
SN-7	3/4	5/8	05212	05260

Series 53

SN-E Style: Inverted Cone Shape with End Cut

Burr Specifications:
Shank Diameter 1/4"
Add "M" for 6mm shank

Tool Name	Diam	LOC	#1 Standard EDP#	#4 DuraCut EDP#
SN-1E	1/4	5/16	05302	05350
SN-2E	3/8	3/8	05303	05351
SN-3E	1/2	1/2	05307	05355
SN-6E	5/8	3/4	05311	05359
SN-7E	3/4	5/8	05312	05360

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ULTRATOOL® Solid Carbide Construction Burrs • 1/16 to 3/16" Diameter

Series 59 Solid Carbide Construction • 1-1/2" OAL • 1/8" Diameter Shank

For Metric sizing (1.5mm – 3.0mm Diam, 38mm OAL, 3mm shank), add 70000 to displayed EDP.

ULTRA-Carb® TA

Burr Specifications:
Shank Diameter 1/8"
Add "M" for 3mm shank

SA-43 • 1/8 x 9/16

Cut	EDP#
#1	05901
#4	05904

SD-42 • 1/8 Ball

Cut	EDP#
#1	05949
#4	05952

SF-42 • 1/8 x 1/2

Cut	EDP#
#1	05997
#4	15901

SM-42 • 1/8 x 7/16 14° IncTaper

Cut	EDP#
#1	15946
#4	15949

SA-42 • 3/32 X 7/16

Cut	EDP#
#1	05909
#4	05912

SD-41 • 3/32 Ball

Cut	EDP#
#1	05957
#4	05960

SF-41 • 1/8 X 1/4

Cut	EDP#
#1	15906
#4	15909

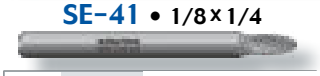
SM-43 • 1/8 x 5/8 7° IncTaper

Cut	EDP#
#1	15954
#4	15957

SA-41 • 1/16 x 1/4

Cut	EDP#
#1	05917
#4	05920

SE-41 • 1/8 x 1/4

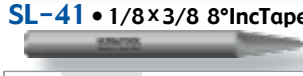


Cut	EDP#
#1	05965
#4	05968

SG-44 • 1/8 x 1/2

Cut	EDP#
#1	15914
#4	15917

SL-41 • 1/8 x 3/8 8° IncTaper



Cut	EDP#
#1	15962
#4	15965

SB-41 • 1/8

Cut	EDP#
#1	05925

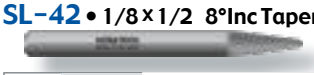
SH-41 • 1/8 x 1/4

Cut	EDP#
#1	05973
#4	05976

SG-43 • 1/8 x 3/8

Cut	EDP#
#1	15922
#4	15925

SL-42 • 1/8 x 1/2 8° Inc Taper



Cut	EDP#
#1	15970
#4	15973

SC-42 • 1/8 x 9/16

Cut	EDP#
#1	05933
#4	05936

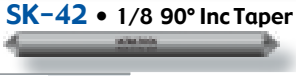
SN-42 • 1/8 x 3/16

Cut	EDP#
#1	05981
#4	05984

SG-41 • 1/8 x 1/4

Cut	EDP#
#1	15930
#4	15933

SK-42 • 1/8 90° Inc Taper



Cut	EDP#
#1	15978
#4	15981

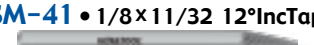
SC-41 • 3/32 x 7/16

Cut	EDP#
#1	05941
#4	05944

SN-41 • 3/32 x 1/8

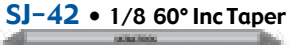
Cut	EDP#
#1	05989
#4	05992

SM-41 • 1/8 x 11/32 12° IncTaper



Cut	EDP#
#1	15938
#4	15941

SJ-42 • 1/8 60° Inc Taper



Cut	EDP#
#1	15986
#4	15989

Series 71 Solid Carbide Construction • 2" OAL • 1/8" Diameter Shank

For Metric sizing (4mm & 4.75mm Diam, 51mm OAL, 3mm shank), add 70000 to displayed EDP.

ULTRA-Carb® TA

Burr Specifications:
Shank Diameter 1/8"
Add "M" for 3mm shank

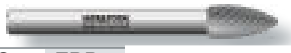
SA-53 • 3/16 x 1/2" LOC

Cut	EDP#
#1	07101
#4	07104

SN-53 • 3/16 x 1/4 10° IncTaper

Cut	EDP#
#1	07135
#4	07138

SH-53 • 3/16 x 3/8" LOC

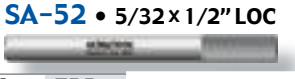


Cut	EDP#
#1	07159
#4	07162

SG-53 • 3/16 x 1/2" LOC

Cut	EDP#
#1	07183
#4	07186

SA-52 • 5/32 x 1/2" LOC



Cut	EDP#
#1	07109
#4	07122

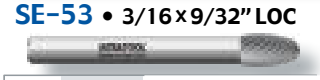
SC-53 • 3/16 x 1/2" LOC

Cut	EDP#
#1	07143
#4	07146

SM-53 • 3/16 x 1/2 16° IncTaper

Cut	EDP#
#1	07167
#4	07170

SE-53 • 3/16 x 9/32" LOC

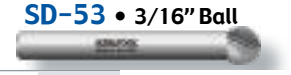


Cut	EDP#
#1	07191
#4	07194

SF-53 • 3/16 x 1/2" LOC

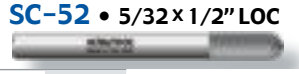
Cut	EDP#
#1	07127
#4	07130

SD-53 • 3/16" Ball



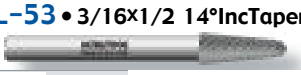
Cut	EDP#
#1	07151
#4	07154

SC-52 • 5/32 x 1/2" LOC



Cut	EDP#
#1	07175
#4	07178

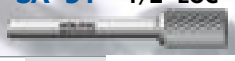
SL-53 • 3/16 x 1/2 14° IncTaper



Cut	EDP#
#1	07300
#4	07303

ULTRATOOL® Carbide Rotary Files (Burrs)

SA-51 • 1/2" LOC



Cut	EDP#
#1	07001
#4	07004

Series 70 1/4" Diameter Carbide Head • 1/8" Steel Shank • 2" max OAL

For Metric sizing, add 70000 to displayed EDP #. Diameter = 6.4mm, 3.0mm Shank, 38mm Shank Length

ULTRA-Carb® TA

Burr Specifications:
Shank Diameter 1/8"
Add "M" for 3mm shank

All Cut Styles available with TA coating.

SB-51 • 3/16" LOC

Cut	EDP#
#1	07009
#4	07022

SC-51 • 1/2" LOC

Cut	EDP#
#1	07035
#4	07038

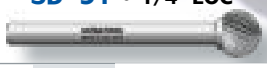
SG-51 • 1/2" LOC

Cut	EDP#
#1	07051
#4	07054

SE-51 • 3/8" LOC

Cut	EDP#
#1	07067
#4	07070

SD-51 • 1/4" LOC



Cut	EDP#
#1	07027
#4	07030

SF-51 • 1/2" LOC

Cut	EDP#
#1	07043
#4	07046

SM-51 • 1/2" LOC 22°

Cut	EDP#
#1	07059
#4	07062

SN-51 • 1/4" LOC 10°

Cut	EDP#
#1	07075
#4	07078

ULTRATOOL® Fast Mill Non-Ferrous Cut Carbide Rotary Files (Burrs)

Cut #7 Non-Ferrous Cut Style • 1/4" Shank

For Metric sizing, add 70000 to displayed EDP#; shank diameter = 6.0mm.

Fast-Mill is designed specifically for use on non-ferrous and non-metal materials. Designed for rapid stock removal with minimum chip load. The best selection for rapid removal of aluminum. These tools more resemble form tools than traditional burrs; each is CNC ground with with high precision, tight tolerances, and superb surface finishes.

TC

Our #7 Fast Mill non-ferrous cut is available with TC (or A1 upon request) coating.

Burr Specifications:
Shank Diameter 1/4"
Add "M" for 6mm shank

ULTRA-Carb® #7 cut

Style	# flutes	FastMill EDP#	Available Coating
SA-1 #7	6	04199	TC
SA-3 #7	6	14104	
SA-5 #7	8	14108	
SB-1 #7	6	04099	
SB-3 #7	6	14004	
SB-5 #7	8	14008	
SC-1 #7	6	04299	
SC-3 #7	6	14204	
SC-5 #7	8	14208	
SD-1 #7	6	04399	
SD-3 #7	6	14303	
SD-5 #7	8	14308	
SE-3 #7	6	14403	
SE-5 #7	8	14408	
SF-1 #7	6	04599	
SF-3 #7	6	14503	
SF-5 #7	8	14508	
SF-5 #7spl	6	14506	
SF-14 #7	12	14513	
SL-3 #7	6	14803	
SL-4 #7	8	14808	

ULTRATOOL® BURRS & SETS ALSO AVAILABLE IN METRIC CONFIGURATION:
Furnished on 6mm or 3mm shanks. Add 70000 to displayed EDP# (#04001 becomes #74001). Add "M" to Style description (SA-5 becomes MSA-5). Two-piece construction burrs retain fractional head diameters & LOC.

phone 714.898.9224 / 800.854.2431 / fax 714.891.7816
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ultra-tool.com

Extended Length ULTRATOOL® Burrs

SB, SA, SC, SD, SE, SF, SG, SH & SL Styles with 6" Extended Length Shanks

Series 54

Our most popular burr shapes & cut styles are now offered with 6" long shanks for extended reach.
Also available with 6mm diameter metric shanks (add 70000 to displayed EDP# or "M" to tool name).

