



## SMART CUT™ 4002

## Sectioning Saw Specifications

**SMART CUT 4002** is a Manual / Semi Automatic Precision Sectioning Saw. Providing equal Precision, Productivity and Versatility as High Cost Fully Automatic Diamond Wafering Saws, at a small fraction of the price. Perfect for Production and R & D facilities on a Budget. This saw is able to withstand more exploitation, requires less maintenance, and much easier to use than Fully Automatic Wafering Saws.

### Saw Dimensions



**Length:** 15.0" max (381mm)

**Width:** 10.5" max (266.7mm)

**Height:** 7.59" (192.786mm)

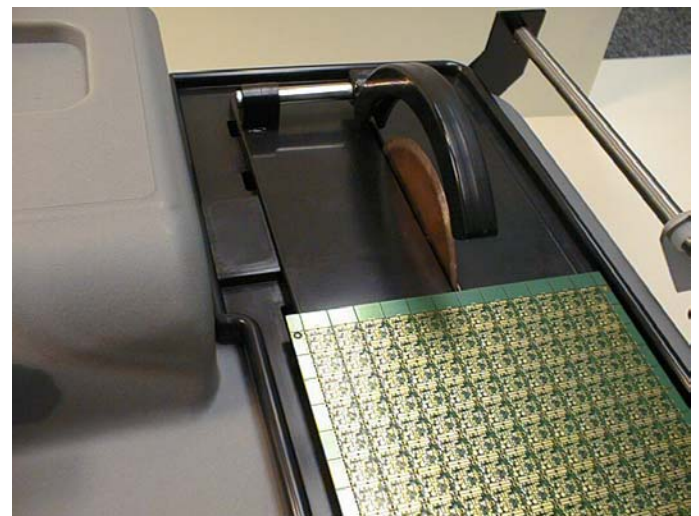
**Bottom:** Amortization legs (caps) on bottom of saw to minimize and eliminate vibration.

Motor Shaft:

- a.) Diameter 3/8" (9.525mm)
- b.) Length from plastic body 1.7990" (45.695mm)

Direct Drive Motor Tolerance: .001" (0.0254mm)

### Saw Working Area



**Size of working table:** 4.50" x 8.75" (114.3mm x 222.25mm)

**Maximum size of material that can be cut on table:**

**Length:** 3.625" (92.075mm) **Width:** 4.25" (107.95mm)

**Thickness:** 0.180" to 0.80" (SMART CUT 4002 can accommodate material thickness more than .180", but no more than 0.80").

**Maximum cutting thickness:** 0.80" (20.32mm)

**Exposure over table:** 1.121" (28.473mm)

### Most Widely Used & Affordable Diamond Sectioning Saw on the market today

- ADVANCED MATERIALS
- ULTRA HARD & BRITTLE MATERIALS
- OPTICS, GLASS & QUARTZ
- COMPOSITES
- METALS
- MANY OTHER MATERIALS

- Most Samples / Materials can be sectioned in seconds or few minutes, with no material deformation, & preserving sample/material True Micro Structure.
- It's straight forward design allows the operator to concentrate on sectioning samples, not operating the machine.



## **COMPARE TO ANY BRAND NAME SECTIONING SAW**

Designed for Fast & Precision sectioning of printed circuit boards, ceramic substrates, electronic packages, and many other materials. Precision saw combined with longer sample sectioning capability. Can be used for precision applications and for general low deformation, low kerf loss sectioning. **SMART CUT 4002** has largest work surface area than any other saw in its class. Designed to accommodate oversize samples.

