

## new! CUD Series: Compression Up/Down routers

Tight tolerance square end router for wide material range featuring 2+2 or 4+4 design.

- Designed for compression routing of a wide range of materials
- Proprietary cemented carbide grade with sharp & polished SmoothGrind cutting edges plus available SmoothCoat
- Use UnCoated for general purpose routing needs • Use A1 (TiB2) coated for titanium, aluminum & other non-ferrous materials
- Use thin, smooth, & hard D1 PVD diamond coating for plastics, woods, composites, CFRP's, honeycombs & other abrasive materials
- Use hard & thick D2 CVD diamond coating for long-run jobs in composites, CFRP's, honeycombs & other abrasive materials



						CUD UnCoated		CUD A1 Coated		CUD D1 Coated		CUD D2 Coated	
						Square EDP#	Price	Square EDP#	Price	Square EDP#	Price	Square EDP#	Price
1/4	2+2	3/4	.285	2-1/2	1/4	30416	\$37.10	58281	\$41.20	58365	\$45.60	58366	\$99.60
1/4	2+2	1"	.285	2-1/2	1/4	58361	\$40.30	58282	\$44.40	58367	\$48.80	58368	\$102.80
1/4	4+4	.905	.250	2-1/2	1/4	40418	\$41.30	58283	\$45.40	58369	\$49.80	58370	\$103.80
1/4L	4+4	1-1/4	.250	2-1/2	1/4	40417	\$44.50	58284	\$48.60	58371	\$53.00	58372	\$107.00
3/8	2+2	1"	.435	3"	3/8	58210	\$55.10	58285	\$61.10	58373	\$64.60	58374	\$160.60
3/8	2+2	1-1/8	.435	3"	3/8	58362	\$55.10	58286	\$61.10	58375	\$64.60	58376	\$160.60
1/2	2+2	1"	.435	3"	1/2	58363	\$62.00	58287	\$68.80	58377	\$75.50	58378	\$193.00
1/2	2+2	1-1/8	.435	3"	1/2	58221	\$63.10	58288	\$69.90	58379	\$76.60	58380	\$194.10
1/2	2+2	1-1/8	.435	4"	1/2	58220	\$78.40	58289	\$87.20	58381	\$95.40	58382	\$208.40
1/2	2+2	1-3/8	.435	3"	1/2	58190	\$65.20	58290	\$72.00	58383	\$78.70	58384	\$196.20
1/2	2+2	1-3/8	.435	4"	1/2	58230	\$81.60	58291	\$90.40	58385	\$98.60	58386	\$211.60
1/2	2+2	1-5/8	.435	4"	1/2	58240	\$83.70	58292	\$92.50	58387	\$100.70	58388	\$287.70
5/8	2+2	1-5/8	.735	4"	5/8	58250	\$154.20	58293	\$164.30	58389	\$175.20	58390	\$407.70
5/8	2+2	1-7/8	.735	5"	5/8	58260	\$171.70	58294	\$187.60	58391	\$204.20	58392	\$424.70
5/8	2+2	2-1/4	.735	5"	5/8	53864	\$179.70	58295	\$195.60	58393	\$212.20	58394	\$432.70
3/4	2+2	1-5/8	.860	4"	3/4	58270	\$174.90	58296	\$186.90	58395	\$198.90	58396	\$522.90
3/4	2+2	2-1/2	.985	5"	3/4	58280	\$218.40	58297	\$236.90	58397	\$256.90	58398	\$566.40

## FR Series: Fiberglass Routers

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

- Designed for routing of a wide range of materials
- Plain, Burr, End Mill, Drill point, and Fish Tail end features
- Proprietary cemented carbide grade with 3 different SmoothCoat coatings
- Use UnCoated for general purpose routing needs
- Use A1 (TiB2) coated for titanium, aluminum & other non-ferrous materials
- Use D1 PVD diamond coated for composites, CFRP's, honeycombs, plastics, woods & other abrasive materials • Use hard & thick D2 CVD diamond coating for long-run jobs in composites, CFRP's, honeycombs & other abrasive materials

D1 PVD Diamond coating is the perfect compliment for routing abrasive materials with our FR 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 (or A1/D2) as a suffix to the EDP #.



FRNOUC



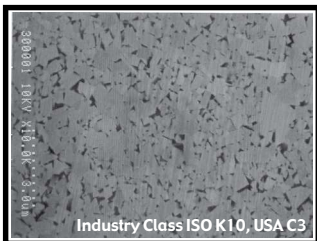
new!