Burr Specifications:
Shank Diameter 1/4"
Add "M" for 6mm shank

Tool Name	Diam	LOC	#1 Standard EDP#	#4 DuraC EDP#	#8 Diamond EDP#
SB-1L6	1/4	1/2	03024	03050	03076
SB-3L6	3/8	3/4	03025	03051	03077
SB-5L6	1/2	1"	03026	03052	03078
SA-1L6	1/4	1/2	03001	03027	03053
SA-3L6	3/8	3/4	03002	03028	03054
SA-5L6	1/2	1"	03003	03029	03055
SC-1L6	1/4	1/2	03004	03030	03056
SC-3L6	3/8	3/4	03005	03031	03057
SC-5L6	1/2	1"	03006	03032	03058
SD-1L6	1/4	7/32	03007	03033	03059
SD-3L6	3/8	5/16	03008	03034	03060
SD-5L6	1/2	7/16	03009	03035	03061
SE-1L6	1/4	3/8	03010	03036	03062
SE-3L6	3/8	5/8	03011	03037	03063
SE-5L6	1/2	7/8	03012	03038	03064
SF-1L6	1/4	1/2	03013	03039	03065
SF-3L6	3/8	3/4	03014	03040	03066
SF-5L6	1/2	1"	03015	03041	03067
SG-1L6	1/4	1/2	03016	03042	03068
SG-3L6	3/8	3/4	03017	03043	03069
SG-5L6	1/2	1"	03018	03044	03070
SH-2L6	5/16	3/4	03019	03045	03071
SH-5L6	1/2	1-1/4	03020	03046	03072
SL-1L6	1/4	5/8	03021	03047	03073
SL-3L6	3/8	1-1/16	03022	03048	03074
SL-4L6	1/2	1-1/8	03023	03049	03075

Solid Carbide ULTRATOOL® Piloted Die Trimmers

new!

Series 341

Solid Carbide Piloted Die Trimmers
Double "Dura-Cut" Style • Right Hand Cut • Non-Cutting Pilot

These die trimming burrs have a cylindrical, non-cutting pilot with OD tolerance of +.0000 / -.0003 (before coating) to prevent scoring of the die beyond the intended work area. The double Dura-Cut style allows for easy operator control and rapid material removal. Available UnCoated (UC) or with TA SmoothCoat.

ULTRA-Grain®

Diam	LOC	Pilot Lgth	OAL	Shank	EDP#	Available Coating
1/8	1"	1/2	2-1/2	1/8	34168	TA
3/16	1"	1/2	2-1/2	3/16	34169	
1/4	1"	1/2	2-1/2	1/4	34170	
1/4	1"	1/2	3"	1/4	34171	
3/8	1"	1/2	2-1/2	3/8	34172	
1/2	1"	1/2	2-1/2	1/2	34173	

ULTRA-Grain®

Diam	LOC	Pilot Lgth	OAL	Shank	EDP#	Available Coating
3.0mm	25	12	63	3.0	34174	TA
4.0mm	25	12	63	4.0	34175	
5.0mm	25	12	63	5.0	34176	
6.0mm	25	12	63	6.0	34177	
8.0mm	25	12	63	8.0	34178	
10.0mm	25	12	70	10.0	34179	

ULTRATOOL® Solid Carbide Engraving Tools

new!

Series 651
Single End Half Round Right Hand Engraving Cutters

Use these half round style cutters for engraving in a wide application range featuring 6 end styles, 3 included angles, and matched with 3 coatings for extended wear.

SFR Engraving Blank Specs:
Split +.001/-.000 over center
Diam +.0000/-.0003 OAL ±.060

∅ Diam	Flat	Split Length	OAL	Shank	30° EDP#	60° EDP#	90° EDP#
1/8	.000(P)	3/8	1-1/2	1/8	65122	65141	65179
1/8	.005	3/8	1-1/2	1/8	65124	65142	65181
1/8	.010	3/8	1-1/2	1/8	65125	65143	65182
1/8	.015	3/8	1-1/2	1/8	65126	65144	65183
1/8	.020	3/8	1-1/2	1/8	65127	65145	65184
1/8	.030	3/8	1-1/2	1/8	65128	65146	65185
3/16	.000(P)	3/8	2"	3/16	65129	65147	65186
3/16	.005	3/8	2"	3/16	65130	65148	65187
3/16	.010	3/8	2"	3/16	65131	65149	65188
3/16	.015	3/8	2"	3/16	65132	65153	65189
3/16	.020	3/8	2"	3/16	65133	65154	65190
3/16	.030	3/8	2"	3/16	65134	65155	65191
1/4	.000(P)	3/8	2-1/2	1/4	65135	65162	65192
1/4	.005	3/8	2-1/2	1/4	65136	65174	65193
1/4	.010	3/8	2-1/2	1/4	65137	65175	65194
1/4	.015	3/8	2-1/2	1/4	65138	65176	65195
1/4	.020	3/8	2-1/2	1/4	65139	65177	65196
1/4	.030	3/8	2-1/2	1/4	65140	65178	65197

Available Coating
TA, A1 or D1

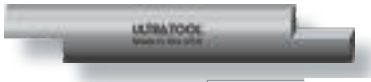
ULTRATOOL® Solid Carbide Engraving Blanks

Series 652
Ground & Polished Carbide Round Blanks • Split Both Ends

Use these precision ground double-ended half round split blanks for modification into special cutters. Featuring pure Ultra-Grain for extended wear and chipping resistance.

ULTRA-Grain®

SFR Engraving Blank Specs:
Split +.001/-.000 over center
Diam +.0000/-.0003 OAL ±.060



Diam	OAL	Split	EDP#
1/8	1-1/2	1/4	65203
1/8	2"	1/4	65204
1/8	3"	1/4	65205
1/8	4"	1/4	65206
1/8	6"	1/4	65207
3/16	2"	1/4	65208
3/16	3"	1/4	65209
3/16	4"	1/4	65210
3/16	6"	1/4	65211
1/4	2"	3/8	65212
1/4	2-1/2	3/8	65213
1/4	3"	3/8	65214
1/4	4"	3/8	65215
1/4	6"	3/8	65216
5/16	2-1/2	3/8	65217
5/16	3"	3/8	65218
5/16	4"	3/8	65219
5/16	6"	3/8	65220
3/8	2-1/2	1/2	65221
3/8	3"	1/2	65222
3/8	4"	1/2	65223
3/8	6"	1/2	65224
7/16	2-3/4	1/2	65225
7/16	3"	1/2	65226
7/16	4"	1/2	65227
7/16	6"	1/2	65228
1/2	3"	1/2	65229
1/2	4"	1/2	65230
1/2	6"	1/2	65231

Series 652 • Metric
Ground & Polished Carbide Round Blanks • Split Both Ends

Diam	OAL	Split	EDP#
3.0mm	38	6	65232
3.0mm	75	6	65233
4.0mm	50	6	65234
4.0mm	75	6	65235
5.0mm	50	6	65236
5.0mm	75	6	65237
6.0mm	50	9	65238
6.0mm	75	9	65239
7.0mm	60	9	65240
8.0mm	63	9	65241
8.0mm	100	9	65242
9.0mm	63	12	65243
10.0mm	70	12	65244
10.0mm	100	12	65245
12.0mm	74	12	65246
12.0mm	100	12	65247

SFR Engraving Blank Specs (Metric):
Split +0.025/-0.000mm over center
Diam +0.000/-0.007mm
OAL ±1.52mm

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ULTRATOOL® Precision Ground & Polished Solid Carbide Blanks

new!

ULTRA-Grain®

Series 650
Solid Carbide Blanks

Diam	Dec.	OAL	EDP#
#69	.0292	1-1/4	65301
#68	.0310	1-1/4	65302
1/32	.0312	1-1/4	65303
#67	.0320	1-1/4	65304
#66	.0330	1-1/4	65305
#65	.0350	1-1/2	65306
#64	.0360	1-1/2	65307
#63	.0370	1-1/2	65308
#62	.0380	1-1/2	65309
#61	.0390	1-1/2	65310
#60	.0400	1-1/2	65312
#59	.0410	1-1/2	65313
#58	.0420	1-1/2	65314
#57	.0430	1-1/2	65315
#56	.0465	1-1/2	65316
3/64	.0469	1-1/2	65317
#55	.0520	1-1/2	65318
#54	.0550	1-1/2	65319
#53	.0595	1-1/2	65321
1/16	.0625	1-1/2	65001
#52	.0635	1-1/2	65322
#51	.0670	1-3/4	65323
#50	.0700	1-3/4	65325
#50	.0700	2"	65324
#49	.0730	1-3/4	65327
#49	.0730	2"	65326
#48	.0760	1-3/4	65329
#48	.0760	2"	65328
5/64	.0781	1-3/4	65331
5/64	.0781	2"	65330
#47	.0785	1-3/4	65333
#47	.0785	2"	65332
#46	.0810	1-3/4	65337
#46	.0810	2"	65336
#45	.0820	1-3/4	65339
#45	.0820	2"	65338
#44	.0860	2"	65340
#43	.0890	2"	65341
#42	.0935	2"	65342
3/32	.0938	2"	65002
#41	.0960	2"	65343
#40	.0980	2"	65344
#39	.0995	2-1/4	65346
#38	.1015	2-1/4	65347
#37	.1040	2-1/4	65348
#36	.1065	2-1/4	65349
7/64	.1094	2-1/4	65036
#35	.1100	2-1/4	65350
#34	.1110	2-1/4	65351
#33	.1130	2-1/4	65352
#32	.1160	2-1/4	65353
#31	.1200	2-1/4	65355
1/8	.1250	1-1/2	65003