Compare to any other low or high speed brand name Sectioning / Wafering Saw. **SMART CUT™ 4002** is able to withstand more exploitation, requires less maintenance, and much easier to use. No complex programs or controls to learn or restrict your sectioning operation. **It's straight forward design allows the operator to concentrate on sectioning samples, not operating the machine.**

Coolant is stored below and applied to sample by rotating the blade. Saw table has a **large working area** measuring **6" x 10"** has no inhibiting lip. The saw housing is made from unbreakable cross-linked polyethylene and the housing is guaranteed for life. The saw has powerful 1/4 HP motor, running at **variable speed of 400 to 3,400 RPM. Allowing the user to adjust RPM's to better fit sample/material being cut.** Motor is designed to insure that selected speed remains constant at any load. Sectioning is done in closed environment by utilizing Plexiglas Cover. Gravity Weight Feed allows samples to be sectioned unattended (without operator presence). **Most Samples / Materials can be sectioned in seconds or few minutes, with no material deformation, & preserving sample/material True Micro Structure. Made in U.S.A.**

### **Gravity Weight Feed**

Allows samples/material to be sectioned unattended (without operator presence). Gravity weight feed propels material / sample firmly positioned in vice assembly into rotating blade. Weight can be adjusted depending on material diameter, hardness, & density. As well as users objectives for sectioning speed in correlation quality of cut, and surface finish.

### **SMART CUT™ Synthetic Water Soluble Coolant**

Stream of SMART CUT™ coolant added to deionized (DI) water reduces material thermal stress, edge damage, & internal cracking, assuring long-term integrity of material being cut. Since SMART CUT™ KOOL is a coolant and lubricant, both the diamond blade and material benefit.

- **Improve Sectioning Speed and Efficiency**
- **Increase Blade Life**
- **Improve Material Surface Finish**
- **Reduce Chipping**
- **Reduce Material Cracking**
- **Preserve Material True Micro Structure**



### **SMART CUT™ LP Grinder / Polisher**

Perfect companion to SMART CUT™ 4002 Precision Sectioning Saw.

Grind & Polish samples sectioned with this sectioning saw fast & easy.

**BUY BOTH & SAVE**



## FEATURES:

### Cutting Action:

Linear blade feeds into work piece. Material is slowly feed into the rotating blade.

**Motor Power:** 1/4 HP

### RPM's (Variable Speed)

400-3,400 rpm

**Blades SMART CUT 4002 can accommodate:**

### Wafering Blade Diameters:

3" to 5" (75-125mm)

### Abrasive Blade Diameters:

3" to 5" (75-125mm)

**Blade Thickness:** .005" to .075"

### Can be used with:

- SMART CUT Diamond Wafering Blades
- Other manufacturers Diamond Wafering Blades
- Abrasive Cut Off blades.

**Coolant Capacity:** ¼

**Arbor:** 5/8" or ½" (15.8 or 12.7mm)

**Slot for blade:** 0.124" (3.15mm)

**Arbor Size Diameter:** 1.0"

**Shipping Weight:** 22 lb

**Table shown below may easily be removed, cleaned and adjusted. Blade guard may be adjusted and raised to accommodate larger samples and better fit any particular diamond wafering or abrasive cut off blade. Coolant is stored below and applied to material / sample by rotating the blade.**

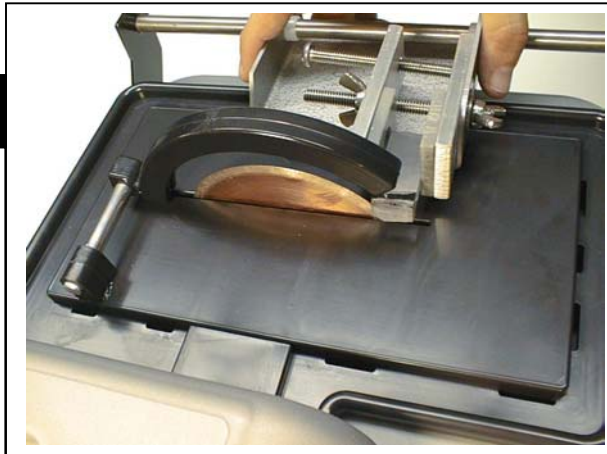
## ADVANTAGES:

