

## Vitrified Bonded Dressing Board

### General description

This product is a vitrified bonded grind stone disk that was formed so as to have the same diameter as silicon wafers. This is used for dressing the diamond wheel that is used to grind the back plane of silicon wafers and to adjust to the flat surface of a fixture table.

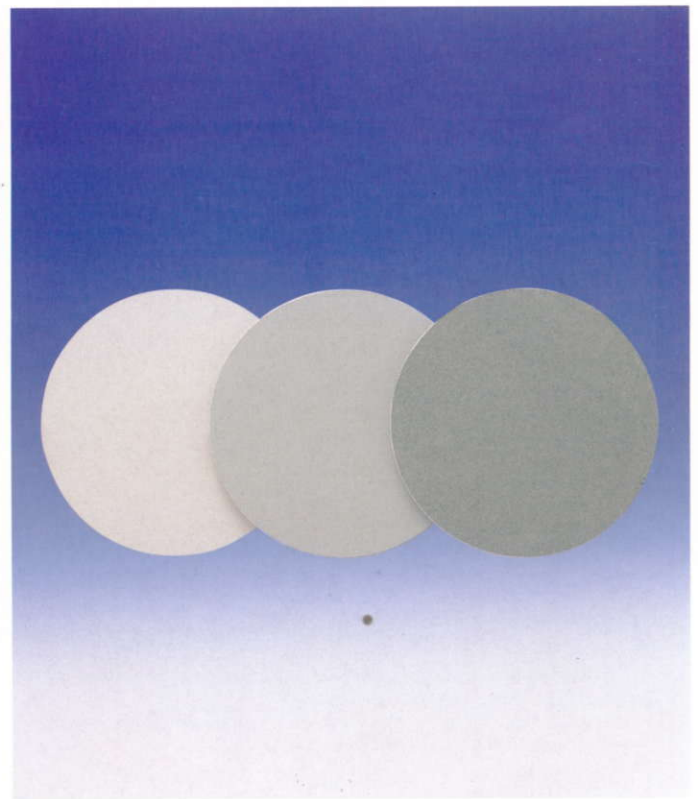
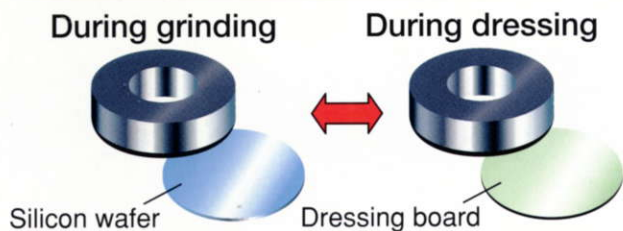
### Feature

1. Since it has fine and uniform pores, it provides a very stable dressing performance.
2. Ability to offer a unique specification matched to the diamond wheel in use by controlling the grain size of abrasive material.

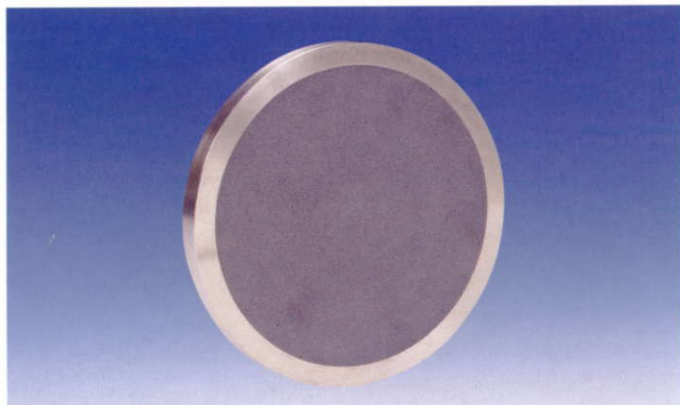
### Application

1. Dressing the diamond wheel
2. Grinding the back plane of silicon wafers
3. Grinding for adjusting to the flat surface of a fixture table

**Specifications** Possible to manufacture this dressing board with a diameter up to 8 inches



## Vacuum Chuck



### General description

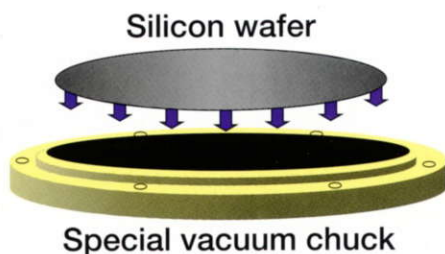
This product is a fixture for chucking the silicon wafers with vacuum, applying a vitrified grind stone disk as an absorbing plane.