Diam	Dec.	OAL	EDP#
1/8	.1250	2"	65004
1/8	.1250	2-1/4	65037
1/8	.1250	3"	65005
1/8	.1250	4"	65006
1/8	.1250	6"	65007
1/8	.1250	12"	65038
#30	.1285	2-1/4	65356
#29	.1360	2-1/2	65357
#28	.1405	2-1/2	65359
9/64	.1406	2-1/2	65039
#27	.1440	2-1/2	65360
#26	.1470	2-1/2	65361
#25	.1495	2-1/2	65362
#24	.1520	2-1/2	65363
#23	.1540	2-1/2	65364
5/32	.1562	2-1/2	65040
#22	.1570	2-1/2	65365
#21	.1590	2-1/2	65367
#20	.1610	2-1/2	65368
#19	.1660	2-3/4	65369
#18	.1695	2-3/4	65370
11/64	.1719	2-1/2	65372
11/64	.1719	2-3/4	65041
#17	.1730	2-3/4	65373
#16	.1770	2-3/4	65374
#15	.1800	2-1/2	65450
#15	.1800	2-3/4	65376
#14	.1820	2-1/2	65451
#14	.1820	2-3/4	65377
#13	.1850	2-1/2	65452
#13	.1850	2-3/4	65378
3/16	.1875	2"	65008
3/16	.1875	2-1/2	65042
3/16	.1875	2-3/4	65043
3/16	.1875	3"	65009
3/16	.1875	4"	65010
3/16	.1875	6"	65011
3/16	.1875	12"	65044
#12	.1890	2-1/2	65453
#12	.1890	2-3/4	65379
#11	.1910	2-1/2	65454
#11	.1910	2-3/4	65380
#10	.1935	2-3/4	65381
#9	.1960	3"	65382
#8	.1990	3"	65384
#7	.2010	3"	65385
13/64	.2031	2-1/2	65386
13/64	.2031	3"	65045
#6	.2040	3"	65387
#5	.2055	3"	65388
#4	.2090	3"	65389
#3	.2130	3"	65390
7/32	.2188	2-1/2	65392
7/32	.2188	3"	65046
#2	.2210	3"	65393
#1	.2280	3-1/4	65394
A	.2340	2-1/2	65482
A	.2340	3-1/4	65395
15/64	.2344	2-1/2	65396
15/64	.2344	3-1/4	65047
B	.2380	2-1/2	65483
B	.2380	3-1/4	65399

Diam	Dec.	OAL	EDP#
C	.2420	2-1/2	65484
C	.2420	3-1/4	65400
D	.2460	2-1/2	65485
D	.2460	3-1/4	65401
1/4	.2500	2"	65012
1/4	.2500	2-1/2	65013
1/4	.2500	3"	65014
1/4	.2500	3-1/4	65048
1/4	.2500	4"	65015
1/4	.2500	6"	65016
1/4	.2500	12"	65049
F	.2570	2-1/2	65487
F	.2570	3-1/2	65403
G	.2610	2-1/2	65488
G	.2610	3-1/2	65404
17/64	.2656	2-1/2	65405
17/64	.2656	3-1/2	65050
H	.2660	2-1/2	65489
H	.2660	3-1/2	65406
I	.2720	2-1/2	65490
I	.2720	3-1/2	65407
J	.2770	2-1/2	65491
J	.2770	3-1/2	65409
K	.2810	2-1/2	65492
K	.2810	3-1/2	65410
9/32	.2812	2-1/2	65411
9/32	.2812	3-1/2	65051
L	.2900	2-1/2	65493
L	.2900	3-3/4	65412
M	.2950	2-1/2	65494
M	.2950	3-3/4	65413
19/64	.2969	2-1/2	65415
19/64	.2969	3-3/4	65052
N	.3020	2-1/2	65495
N	.3020	3-3/4	65416
5/16	.3125	2-1/2	65017
5/16	.3125	2-3/4	65417
5/16	.3125	3"	65018
5/16	.3125	3-3/4	65053
5/16	.3125	4"	65019
5/16	.3125	6"	65020
5/16	.3125	12"	65054
O	.3160	2-1/2	65496
O	.3160	3-3/4	65420
P	.3230	2-1/2	65497
P	.3230	4"	65421
21/64	.3281	3"	65508
21/64	.3281	4"	65055
Q	.3320	3"	65498
Q	.3320	4"	65422
R	.3390	3"	65499
R	.3390	4"	65424
11/32	.3438	3"	65425
11/32	.3438	4"	65056
S	.3480	3"	65500
S	.3480	4"	65426
T	.3580	3"	65501
T	.3580	4-1/4	65428
23/64	.3594	4-1/4	65057
U	.3680	3"	65502
U	.3680	4-1/4	65429
3/8	.3750	2-1/2	65021

ULTRATOOL® Precision Ground & Polished Solid Carbide Blanks

Diam	Dec.	OAL	EDP#
3/8	.3750	3"	65022
3/8	.3750	4"	65023
3/8	.3750	4-1/4	65058
3/8	.3750	6"	65024
3/8	.3750	12"	65059
V	.3770	3"	65503
V	.3770	4-1/4	65431
W	.3860	3"	65504
W	.3860	4-1/2	65432
25/64	.3906	3"	65433
25/64	.3906	4-1/2	65060
X	.3970	3"	65505
X	.3970	4-1/2	65436
Y	.4040	3"	65506
Y	.4040	4-1/2	65437
13/32	.4062	3"	65438
13/32	.4062	4-1/2	65061
Z	.4130	3"	65507
Z	.4130	4-1/2	65439
27/64	.4219	4-1/2	65062
7/16	.4375	2-3/4	65025
7/16	.4375	3"	65026
7/16	.4375	4"	65027
7/16	.4375	4-1/2	65063
7/16	.4375	6"	65028
7/16	.4375	12"	65064
29/64	.4531	3"	65443
29/64	.4531	4-3/4	65065
15/32	.4688	4-3/4	65066
31/64	.4844	4-3/4	65445
1/2	.5000	2-1/2	65105
1/2	.5000	3"	65029
1/2	.5000	4"	65030
1/2	.5000	4-3/4	65067
1/2	.5000	6"	65031
1/2	.5000	12"	65068
17/32	.5312	6"	65509
9/16	.5625	3-1/2	65032
9/16	.5625	6"	65110
9/16	.5625	12"	65111
19/32	.5938	6"	65510
5/8	.6250	3-1/2	65033
5/8	.6250	5"	65106
5/8	.6250	6"	65069
5/8	.6250	12"	65070
21/32	.6562	6"	65511
11/16	.6875	6"	65512
3/4	.7500	4"	65034
3/4	.7500	5"	65107
3/4	.7500	6"	65071
3/4	.7500	12"	65072
13/16	.8125	6"	65513
7/8	.8750	4"	65075
7/8	.8750	6"	65449
7/8	.8750	12"	65514
15/16	.9375	6"	65515
1"	1.000	4"	65035
1"	1.000	5"	65108
1"	1.000	6"	65073
1"	1.000	12"	65074

Diam	Dec.	OAL	EDP#
1.0mm	.0394	38	65311
1.5mm	.0591	38	65320
2.0mm	.0787	44	65335
2.0mm	.0787	50	65334
2.5mm	.0984	50	65345
3.0mm	.1181	38	65076
3.0mm	.1181	57	65354
3.0mm	.1181	75	65077
3.0mm	.1181	100	65109
3.0mm	.1181	305	65516
3.5mm	.1378	63	65358
3.5mm	.1378	305	65517
4.0mm	.1575	50	65078
4.0mm	.1575	63	65366
4.0mm	.1575	75	65079
4.0mm	.1575	100	65480
4.0mm	.1575	305	65518
4.5mm	.1772	63	65475
4.5mm	.1772	70	65375
4.5mm	.1772	305	65519
5.0mm	.1969	50	65080
5.0mm	.1969	63	65383
5.0mm	.1969	75	65081
5.0mm	.1969	100	65481
5.0mm	.1969	305	65520
5.5mm	.2165	75	65391
5.5mm	.2165	305	65521
6.0mm	.2362	50	65082
6.0mm	.2362	63	65398
6.0mm	.2362	75	65083
6.0mm	.2362	82	65397
6.0mm	.2362	100	65448
6.0mm	.2362	305	65522
6.5mm	.2559	82	65402
6.5mm	.2559	305	65523
7.0mm	.2756	60	65084
7.0mm	.2756	89	65408
7.0mm	.2756	100	65524
7.0mm	.2756	305	65525
7.5mm	.2953	95	65414
7.5mm	.2953	305	65526
8.0mm	.3150	63	65085
8.0mm	.3150	70	65419
8.0mm	.3150	95	65418
8.0mm	.3150	100	65086
8.0mm	.3150	305	65527
8.5mm	.3346	100	65423
8.5mm	.3346	305	65528
9.0mm	.3543	63	65087
9.0mm	.3543	100	65529
9.0mm	.3543	108	65427
9.0mm	.3543	305	65530
9.5mm	.3740	108	65430
10.0mm	.3937	70	65088
10.0mm	.3937	75	65435
10.0mm	.3937	100	65089
10.0mm	.3937	114	65434
10.0mm	.3937	305	65531
10.5mm	.4134	114	65440
11.0mm	.4331	114	65441
11.0mm	.4331	305	65541
11.5mm	.4528	120	65442

Diam	Dec.	OAL	EDP#
12.0mm	.4724	74	65090
12.0mm	.4724	100	65091
12.0mm	.4724	120	65444
12.0mm	.4724	150	65101
12.0mm	.4724	305	65532
12.5mm	.4921	120	65446
14.0mm	.5512	89	65092
14.0mm	.5512	100	65533
14.0mm	.5512	150	65102
14.0mm	.5512	305	65534
16.0mm	.6299	89	65093
16.0mm	.6299	100	65535
16.0mm	.6299	125	65094
16.0mm	.6299	150	65103
16.0mm	.6299	305	65536
18.0mm	.7087	100	65095
18.0mm	.7087	150	65104
18.0mm	.7087	305	65537
20.0mm	.7874	100	65096
20.0mm	.7874	150	65097
20.0mm	.7874	305	65538
22.0mm	.8661	100	65098
22.0mm	.8661	305	65539
25.0mm	.9843	100	65099
25.0mm	.9843	150	65100
25.0mm	.9843	305	65540

Ultra-Tool's Series 650 Polished Ground Carbide Cylinders feature the same world-class tungsten carbide substrate we use in all our finished cutting tools. Ultra-Grain has an excellent combination of high hardness & transverse rupture strength. Additionally, although cemented carbides typically feature poor corrosion resistance, our Series 650 offers industry leading specifications for this characteristic as well. These cylinders, like all Ultra-Tool solid carbide products, are Shrink-Fit Ready (SFR).

