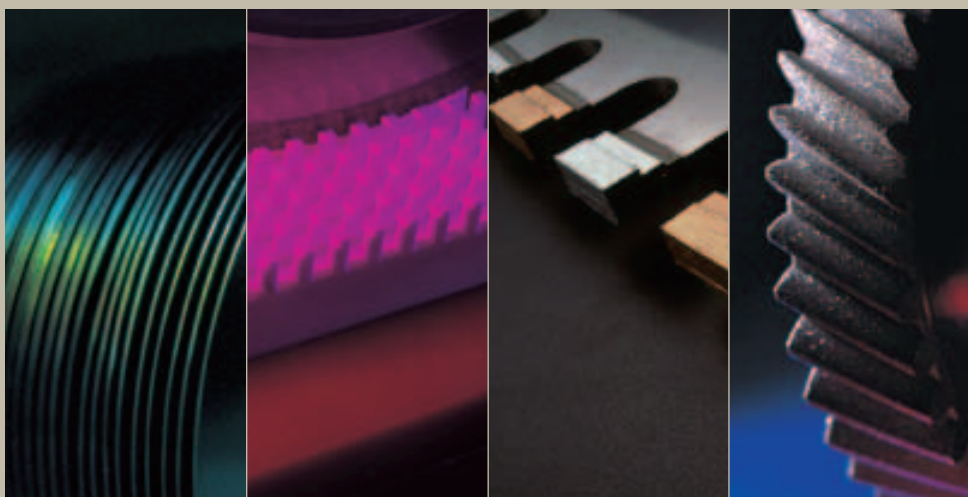
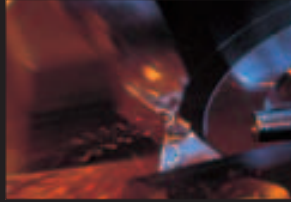




**Asahi Diamond Industrial Co., Ltd.**



**SHAPING THE FUTURE**



#### **Natural Diamond**

Natural diamond is produced in only a few favored places in the world because of the very unusual conditions under which it occurs. Rough diamonds are used in wire drawing dies, drill bits, dressers, etc.



#### **Synthetic Diamond**

Synthetic diamond is different from natural diamond in that it can be mass-produced and that optimum properties for particular applications can be imparted to it. Synthetic diamonds play an important role in improving the workability of hard, brittle materials, such as stone, concrete, and carbides.

#### **Cubic Boron Nitride (CBN)**

Like synthetic diamond, CBN is artificially made under extremely high temperature and pressure. CBN is a substance which does not occur in nature. Second only to diamond in hardness, CBN has excellent heat resistance and mechanical strength. Because of these properties, CBN is used in tools for grinding very tough materials, such as hard steels and alloys.



#### **SUNPAX: Polycrystalline Diamond (PCD)**

SUNPAX is produced by processing a mixture of polycrystalline synthetic diamond powder and bonding agent under high temperature and pressure. It is used in precision cutting tools for various nonferrous metals, nonmetals, and composite materials and in wear-resistant tools.

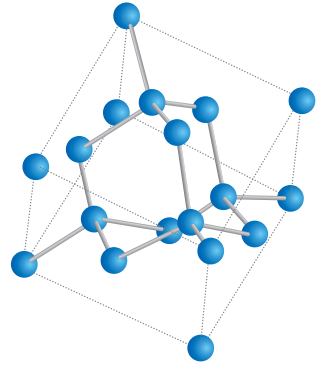
#### **SUNNITE: Polycrystalline Cubic Boron Nitride (PCBN)**

SUNNITE is produced by processing a mixture of polycrystalline CBN powder and bonding agent under very high temperature and pressure. It is especially suitable for tools used in cutting extremely hard materials, such as hardened steels and heat-resistant steels.



#### **Chemical Vapor Deposition (CVD) Diamond**

CVD diamond film, which is made through chemical vapor-phase synthesis, is used in microdrills, TAB tools, and various other precision diamond tools.



## **Utilizing the unique characteristics of diamond**

**Diamond is one of nature's most precious gifts to humankind. Its sturdy crystalline structure and strong atomic bond give it properties which make it ideal for use in the working of advanced technology materials.**

**As industry develops more complex materials which require increasingly sophisticated equipment to cut, drill, shape, grind and polish them for highly specialized uses, diamond will become indispensable.**

**As the world's leading producer of highly functional diamond and cubic boron nitride tools, and backed by superior technological capabilities, Asahi Diamond continues to enhance the performance and increase the value-added content its products.**



4

## AUTOMOBILES, ELECTRICAL MACHINERY, BEARINGS



### GRINDING

- Vitrified Bond CBN Wheels
  - For Grinding Camshafts "VT Series"
  - For Internal Grinding "VS Series"
  - For Centerless Grinding
  - For Grooving and Forming
- Resin Bond CBN Wheels
  - For Double-Disc Surface Grinding
- Electroplated CBN Wheels
- Diamond and CBN Wheels
  - For Re-grinding Machining Tools
- Diamond Wheels
  - For Pencil Edging Automobile Window Glass
- Diamond and CBN Honing Stones
- Diamond Gear Dressers
- Diamond Roller Dressers—Sintered and Electroforming Types
- Other Diamond Dressers

### MACHINING

- SUNPAX and SUNNITE Machining Tools
  - Reamers
  - End Mills
  - Turning Tools and Drills

### WEAR PARTS

- SUNPAX Wear Parts
  - Lathe Centers
  - Centerless Blades (Work-Rest)
  - Shoes and Rest
  - Gauge Heads

10

## MACHINERY TOOLS, DIES



### GRINDING

- Diamond Wheels
  - For Grinding Machining Tools
- Metal Bond CBN Wheels
- Resin Bond CBN Wheels
- Vitrified Bond CBN Wheels

### CUTTING / GROOVING

- Precision Cutting Wheels

### Machining

- SUNPAX and SUNNITE Machining Tools

### WEAR PARTS

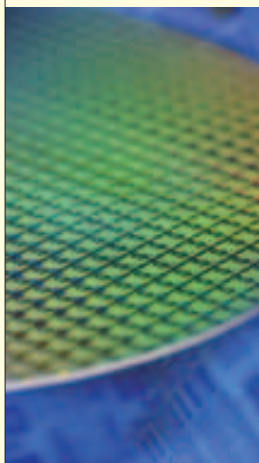
- SUNPAX Wear Parts
  - Lathe Centers
  - Centerless Blades

### OTHER TOOLS

- Diamond Hand Stones
- Diamond Files
- Diamond Paste and Diluent
- Diamond Slurry
- Electroplated Wheels with Shaft

14

## SEMICONDUCTORS, ELECTRONIC PARTS



### Semiconductor Manufacturing Process

- Cutting Silicon Ingots
  - Electroplated Diamond Band Saws
- Grinding Outer Diameter and Orientation Flat
  - Diamond Wheels
- Slicing Silicon Ingots
  - ID Blades
- Edge Grinding and Notch Grinding
  - Diamond Wheels
- CMP
  - CMP Conditioners
- Back Grinding of Wafers
  - Diamond Wheels
- Dicing
  - Electroforming Hub and Hubless-Type Dicing Blades
- Bonding of IC Chips (Wire bonding, TAB and flip chip bonding)
  - "SUN" TAB Tools
  - "SUN" TAB Auxiliary Tools (Bonding Stage, Pusher Pins, TAB Cleaner, Collet Holders, Alignment Pawls)
- Molding Finish

### Working of Electronic Parts

- Electroplated Diamond Wire "EcoMEP"
- Diamond Metal Band Saws
- Precision Cutting Wheels
  - Non-Core Type
  - Multi-Set Type
- Diamond Scribes
- SUNPAX Cutter for Chamfering PCB

18

## GLASS,CERAMICS, MAGNETIC MATERIALS



### GRINDING (for Glass)

- Diamond Wheels
  - For Precision Grinding of Optical Lenses
  - For Grinding Eye-Glass Lenses
  - For Chamfering Sheet Glass
  - For Beveling Sheet Glass
  - For Edging Thin Sheet Glass

### GRINDING (for Ceramics)

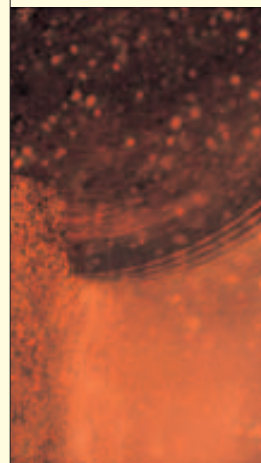
- Diamond Wheels
  - For Grinding Ceramics and Magnetic Materials
  - For Double-Disc Surface Grinding

### GRINDING (for Magnetic Materials)

- Diamond Wheels
  - For Centerless Grinding
  - For Double-Disc Surface Grinding
  - Precision Cutting Wheels
  - For Grinding Rotary Transformer Cores
  - For Grinding Magnetic and Ceramic Materials
  - For Mirror-finish Grinding of Magnetic Heads

22

## STONE



### CUTTING

- Diamond Circular Saw Blades
- Diamond Circular Saw Blades "Slide-on Type"
- Diamond Frame Saws
- Circular Saw Blades for Trimming
- Blades for Masonry Saws "S-cut"
- Diamond Portable Cutters "Blue," "Light Blue"
- Diamond Cup Wheels
- Diamond Wire Saws "Prime Wire"

### GRINDING / POLISHING

- Diamond Drum Wheels
- Diamond Polishing Wheels
- Metal Bond Polishing Wheels
- Resin Bond Polishing Wheels

### DRILLING / OTHERS

- Diamond Core Drills
- Special Diamond Tools



25

## CIVIL ENGINEERING, MINING



### DRILLING

- Diamond Impregnated Core Bits
- Surface Set Diamond Core Bits
- Diamond Bits (Non-core, Casing, etc.)
- Diamond Reamers

26

## ROADS, CONSTRUCTION



### CUTTING / GROOVING

- Saw Blades for Asphalt "MV Series"
- Grooving Blades
- Saw Blades for Concrete "CB Series," "Wall Saw Blades," "Jointing Blades"
- General-Purpose Saw Blades "Merit"
- Diamond Portable Cutters
- Diamond Cup Wheels
- Diamond Wire Saws "Hyper Snake"