A porous material manufacturing technology and a high precision flat plane finishing technology that have been cultivated in development of Noritake's vitrified bonded grind stone disks are applied to this product.

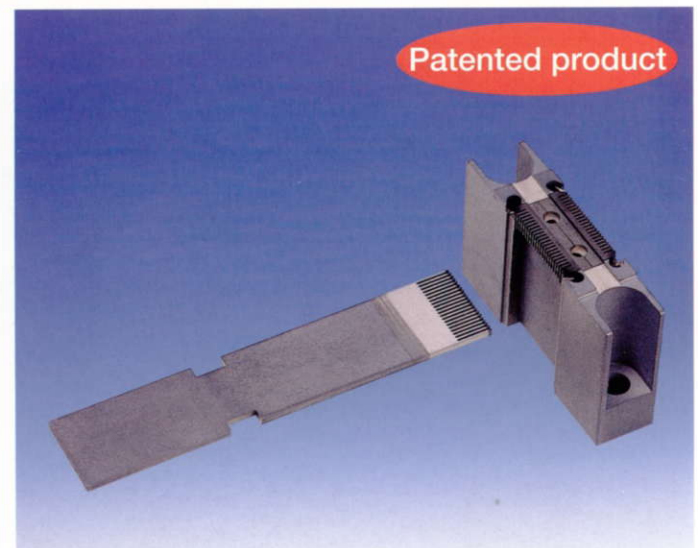
### Feature

1. Since it has many fine and uniform pores, it provides a very stable vacuum absorbing performance.
2. Highly precise surface flatness has been achieved.
3. Ability to adjust to various shapes and thickness.

**Application** 1. Silicon wafers, Quartz photo-mask substrates, Altic (Al<sub>2</sub>O<sub>3</sub>, TiC) wafers, etc.  
2. Substrate transfer systems.



## PCD Tie-Bar Cutting Punch / Die



### General description

This product is a fixture that is used for punching the lead frame and the resin mold at the same time in the post process of manufacturing the IC packages. Ability to significantly increase the life of the fixture compared to super rigid products.

### Feature

1. Owing to the outstanding wear resistant capability of PCD, it provides a phenomenally long life to the fixture.
2. Owing to its long life, loss of time caused by changing the fixture is greatly reduced and productivity is improved.

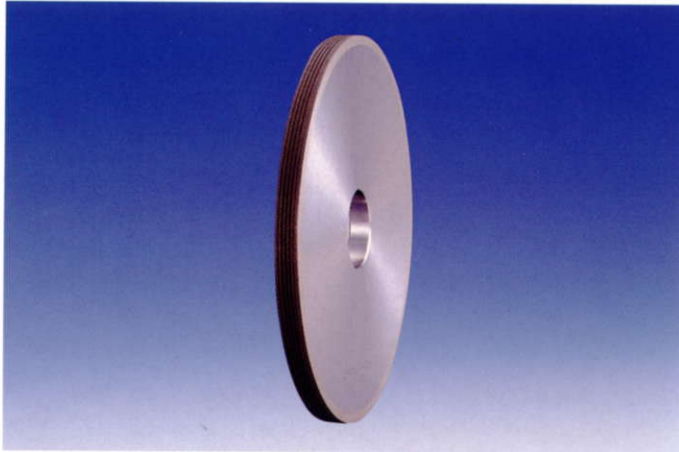
### Application

1. Cutting/punching the mold for various ICs, electroplated products and wear resistant products
2. Various punch / die for Tie-Bar cut, Resin cut, Pinch cut, Gate cut, Lead cut, etc.

### Specifications

Applicable pitch: >0.5mm

## Beveling Wheel for LCD



### General description

Ability to do highly precise and effective beveling owing to its excellent form factor accuracy and optimum abrasive surface state. In addition, a high grade finished surface can be obtained owing to the uniform and fine structure of the abrasive material layer.