ULTRA-Grain®

Ultra-Grain® 1
Cobalt Percentage: 10%
Grain Size (µm): ≤ 0.7
Hardness: 92.7 HRa, 1680 HV
Fracture Toughness (K_{1c}): 7.9
TRS (GPa): 4.1
Density (gm/cc): 14.30

SFR Ground Cyl Specs (Metric): Diameter +0.000/-0.007mm OAL ±1.52mm

SFR Ground Cylinder Specs: Diameter +.0000/-.0003 OAL ±.060

Diameter tolerance is .0005 on lengths of 6" and longer. Lengths of 12" (305 mm) are uncut and will have greater OAL plus + tolerance. Series 650 may have chamfer on one end dependent upon size.

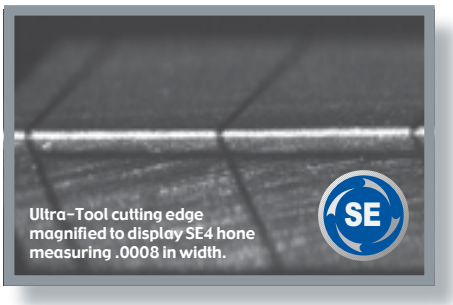
phone 714.898.9224 / 800.854.2431 / fax 714.891.7816
5451 McFadden Avenue • Huntington Beach, CA 92649
ultra-tool.com

SmoothEdge®

Our newest technology can achieve incredible productivity increases in specific applications. Many of our new Series include SmoothEdge as a standard feature, while on others it can be added as a same day post treatment for a small charge. Ask your Inside Sales representative about SmoothEdge today!

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 process 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. All six types of **SmoothEdge** will yield different benefits dependent upon application. **SmoothEdge** will make your tools sound and run smooth from the first cut and protect your tooling investment from unnecessary potential for chipping during initial tool paths.



Ultra-Tool cutting edge magnified to display SE4 hone measuring .0008 in width.

Combine SmoothEdge with our other value added features to design the ultimate cutting solution.

ULTRATOOL® PERFORMANCE SERIES

SmoothEdge included on all Ultra-Tool Performance Series end mills

SmoothEdge1

A microblasting treatment using extremely fine aluminum oxide powder to smooth the carbide surface while generating a very light edge preparation. This feature comes standard with any SmoothCoat® coating.
Uses: Highly recommended for most milling and drilling applications.

SmoothEdge2

A lapping treatment to create extreme lubricity & smoothness with minimal edge prep on uncoated tools.
Uses: Highly recommended for milling and drilling of aluminum and other non-ferrous applications using UnCoated, A1, or TC coated tools.

SmoothEdge3

Combines microblasting and lapping for a light hone with extreme lubricity.
Uses: Highly recommended for a wide range of general purpose machining applications using coated tools.

SmoothEdge4

Adds a proprietary hone to the blasting and lapping cycles for a medium edge prep with excellent lubricity.
Uses: Highly recommended for milling and drilling applications involving general steels, stainless, and cast iron.

SmoothEdge5

Doubles the honing and lapping cycle for maximum edge strength; a robust edge preparation combined with excellent lubricity characteristics.
Uses: Highly recommended for milling and drilling applications involving stainless, high-temp alloys, and exotics.

SmoothEdge8

Adds a minute, proprietary hone to smooth our sharpest cutting edges and creates a minimal but highly effective edge prep.
Uses: Highly recommended for milling and drilling aluminum plus many materials commonly used in medical applications.

ULTRATOOL® Technical Data

With so many variables present in the machining process, it is essential to optimize every possible factor to achieve world-class efficiency. Your choice of a genuine Ultra-Tool® Solid Carbide product is an excellent first step in the process. Ultra-Tool® Solid Carbide products are high-performance tools that will perform best in a machining environment characterized by rigid fixturing and minimal spindle runout. Attention to proper speed and feed will eliminate vibration, chatter, and overheating as well as extending tool life. Generally speaking, the peripheral speed of solid carbide tools will vary with the hardness of the material being cut. The harder the material, the slower the speed. High speed and insufficient feed will cause work surface glazing and poor tool life. Chipping of cutting edges is an indication of chatter which can be caused by too high of speed, too light of cut, or improper support of the tool or workpiece. Handling is also very important; sharpened cutting edges should never be allowed to come into contact with any hard object (or another tool) in a non-machining environment as they will chip easily. Keep your Ultra-Tool® products in their original protective packaging until ready for use.

The guidelines on the following pages are generalities designed to demonstrate the operating window within which you may experience the best results. The charts and information provided should prove valuable in longer tool life with greatly reduced operational costs. This information is for uncoated product: SmoothCoat products will have significantly higher speed and feed rates. For more information contact an Ultra-Tool® Factory Engineer, Sales Manager or consult our websites at **ultra-tool.com** and **toolalliance.com**. eMails can be sent to **technical@toolalliance.com**.

Ultra-Tool International, Inc. is constantly striving to improve its processes, specifications, and tolerances. As such, products are subject to change without prior notice.

WARNING: Grinding or other use of this tool may produce hazardous dust and fumes which may endanger health. Grinding or modification should be done by professionals only. To avoid adverse health effects, read the material safety data sheet for this product. Utilize adequate ventilation and appropriate protection. Cutting tools may shatter when broken; eye protection in vicinity of use is strongly advised. MSDS available at www.ultra-tool.com.

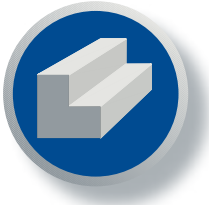
Commonly Used Formulas:

Surface Feet Minute (SFM)=RPM x Diam. x .262
Revolutions Per Minute (RPM)=3.82 x (SFM / Diam.)
Feed Rate (IPM)=IPT x #teeth x RPM
Drilling (IPM)=IPR x RPM
Feed Per Tooth (IPT)=IPM / (#teeth x RPM)
Convert Inches to millimeters: Multiply by 25.4
Convert millimeters to Inches: Multiply by .03937

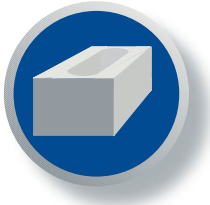
Tech Help Call, eMail us at **technical@toolalliance.com**, or copy / fax us this page for detailed assistance beyond what printed materials can provide. Please have the following information available to assure we can promptly process a response.

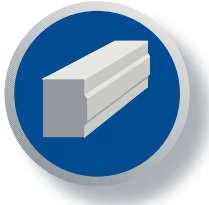
Checklist:
- Tool Description
- Application Description
- Work Piece Material
- Hardness (HRc)
- Current Speed (RPM or SFPM)
- Current Feed (CPT or IPM or FPR)
- Axial DOC
- Radial DOC
- Hole Depth (drilling)
- Machine Tool


Face Milling


End Milling


Slot Milling


Pocket Milling


Peripheral Milling

phone 714.898.9224 / 800.854.2431 / fax 714.891.7816
5451 McFadden Avenue • Huntington Beach, CA 92649
ultra-tool.com

Application Tips for ULTRATOOL® Solid Carbide Products

Trouble Shooting for Ultra-Tool® Carbide End Mills

Problem	Cause	Solution
Chipping	• Feed rate too high • Up milling (conventional) • Cutting edge too sharp • Chattering • Loose tool • Workpiece rigidity • Tool rigidity • Low cutting speed • Loose toolholder	• Reduce feed rate • Change to down milling (climb) • Hone cutting edge or allow break-in • Reduce RPM • Remove, clean, and retighten • Tighten workpiece holding method • Shorten LOC, place shank further up holder • Increase RPM • Remove from spindle, clean and replace
Wear	• High cutting speed • Low feed rate • Up milling (conventional) • Hard material • Poor chip evacuation • Improper cutter helix • Poor coolant	• Reduce RPM • Increase feed rate • Change to down milling (climb) • Use coated tool • Reposition coolant lines, use air blasting • Change to recommended helix angle • Replace coolant or correct mixture
Breakage	• Feed rate too high • Depth of cut too large • Poor tool rigidity • Tool wear • Poor chip evacuation	• Reduce feed rate • Reduce depth of cut • Shorten LOC, place shank further up holder • Replace/regrind sooner • Reposition coolant lines, use air blasting
Chattering	• Speed and feed too high • Poor toolholder rigidity • Poor spindle rigidity • Workpiece rigidity • Relief angle too high • Depth of cut too large • Poor tool rigidity	• Reduce feed rate • Replace with shorter/more rigid holder • Use larger spindle or different machine tool • Tighten workpiece holding method • Regrind with smaller relief angle • Reduce depth of cut • Shorten LOC, place shank further up holder
Short Life	• Cutter/workpiece friction • Hard material • Poor material condition • Improper cutter angle • Poor coolant	• Use coated tool • Use coated tool • Use coated tool, clean material surface • Regrind with proper primary relief angle • Replace coolant or correct mixture
Chip Packing	• Feed rate too high • Low cutting speed • Insufficient chip room • Insufficient coolant	• Reduce feed rate or increase speed • Increase RPM or reduce feed rate • Use tool with less flutes, increase helix • Increase volume of coolant
Poor Surface Finish	• Feed rate too high • Low cutting speed • Tool wear • Edge build up • Depth of cut too large • Chip welding	• Reduce feed rate • Increase RPM • Replace or regrind tool • Increase RPM, switch to higher helix tool • Reduce depth of cut • Increase volume of coolant
Burring or Workpiece Chipping	• Tool wear • Improper helix angle • Feed rate too high • Depth of cut too large	• Replace or regrind tool • Change to recommended helix angle • Reduce feed rate • Reduce depth of cut
Workpiece Inaccuracy	• Loose/worn toolholder • Poor toolholder rigidity • Poor spindle rigidity • Insufficient number of flutes • Tool deflection	• Repair or replace • Replace with shorter/more rigid toolholder • Use larger spindle or different machine tool • Use tool with higher flute quantity • Shorten LOC, place shank further up holder