### DRILLING

- Diamond Thin-Wall Bits "Hyper-Mole Z"
- "Hyper-Mole Mega"
- "M27"

28

## WOOD, STRUCTURAL MATERIALS



### CUTTING / MACHINING

- SUNPAX Multi-Edged Blade Cutting Tools
  - SUNPAX Cutters
  - SUNPAX Tipped Saws
- Diamond Portable Cutters "New Gold"



### GROOVING / DRILLING

- SUNPAX Router Bits



### GRINDING

- Diamond Wheels (for cutter sharpening)

30

## PRECISION WIRE DRAWING DIES, APPLIED PRODUCTS

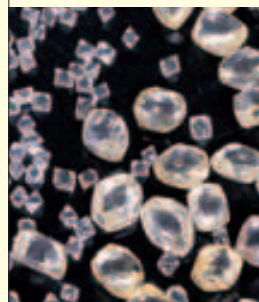


### WEAR-RESISTANT TOOLS

- Diamond Wire Drawing Dies
  - Wire Drawing Dies
  - Formed Dies
  - Tin Coating Guide Dies
  - Nipple
- Diamond Wire Guides
- Diamond Water Jet Nozzles

31

## OTHER PRODUCTS AND JEWELRY BUSINESS



- Natural Diamonds
- SUNPAX and SUNNITE Blanks
- Diamond Powder
- Related Equipment and Devices
  - Roller Dresser Drive Units
- Jewelry Business

32

## GRINDING TOOLS (Koremura Asahi Products)



### GRINDING

- Precision Grinding Wheels
  - Precision Shaft-mounted Grinding Wheels
- Superfinishing Grinding Stones
- Superabrasives Shaft-mounted Grinding Wheels
- Superabrasives Superfinishing Grinding Stones



## AUTOMOBILES, ELECTRICAL MACHINERY, BEARINGS

The growth of the automobile, electrical machinery, and bearing industries has been instrumental in Japan's rapid economic development. High-precision tools are an integral part of the advanced, fully automated mass-production systems employed by these industries. As one of the world's leading precision tool manufacturers, Asahi Diamond has created a full range of super-abrasive grinding wheels for use in automobile, electrical machinery, and bearing manufacturing.



### Vitrified Bond CBN Wheels (for grinding camshafts) "VT Series"

Vitrified bond CBN wheels are used for grinding the cam lobes of automobile camshafts. Optimum bond specifications have been set for each type of cam material, and since the wheels are used for high-speed grinding, bond quality, adhesives, and the materials used for the core are carefully designed for safety.



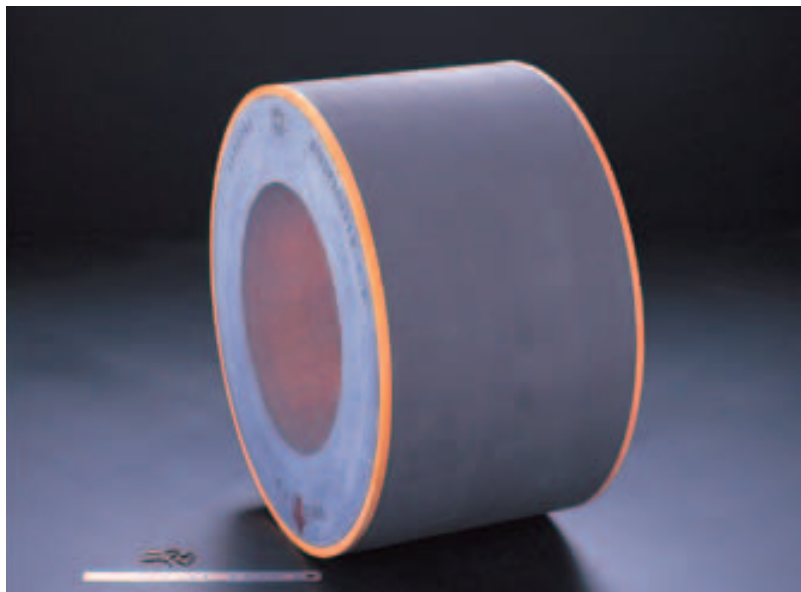
Internal grinder

### Vitrified Bond CBN Wheels (for internal grinding) "VS Series"

Vitrified bond CBN wheels are also used for internal grinding of various auto parts, including transmission gears, injection nozzles, cross joint caps, and connecting rods CVJ outer races and raceways, spherical surfaces. They are also used for internal grinding of bearing inner races, and compressor and pump parts. The wheels can be applied to a wide variety of materials, including cemented steel, carbon steel, bearing steel, sintered alloy, etc.

### **Vitrified Bond CBN Wheels (for centerless grinding)**

Vitrified bond CBN wheels are used for centerless grinding of various types of bearing rollers, injection nozzles, pump parts, etc. Since CBN has excellent grinding characteristics, vitrified bond CBN wheels need not be as large as conventional abrasive wheels. However, due to their comparatively large width and diameter, and in order to maintain wheel balance essential for high-speed revolution, a ceramic core is used to reduce overall weight and prevent thermal deformation.



### **Vitrified Bond CBN Wheels (for grooving & forming)**

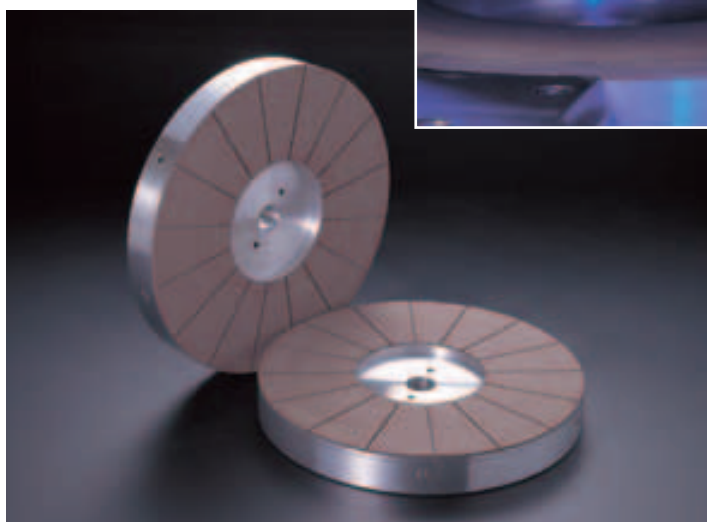
Vitrified bond CBN wheels are used for grooving vane pump rotors and synchromesh ball-joints, etc., as well as for forming injection parts.

Double-disc surface grinder



### **Resin Bond CBN Wheels (for double-disc surface grinding)**

Resin bond CBN wheels are used for double-disc surface grinding of the inner and outer race surfaces of bearings, transmission gears, washers, tappet shims, compressor parts, vane pump vanes and rotors, precision springs, etc. These are applicable to a wide range of materials, such as high-speed tool steel, die steel, bearing steel, carbon tool steel, spring steel, cast iron, sintered ferrous metal, etc. Our superior know-how for this wide surface wheel is applied in CBN distribution, consistent bond quality and dimensional accuracy.







## GRINDING

### Electroplated CBN Wheels

The CBN layer, electroplated onto the core of the wheel, has excellent cutting ability due to its greater protrusion of CBN particles. This structure is suitable for high precision formed wheels such as those used in gear form grinding. It is also used for high-speed grinding applications, owing to its extremely rigid core.



Profile of electroplated CBN-forming wheel

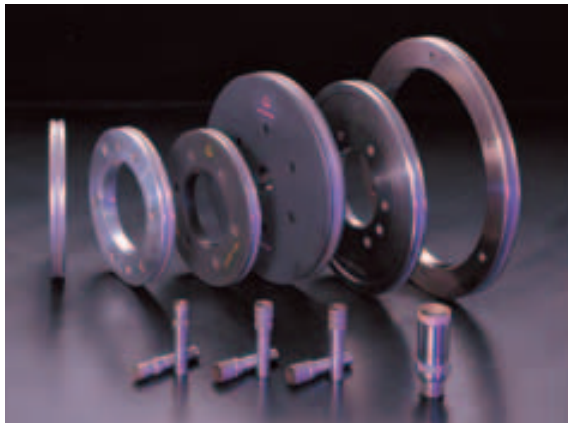


### Diamond & CBN Wheels (for re-grinding machining tools)

Diamond or CBN wheels are used to re-grind machining tools made of high-speed tool steel, cemented carbide alloy, cermets, ceramic, diamond compact, CBN compact. Various types of resin, metal, and vitrified bonds such as Polyx, Cermex, and Hi-Cerax are provided by Asahi Diamond depending on applications.







### **Diamond Wheels (for pencil edging automobile window glass)**

Metal bond diamond wheels used for pencil edging automobile window glass and diamond core drills for drilling holes in it have contributed greatly to automobile safety.

### **Diamond & CBN Honing Stones**

Honing stones are used for accurate and efficient honing of the inner surfaces of holes in automotive parts, such as cylinder liners, connecting rods, crankshaft bearings, valve rocker arms, transmission gears and brake hydraulic cylinders, and in vessel and generator parts, such as engine cylinder liners and compressors.



Gear dresser form accuracy being measured

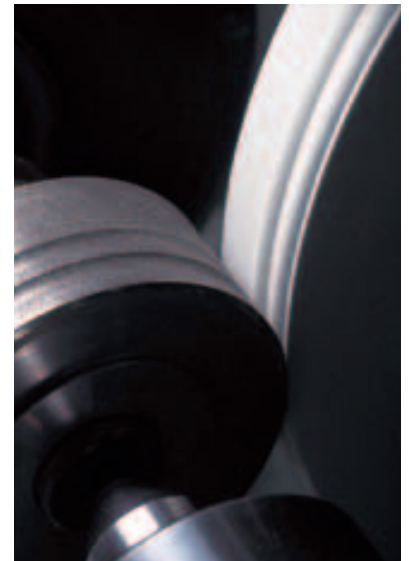
### **Diamond Gear Dressers**

Gear-shaped diamond roller dressers are used for dressing worm gear-shaped abrasive grinding wheels and internal gear-shaped abrasive grinding wheels. These gear dressers are effective in mass production of those high precision gears.