### Feature

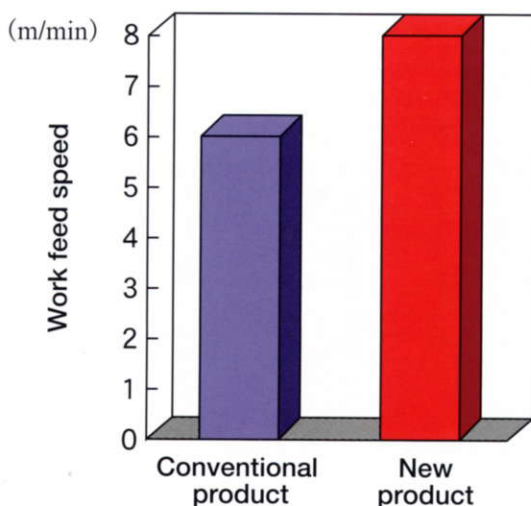
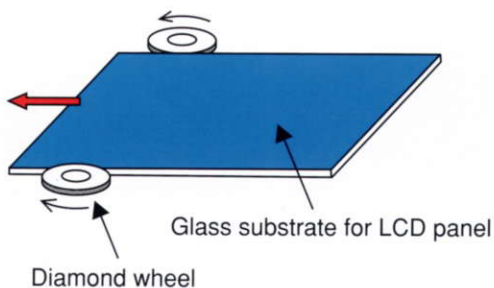
1. Highly precise finishing can be realized owing to its excellent form factor remaining capability and stable cutting performance by adopting a special metallic bond that has been developed for the sole purpose for beveling glass edges.
2. Ability to create a chippingless finish owing to its dense and fine structure of the abrasive material layer.
3. Ability to adjust to various shapes of chamfering owing to the high precision electric discharge machine technology.

### Application

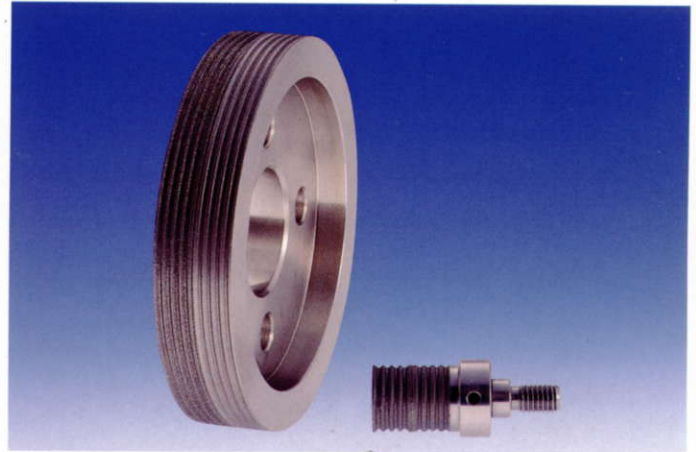
1. Chamfering of glass substrate used for LCD panels
2. Chamfering of glass substrate used for TFT and STN-LCD display panels

### Specifications

Standard spec. / SD500N50MFP  $\phi 150 \times 20 \times 25.4H$   
 (Range of manufacturing) SD325~800



## Electroplated Diamond Wheel for Glass HD Substrate



### General description

This product is a diamond tool used for chamfering the outer edge glass substrate for hard disks.

### Feature

Very long life has been achieved by reducing chippings by firmly fixing the highly selected diamond abrasive grains to the wheel using a high precision electroplating technology.

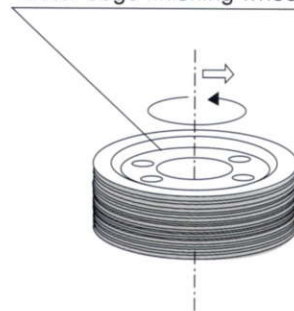
### Application

1. Finishing the inner and outer edge of glass substrate for hard disks
2. Finishing the inner and outer edge of glass substrate for hard disks

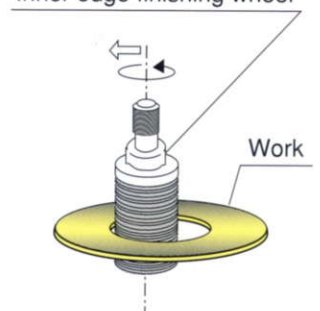
### Specifications

Standard spec. /  
 SD230 / 500PC5 (2 stage finishing)  $\phi 100 \times 20T \times 32$   
 SD270 / 500PC5 (2 stage finishing)  $\phi 17 \times 30L$   
 (Range of manufacturing)  
 Outer edge finishing wheel  $\phi 100 \times 20T \times 30H$   
 Inner edge finishing wheel  $\phi 4 \sim 25 \times 47L$