Trouble Shooting for Ultra-Tool® Carbide Drills

Problem	Cause	Solution (see key below)
Heavy Wear at Outer Edge	• Insufficient coolant • Incorrect speed & feed	• 5, 6 • 1, 2, 8
Chipping at Outer Cutting Edge	• Loose tool, tool movement • Workpiece movement • Poor coolant conditions • Incorrect speed & feed	• 8, 10, 11, 12, 14, 16, 17, 21 • 8, 12, 13, 21 • 5, 6 • 1, 2, 3, 4
Drill Point Chipping	• Loose tool, tool movement • Incorrect speed & feed • Drill centering	• 10, 11, 12, 14 • 1, 2, 3, 4 • 8, 10, 11, 12, 21
Margin Wear	• Drill margin rubbing wall • Poor chip evacuation • Poor coolant conditions • Workpiece movement	• 20 (check drill for backtaper) • 5, 6, 8, 20 • 5, 6 • 8, 13, 21
Tool Breakage	• Loose tool, tool movement • Workpiece movement • Wrong drill type • Poor coolant conditions • Incorrect speed & feed	• 8, 10, 11, 12, 14, 16, 17, 21 • 8, 12, 13, 21 • 9, 15, 16, 18, 19, 20 • 5, 6 • 1, 2, 3, 4
Poor Tool Life	• Incorrect speed & feed • Poor coolant conditions • Wrong drill point	• 1, 2, 3, 4 • 5, 6 • 8, 21
Drill Walk	• Incorrect speed & feed • Tool wear • Wrong drill point • Material condition	• 1, 2 • 7, 8, 21 • 8, 10, 11, 21 • 11, 12, 15, 16, 17
Chip Welding	• Poor coolant conditions • Wrong drill type	• 5, 6 • 19, 20
Hole Size Inaccuracy	• Incorrect speed & feed • Poor coolant conditions • Loose tool • Wrong drill type	• 1, 2, 3, 4 • 5, 6 • 14 • 9, 18
Non-Cylindrical Hole	• Loose tool, tool movement • Workpiece movement • Incorrect speed & feed • Wrong drill type	• 8, 10, 11, 12, 14, 16, 17 • 13 • 1, 2 • 18, 21
Heavy Burr	• Incorrect speed & feed • Incorrect drill point	• 1, 2 • 8, 21
Blue Chips	• Poor coolant conditions • Tool wear	• 5, 6 • 7, 8
Long Chips	• Poor point grind • Incorrect speed & feed	• 8 • 1, 2

Solutions Key for Drills

1) Reduce RPM	8) Repoint drill	15) Use straight flute
2) Increase feed	9) Correct drill type/size	16) Use stub length
3) Increase RPM	10) Use self-centering drill	17) Place further up holder
4) Reduce feed	11) Spot/center drill	18) Use three-flute
5) Increase coolant	12) Clean surface	19) Use slower helix
6) Increase mixture	13) Improve rigidity/clamp	20) Use parabolic design
7) Add negative hone	14) Tighten holder	21) Change point style

Trouble Shooting for Ultra-Tool® Carbide Reamers

Problem	Cause	Solution
Chatter	• High cutting speed • Feed rate too low • Workpiece movement • Toolholder rigidity • Tool rigidity	• Lower RPM or increase feed rate • Increase feed rate • Tighten workpiece rigidity • Tighten toolholder or reduce float • Use shorter tool, place further up holder
Tool Wear / Chipping	• Incorrect feed rate • Incorrect speed • Poor hole condition • Abrasive material • Poor chip evacuation • Poor coolant • Insufficient coolant • Workpiece alignment • Excessive stock removal	• Increase feed rate (typically) • Reduce speed (typically) • Work-hardened hole; change drilling type • Use proper coolant, coated reamer • Use/increase coolant, use helical reamer • Replace coolant or correct mixture • Increase coolant volume • Use bushing, floating holder, lead chamfer • Use larger diameter starter drill
Tool Breakage	• Incorrect feed rate • Incorrect speed • Tool wear • Bottoming of hole • Coolant conditions • Insufficient stock removal • Poor set up • Excessive stock removal	• Increase feed rate (typically) • Reduce speed (typically) • Sharpen or replace reamer • Adjust stop depth, check preset • Increase, replace, or correct coolant • Use smaller diameter starter drill • Use bushing, floating toolholder • Use larger diameter starter drill

Problem	Cause	Solution
Poor Finish	• Feed rate too low • Insufficient stock removal • Poor hole condition • Poor coolant • Insufficient coolant	• Increase feed rate • Use smaller diameter starter drill • Work-hardened hole; change drilling type • Replace/correct coolant mixture • Increase coolant volume
Hole Tolerance	• Workpiece alignment • Incorrect tool size • Material shrinkage • Tool wear • Toolholder runout	• Use bushing, floating toolholder • Check diameter of tool • Adjust diameter for shrinkage; more coolant • Sharpen or replace tool • Adjust or replace toolholder

Application Data for High Performance Series 323, 355, 377, & 365 Series ULTRATOOL® End Mills

The milling data presented below is for the **323**, **355**, **377**, and **365** Series of Ultra end mills. When using SmoothCoat & SmoothEdge surface treatments, Surface Feet or Meters Per Minute can be increased from the stated levels by at least 25%.
Do not use a radial DOC exceeding more than 25% of diameter for Series 355 only.

Peripheral Milling data based on axial depth ≤ 100% of tool diameter & radial depth of ≤ 25% of tool diameter.

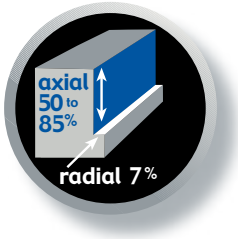
Slot Milling data based on axial depth of cut = 50% of tool diameter.

End Mill Specifications:
Diameter: +.000 / −.002
Shank Diameter: +.0000 / −.0003
LOC: +.060 / −.000
OAL: ± .060
Helix: ± 2°

Milling; Fractional

Material	SFPM	SFPM	1/8"	3/16"	1/4"	5/16"	3/8"	7/16"	1/2"	5/8"	3/4"	1"
Steel	**Peripheral**	**Slotting**					**Feed Per Tooth (FPT)**					
1018 / 1020	300 to 600	200 to 400	.0007	.0012	.0015	.0018	.0020	.0025	.0030	.0035	.0040	.0045
4140 / 4340 / P20	250 to 500	200 to 350	.00065	.0010	.0012	.0015	.0018	.0022	.0025	.0030	.0035	.0040
Stainless Steel												
303 / 304 / 316	250 to 400	200 to 350	.0006	.0008	.0010	.0012	.0018	.0022	.0025	.0030	.0035	.0038
410 / 420 / 440C	200 to 300	150 to 250	.0006	.0008	.0010	.0012	.0018	.0022	.0025	.0030	.0035	.0038
15-5/17-4 ≤ 32HRc	200 to 350	150 to 300	.0006	.0008	.0010	.0012	.0018	.0022	.0025	.0030	.0035	.0038
15-5/17-4 ≥ 32HRc	150 to 250	150 to 250	.0004	.0006	.0008	.0010	.0015	.0020	.0020	.0025	.0030	.0035
Tool Steel												
A2/D2/H13 ≤ 32HRc	200 to 300	150 to 250	.0005	.0008	.0010	.0012	.0018	.0022	.0025	.0030	.0035	.0035
A2/D2/H13 ≥ 32HRc	150 to 250	100 to 200	.0004	.0006	.0008	.0010	.0015	.0020	.0020	.0025	.0030	.0035
Titanium												
6Al-4V	150 to 300	125 to 225	.0005	.0008	.0010	.0010	.0012	.0020	.0025	.0025	.0030	.0040
High Temp Alloys												
Inconel 625	100 to 150	75 to 125	.0005	.0007	.0010	.0012	.0012	.0018	.0020	.0020	.0025	.0030
Inconel 718	70 to 150	50 to 100	.0005	.0007	.0008	.0009	.0012	.0018	.0020	.0020	.0030	.0040
Cast Iron												
Gray Iron ≤ 32HRc	150 to 400	150 to 300	.0005	.0007	.0010	.0012	.0015	.0018	.0020	.0030	.0040	.0045

Dynamic Milling: Application Data for Series 323, 355, 377, and 365 High Performance End Mills (continued)



Recommendations are based upon a **radial cut depth of 7%** of the end mill's diameter and **axial cut depth of 50–85%** of the tool's LOC.

Dynamic ("peel") milling can be performed wet or dry (with AT coating); please consult **technical@toolalliance.com** for specific application data.

Series 323, 355, 377, and 365 Dynamic Milling
Surface Feet Per Minute (**SFPM**) and Feed Per Tooth (**FPT**) recommendations by tool diameter and material:

See it run now!
Scan the Quick Code and watch the Series 365 milling various materials on the Tool Alliance YouTube channel.