### **Diamond Roller Dressers Sintered & Electroforming Types**

Diamond roller dressers are used for forming and dressing fired abrasive grinding wheels and CBN wheels. Since these dressers are capable of accurate and speedy form dressing, they can effectively be used to mass produce work parts

with a high degree of accuracy. Diamond roller dressers are available in sintered and electroforming types.



Electroforming diamond roller dresser

### **Other Diamond Dressers**

A diamond dresser has one or more diamonds mounted on the tip of its shank and is used for truing and dressing abrasive grinding wheels.

The efficiency of grinding and finishing depends on the quality of the dresser. Asahi Diamond manufactures a broad range of diamond dressers, including:

- Single-point dressers
- Pyramid dressers
- Conical dressers
- Forming dressers
- Multi-point dressers
- Blade dressers
- Bond dressers
- Impregnated dressers



## SUNPAX & SUNNITE Machining Tools

### Reamers

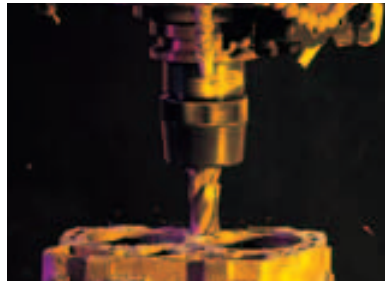
SUNPAX reamers are used for finishing drilled holes to precise specifications in auto parts such as engines and transmissions, and home appliance components.

### End Mills

SUNPAX or SUNNITE end mills are used for cutting aluminum alloy, steel, etc.

### Turning Tools & Drills

Natural diamond, SUNPAX or SUNNITE turning tools/drills are used as the cutting edge depending on the material to be worked, i.e., nonmetals, castings, cemented carbide alloys, etc.



Machining of a cylinder block

## SUNPAX Wear Parts

### Lathe Centers

SUNPAX lathe centers, which hold work pieces on a lathe or grinding machine, dramatically increase wear resistance and durability over of tungsten carbide.

### Centerless Blades (Work-Rest)

SUNPAX also greatly improves accuracy and efficiency at the work-rest of a centerless grinding machine.

### Shoe & Rest

The shoe and rest are used for fixing work pieces on a grinding machine. SUNPAX used for the shoe and rest increases accuracy and durability.



### Gauge Heads

Diamond or SUNPAX applied to gauge heads for measuring the dimensions of machined parts reduces wear and improves measuring accuracy due to its durability.

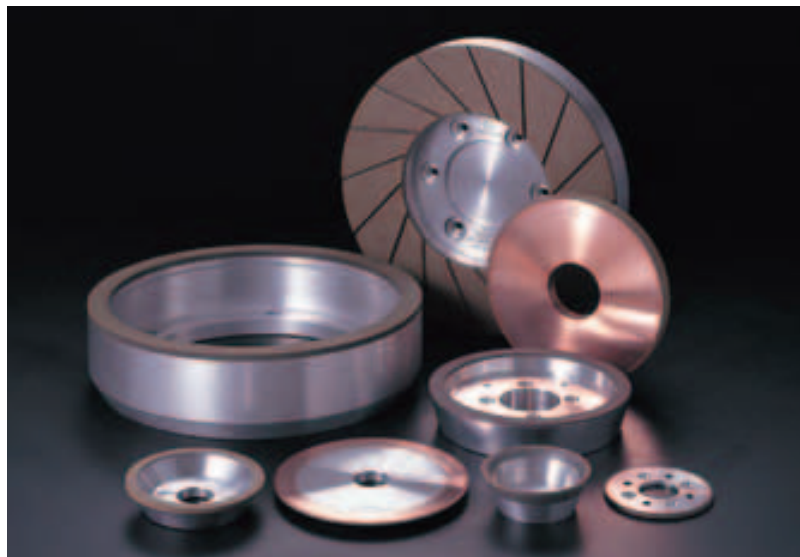




## GRINDING

### **Diamond Wheels (for grinding machining tools)**

To grind machining tools made of cemented carbide alloys, cermets, ceramics, etc., a wide variety of unique and effective bonds (Polyx, resin, metal, vitrified and electroplated) is available for different purposes and uses.



## MACHINERY TOOLS, DIES

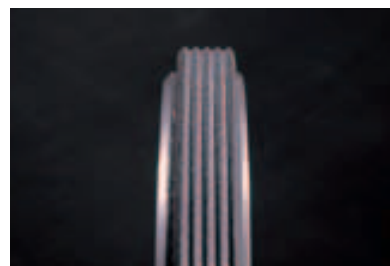
Many industries, including mould, machinery, tools, etc., which have supported the automobile and electrical machinery industries, continue to expand their operations to encompass other and new industries outside their original fields by applying and improving their processing methods. Asahi Diamond manufacturers highly advanced industrial-use tools that can process a wide range of materials for various applications, and contributes to all industries with its superior know-how.



Crush roll forming by metal bond wheel "FX-350"



Electroplated forming wheel

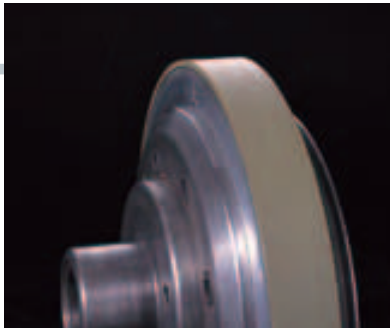


Profile of formed wheel



Double-disc surface grinder



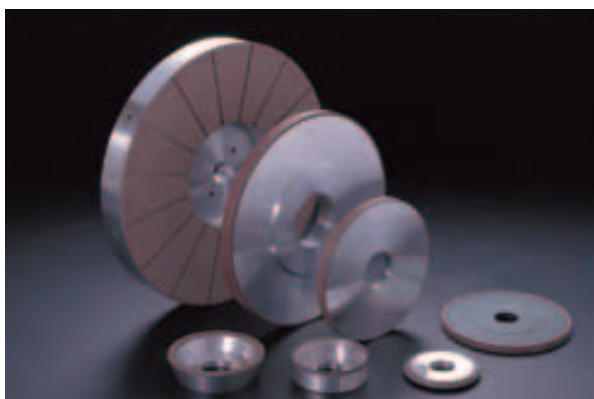


Resin bond diamond wheel



### Diamond Wheels

Diamond wheels used for precision grinding of dies include a broad range of wheels with assorted bonds to meet varying work specifications.



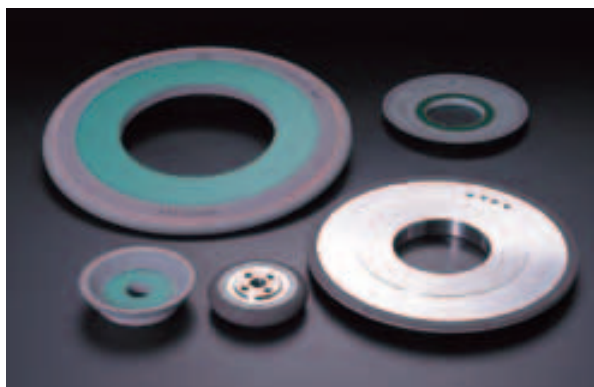
### Resin Bond CBN Wheels

Resin bond CBN wheels are used for sharpening the cutting edges of taps, end mills, drills, reamers, milling cutters, etc., as well as for fluting, cylindrical grinding and centerless grinding of shanks.

CBN Neo-Star wheels, which employ heat-resistant resin, are ideal for grinding for hard sintered high-speed steel.

### Metal Bond CBN Wheels

Metal bond CBN wheels are used for vertical spindle surface grinding of tool materials, fluting and gash grinding of end mills, and profile grinding in which the life and form of work pieces is essential.



### Vitrified Bond CBN Wheels

Vitrified bond CBN wheels are used in the thread grinding of rolling dies, ball screws, and taps, as well as for form grinding of die punches and working tools, the grinding of gears and the grinding of machine bed surfaces.



## CUTTING / GROOVING

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### Precision Cutting Wheels

These are precision cutting wheels featuring a layer of diamond or CBN bonded on the periphery of a highly rigid metal core. Various types of bonds (metal, resin, electroplated) and edge shapes (V-shape, R-shape, etc.) are available for many different purposes.



## MACHINING

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SUNPAX & SUNNITE end mills

### SUNPAX & SUNNITE Machining Tools

SUNPAX and SUNNITE machining tools, such as bits, end mills, drills and reamers are used in the cutting of a variety of metallic and non-metallic materials.



## SUNPAX Wear Parts

### Lathe Centers

SUNPAX lathe centers for holding works on a lathe or grinding machine offer exceptional durability and increase accuracy.

### Centerless Blades

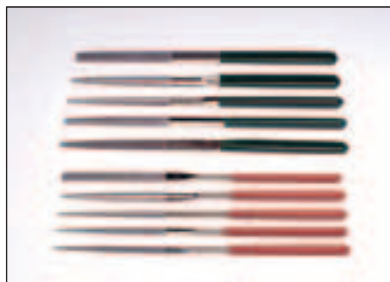
SUNPAX blades for centerless grinding machines increase tool working accuracy and efficiency well over of tungsten carbide.



## OTHER TOOLS



Diamond hand stones



Diamond files



Diamond paste and diluent, and diamond slurry



Electroplated Wheels with Shaft



## Semiconductor Manufacturing Process

### Cutting Silicon Ingots

#### Electroplated Diamond Band Saws

Thin-band saws (consisting of an endless, high-strength steel band with an electroplated diamond cutting edge) is capable of cutting large-diameter silicon ingots and other large diameter materials accurately and efficiently and can be manufactured in different sizes.



### Grinding Outer Diameter & Orientation Flat

#### Diamond Wheels

A cup-type diamond wheel is used to grind the outer diameter of silicon ingots and work on the orientation flat.

A special V-shaped wheel is employed to cut an orientation notch.



### Slicing Silicon Ingots



ID blades

#### ID Blades

ID blades are used to slice silicon ingots and other semiconductive materials with a high degree of accuracy. ID blades have been developed to accommodate increasingly larger

wafer sizes and are also used to slice glass, ceramics, and other hard materials.



Wheel for grinding wafers

## SEMICONDUCTORS, ELECTRONIC PARTS

Semiconductors and a wide range of other electronic components are among the essential building blocks of modern industry. Technological development across the entire spectrum of industry is resulting in the need for increasingly stringent requirements for precision and efficiency in tools, materials processing and in production systems.