- Minimal Blade Load / Very Simple to Use
- Largest surface work area available for saw in its class.
- Powerful motor designed for cutting very hard to soft materials
- Unbreakable cross-linked polyethylene prevents corrosion. Guaranteed for life
- Best performance & price per cut
- Universal Application / Adjusts to fit any application
- Can withstand more exploitation than conventional Automatic Precision Diamond Saws
- Very easy to Use and Maintain
- Save Money – Equal Performance on most Applications to Fully Automatic Sectioning Saws, at small Fraction of cost.
- **Perfect for Manufacturing and R & D Organizations on a Budget**





## Vise Specifications



**Operator can change blade speed (RPM's) during operation.**

## Wafering Blades

### Sintered (Metal Bond) or CBN

- 3" x .010" x 1/2" or 5/8" ID
- 3" x .006" x 1/2" or 5/8" ID
- 3" x .005" x 1/2" or 5/8" ID
- 3" x .004" x 1/2" or 5/8" ID
- 4" x .020" x 1/2" or 5/8" ID
- 4" x .014" x 1/2" or 5/8" ID
- 4" x .010" x 1/2" or 5/8" ID
- 5" x .020" x 1/2" or 5/8" ID
- 5" x .014" x 1/2" or 5/8" ID
- 5" x .010" x 1/2" or 5/8" ID

### Electroplated (Plated)

- 4" x .007" x 1/2" or 5/8" ID
- 4" x .012" x 1/2" or 5/8" ID

### HYBRID™ Bond Blades

- 4" x 14" x 1/2" or 5/8" ID
- 5" x .014" x 1/2" or 5/8" ID

All wafering blades are available from stock in different diamond concentrations, grit sizes, and bond harnesses to fit your specific application. Blades can be used with plain water, water soluble coolant, or oil.



**User adjustable RPM's allows even the most delicate samples to be cut without deformation**



### Vise Specifications/Material Capacity:

**Width:** 1.1430" (29.032mm) **Height:** 2.2075" (56.071mm) **Length:** 2.50" (63.5mm)

**SMART CUT 4002** Vise Assembly is an adjustable guide that allows for accurate precision cuts.

Wing nuts are tightened to clamp the work piece securely in place. The carriage advances slowly to feed material evenly into the blade. Easily installed by bolting into place. Samples can be accurately positioned in vice.

Vise can be easily adjusted to accommodate a large variety of material sizes, thickness, shapes, and configurations.

SMART CUT 4002 vises to hold longer samples for applications such as slot cutting and cutting samples on angle.

### ACCESSORIES:

Vise Assembly, Plexiglass Cover, Gravity Weight Feed, Dressing Sticks 1/2" x 1/2" x 6" Alumina Oxide or Silicon Carbide.

**Coolants:** Synthetic Water Soluble Coolant (non contamination), Synthetic Oils available in 1 quart, 1gallon bottles, 5 gallon pails, and 55 gallon drums.



**High Precision & Low Cost Manual Sectioning of a wide variety of materials, such as: PCB Boards, Copper Lead Frames, Silicon Wafers, Optical Glass, Ferrite Chunks, and many other materials.**

**APPLICATIONS:**

**Ferrous & Non-Ferrous Metals:**

- Plain Carbon Steels Electronic Packages
- Stainless Steels Plastics
- Tool Steels Fasteners
- Aluminum Refractories
- Copper Base Alloys Integrated Circuits
- Magnesium Thermal Spray Coatings
- Titanium Metal Matrix Composites
- Biomedical Wafers
- PCB's Ceramics
- Petrographic