Material	SFPM	1/8"	3/16"	1/4"	5/16"	3/8"	7/16"	1/2"	5/8"	3/4"	1"
Steel	**Peripheral**					**Feed Per Tooth (FPT)**					
1018 / 1020	400 to 600	.001-.003	.001-.004	.0015-.005	.002-.008	.002-.008	.003-.010	.003-.010	.003-.010	.004-.012	.004-.012
4140 / 4340 / P20	350 to 500	.001-.002	.001-.003	.001-.004	.0015-.006	.0015-.006	.002-.007	.002-.007	.002-.007	.0025-.008	.0025-.008
Stainless Steel											
303 / 304 / 316	300 to 500	.001-.002	.001-.003	.0015-.004	.002-.006	.002-.006	.003-.008	.003-.008	.003-.008	.003-.010	.003-.010
410 / 420 / 440C	250 to 500	.001-.002	.001-.003	.0015-.004	.002-.006	.002-.006	.003-.008	.003-.008	.003-.008	.003-.010	.003-.010
15-5/17-4 ≤ 32HRc	300 to 500	.001-.002	.001-.003	.0015-.004	.002-.006	.002-.006	.003-.008	.003-.008	.003-.008	.003-.010	.003-.010
15-5/17-4 ≥ 32HRc	200 to 300	.0005-.002	.0005-.002	.001-.003	.0015-.005	.0015-.005	.002-.006	.002-.006	.002-.006	.003-.008	.003-.008
Tool Steel											
A2/D2/H13 ≤ 32HRc	250 to 500	.001-.002	.001-.003	.0015-.004	.002-.006	.002-.006	.003-.008	.003-.008	.003-.008	.003-.010	.003-.010
A2/D2/H13 ≥ 32HRc	200 to 300	.001-.002	.001-.003	.0015-.004	.002-.006	.002-.006	.003-.008	.003-.008	.003-.008	.003-.010	.003-.010
Titanium											
6Al-4V	250 to 500	.001-.002	.001-.003	.0015-.004	.002-.006	.002-.006	.003-.008	.003-.008	.003-.008	.003-.010	.003-.010
High Temp Alloys											
Inconel 625	125 to 200	.0005-.002	.0005-.002	.001-.003	.0015-.005	.0015-.005	.002-.006	.002-.006	.002-.006	.003-.008	.003-.008
Inconel 718	100 to 200	.0005-.002	.0005-.002	.001-.003	.0015-.005	.0015-.005	.002-.006	.002-.006	.002-.006	.003-.008	.003-.008
Cast Iron											
Gray Iron ≤ 32HRc	250 to 500	.001-.002	.001-.003	.001-.004	.0015-.006	.0015-.006	.002-.007	.002-.007	.002-.007	.0025-.008	.0025-.008

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Application Data for Standard ULTRATOOL® End Mills

The milling data presented below is for all "standard" Series of Ultra end mills (data is presented separately on each respective product page for our application-specific high performance designs). Note: When using SmoothCoat & SmoothEdge surface treatments, Surface Feet or Meters Per Minute can be increased from the stated levels by at least 25%.

Peripheral Milling data based on axial depth ≤ 100% of tool diameter & radial depth of ≤ 25% of tool diameter.

Slot Milling data based on axial depth of cut = 50% of tool diameter.

End Mill Specifications:
Diameter: +.000 / -.002
Shank Diameter: +.0000 / -.0003
LOC: +.060 / -.000
OAL: ± .060
Helix: ± 2°

Milling; Fractional

Material	SFPM	SFPM	1/8"	3/16"	1/4"	5/16"	3/8"	7/16"	1/2"	5/8"	3/4"	1"
Steel	**Peripheral**	**Slotting**					**Feed Per Tooth (FPT)**					
1018 / 1020	150 to 350	150 to 300	.0005	.0010	.0015	.0018	.0020	.0025	.0030	.0035	.0040	.0045
4140 / 4340 / P20	150 to 300	125 to 225	.0005	.0007	.0010	.0012	.0015	.0018	.0020	.0025	.0030	.0040
Stainless Steel												
303 / 304 / 316	150 to 300	125 to 250	.0005	.0007	.0010	.0012	.0015	.0018	.0020	.0030	.0040	.0040
410 / 420 / 440C	150 to 300	125 to 250	.0005	.0007	.0010	.0012	.0015	.0018	.0020	.0025	.0035	.0038
15-5/17-4 ≤ 32HRc	125 to 250	100 to 225	.0005	.0007	.0010	.0012	.0015	.0018	.0020	.0025	.0030	.0038
15-5/17-4 ≥ 32HRc	100 to 150	100 to 150	.0003	.0005	.0010	.0012	.0015	.0015	.0015	.0020	.0030	.0038
13-8 / 316L	125 to 300	125 to 250	.0005	.0007	.0010	.0012	.0015	.0018	.0020	.0030	.0040	.0040
Tool Steel												
A2/D2/H13 ≤ 32HRc	125 to 250	100 to 200	.0005	.0007	.0010	.0012	.0015	.0018	.0020	.0025	.0030	.0035
A2/D2/H13 ≥ 32HRc	100 to 150	100 to 125	.0003	.0005	.0010	.0012	.0015	.0015	.0015	.0020	.0030	.0035
Titanium												
6Al-4V	120 to 250	100 to 175	.0005	.0007	.0010	.0012	.0012	.0018	.0020	.0020	.0030	.0040
High Temp Alloys												
Inconel 625	50 to 150	50 to 125	.0005	.0007	.0010	.0012	.0012	.0018	.0020	.0020	.0025	.0030
Inconel 718	50 to 150	50 to 125	.0003	.0005	.0010	.0012	.0012	.0015	.0015	.0020	.0025	.0025
Cast Iron												
Gray Iron ≤ 32HRc	150 to 350	125 to 300	.0005	.0007	.0010	.0012	.0015	.0018	.0020	.0030	.0040	.0045
Ductile Iron	150 to 300	125 to 250	.0005	.0007	.0010	.0012	.0015	.0018	.0020	.0025	.0035	.0045
Non-Ferrous												
6061 T6 Aluminum	up to 2000	up to 1500	.0010	.0020	.0020	.0025	.0030	.0035	.0040	.0050	.0060	.0070
Copper,Brass,Bronze	up to 1200	up to 1000	.0010	.0010	.0020	.0022	.0025	.0028	.0030	.0040	.0040	.0050
Plastic	up to 2000	up to 1500	.0010	.0020	.0030	.0035	.0040	.0050	.0060	.0080	.0100	.0120

Metric End Mill Specifications:
Diameter (mm): +.000 / -.051mm
Shank Diameter(mm): +.000 / -.007mm
LOC: +1.52 / -0.00mm
OAL: ±1.52mm

Metric

Material	SMPM	SMPM	2 mm	3 mm	4 mm	6 mm	8 mm	10 mm	12 mm	16 mm	20 mm	25 mm
Steel	**Peripheral**	**Slotting**					**Feed Per Tooth (FPT)**					
1018 / 1020	45 to 110	45 to 90	0.010	0.012	0.025	0.038	0.045	0.050	0.080	0.090	0.100	0.120
4140 / 4340 / P20	45 to 90	40 to 70	0.010	0.012	0.018	0.025	0.030	0.038	0.050	0.065	0.080	0.100
Stainless Steel												
303 / 304 / 316	45 to 90	40 to 75	0.010	0.012	0.018	0.025	0.030	0.038	0.050	0.080	0.100	0.100
410 / 420 / 440C	45 to 90	40 to 75	0.010	0.012	0.018	0.025	0.030	0.038	0.050	0.065	0.080	0.100
15-5/17-4 ≤ 32HRc	38 to 75	30 to 70	0.010	0.012	0.018	0.025	0.030	0.038	0.050	0.065	0.080	0.100
15-5/17-4 ≥ 32HRc	30 to 45	30 to 45	0.005	0.007	0.012	0.025	0.030	0.038	0.038	0.050	0.080	0.100
13-8 / 316L	38 to 90	40 to 75	0.010	0.012	0.018	0.025	0.030	0.038	0.050	0.080	0.100	0.100
Tool Steel												
A2/D2/H13 ≤ 32HRc	38 to 75	30 to 60	0.010	0.012	0.018	0.025	0.030	0.038	0.050	0.065	0.080	0.090
A2/D2/H13 ≥ 32HRc	30 to 45	30 to 40	0.005	0.007	0.012	0.025	0.030	0.038	0.038	0.050	0.080	0.090
Titanium												
6Al-4V	35 to 75	30 to 53	0.010	0.012	0.018	0.025	0.030	0.038	0.050	0.065	0.080	0.100
High Temp Alloys												
Inconel 625	15 to 45	15 to 38	0.010	0.012	0.018	0.025	0.030	0.038	0.050	0.050	0.065	0.070
Inconel 718	15 to 45	15 to 38	0.005	0.007	0.012	0.025	0.030	0.038	0.038	0.050	0.065	0.065
Cast Iron												
Gray Iron ≤ 32HRc	45 to 110	40 to 90	0.010	0.012	0.018	0.025	0.030	0.038	0.050	0.080	0.100	0.120
Ductile Iron	45 to 90	40 to 75	0.010	0.012	0.018	0.025	0.030	0.038	0.050	0.065	0.090	0.120
Non-Ferrous												
6061 T6 Aluminum	up to 600	up to 450	0.020	0.025	0.050	0.050	0.064	0.080	0.100	0.130	0.150	0.180
Copper,Brass,Bronze	up to 365	up to 300	0.020	0.025	0.025	0.050	0.056	0.065	0.080	0.100	0.100	0.130
Plastic	up to 600	up to 450	0.020	0.025	0.050	0.080	0.089	0.100	0.150	0.200	0.250	0.300

Application Data for High Performance Series 330AL and 333AL ULTRATOOL® End Mills

The milling data presented below is for the **330AL** and **333AL** Series of Ultra end mills. When using SmoothCoat & SmoothEdge surface treatments, Surface Feet or Meters Per Minute may be increased from the stated levels.
Do not use a radial DOC exceeding more than 50% of diameter.