As a technology-based producer of highly advanced industrial tools and processing methods, Asahi Diamond continues to increase the precision and durability of its expanding range of products.



## Edge Grinding & Notch Grinding

### Diamond Wheels (for silicon wafers)

Metal bond diamond wheels are used for edge grinding of silicon wafers. For notch grinding of large-diameter wafers, a small-diameter formed wheel is employed.



## Lapping

## Edge & Notch Grinding

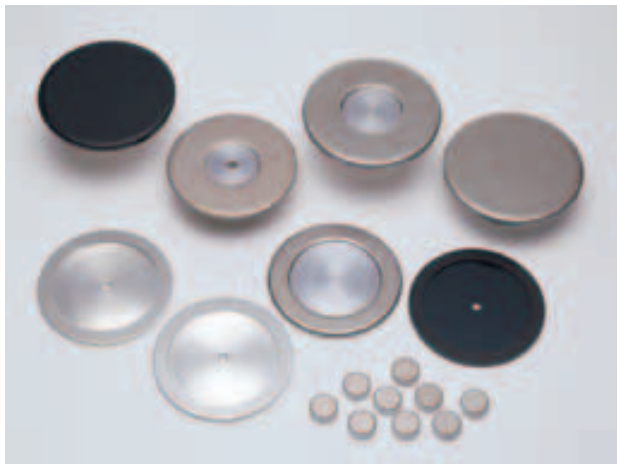
## Etching, Polishing, & Finishing Wafers

## Patterning

## CMP

### CMP Conditioners

Chemical mechanical polishing (CMP) helps smooth wafer surfaces, an important part of VLSI production. Conditioning is essential to assure stable CMP grinding. Asahi Diamond offers a variety of CMP conditioners to suit diverse wafer shapes and specifications.



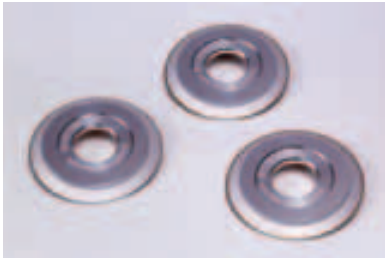
## Back Grinding of Wafers

### Diamond Wheels (for back grinding of wafers)

By using a diamond wheel for back grinding of patterned silicon wafers, it is possible to obtain a smooth, surface finish with minimum working strain.



## Dicing



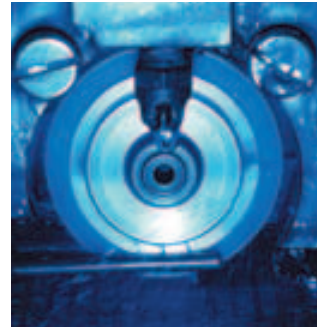
Hub-type dicing blades

### Electroforming Hub & Hubless-Type Dicing Blades

Electroforming dicing blades are commonly used to dice patterned wafers. The hub-type blade is easier to handle than the hubless-type blade, and both offer exceptional rigidity and grooving accuracy.



Hubless-type dicing blades



Dicing of silicon wafers

## Bonding of IC Chips (wire bonding, TAB\* & flip chip bonding)

### "SUN" TAB Tools

Bonding tools, which operate under a repetitive load at 400°C to 600°C, must have excellent heat resistance and conductivity and be extremely durable. The "SUN" TAB\* tool, using CVD diamond, meets all of these requirements.

\* Tape Automated Bonding



CVD-D TAB tools



### "SUN" TAB Auxiliary Tools

Applying diamond to TAB auxiliary tools, such as the bonding stage, collet holders, alignment pawls and pusher pins, increases the accuracy of bonding.

#### Bonding Stage

Applying SUNPAX to base metal improves finishing accuracy and bonding efficiency.

#### Pusher Pins

CVD diamond has been applied to the pusher pin for IC chip fixing tape.

#### TAB Cleaner

TAB cleaner using CBN abrasive grains is far more durable than conventional ceramic cleaners.

#### Collet Holders

The collet holder using SUNPAX draws IC chips accurately and greatly reduces damage to them.

#### Alignment Pawls

Use of a SUNPAX alignment pawl to position IC chips improves accuracy and increases durability.



## Molding Finish





### Electroplated Diamond Wire “EcoMEP”

Using a unique electroplating technology Asahi is able to diamond coat high tensile wire very precisely. This manufacturing technology provides a significant improvement over conventional slurry type wire saw. Observed advantages are reduced cutting time, less kerf loss, improved flatness when sawing silicon, sapphire and other hard and brittle materials.

### Diamond Metal Band Saws

Diamond metal band saws cut polycrystalline silicon, used in solar cells, and quartz glass used in semiconductor manufacturing equipment and optical lenses. Large objects can be accurately and efficiently cut with band saws that can be made for a variety of machines.



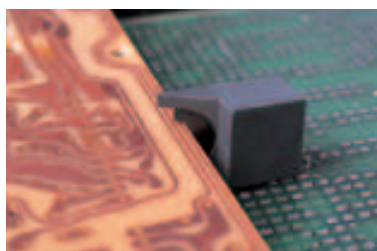
### Precision Cutting Wheels (Non-Core Type)

To work on precision electronic parts, a thin cutting wheel is required. Asahi Diamond's non-core type wheels are hubless and highly precise. The wheels are commonly used with dicing machines or high precision slicing machines. Various types of bonds (metal, resin, electroforming) are available for this type of cutting wheel, which is also used to cut magnetic heads, glass, the ceramics used in electronics, and other materials.



### Diamond Scribers

Diamond scribes are used for scribing silicon wafers into pellets and are available in different configurations, including cone-shaped, multi-pointed and shell-shaped. Each is specifically adapted to various work requirement. Multi-pointed scribes rotate to make use of a new tip after wear, offering longer tool life.



### SUNPAX Cutters for Chamfering PCBs

When resin materials (PCBs etc.) are cut, SUNPAX cutters are invaluable to chamfer them. Precise and sharp, they can provide a smooth surface finish.

SUNPAX cutter for chamfering PCB

### Precision Cutting Wheels (Multi-Set Type)

The multi-cutter type precision cutting wheel can cut and groove mass-produced articles with high precision. It is important to match the wheel precision, multi-setting technology and selection of wheel specification to the specific job requirement.





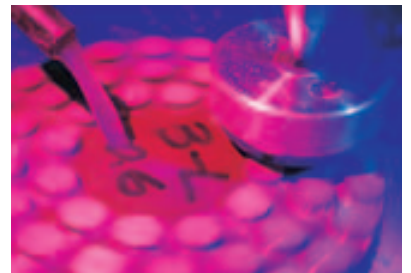


## GRINDING <FOR GLASS>



### Diamond Wheels (for precision grinding of optical lenses)

Diamond wheels with varying bonding materials such as curve generating wheels, pellets, lens centering wheels and chamfering wheels are used for grinding camera and binocular lenses, prisms, etc.



Grinding of glass by pellets

### Diamond Wheels (for grinding eye-glass lenses)

Lenses are made of a diversity of materials, including glass, plastic, or composites of both. Special wheels are needed to create the spher-

ical and nonspherical portions of lenses. Electroforming and metal bond centering wheels are used to grind the materials into the desired lens shape. SUNPAX end mills are widely used in processing plastic lenses.



Frame forming of eyeglass lenses



## GLASS, CERAMICS, MAGNETIC MATERIALS

Diamond tools are being utilized to work an increasingly diverse range of glass, ceramic and magnetic materials. Many new types of highly functional ceramics have been developed as an outgrowth of research and development on conventional ceramic materials. Also, many new magnetic materials, including ferrites, have been developed.

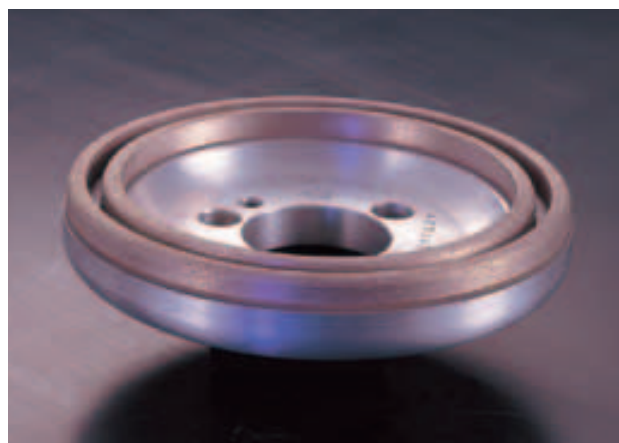
As the range of new materials continues to expand, Asahi Diamond is actively developing high-precision working tools that meet the evolving needs of industry.



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### **Diamond Wheels (for chamfering sheet glass)**

Metal bond diamond wheels play an important role in the pencil edging of sheet glass for automobiles, buildings and various types of mirrors.



### **Diamond Wheels (for beveling sheet glass)**

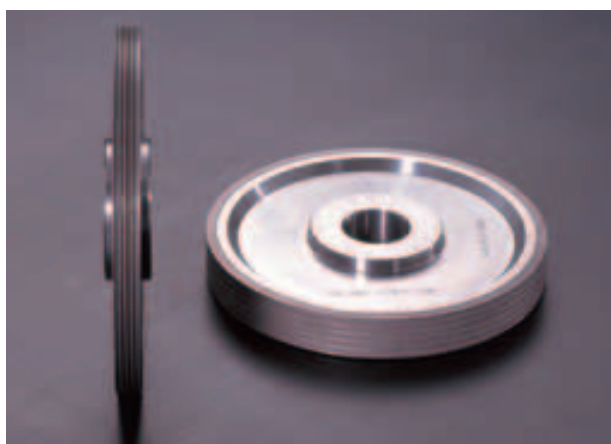
Metal or Polyx bond diamond wheels are capable of beveling various types of glass and building materials with accuracy and efficiency.



One-Way Core Drill for drilling sheet glass

### **Diamond Wheels (for edging thin sheet glass)**

Metal bond diamond wheels are also used in the chamfering of thin sheet glass, such as the screens used in televisions, clocks, and personal computers.