				FRNO EDP#	UC Price	A1 Price	D1 Price	D2 Price	FRBS EDP#	FREM EDP#	FRDP EDP#	FRFT EDP#	UC Price	A1 Price	D1 Price	D2 Price
1/8	1/2	1-1/2	1/8	32001	\$7.40	\$9.30	\$12.30	\$35.30	32101	32201	32301	32401	\$8.70	\$11.00	\$13.60	\$36.60
3/16	5/8	2"	3/16	32002	\$10.90	\$13.50	\$16.50	\$56.00	32102	32202	32302	32402	\$13.70	\$16.70	\$19.30	\$58.80
1/4	3/4	2-1/2	1/4	32003	\$12.40	\$16.50	\$19.50	\$73.50	32103	32203	32303	32403	\$15.40	\$20.00	\$22.50	\$76.50
1/4L	1"	3"	1/4	32007	\$15.60	\$20.10	\$23.10	\$77.10	32107	32207	32307	32407	\$18.90	\$23.60	\$26.40	\$80.40
5/16	1"	2-1/2	5/16	32004	\$20.70	\$25.20	\$29.20	\$102.20	32104	32204	32304	32404	\$26.20	\$31.20	\$34.70	\$107.70
3/8	1"	2-1/2	3/8	32005	\$24.20	\$29.70	\$33.70	\$129.70	32105	32205	32305	32405	\$29.70	\$36.00	\$39.20	\$135.20
1/2	1"	3"	1/2	32006	\$40.00	\$46.80	\$51.80	\$169.30	32106	32206	32306	32406	\$46.90	\$55.50	\$58.70	\$176.20
<b>Metric Diameters</b>																
6.0mm	19	63	6.0	32008	\$12.40	\$16.50	\$19.50	\$73.50	32108	32208	32308	32408	\$15.40	\$20.00	\$22.50	\$76.50
6.0	25	76	6.0	32009	\$15.40	\$19.90	\$22.90	\$76.90	32109	32209	32309	32409	\$18.70	\$23.40	\$26.20	\$80.20
8.0	25	63	8.0	32010	\$20.70	\$25.20	\$29.20	\$102.20	32110	32210	32310	32410	\$26.20	\$31.20	\$34.70	\$107.70
10.0	25	70	10.0	32011	\$29.70	\$37.70	\$42.10	\$146.60	32111	32211	32311	32411	\$38.10	\$46.50	\$50.50	\$155.00
12.0	25	75	12.0	32012	\$40.00	\$46.80	\$51.80	\$169.30	32112	32212	32312	32412	\$46.90	\$55.50	\$58.70	\$176.20

1 **ULTRA-Grain®**

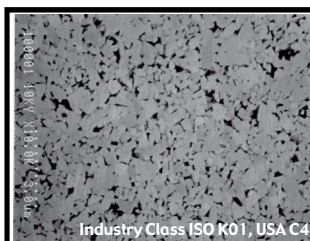
## Components of Guaranteed Quality

**COMPONENT #1: Carbide Substrate** From being the first Company to introduce MicroGrain carbide to the mass-market round tool industry through the present day, Tool Alliance® has consistently innovated new powder and grade combinations for demanding applications. We recognize that our material is the very first Significant Characteristic. By creating partnerships with a limited number of tungsten powder and cemented-carbide material suppliers, we are able to guarantee that our customers receive precision-tolerance tools ground from only the purest, finest grades available worldwide. The following photographs of Ultra-Carb® 1 and Ultra-Grain® 2 respectively demonstrate the complexity of the compound we commonly refer to as Cemented Carbide. Taken at magnification of 10,000 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 (K1c): 6.6  
TRS (GPa): 3.8  
Density (gm/cc): 14.90

ULTRA-Carb®

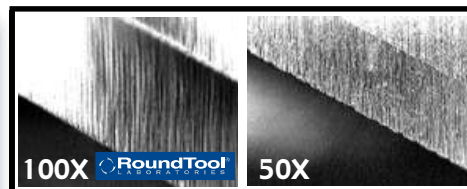
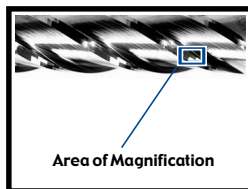


**Ultra-Grain® 2**  
Cobalt Percentage: 8%  
Grain Size (µm): ≤ 0.6  
Hardness: 93.8 HRa  
Fracture Toughness (K1c): 5.8  
TRS (GPa): 4.0  
Density (gm/cc): 14.6

ULTRA-Grain®

2 **SmoothGrind®**

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



**SmoothGrind® Competitor's**

3 **SmoothContricity®**



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

35% tighter shank tolerance than h6!