Peripheral Milling data based on axial depth ≤ 150% of tool diameter & radial depth of ≤ 50% of tool diameter.

Slot Milling data based on axial depth of cut ≤ 100% of tool diameter.

End Mill Specifications:
Diameter: +.0000 / −.0003
Shank Diameter: +.0000 / −.0003
LOC: +.060 / −.000
OAL: ± .060
Helix: ± 1°

Milling; Fractional

Material	Type	SFPM	1/8"	3/16"	1/4"	5/16"	3/8"	7/16"	1/2"	5/8"	3/4"	1"
			Feed Per Tooth (FPT)									
Wrought Aluminum 6061 / 7075 / 2024	Peripheral	1200 to 2000	.0015	.0025	.0030	.0035	.0050	.0055	.0060	.0065	.0070	.0090
	Slotting	1200 to 2000	.0010	.0018	.0025	.0025	.0035	.0040	.0045	.0050	.0060	.0080
Cast Aluminum 319 / 355 / 390	Peripheral	750 to 1200	.0015	.0025	.0030	.0035	.0050	.0055	.0060	.0065	.0070	.0090
	Slotting	750 to 1200	.0010	.0018	.0025	.0025	.0035	.0040	.0045	.0050	.0060	.0080
Copper Alloys Bronze / Brass	Peripheral	500 to 1200	.0009	.0015	.0020	.0025	.0035	.0035	.0040	.0050	.0050	.0060
	Slotting	500 to 1200	.0008	.0012	.0020	.0020	.0030	.0040	.0040	.0050	.0050	.0060

330AL and **333AL Tech Tip:** Start with these recommended values for standard length tools. For stub LOC's, speeds and feeds may be increased. Longer LOC's and OAL's may require reductions in FPT and DOC. Our Monolith Series operating parameters should be adjusted to maintain a stable cut and reduced chatter (due to extended reach lengths).

ULTRATOOL® Countersink Application Info

Use starting feed rates of .001 (small diameter) to .004 (large) then increase feed until chatter is eliminated. Max feed rate approx .004 (small) to .010 (large). Use same approach for SFM; start low and increase for maximum performance. Chatter usually results from too high a speed, too low a feed, or combination of both.
• Select a diameter appropriate for hole size.

Material	SFPM	1st/2nd choice
Steel		
1018 / 1020	100 to 150	910 / 912
4140 / 4340 / P20	70 to 120	910 / 912
Stainless Steel		
303 / 304 / 316	60 to 90	910 / 912
410 / 420 / 440C	40 to 70	910 / 912
15-5/17-4 ≤ 32HRc	80 to 120	910 / 912
15-5/17-4 ≥ 32HRc	50 to 75	910 / 912
13-8 / 316L	60 to 90	910 / 912
Tool Steel		
A2/D2/H13 ≤ 32HRc	60 to 100	910 / 912
A2/D2/H13 ≥ 32HRc	40 to 80	910 / 912
Titanium		
6Al-4V	50 to 90	910 / 912
High Temp Alloys		
Inconel 625	25 to 35	910 / 912
Inconel 718	20 to 30	910 / 912
Cast Iron		
Gray Iron ≤ 32HRc	100 to 200	910 / 912
Ductile Iron	100 to 200	910 / 912
Non-Ferrous		
6061 T6 Aluminum	300 to 450	911 / 912
Copper, Brass, Bronze	150 to 250	911 / 912
Plastic	250 to 400	911 / 912

Hole diameter size gain per .001 axial depth for Ultra countersink angles:

60° = .0010
82° = .0017
90° = .0020
100° = .0028

The newest SmoothEdge® for our Aluminum end mills contributes to amazing surface finishes on milled parts.

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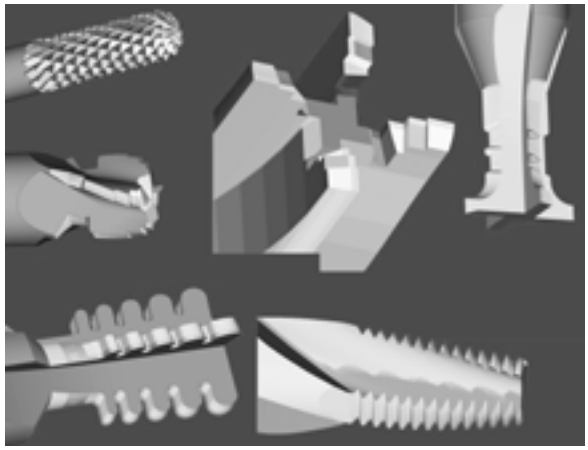

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Application Data for ULTRATOOL® Reamers

Spiral flutes produce the best hole finish. Right-hand spiral should be used for blind holes, while left-hand spiral is excellent for thru-hole applications. Straight flute is appropriate for all general reaming requirements.

Reaming; Fractional

Material	SFPM UC	SFPM TA	1/16"	1/8"	3/16"	1/4"	5/16"	3/8"	7/16"	1/2"	5/8"	3/4"
Steel	**UnCoated**	**SmoothCoat**	**Feed Rate: Inches Per Rev (IPR)**									
1018 / 1020	50 to 125	50 to 150	.0040	.0050	.0050	.0060	.0070	.0080	.0090	.0100	.0100	.0100
4140 / 4340 / P20	40 to 120	40 to 140	.0040	.0040	.0040	.0040	.0050	.0050	.0050	.0060	.0060	.0060
Stainless Steel												
303 / 304 / 316	30 to120	30 to 140	.0040	.0050	.0050	.0060	.0070	.0080	.0090	.0100	.0100	.0100
410 / 420 / 440C	20 to 80	20 to 100	.0040	.0050	.0050	.0060	.0070	.0080	.0090	.0100	.0100	.0120
15-5/17-4 ≤ 32HRc	40 to 140	40 to 160	.0040	.0040	.0040	.0040	.0050	.0050	.0050	.0060	.0070	.0080
15-5/17-4 ≥ 32HRc	25 to 100	25 to 120	.0020	.0020	.0030	.0030	.0040	.0040	.0050	.0050	.0060	.0060
13-8 / 316L	30 to 120	30 to 140	.0040	.0050	.0050	.0060	.0070	.0080	.0090	.0100	.0100	.0100
Tool Steel												
A2/D2/H13 ≤ 32HRc	30 to 120	30 to 120	.0040	.0040	.0040	.0040	.0050	.0050	.0050	.0060	.0070	.0080
A2/D2/H13 ≥ 32HRc	20 to 80	20 to 100	.0020	.0020	.0030	.0030	.0040	.0040	.0050	.0050	.0060	.0060
Titanium												
6Al-4V	20 to 100	20 to 120	.0020	.0020	.0030	.0030	.0040	.0040	.0060	.0060	.0080	.0100
High Temp Alloys												
Inconel 625	20 to 60	20 to 80	.0020	.0020	.0030	.0030	.0040	.0040	.0050	.0050	.0060	.0060
Inconel 718	20 to 50	20 to 70	.0020	.0020	.0030	.0030	.0040	.0040	.0050	.0050	.0060	.0060
Cast Iron												
Gray Iron ≤ 32HRc	80 to 200	80 to 250	.0060	.0060	.0060	.0060	.0070	.0080	.0100	.0120	.0140	.0150
Ductile Iron	80 to 200	80 to 250	.0060	.0060	.0060	.0060	.0070	.0080	.0100	.0100	.0100	.0120
Non-Ferrous												
6061 T6 Aluminum	100 to 300	100 to 375	.0050	.0050	.0060	.0060	.0070	.0080	.0100	.0120	.0140	.0150
Copper,Brass,Bronze	75 to 200	75 to 250	.0050	.0050	.0060	.0060	.0070	.0080	.0100	.0120	.0140	.0150
Plastic	100 to 350	100 to 350	.0050	.0050	.0060	.0060	.0070	.0080	.0100	.0120	.0140	.0150

Total Stock Removal:
Minimum and Maximum amounts of stock removal should be adhered to for proper reaming action. This is the amount the reamer should be oversized relative to the drilled hole.

Up to 1/16	.003 - .005
1/16 to 1/8	.004 - .008
1/8 to 1/4	.006 - .012
1/4 to 3/8	.008 - .014
3/8 to 1/2	.010 - .015
1/2 to 1"	.012 - .020

Reamer Specifications (decimal):
Cutting Diameter: +.0002 / -0
Shank Diameter: ±.0005
LOC: ±.030
OAL: ±.060
Helix (RH & LH): 12°
Lead Angle: 45°

All Ultra-Tool® reamer products are manufactured from Ultra-Carb®. Carbide reamers constructed with steel shank are induction-brazed (using controlled-frequency amplification) and slow-cooled in our own factory for maximum strength. All products are manufactured with centers (male, female, or both) for high concentricity characteristics and resharpening capabilities. Also, shanks are ground to the next smallest common fractional diameter for effective tool-holding and practicality. Note: Series 411 has oversized shank with clearance neck and does not feature centers.

new! Now available with TA coating!

Application Data for ULTRATOOL® Slitting Saws

All Ultra-Tool® Saw products are manufactured from Ultra-Carb®. Use a higher RPM and lower feed ratios than in most cutting tool applications. Use light viscosity coolants at most; dry running is acceptable and/or preferred. Concentricity is the single most determining factor in an efficient slotting operation.

new! Now available with standard SmoothCoat!