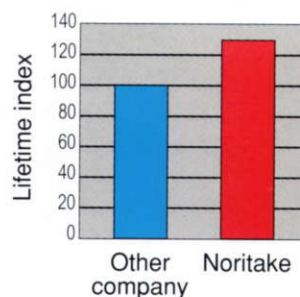
Outer edge finishing wheel



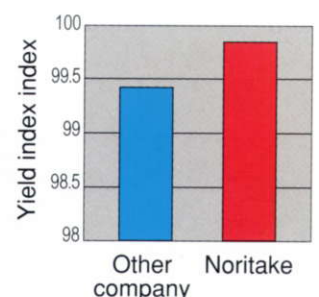
Inner edge finishing wheel



1) Lifetime index in grinding a non-crystallized glass

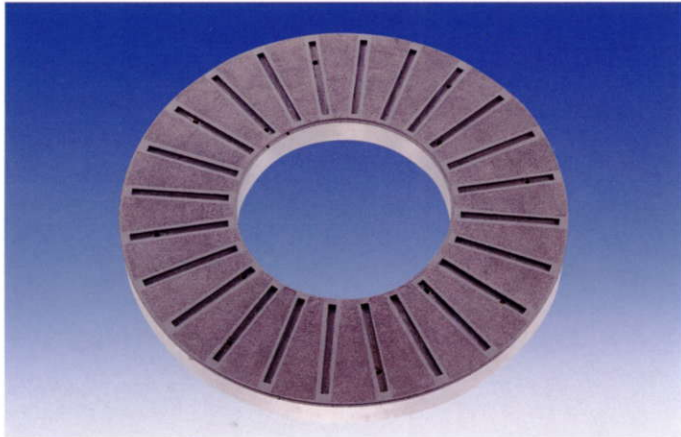


2) Yield index in grinding a non-crystallized glass



Attention: Those rates may change due to condition and are not to guarantee the efficiency of performance

## Diamond Lapping Wheel (Fixed Abrasive Grain Type)



### General description

Fixed abrasive grain lapping wheel provides solutions for such problems as finishing accuracy and low efficiency in loose abrasive grain lapping as well as a poor working environment, and enables improved accuracy of surface finishing.

### Feature

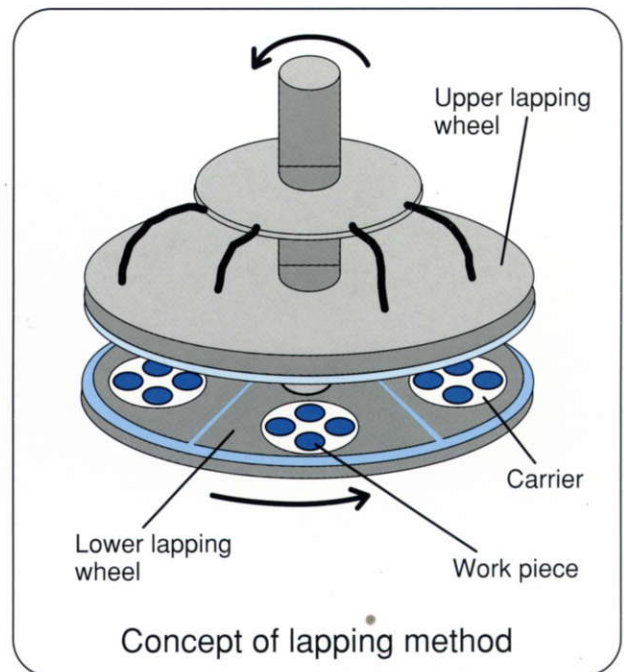
1. Ability to significantly improve the finishing efficiency comparing with the loose abrasive grain lapping method.
2. Since it is using precisely arranged abrasive grains, the smoothness of the finished surface is remarkably stable.
3. Ability to improve the working environment that occurs when using a loose abrasive grain lapping method.
4. Ability to select an appropriate pattern of abrasive grain layer that matches the form and size of the material to be finished.

### Application

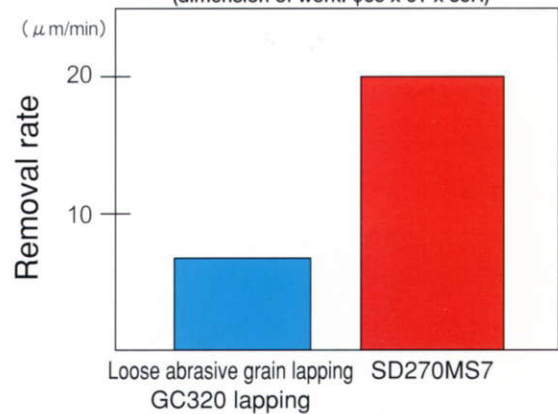
1. High precision polishing of glass, quartz and ceramics etc
2. High precision polishing of glass substrate for hard disks
3. High precision polishing of alumina ceramics

### Specifications

Rough polishing : SD140~600MS7 Fine finishing: SD800~3000MS8  
(Standard size)  
φ250~φ1500



Example of alumina ceramics finishing  
(dimension of work: φ65 x 6T x 35H)



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## CE Plate 200's

### General description

This is a polishing tool of the fixed grain lapping method containing CeO<sub>2</sub> abrasive grains.