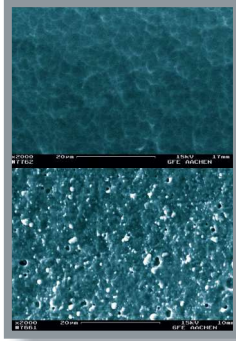
Shrink Fit Ready

4 **SmoothEdge®**



**COMPONENT #4: The Edge Preparation Process**

Our cutting edges are literally too sharp for certain materials. For our carbide inserts and now increasingly for our solid carbide round tools, proper edge preparation can yield huge productivity improvements to "out of the box" tool application. Using a treatment we call SmoothEdge® and performed on machine tools developed in our own R&D lab, we've taken the mystery out of tool "break-in" and provided a consistency that can be counted on time and again. The process ranges from SmoothEdge 1, a micro-blasting treatment using extremely fine aluminum oxide powder (this procedure is standard with any non-micro coated product) to SmoothEdge 5, which adds a double cycle of honing & lubricity treatments. All five will sound and run smooth from the first cut and protect your tooling investment from unnecessary potential for chipping during your initial tooling paths. Big productivity gains can be achieved in certain applications as well due to improved chip formation and evacuation. Learn more about SmoothEdge at [toolalliance.com](http://toolalliance.com).



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

# SmoothCoat® 5

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

**RoundTool Lab's Standard Coating Availability** Coating selection usually included within the EDP but for indicated Series it is added as a suffix to the EDP#.

Other Tool Alliance coatings:



Uncoated



AlTiN HSN<sup>2</sup>



TiB<sub>2</sub>



TiCN

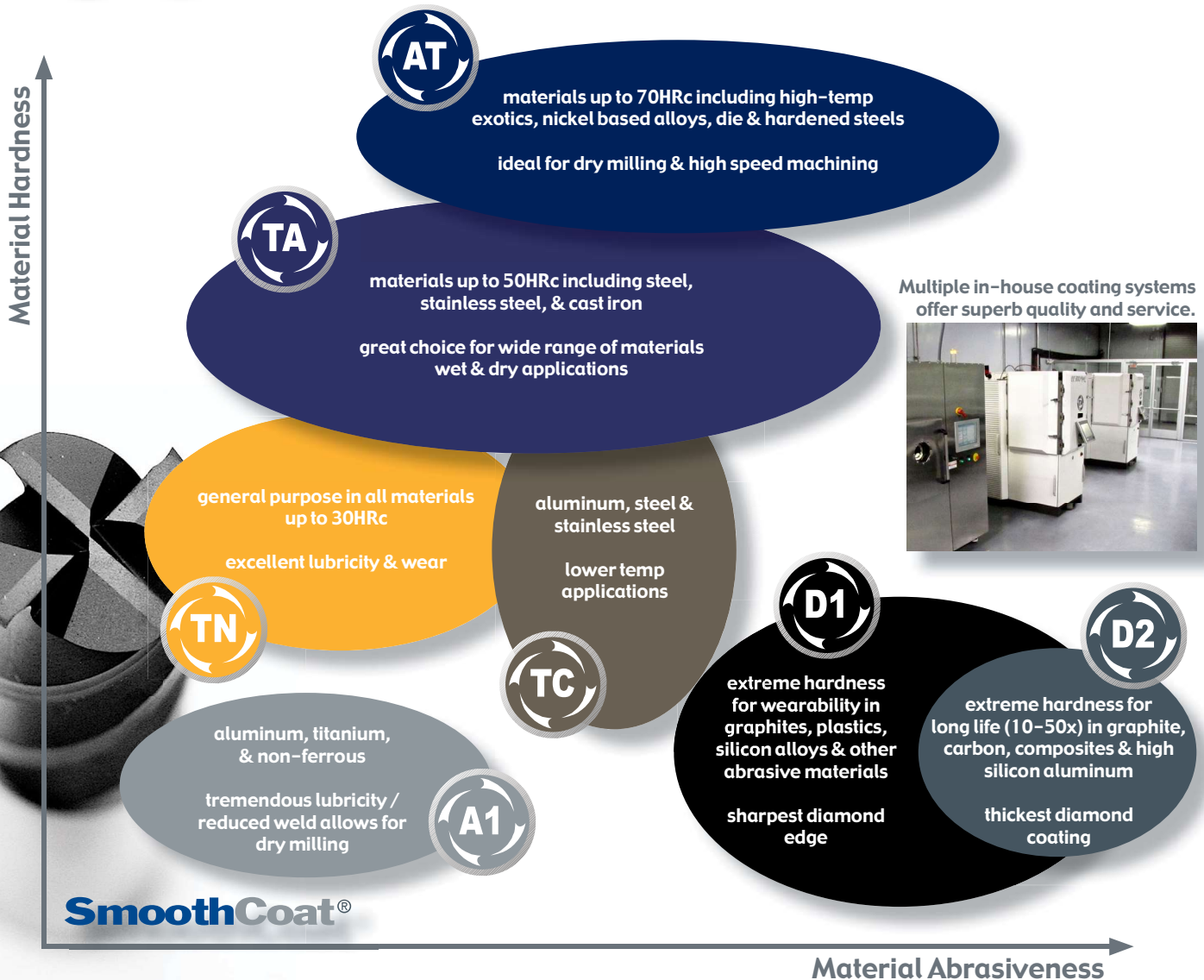


PVD Diamond



CVD Diamond

Standard Coatings available at respective "Coated" List Price



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