## GRINDING <FOR CERAMICS>

### Diamond Wheels

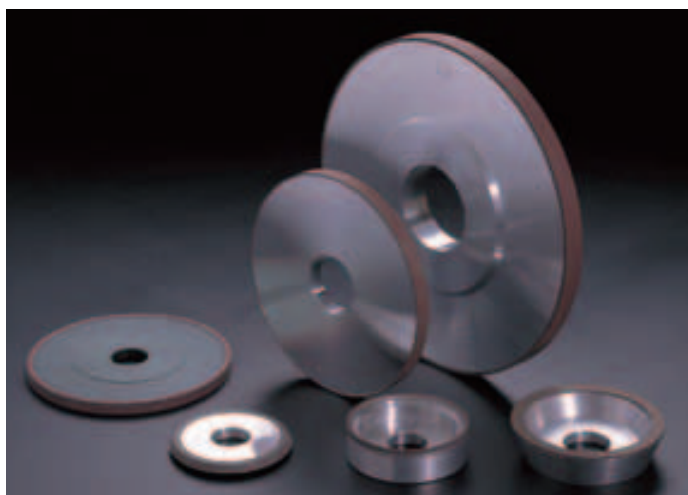
As some types of ceramics are relatively easy to grind and others extremely difficult, various types of diamond wheels are employed. Asahi Diamond continues to develop new bonding technology in order to produce tools capable of working the increasingly complex materials being developed in various industries.



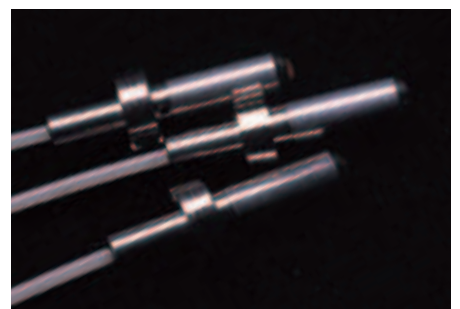
Chamfering of ceramic material



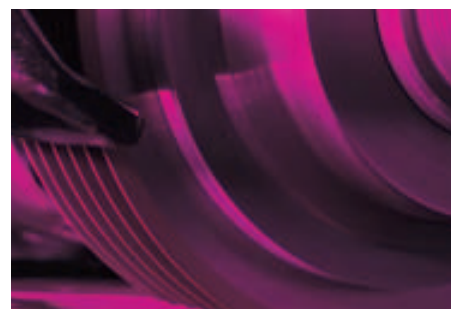
Electroplated diamond formed wheels for grinding ceramics and magnetic materials



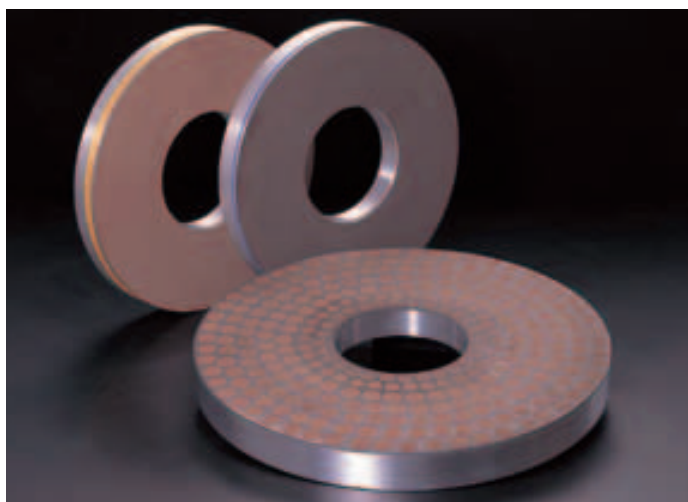
Diamond wheels for grinding ceramics



Ceramic connectors for fiber optic cables



Multi-set cutter



Resin bond diamond wheels for double-disc surface grinding



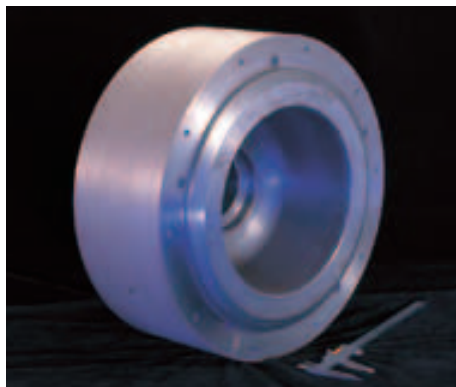
Cylindrical grinding of ceramic



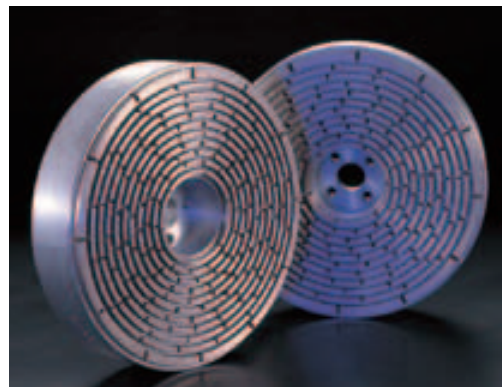
## GRINDING <FOR MAGNETIC MATERIALS>

### Diamond Wheels

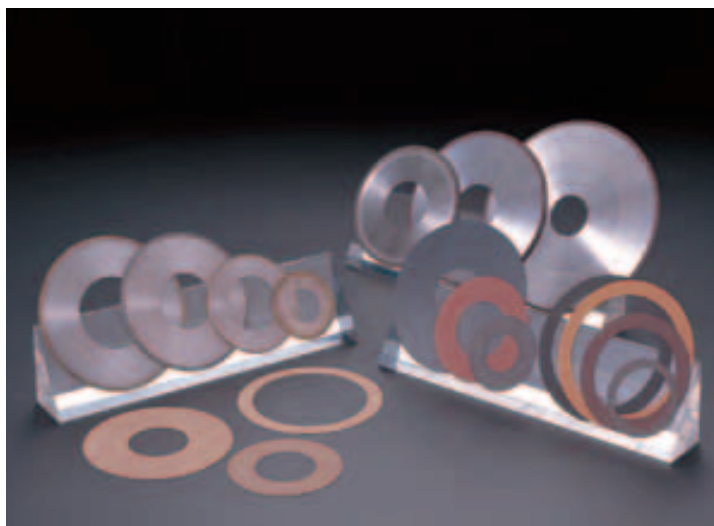
The tooling requirements of advanced processes, such as internal grinding, cylindrical grinding, centerless grinding, double-disc surface grinding, thread-grinding and cutting of ferrites, samarium cobalt, neodymium iron and other magnetic materials, vary widely. Asahi Diamond's overall technological capabilities, and its expertise in bond selection in particular, has enabled it to keep pace with the quickly evolving needs of its customers.



Diamond wheels for centerless grinding  
(metal and resin bond wheels for grinding magnetic materials)



Metal bond diamond wheels for double-disc surface grinding



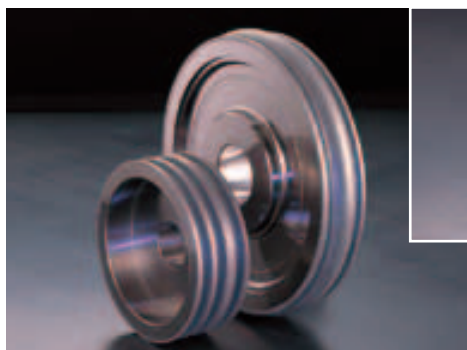
Precision cutting wheels



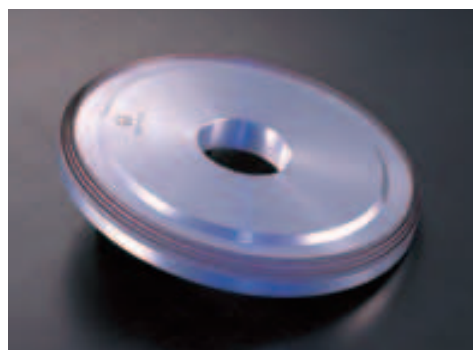
Metal bond diamond wheels for grinding rotary transformer cores



Examples of working on ferrites



Electroplated formed diamond wheels for grinding  
magnetic and ceramic materials



Resin bond diamond wheels for mirror-finish  
grinding of magnetic heads

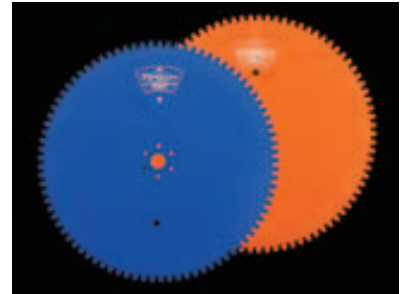




## CUTTING

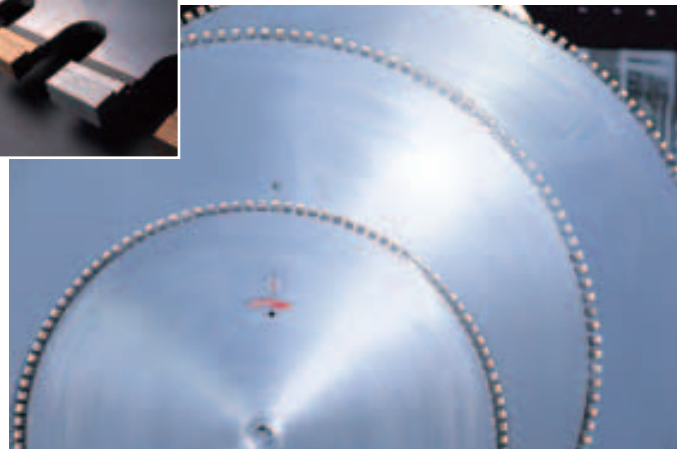
### Diamond Circular Saw Blades

Diamond circular saw blades are used to cut granite, marble and other natural stone, as well as brick and tile, and are available in sizes from 4 to 140 inches in diameter. In situations where noise-reduced blades are required, Asahi Diamond's medium-diameter Prime Saw blades are ideal, featuring improved cutting finish and precision, as well as longer life, than conventional blades.



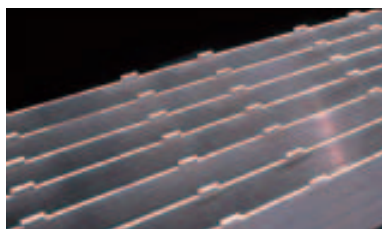
### Diamond Circular Saw Blades "Slide-on Type"

The Slide-on Type diamond saw blade is equipped with a unique replaceable cassette-tip mechanism that allows diamond segments to be replaced without removing the blade from the machine.