This tool has been designed so that the chemical reaction of CeO<sub>2</sub> can be maximally utilized.

### Feature

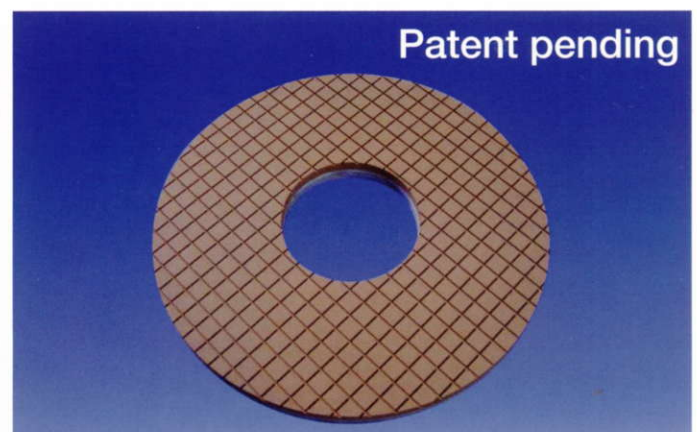
1. Ability to execute slurryless polishing.
2. Possible to obtain an extremely flat surface without scratching.
3. Possible to obtain a high grade surface with small undulation edge sags.
4. Ability to execute the entire operation of all the different materials while maintaining a level finish.

### Application

1. Polishing of glass and ceramics
2. High precision polishing of glass substrate for hard disks and prisms
3. High precision polishing of quartz photo-mask substrate

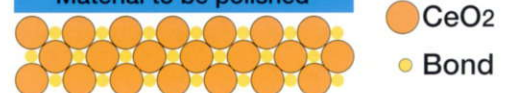
### Specifications

(Range of manufacturing) OD Size < φ650



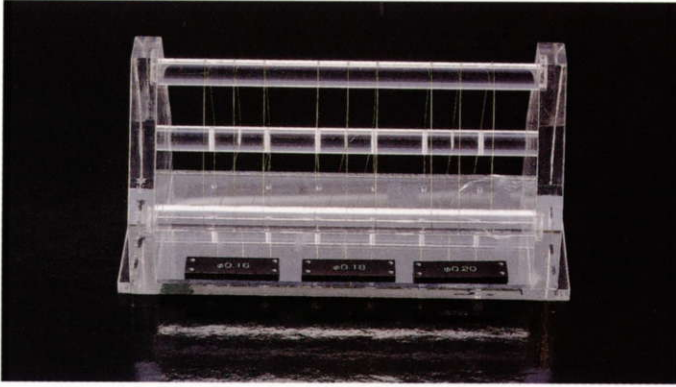
- ① High density abrasive grain
- ② High elastic coefficient  
→ Improved polishing rate and roll-off
- ⑤ Appropriate fixing force of abrasive grain  
→ Improved form factor remaining capability and in-surface uniformity

### Material to be polished



- ③ Uniform abrasive grain / bond distribution
- ④ Small amount bond (thin bridge)  
Reduction of scratch
- ⑥ High porosity and appropriate self-generation of abrasive grains  
→ Longer lifetime of abrasive layer

## Diamond Wire Saw



### General description

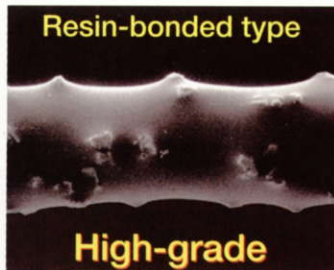
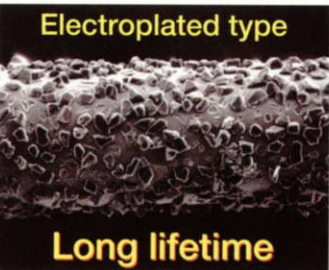
A loose abrasive grain type diamond wire saw is generally used for cutting the glass, quartz, sapphire, and silicon ingots. But, we have developed a fixed drain type diamond wire saw in order to improve cutting efficiency, cutting accuracy and the working environment as well as to address the natural environment issue of reducing industrial wastes. Two types of product, an electroplated type and a resin bonded type, are available.