**Precision Longitudinal Cuts and Slot Cutting on Long Samples:**

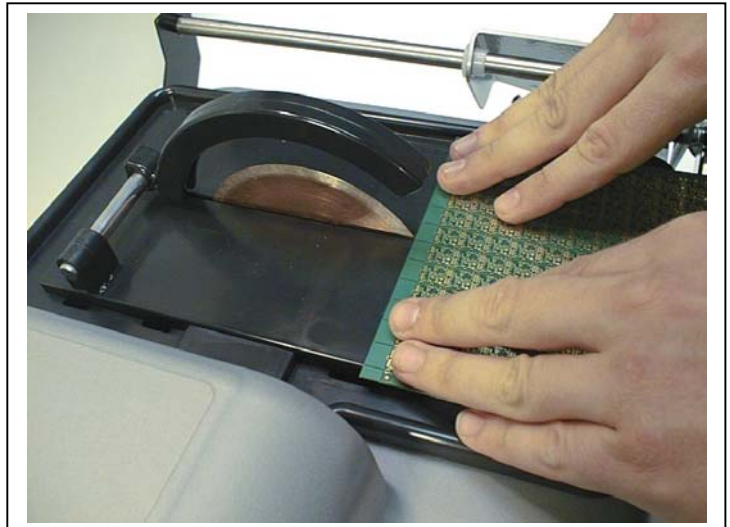
- Implants Bones
- Tubing Aircraft Fasteners
- Turbine Blades
- Cutting and Notching Ceramic and Plastic Specimens

**INDUSTRIES USED IN:**

- Advanced Ceramics
- Composites
- Glass
- Quartz
- Medical Devices
- Metallography
- Photonics / Optics
- Semiconductor
- Many Others

**BENEFITS:**

- + Improve cutting speeds**
- + Minimize material structure damage**
- + Improve surface finish quality**
- + Reduce material loss**
- + Obtain more accurate tolerances**

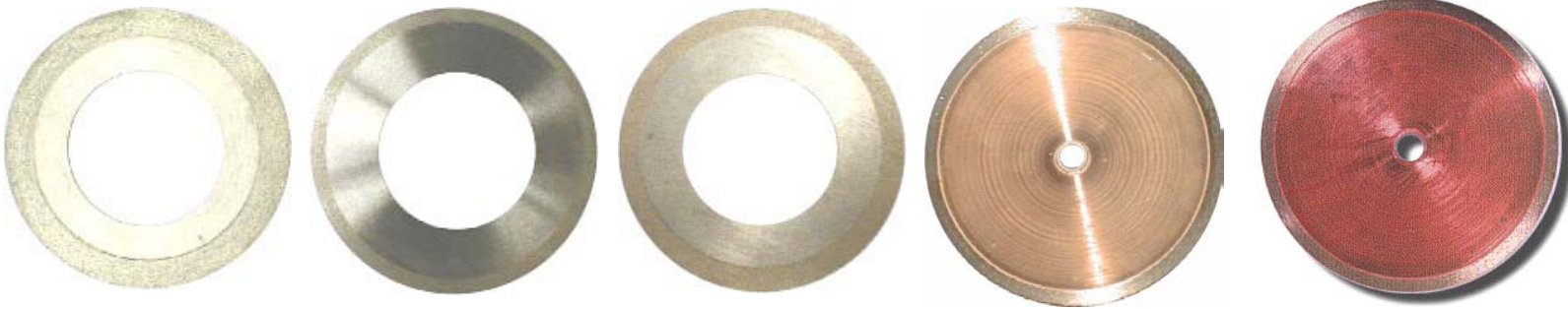
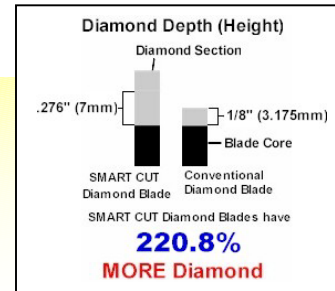


**= SUPERIOR RESULTS**



**UKAM Industrial Superhard Tools** Division of LEL Diamond Tools International, Inc.  
 28231 Avenue Crocker, Unit 80 Valencia, CA 91355 USA  
 Phone: (661) 257-2288 Fax: (661) 257-3833 www.ukam.com

**SMART CUT™ precision Diamond Wafering Blades are designed and specially selected to provide the maximum possible blade life for your desired cut quality, and speed.**



**UKAM Industrial Superhard Tools** is one of the leading manufacturers of high Precision Diamond Wafering Blades in the world. From 0.5" to 72" OD, starting .001" TH and up. With over 50 years of experience in manufacturing, research, and development. Following the belief that there is always room for improvement. We continue to raise standards for the whole industry. In addition to manufacturing diamond wafering / sectioning blades for our own SMART CUT series Precision Diamond Saws. We manufacture many Diamond Wafering Blades used on other well know sectioning / wafering saws.