## STONE

For centuries, stone materials were worked by the skillful hands of masons using only hammer and chisel. Today, stone is processed by diamond with much higher speed and efficiency. Asahi Diamond has developed a broad range of high-precision tools for processing stone and other materials for tombstones, building exteriors and interiors, pavement, and countless other uses.



### Diamond Frame Saws

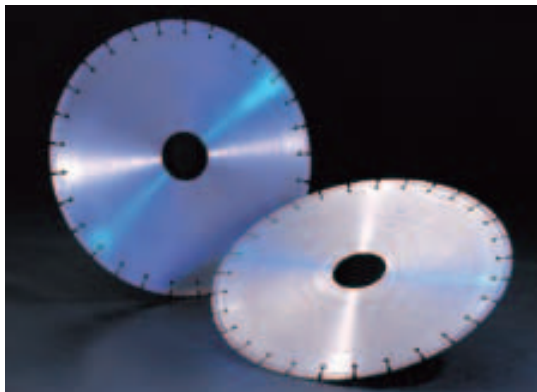
Frame saws are used for cutting multiple slabs from large blocks of marble and other stone materials at a fraction of the time it would take using a conventional single blade saw.



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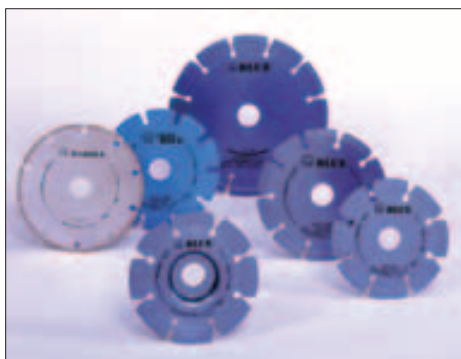
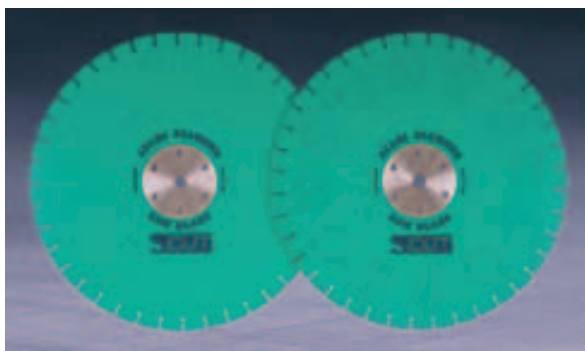
### Circular Saw Blades for Trimming

Precise cutting is essential to construction processes involving natural stone. Asahi Diamond's stone cutting, high-performance saw blades are known for their accuracy, speed and durability.



### Blades for Masonry Saws "S-cut"

Asahi Diamond's masonry saw blades S-cut perform with a superior degree of accuracy and speed.



### Diamond Portable Cutters "Blue," "Light Blue"

The Blue Series are the ultimate portable cutters suitable for dry stone cutting. Asahi Diamond supplies the "Blue" cutters for both long-life and first-rate cutting and the "Light Blue" cutters for minimal chipping when cutting.

### Diamond Cup Wheels

Designed for grinding chamfers, curved and flat surfaces on granite and other hard stones.



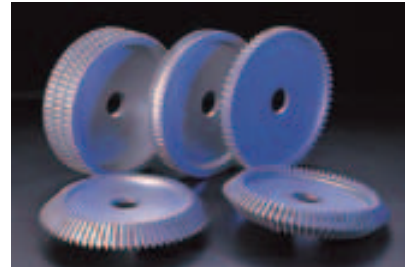
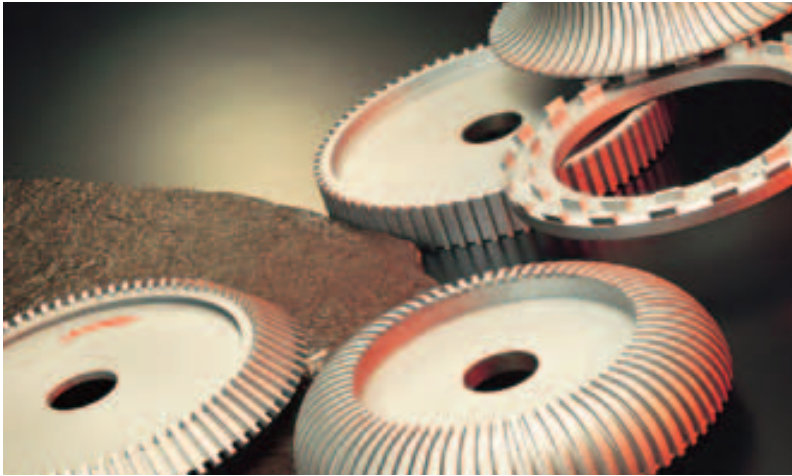
### Diamond Wire Saws "Prime Wire"

Prime Wire is used in situations where saw blades are impractical, such as when cutting very large stones. We offer a full array of Prime Wire products to suit a variety of machinery and other conditions.





## GRINDING / POLISHING



### Diamond Drum Wheels

Diamond drum wheels are indispensable in the form grinding of stone materials. Applicable to various stone shapes, the drum wheels restore the original finish of the stone.

### Diamond Polishing Wheels

Diamond polishing wheels have helped to reduce the cost of polishing stone, concrete, brick, and various other materials.



### Metal Bond Polishing Wheels

Asahi Diamond produces various types of metal bond polishing wheels for rough polishing of stone, including the standard, resin-embedded, tip replaceable and other types.

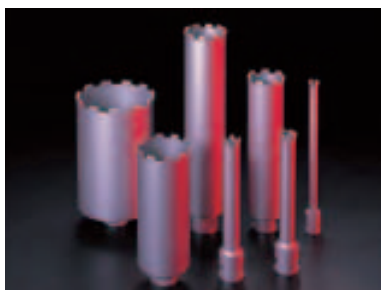


### Resin Bond Polishing Wheels

Resin bond polishing wheels bring out the natural luster and brilliance of stone.



## DRILLING / OTHERS



### Diamond Core Drills

Diamond core drills are used primarily for drilling stone and are indispensable in drilling holes of different diameters in stone or cutting out stone cylinders.



### Special Diamond Tools

Asahi Diamond manufactures various special tools which are useful in the form grinding of stone and can be applied to various stone shapes and uses.



## CIVIL ENGINEERING, MINING

Diamond bits are utilized in various geological surveys, investigation for underground resources, and for dam and tunnel construction, to name only a few. Their value to society is immeasurable, making possible many of the modern conveniences which society takes for granted.



## DRILLING



### Diamond Impregnated Core Bits

Asahi Diamond's diamond core bits come in an assortment of sizes and strengths to suit any type of rock stratum, from homogeneous soft rock to extremely hard rock and collapsed rock layers.

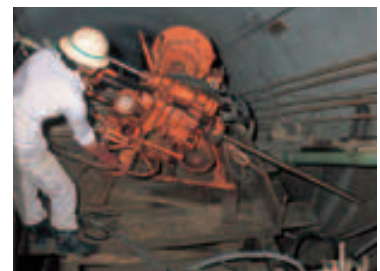
### Surface Set Diamond Core Bits

Surface set diamond bits are made by setting rough diamond borts on the matrix surface. They are available in a variety of sizes for diverse applications.



### Diamond Bits (Non-core, Casing, etc.)

Non-core bits are used in drilling projects that do not require the collection of a core sample. Casing bits are used to insert casing pipe into collapsed stratum.



### Diamond Reamers

Diamond reamers are used in conjunction with core bits and non-core bits to ensure specific drill hole dimensions, prevent drill hole deformation and reduce vibration.





## ROADS, CONSTRUCTION

The need for diamond tools continues to grow. Such tools are necessary to cut asphalt or concrete, in order to install telephone lines and water, sewage, and gas pipes. They are also used to cut grooves into roads and runways to prevent slipping, as well as to demolish structures, such as those used in earthquake-resistant construction projects, bridge beams, highways, and nuclear power plants.



### Saw Blades for Asphalt "MV Series"

The V shaped design of the MV Series of saw blades works for smooth cutting — from start to finish — making them perfect for asphalt road improvements, burying gas and water pipes and other civil engineering tasks.



### Grooving Blades

These superior blades are used for grooving roads and tarmacs to enhance vehicle safety in the wet and optimizing aircraft control when landing.



### Saw Blades for Concrete CB Series, Wall Saw Blades, Jointing Blades

The CB Series of blades are used for various types of concrete cutting including reinforced concrete. Wall Saw Blades for precision cutting of windows in concrete walls and Jointing Blades for grooving concrete to prevent cracking when drying are also available.



### General-Purpose Saw Blades "Merit"

The Merit Series of saw blades, developed specifically to cut concrete, are highly economical, featuring excellent cutting finish and long blade life.

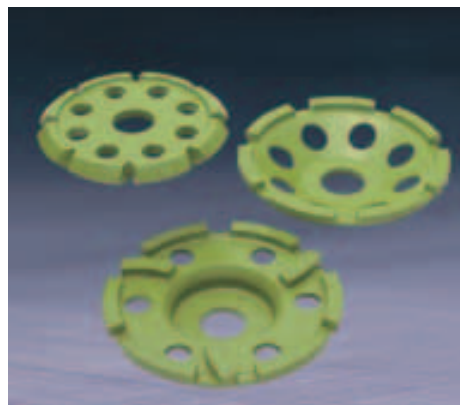
## Diamond Portable Cutters

The portable cutters used in dry cutting of concrete, ordinary tile, concrete block, roof tile, and various non-flammable structural materials are available in several variations.



## Diamond Cup Wheels

Diamond cup wheels are ideal for grinding work on concrete. Grooving wheels are also available in a V shape to enable the repair of cracks in walls of concrete structures.



## Diamond Wire Saws "Hyper Snake"

Hyper Snake diamond wire saws are attracting increasing attention as effective tools for cutting and demolishing reinforced concrete structures. Hyper Snake greatly improves work efficiency and creates less noise and pollution than conventional saws.