### Feature

1. Ability to select either an electroplated type or a resin-bonded type depending on required conditions. Electroplated type  $\leftrightarrow$  long life Resin bonded type  $\leftrightarrow$  high accuracy
2. Since abrasive grains are tightly fixed on wire, high speed cutting is possible.
3. Since working abrasive grains are stable, excellent cutting accuracy can be obtained.
4. Since it's possible to use water-soluble grinding fluid, the working environment can be improved.
5. Ability to reduce the consumption of wire saw and to reduce slurry.

**Application** 1. Slicing an ingot of various materials  
2. Slicing of glass, magnetic material, quartz, silicon, sapphire, etc

**Specifications** (Electroplated type) core diameter of wire /  $\phi 180\mu\text{m}$  Spec / SD500~100P  
(Resin bonded type) core diameter of wire /  $\phi 120\sim 200\mu\text{m}$  Spec / SD450~800B



## Ultra Thin Resinoid / Metal Bonded Cutting Blade



### General description

This product is an extremely accurate ultra thin cutting blade for high accuracy cutting and grooving of fragile materials.

### Feature

1. By the highly precise finishing method, minimum thickness tolerance of  $\pm 0.002\text{mm}$  has been achieved.
2. Since slant cutting and blade vibration is suppressed owing to an increase of rigidity, cutting width accuracy is improved. Two types of blade, a resin bonded type and a metal bonded type, are available.

**Application** 1. Highly precise cutting and grooving of ceramics, ferrite, glass, and semiconductor materials, etc  
2. Cutting of alumina substrate, quartz glass, BGA package, etc

**Specifications** Grain size / #200~#800 Outer diameter / 50.8~76.2 mm  
Thickness / 0.1~0.3 mm Hole diameter / 25.4, 40

## Metal Bonded Wheel for Ultrasonic Drilling



### General description

This product is a diamond tool used for ultrasonic drilling.

### Feature

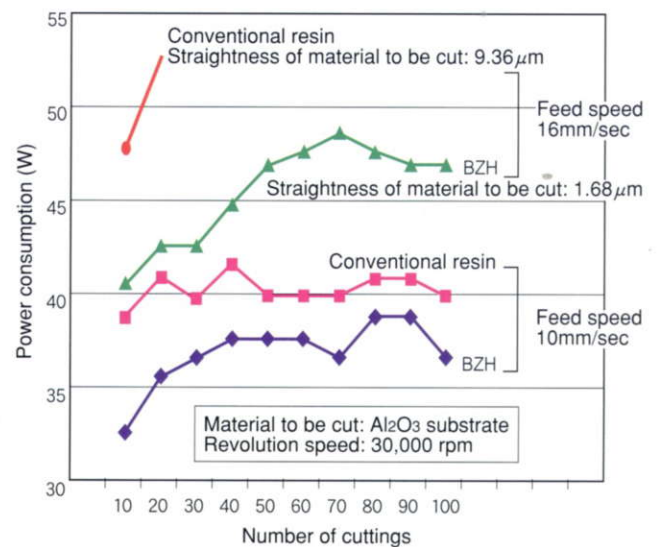
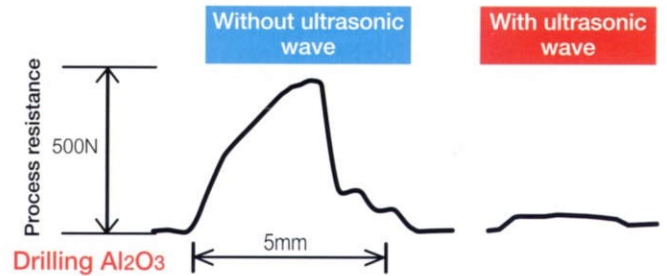
1. Ability to open a hole (drilling) with high accuracy owing to its highly precise finishing.
2. Highly accurate drilling ability remains for a long time owing to the adoption of a high rigidity shank.
3. Long life and long lasting cutting performance have been realized owing to the newly developed, dedicated bond that keeps abrasive grains well adhered.

### Application

1. Drilling the fragile and rigid materials such as ceramics and silicon, etc
2. Opening a small diameter hole in ceramics
3. Drilling a deep hole in quartz glass