Saw Specifications:
Diameter: ±.015
Hole (ID): +.0005 / -.0000
Thickness: ±.00025

Slitting

Material Group	Speed SFPM
Aluminum/Related Alloys	700-1000
Brass/Bronze	450-750
Cast Iron (soft)	250-450
Cast Iron (medium)	150-350
Cast Iron (hard)	100-200
Magnesium	800-1200
Monel/Nickel Alloys	150-225
Steel-Heat Treated (35-40Rc)	150-250
Steel-Heat Treated (40-45Rc)	100-200
Steel-Heat Treated (45+Rc)	75-135
Steel-Low Carbon	250-425
Stainless-Soft	200-300
Stainless-Hard	100-200
Titanium Alloys	150-275

Feed Rate: Chip Load from .0001 per tooth (hardest materials) to .0015 (easiest machinability).

Application Data for ULTRATOOL® Drills

Drilling speeds and feeds are based upon hole depth of up to 3X diameter. For deeper hole ratios reduce speeds and feeds by 10% to 25%.

Drilling; Fractional

Material	SFPM	SFPM	1/16"	1/8"	3/16"	1/4"	5/16"	3/8"	7/16"	1/2"	5/8"	3/4"
Steel	UnCoated	SmoothCoat	Feed Rate: Inches Per Rev (IPR)									
1018 / 1020	100 to 250	100 to 300	.0010	.0030	.0050	.0070	.0090	.0100	.0110	.0120	.0140	.0160
4140 / 4340 / P20	60 to 230	60 to 260	.0010	.0030	.0050	.0070	.0090	.0100	.0110	.0120	.0140	.0160
Stainless Steel												
303 / 304 / 316	60 to 150	60 to 200	.0010	.0030	.0050	.0060	.0070	.0080	.0090	.0100	.0120	.0140
410 / 420 / 440C	40 to 100	40 to 150	.0010	.0030	.0050	.0060	.0070	.0080	.0090	.0100	.0120	.0140
15-5/17-4 ≤ 32HRc	75 to 175	75 to 200	.0010	.0015	.0025	.0040	.0050	.0060	.0070	.0080	.0090	.0100
15-5/17-4 ≥ 32HRc	50 to 125	50 to 150	.0005	.0010	.0015	.0025	.0030	.0035	.0038	.0040	.0050	.0060
13-8 / 316L	60 to 150	60 to 200	.0010	.0030	.0050	.0060	.0070	.0080	.0090	.0100	.0120	.0140
Tool Steel												
A2/D2/H13 ≤ 32HRc	60 to 150	60 to 200	.0010	.0015	.0025	.0040	.0050	.0060	.0070	.0080	.0090	.0100
A2/D2/H13 ≥ 32HRc	40 to 100	40 to 150	.0005	.0010	.0015	.0025	.0028	.0030	.0035	.0040	.0050	.0060
Titanium												
6Al-4V	40 to 150	40 to 175	.0005	.0010	.0020	.0025	.0028	.0030	.0035	.0040	.0050	.0060
High Temp Alloys												
Inconel 625	30 to 70	30 to 80	.0010	.0015	.0025	.0040	.0050	.0060	.0070	.0080	.0090	.0100
Inconel 718	30 to 45	30 to 50	.0005	.0010	.0020	.0025	.0028	.0030	.0035	.0040	.0050	.0060
Cast Iron												
Gray Iron ≤ 32HRc	150 to 300	150 to 350	.0010	.0030	.0050	.0070	.0085	.0100	.0110	.0120	.0140	.0160
Ductile Iron	150 to 300	150 to 350	.0010	.0030	.0050	.0070	.0085	.0100	.0110	.0120	.0140	.0160
Non-Ferrous												
6061 T6 Aluminum	250 to 750	250 to 1000	.0010	.0030	.0050	.0070	.0085	.0100	.0110	.0120	.0140	.0160
Copper,Brass,Bronze	150 to 400	150 to 500	.0010	.0030	.0050	.0070	.0085	.0100	.0110	.0120	.0140	.0160
Plastic	250 to 1000	250 to 1000	.0010	.0030	.0050	.0070	.0085	.0100	.0110	.0120	.0140	.0160

Drill Specifications:
Diameter: +.0000 / -.0003
LOC: +.060 / -.090
OAL: +.060 / -.090
Point Angle: ±1°
Helix Angle: ±1°
Note: Series 560 Combined Drill/C'sink:
Body Diameter: +.0000 / -.0003
Drill Diameter: +.003 / -.000

Ultra-Tool® drills feature diameter tolerances 40% tighter than industry standards. Plus, all shanks are SFR (shrink-fit ready).

Try our drills with standard SmoothCoat for a superb leap in lubricity, productivity, and tool life.

new! Complete range of Brad Point drills with D1 coating!

Application Data for ULTRATOOL® Burrs

DeBurring

Burr Diam	Diam Metric	# Flutes Std Cut	RPM*	Max. RPM
1/16	1.6 mm	6	60,000 - 90,000	100,000
1/8	3.2 mm	12	40,000 - 70,000	80,000
3/16	4.8 mm	15	35,000 - 60,000	70,000
1/4	6.3 mm	16	30,000 - 50,000	60,000
5/16	8.0 mm	18	20,000 - 40,000	52,000
3/8	9.5 mm	20	20,000 - 40,000	52,000
7/16	11.0 mm	22	15,000 - 40,000	50,000
1/2	12.7 mm	24	15,000 - 40,000	45,000
5/8	16.0 mm	28	12,000 - 25,000	30,000
3/4	19.0 mm	30	10,000 - 20,000	24,000
1"	25.4 mm	36	7,500 - 20,000	22,000

*Speeds are for Standard Cut. Reduce by approximately 25% with addition of Dura-Cut. Fine Cut increases flute count approximately 50%. Decrease speed accordingly. Coarse Cut decreases flute count approximately 20%. Increase speed accordingly. Lower listed speeds when cutting harder ferrous materials.

Ultra-Tool® Burrs feature higher hardness and a greater flute count than most competing brands for increased tool life.

Burr heads and solid carbide burrs are manufactured from Ultra-Carb®. Shanks are high speed steel hardened to a rating of 45-48 Rockwell C.

#1 Standard, #2 Fine, #3 Coarse, #4 DuraCut, #5 CoarseDura #6 FineDura, #7 Fast Mill, #8 Diamond. In the event of extended lead times the next closest cut style within the same pricing category may be substituted to enhance service levels.

Burr Specifications:
Standard cylindrical helix angle: 30° ± 2°
Cutting Diameter: ± .010
Flute Count: ±1
Shank Diameter: +0 / - .0005, TIR max .002
Brazed Burr TIR: max .005
Taper Angles: ± 1°

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ULTRATOOL® Terms & Conditions

Ordering Information: All Ultra-Tool® products have a Series-Size designator and EDP number. One or both may be used when entering orders via eMail, fax, phone, web, or postal mail communications. If the product is coated, be sure to include the coating suffix.

Availability: Ultra-Tool® products are available primarily through select Industrial Distributors and catalog houses 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 UPS ground services, 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.

Returned Items: Current catalog items may be returnable subject to a 25% handling charge and approval by the Ultra-Tool® 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 Returned Goods Authorization (RGA) number must be obtained from the Ultra-Tool® Sales Department prior to return. Returned product must be sent to the Factory for credit; consignment locations are not capable of issuing either RGA's or credit memos. Special tools are not returnable. Due to technical advancements, products sold 1 year ago and prior 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 affect pricing upon quotation. Special orders cannot be cancelled without prior approval and proper consideration.

Product Warranty: Ultra-Tool® warrants that products sold by it shall be free from defects in materials and workmanship. Ultra-Tool 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. Ultra-Tool® is not responsible for damages or accidents caused by modifying or altering our products without prior written consent.

Cooperative Advertising: Ultra-Tool® does not participate in any cooperative advertising programs with either industrial distributors or manufacturer's representatives. This policy allows us to avoid any possible favoritism or conflicts of interest, and keeps costs and sales prices as low as possible.

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

Visit our factories on your next trip to the greater Los Angeles / San Diego, CA or Fort Myers / Naples, FL area. View our automated facilities, meet our Associates, and tell us how we can better grow our relationship together. Huntington Beach is officially "Surf City" with miles of open beach on the Pacific Ocean, and we're minutes away from attractions such as Disneyland, Knott's, Universal Studios, Reagan and Nixon Presidential Libraries, Getty Museum, Dodger Stadium, Staples Center, Angel Stadium, Honda Center, The 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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This catalog is dedicated to all the hard-working Associates of Tool Alliance in California and Florida.
Our people make our Company. Thank you for everything you do.
Best,
Dave

ULTRATOOL® Decimal Equivalent Chart

	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

toolalliance.com

Ultra-Tool® sales features:

- The Company has a well known brand, superb quality reputation, and a 49 year operating history.
- Ultra-Tool 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 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 solid carbide Ultra-Tool 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 TiB2 (A1) and HSN² (AT), all performed in-house for quick delivery.
- 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.

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

About the technology of Ultra-Tool® & Tool Alliance®:

We obsess over details that create the finest cutting tools available. Our reward is customer satisfaction via increased 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.
- SmoothContricity® = Precision grinding, tool holding, and tolerances for minimized TIR.
- SmoothCoat® = Sputter-based SuperNitride PVD coating for superior surface hardness & uniformity.
- SmoothEdge® = Surface and edge preparation for lubricity and minimized break-in.

Sharpness & Lubricity.
No wonder it works better.

SmoothGrind®

Tight tolerances.
Minimized run-out.

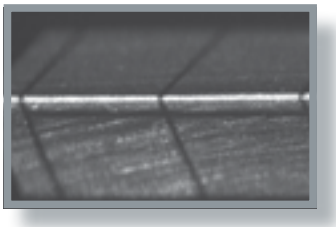
SmoothContricity®

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

SmoothCoat®

Edge Integrity.
Runs great on the first pass.

Ultra-Tool end mill cutting edge magnified to display SE4 hone.



SmoothEdge®

ULTRATOOL®

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