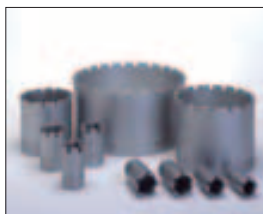
Diamond wire saws at work



## DRILLING

### Diamond Thin-Wall Bits "Hyper-Mole Z" "Hyper-Mole Mega" "M 27"

Diamond thin-wall bits are used to drill holes for wiring and plumbing of reinforced concrete structures. Asahi Diamond has also developed bits for large diameter concrete pipe.



Hyper-Mole Z



Hyper-Mole Mega



M27



## CUTTING / MACHINING

### SUNPAX Multi-Edged Blade Cutting Tools

The SUNPAX multi-edged blade cutting tool employing SUNPAX for its cutting edge is capable of cutting even difficult-to-cut materials ef-

ficiently. SUNPAX multi-edged cutting tools are more accurate, durable and cost efficient than conventional carbide blades.



### WOOD, STRUCTURAL MATERIALS

Natural woods are increasingly being replaced by new composite materials for use in home construction, interiors, and furniture. Asahi Diamond makes high-performance tools to work such materials. We will continue to expand our range highly advanced cutting and grooving tools, including the SUNPAX series. These tools are superior to conventional carbide tools in terms of accuracy, durability, and cost efficiency.

### SUNPAX Cutters

SUNPAX Cutters are indispensable for cutting extremely hard materials such as ceramics, man-made marble and particle board. Asahi Diamond produces various types of cutters

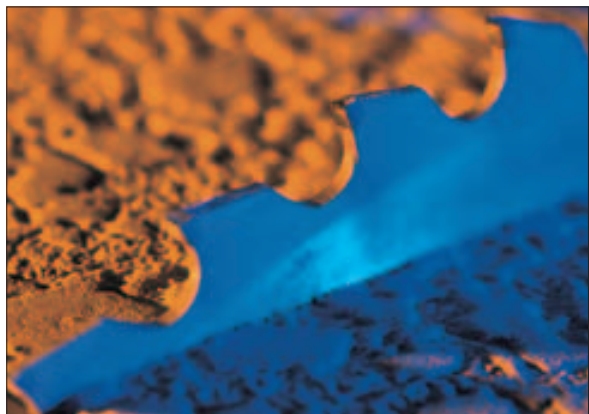
to accommodate special work requirements. These cutters can be adapted for various material shapes and can be used with different combinations of break cutters and tip saws.



Profile of cutting edge

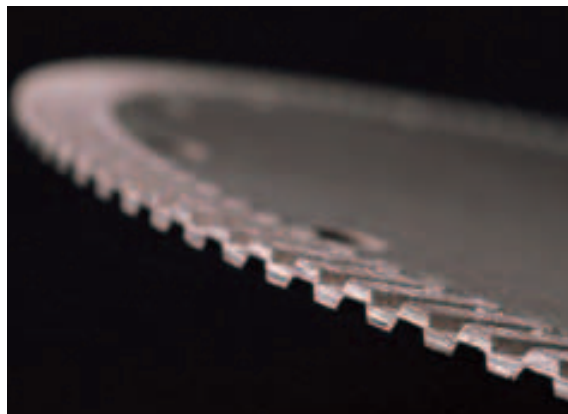






### SUNPAX Tipped Saws

Carbide tipped saws are used in the cutting or grinding of wood, plastics, carbon, etc. SUNPAX tipped saws can easily cut even glass, epoxy resin and man-made marble, which cannot be worked by conventional carbide tipped saws.



### Diamond Portable Cutters “New Gold”

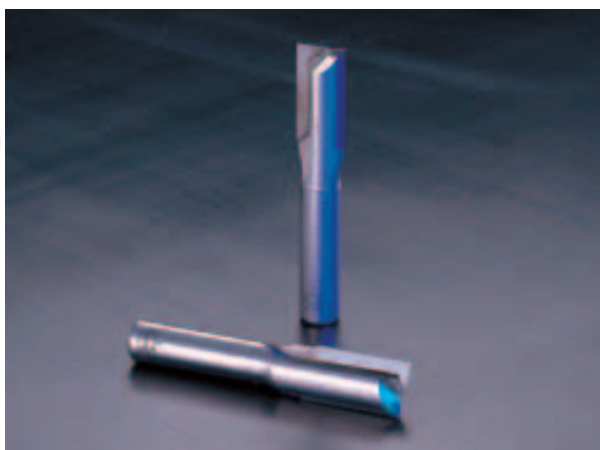
These cutters can cut blocks, tiles, bricks, and other objects with high efficiency. Use of wave-shaped blade edges provides an air-cooling effect and blows away cutting debris. In addition to high efficiency, the blades have a long life.



### GROOVING / DRILLING

#### SUNPAX Router Bits

The SUNPAX router bit is ideal for the cutting, grooving or drilling of ceramic materials, man-made marble, particle board, etc.

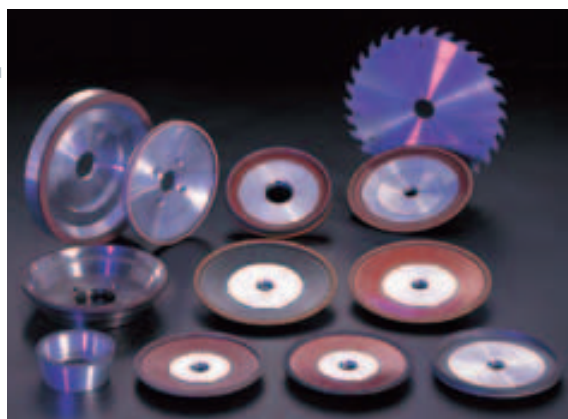


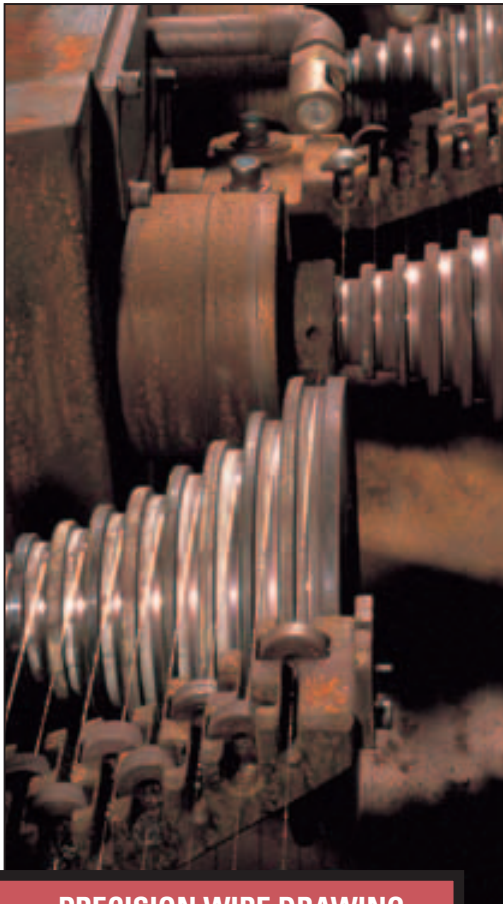
### GRINDING

#### Diamond Wheels (for cutter sharpening)

Diamond wheels are essential for returning cutting tools to their original sharpness. Cemented carbide alloys, Cermet, SUNPAX and many other new materials are used in the make-up of blades to cut anything from wood to composite

materials. To keep these blades in optimal condition the broad capabilities of diamond wheels are required. The right bonding system is available depending on the material used—whether for a chip saw or planing blade.



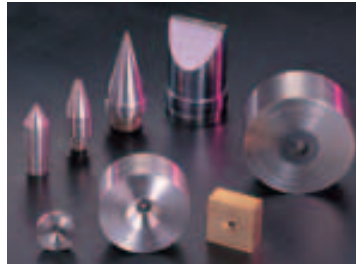


## PRECISION WIRE DRAWING DIES, APPLIED PRODUCTS

Diameters of wires used in semiconductor, electronic, and electrical devices, as well as power transmission lines, have decreased significantly. Asahi Diamond has responded by developing diamond dies that are indispensable to high-precision wire drawing processes. Our experience in wire drawing dies for cable, piano wire, and welding rods led to the development of diamond wire guides for wire electrical discharge machining. This know-how also contributed to the development of the diamond water jet nozzle. We devote our expertise in wire drawing technologies to develop innovative new products.



## WEAR-RESISTANT TOOLS



### Diamond Wire Drawing Dies

Asahi Diamond produces various types of precision wire drawing dies, such as those applicable to gold and other soft wires used in the manufacture of semiconductors. It also markets various types of drawing dies.

Natural diamond, SUNPAX, and synthesized single-crystal diamond are used for wire drawing dies, such as formed dies, guide dies for tin-plated wires, diamond nipples, and others.



### Diamond Wire Guides

The accuracy of wire guides determines the precision of wire electrical discharge machining (EDM), which is used for metal forming processes in various industries.

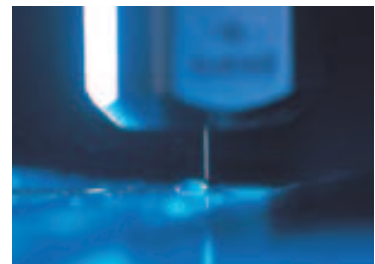


Wire EDM process



### Diamond Water Jet Nozzles

By using diamond for water jet nozzle, water stream width can be minimized and directness and ultrahigh pressure achieved, resulting in higher precision and longer life.



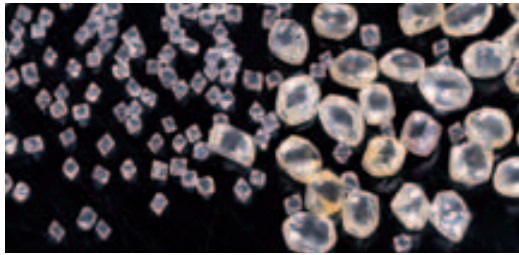
Cutting by water jet nozzle

Asahi Diamond has developed this highly functional diamond wire guide jointly with an electrical discharge machining equipment manufacturer.

Furthermore, by expanding the width of the water stream, the nozzle can also be used for cleaning and removal of burrs.