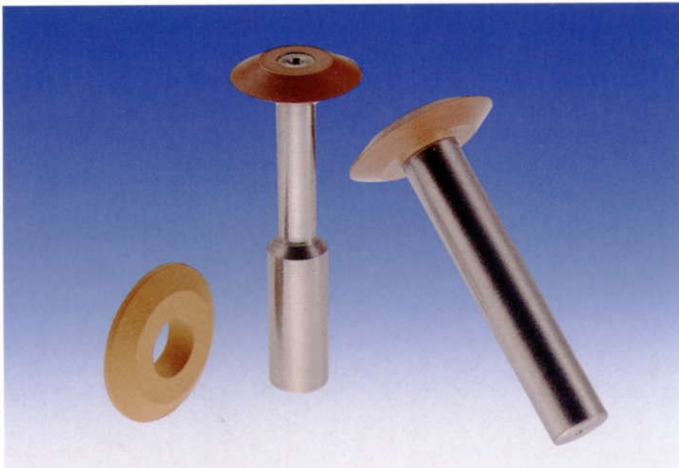
### Specifications

Standard spec. / SD120P100MU2 Grain size / #100~#325  
Outer diameter /  $\phi 2\sim\phi 20$  Length / 30~530



Attention: Those rates may change due to condition and are not to guarantee the efficiency of performance

## Super Fine Resinoid Bonded Wheel for Aspherical Lens Molds



### General description

In general, an aspherical lens is utilized as a CD pickup lens for its small and light characteristics. This product is a diamond tool used for highly accurate finishing of aspherical lens forming molds.

### Feature

1. Possible to execute a highly accurate finishing of an aspherical surface owing to its strong adhesive power of abrasive grains.
2. Since fine abrasive grains are distributed uniformly in the abrasive layer, it provides a balanced cutting performance.

- ### Application
1. Processing a mold which has an aspherical surface
  2. Forming an aspherical surface on highly rigid metal mold
  3. Forming an aspherical surface on SiC ceramics mold

**Specifications** Standard spec. (Dimensions)  $\phi 12 \times 3T \times 4X$   
 Rough finishing / SD 1500P100BPF Semi-finishing / SD1500P150BPF  
 Finishing / SD4000P150BPF

## Ceramics Base Resin Bonded Rim Saw

### General description

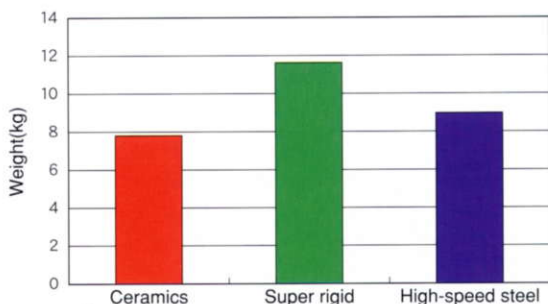
Since a high rigidity substrate is used in this rim saw, it is possible to use it for highly accurate cutting of rare earth magnetic materials such as Neodymium. Work efficiency in changing a rim saw is improved because it is lighter than other super rigid substrate rim saws.

### Feature

1. Rigidity is equivalent to super rigid substrate but it has an excellent cutting performance.
2. It is 50% lighter than super rigid substrate. It is advantageous in work efficiency when it is set in multiple saw settings.

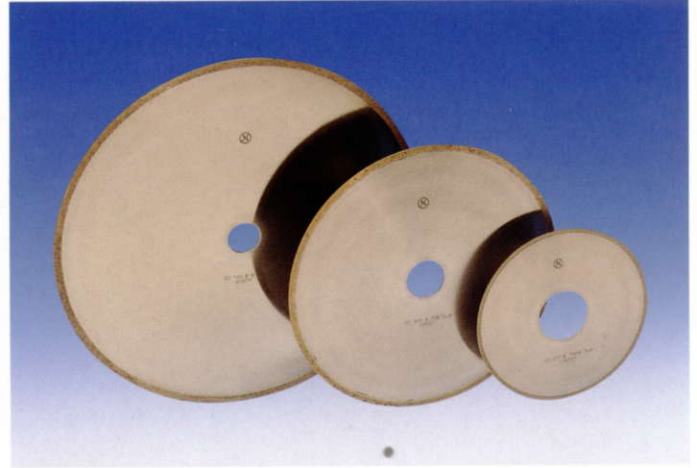
- ### Application
1. Highly accurate cutting and grooving of various rigid and fragile materials
  2. Cutting rare-earth magnetic materials such as Neodymium, Cutting ceramic super rigid blocks, Cutting an optical glass material

**Specifications** Grain size / #60~#325 Outer diameter /  $\phi 100 \sim \phi 150$   
 Thickness / 0.5~3.0 mm



Weight comparison between three types of substrate (Measured with a multiple substrate set each consisting of 50 pieces)