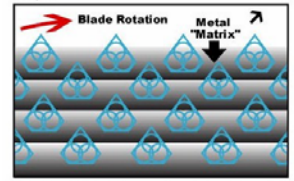
**We recognize that the Diamond Wafering / Sectioning Blade by itself is perhaps the most important factor in your sectioning / precision diamond sawing operation.** The diamonds impregnated inside the bond matrix of the wafering blade, are what actually participate in cutting action. No matter how precision or well made your wafering saw. **You will not be able to obtain the material surface finish, and precision tolerances you need, if the blade you are using is not right for your application**

UKAM Industrial Superhard Tools proprietary blade chemistry, precision manufacturing methods, modern quality control methods, allow us to control and regulate the dozens of variables that affect blade life, quality of cut, surface finish. Reducing and often eliminating additional steps often required after sectioning. All blades are manufactured to fit your specific material, application, and surface finish requirements. We will work with you to determine your needs, and develop the right bond formulation, concentration, and grit sizes.

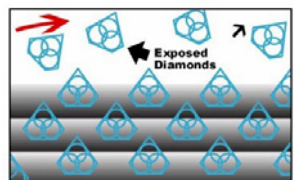
UKAM Industrial Superhard Tools has one of the **Largest Inventory of Precision Diamond Wafering Blades in the U.S.** With over 4,000 diamond wafering blades in stock available in different sizes

**You are sure to find the Right Diamond Wafering Blade for your application in stock and ready for same day delivery. If you are not using these blades, you are paying too much.**

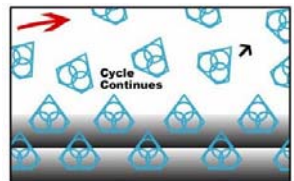
The sharpest and finest quality DeBeers diamonds that go into a Smart Cut Diamond Bond, immediately penetrate into the material, grinding and polishing as they cut.



Diamonds are activated only at the exposed layer. As diamonds layer begin to wear out, diamonds in a new diamond layer are immediately activated, substituting the already used-up diamond layer. The Smart Cut Diamond Bond makes sure every diamond is in the right place and at the right time, working where you need it most.



The newly exposed diamonds don't effect diamonds already working on the material. Unlike many other diamond bonds, diamonds in a Smart Cut remain sharp and grow sharper with each cut. Prolonging product life and consistent performance.



This advanced formulated open diamond bond design insures minimal chipping, fast cut, constant speed of cut, minimal cutting noise, and most important of all minimal loss of precious material.

**SMART CUT™ technology.**  
**Advanced technology that redefines the standard in cutting.**



# UKAM Industrial Superhard Tools

Division of LEL Diamond Tools International, Inc.

28231 Ave Crocker, Unit 80 Valencia, CA 91355 USA

Phone: (661) 257-2288 Fax: (661) 257-3833 www.ukam.com

## SELECTING THE RIGHT DIAMOND BLADE & BOND FOR YOUR APPLICATION

**M = Sintered (Metal Bond). R = Resin Bond. H = Hybrid Bond. E = Electroplated (Nickel Bond). MCBN = Metal Bond Cubic Boron Nitride. RCBN = Resin Bond Cubic Boron Nitride. HCBN = Hybrid**

Acrylic Glass	E
Agate	M
Al-Ni-Co	RCBN
Alumina (fused)	M
Aramid Fibre Plastics	M
Barium Titanate	R/H
Boron Carbide	M
Brake Lining	E
Cemented Carbide	M/R