## Other Products

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Natural diamonds



SUNPAX and SUNNITE blanks



Diamond powder

## Related Equipment and Devices

### Roller dresser drive units (for surface grinding)

- Single support and compact type
- Single support type
- Double support type

## OTHER PRODUCTS

## Jewelry Business

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## GRINDING

### Precision Grinding Wheels/Precision Shaft-mounted Grinding Wheels

These are for bearings, automobile parts, electrical equipment parts, and other machine parts that require high-precision finishing. Using its original manufacturing method, Koremura Asahi makes vitrified-bonded wheels, which are best suited for high-precision grinding processes.



PRECISION GRINDING WHEELS



Precision Shaft-mounted Grinding Wheels

### GRINDING TOOLS (Koremura Asahi Products)

With strengths in the fields of small-diameter precision grinding wheels and super-finishing grinding wheels, Koremura Co., Ltd. has a range of distinctive products.

Koremura has a history going back to its establishment in March 1940. It became a member of the Asahi Diamond Group in July 2013, and changed its name to Koremura Asahi Diamond Industrial Co., Ltd. in January 2018.

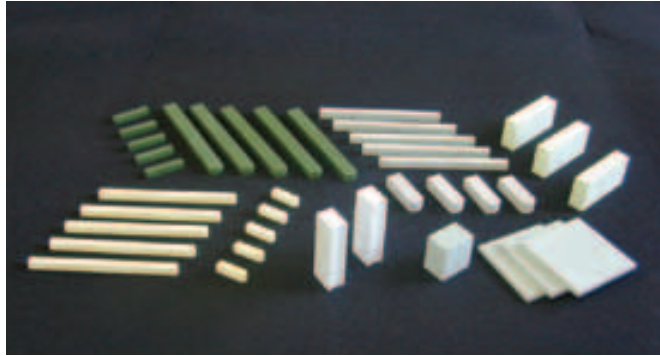
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### Superfinishing Grinding Stones

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Grinding stones designed for finishing process of polishing metal materials.

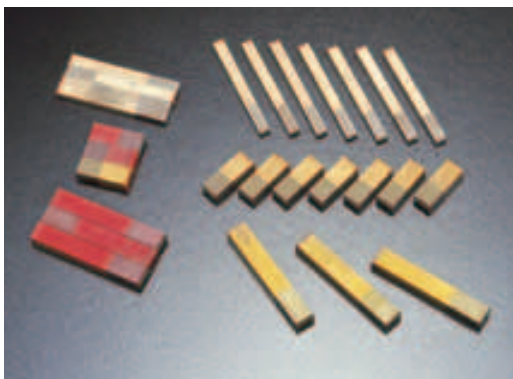
These are suited for finishing grooves of different types of bearings, as well as external ring surfaces of needles and tapered bearings.



### Superabrasive Shaft-mounted Grinding Wheels

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Vitrified grinding wheels that utilize CBN (cubic boron nitride) abrasive. This kind of abrasive wheel accomplishes high accuracy and high efficiency in precision grinding of such items as bearings, automobile parts, electric equipment parts, and other machine parts.

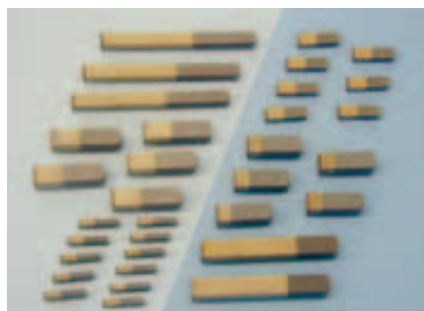


### Superabrasive Superfinishing Grinding Stones

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Vitrified-bonded superfinishing grinding stones for the final stage of the surface finishing process. Designed to accomplish submicron finishing accuracy for super precision applications, such as machine parts, optical parts, and related parts.

Koremura Asahi uses its own manufacturing method to immobilize the super-abrasive micron powder, while adjusting the bonding system and achieving a porous design of the grinding wheel assembly. These make it possible to minimize abrasion of the grinding wheel and also minimize chipping.



## Asahi Diamond's Network Covering the World's Production Centers

Our diamond and CBN tools help improve the efficiency of our customers' production activities and the quality of their products.

In addition to Asia, which is an international production hub, we have production, sales, and service operations in Europe, North America, and elsewhere to meet needs of our customers.



● Asahi Diamond Industrial Europe SAS (France)  
(Manufacturing and Marketing)

■ Europe Representative Office



● Asahi Diamond Industrial Scandinavia  
AB (Sweden) (Marketing)



● Shanghai Xu Hui Diamond Industrial  
Co., Ltd. (China)  
(Manufacturing and  
Marketing)



● Asahi Diamond Industrial Germany  
GmbH (Germany)  
(Marketing)



● Taiwan Asahi Diamond  
Industrial Co., Ltd. (Taiwan)  
(Manufacturing and Marketing)







- Head Office
- Representative Offices
- Subsidiaries
- Affiliated Company



● ASAHI DIAMOND (THAILAND)  
CO., LTD. (Thailand)  
(Manufacturing and Marketing)



● Asahi Diamond Industrial Australia  
Pty., Ltd. (Australia)  
(Marketing)



● Shinhan Diamond Industrial Co., Ltd.  
(Korea)  
(Manufacturing and Marketing)



● Asahi Diamond America, Inc. (U.S.A.)  
(Manufacturing and Marketing)



● PT. Asahi Diamond Industrial  
Indonesia (Indonesia)  
(Manufacturing and Marketing)



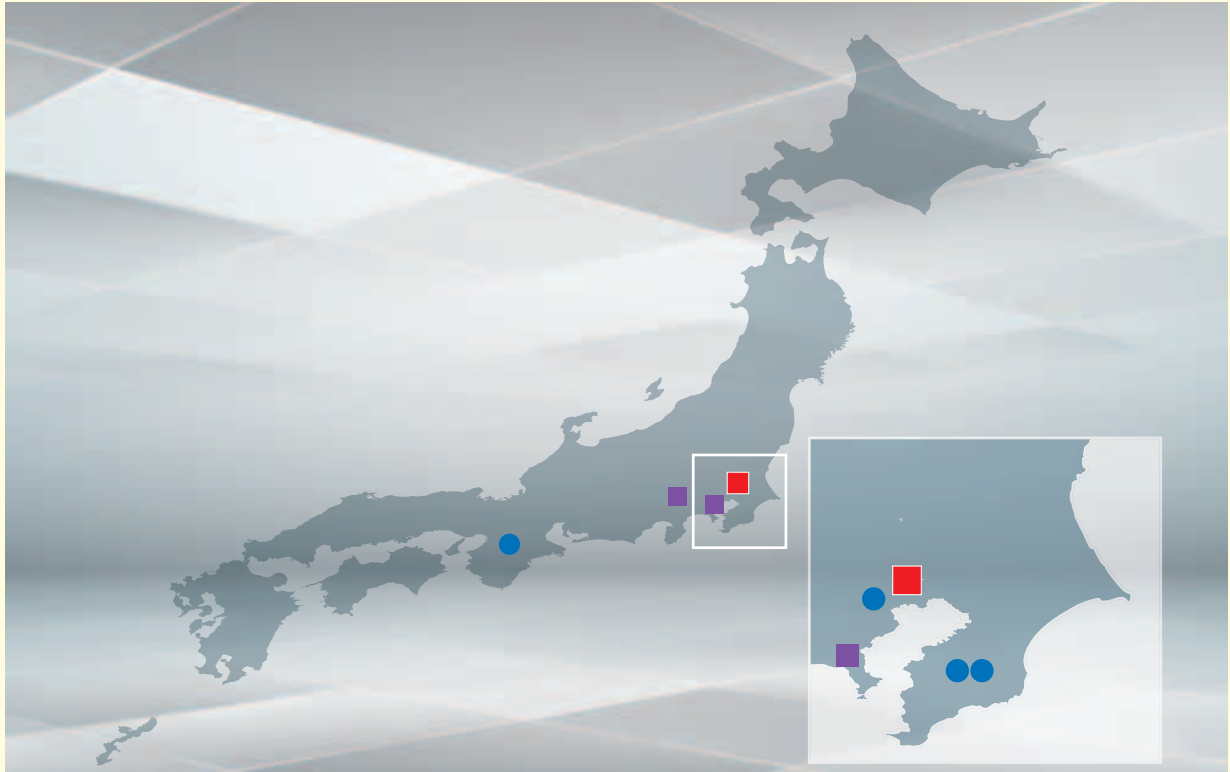
● ASAHI DIAMOND INDUSTRIAL  
MALAYSIA SDN. BHD. (Malaysia)  
(Marketing)



● Asahi Diamond de Mexico, S.A. de  
C.V. (Mexico)  
(Marketing)

## Bringing Japanese manufacturing to the world

Asahi Diamond's history closely reflects that of Japan's product manufacturing sector. Centering on the Tamagawa Factory, Chiba Factories and the Mie Factory — our main production bases — we support Japanese industry with an abundant lineup of products that can be augmented by fellow Group companies that specialize in particular products.



■ Asahi Diamond Industrial Co., Ltd.  
Head Office (Tokyo)

- Head Office
- Factories
- Subsidiaries



● Mie Factory



● Tamagawa Factory



● Chiba Tsurumi Factory and R&D Center



● Chiba No. 2 Factory



■ Yamanashi Asahi Diamond Industrial Co., Ltd.



■ Koremura Asahi Diamond Industrial Co., Ltd.

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**Asahi Diamond Industrial Co., Ltd.**

URL: <http://www.asahidia.co.jp/>

The New Otani Garden Court, 11th Floor 4-1, Kioi-cho, Chiyoda-ku, Tokyo 102-0094, Japan



QMS, EMS CERTIFIED FIRM  
ISO 9001 : JCQA-0096  
ISO 14001:JCQA-E-0530  
Mie Factory  
Tamagawa Factory  
Chiba Tsurumai Factory  
Chiba No.2 Factory

Yamanashi Asahi Diamond Industrial Co., Ltd.  
Koremura Asahi Diamond Industrial Co., Ltd.



**Mixed Sources**  
Product group from well-managed  
forests and other controlled sources  
[www.fsc.org](http://www.fsc.org) Cert no. SGS-COC-1515  
© 1996 Forest Stewardship Council

**Shape the Innovation**

私達の革新で、お客様の革新をカタチにする