## Rim Saw for High Precision Cutting



### General description

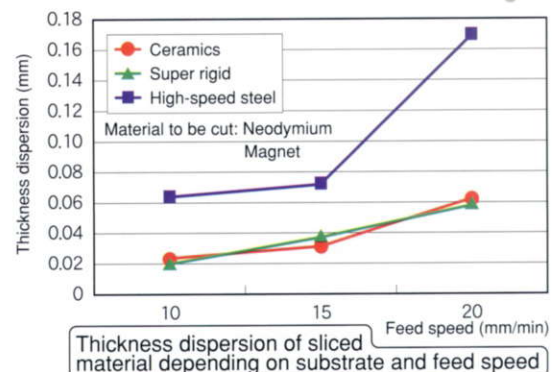
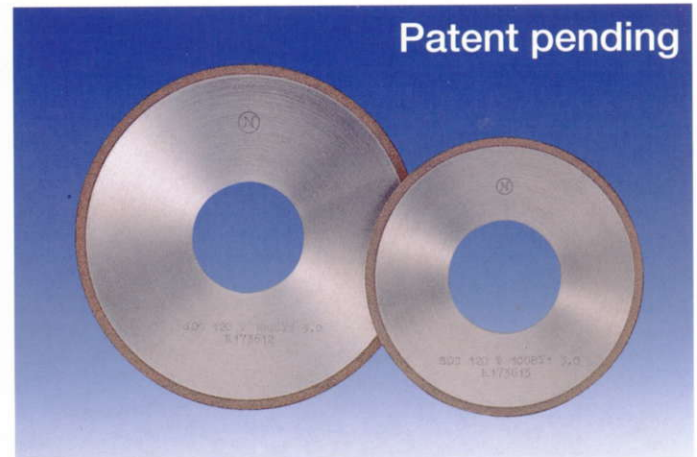
In order to reduce cutting loss and to improve the yield in cutting the expensive materials such as magnetic material, functional ceramics, semiconductor wafer, etc., an extremely thin blade edge has been used in this product.

### Feature

1. Ability to execute highly efficient and highly precise cutting owing to its extremely thin blade edge. Also, less slant cutting becomes possible by adopting high rigidity substrate.
2. Ability to execute chippingless cutting with low cutting resistance owing to the adoption of new bond material.
3. Since it has high thickness accuracy, stable cutting accuracy can be obtained.

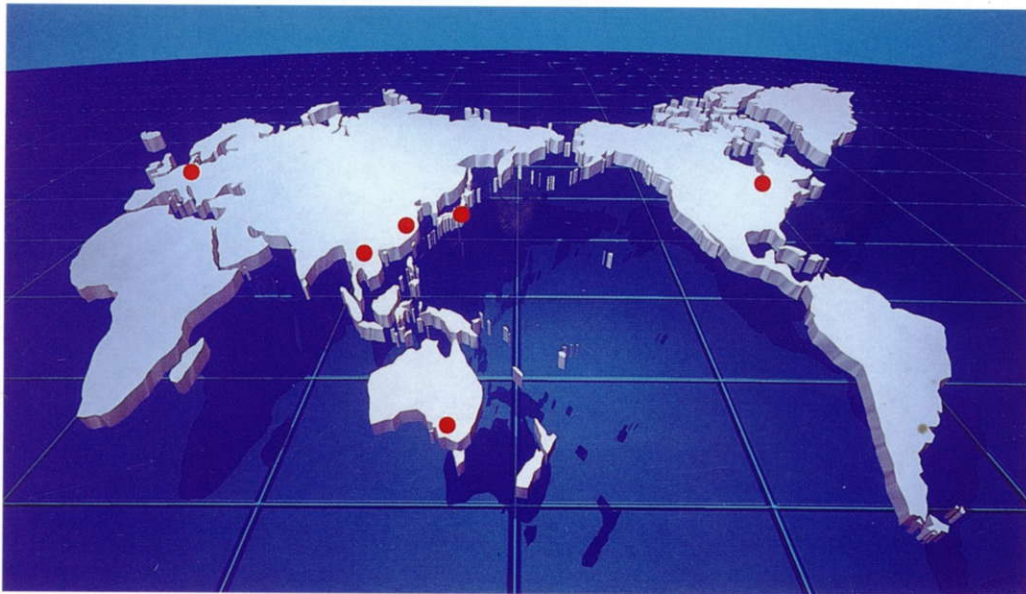
- ### Application
1. Highly accurate cutting and grooving of various rigid and fragile materials
  2. Cutting and grooving magnetic materials
  3. Cutting and grooving functional ceramics
  4. Cutting and grooving optical glass materials

**Specifications** Grain size / #230~#8000  
 Outer diameter /  $\phi 50 \sim \phi 150$  Thickness / 0.15~0.3 mm



Attention: Those rates may change due to condition and are not to guarantee the efficiency of performance

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