### CERAMICS

Oxide ceramics, sintered	
Al <sub>2</sub> O <sub>3</sub> (aluminium oxide)	M
Al <sub>2</sub> O <sub>3</sub> (tubes)	R/H
Al <sub>2</sub> O <sub>3</sub> (electronic resistors)	E/M
Al <sub>2</sub> O <sub>3</sub> (seals)	M
Carbide Ceramics	R/H
TiC (titanium carbide)	M

### NITRIDE CERAMICS

Si <sub>3</sub> N <sub>4</sub> (HPSN) silicon nitride	R/H
Ceramic Tiles	M
Ceramics Unfired	E
Chrome Nickel (10% Cr, 90% Ni)	RCBN/HCBN
CRP (carbon reinforced plastic)	M
Epoxy Resin Boards	E
Epoxy Copper-Clad with circuits	E
Eternite (asbestos-free)	E/M
Formica (nameplates)	E
Germanium (semiconductor)	M
GGG (semiconductor)	E/R/H
Glass Optical	M
Glass Fibres (bundeled)	E/R
Glass Sheet	M
Glass Ceramics	M/R
Glass Hard Laminate (cast epoxy)	E
Glass Fibre Reinforced	E
Glass Laminates (safety/bullet proof glass)	M/H
Glass (quartz glass tubes)	R/H
Glass Wool	E
Glass (pyrostop)	M/H
Glass (thick optics)	M/H
Glass Technical	M
Glass Fibre Rod	E
Glass Hard Laminate	R/H
Granite	M
Graphite	E/M
GRP (window sections)	E
GRP (constructional sections)	M

GRP (internal thermoplastic ring)	E
Helopal Panels (plastic)	E
Hematite	M
HSS Punches	RCBN
HSS Hardened	RCBN
Insulators Ceramic	M
Lapis Lazuli	M

### MAGNETIC MATERIALS

Ferrites Sintered	M/R
Ferrites Cast	MCBN
Rare Earth Magnetic Materials	R/H
Samarium Cobalt	M/R
Malachite	M
Marble	M/E
Melamine Resin	E
Metal Coated Ceramics	E/M
Moybdenum	RCBN/H
Mycalex (cast stone)	M/E
Ni Hard Rods	RCBN
Piezoceramics	M
Polycarbonate (glass reinforced)	E
Polystyrene Sheets	E
Printed Circuit Boards	E/M
PVC Hard	E/M
Quartz (fusible)	M/R
Quartz (synthetic)	M
Rhodochrosite	M
Rose Quartz	M
Sapphire	M/R/H
Sendust	E
Silicon (polycrystalline)	E
Silicon Carbide (pressed & crushed)	M
Silicon (monocrystalline)	M
Silicon (semiconductor)	M
Silicon Nitride	R/H
Silicon Carbide (ReSiC)	R/H
Steatite	M/R/MCBN
Stellite	M
Tiger's Eye	M
Titanium	M/R/H
Titanium Carbide	M
Titanium Zirconate	M
Topaz	M
Tungsten	M/R/E
Tungsten Wires	M
Uranium Dioxide	M
Uranium	M
Zirconium	M



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## HOW TO ORDER



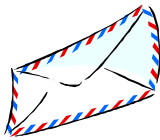
### Order by Phone:

Call: (661) 257-2288 Monday through Friday 8:30 a.m. to 5:30 p.m.



### Order by Fax:

Fax: (661) 257-3833, available 24 hours a day.



### Order by Mail:

send your orders to: 28231 Avenue Crocker, Unit 80 Valencia, CA 91355 U.S.A.

please include product item number, description, and payment.

### Accepted forms of payment



We accept Visa, MasterCard, and American Express. Organizations located in State of California add 8.25% sales tax. Net 30 terms on approved credit. Credit terms are only available to eligible organizations in USA and Canada.

Pre Payment is requested from all customers outside North America. Payment by wire transfer is preferred. If paying by wire transfer, please add \$35.00 USD to total. This is how much our bank charges us for each incoming wire transfer.