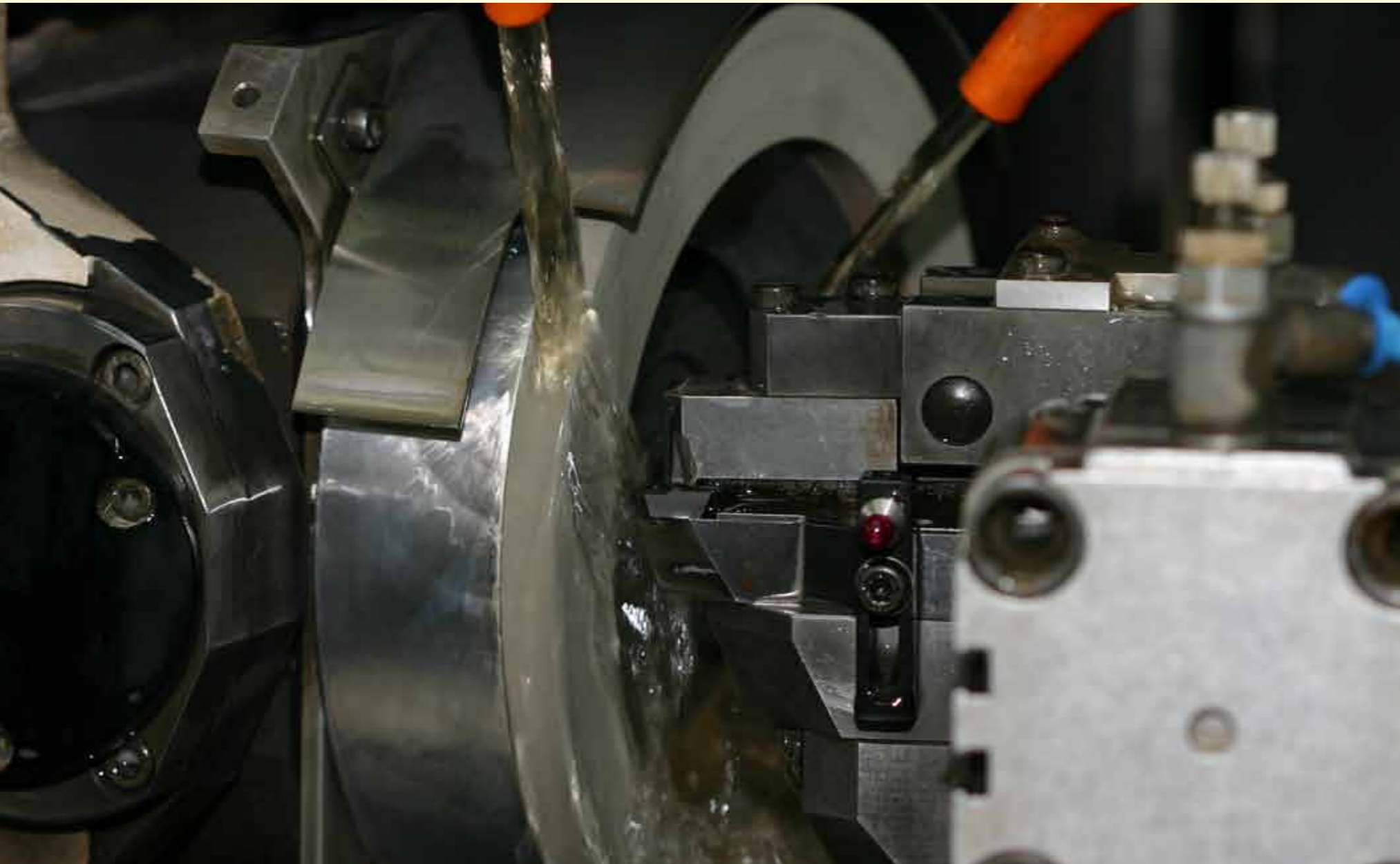


EHWA

Your Partner in Cutting Across Global Boundaries



EHWA has become an international benchmark for success because of our ability to adapt quickly to the changing markets and diverse needs of customers, and by leading the way in applying the most advanced technology for manufacturing industrial diamond tools.

Since 1975, EHWA has been able to greatly expand its market share throughout the world because we have established a world renowned reputation of high quality products, service and expertise in the industry. EHWA is deeply committed to keeping customers up-to-date and equipped with the most competitive products and technical information. Our success can only be measured by the success of our customers.

The key to our flexibility and strength in the global marketplace is our many alliances with reliable overseas partners and customers throughout the world. EHWA purchases only the highest quality raw materials, industrial diamonds and CBN from reputable sources such as D.I.(Diamond Innovation) of the U.S., Element 6 of Ireland, Tomei Co. and Showadenko Co. of Japan, and Iljin of South Korea. In addition to having strong supply lines with major suppliers, EHWA has successfully teamed up with high-tech manufacturers in Europe, Japan, and U.S. under several joint-ventures for the research and development of high precision diamond tools, rotary dressers, and precision electroplated diamond tools.

The success of a company depends on its ability to adapt and compete in the global marketplace. EHWA is able to survive in the age of globalization because we are already globalized.

EHWA diamond tools are your partner for success.

Highly stabilized process and quality control system



All manufacturing processes are tightly controlled in accordance with the ISO 9000 Quality assurance system, and all data are fed back by statistical techniques, thereby contributing to tight process control and incessant quality improvement. In particular, the Sintering process is highly reliable as it is tightly controlled. In addition, the computer control of all the processes, including the bar code system, has greatly reinforced these highly reliable processes. Thus helping to maintain the established reputation for quality it is an essential process based upon our accumulated know-how.

Various raw materials, including diamonds, are supplied from reliable sources in the world on a stable basis. This suggests that EHWA is capable of supplying all customers with good quality tools on a continual basis. Our advanced technology and reliable production process are primary factors in getting EHWA a recognized name in the world today.

Recently the productivity of manufacturers has been adversely affected by increases in material and labor costs. In an effort to overcome this difficulty, the company has concentrated all its efforts on productivity improvement and automated a substantial portion of the manufacturing process.



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Resin Bonded Wheels

The Industrial Revolution was a catalyst in the rapid and gigantic growth of the auto and heavy machinery industries. AS more and more 'difficult-to-grind' materials and alloys were being used by these industries, the demand for higher quality, effective, and durable machine tools for cutting, grinding, and machining such materials continued to escalate. As a result, superabrasive diamond and cubic boron nitride (CBN) tools were invented to meet the needs of these industries and their heavy requirements. Today, the development and use of these specialized tools has expanded to various industries as demand never ceases and new applications are being discovered.

One of the most demanded tools is the 'resin-bonded wheel', which is manufactured through the curing process of bonding diamond or CBN abrasives, with inorganic fillers, and using resins as binders, such as phenol and polyimide. Resin bonded wheels are now effectively applicable to all sorts of grinding operations such as surface grinding, cylindrical and centerless grinding, grooving and internal grinding, and etc.. It is ideally used for grinding super alloys, cermet, ceramic, glass, ferrite, high-speed steel, tool alloys, and many other new ultra-hard materials.



Truing of resin bonded centerless wheel

Many types of resin-bonded diamond wheels are specially made for fast and cool cutting. These are particularly suited for the grinding of carbide tipped and inserted tooling, such as saws, cutters, reamers, and etc.. In addition, they are utilized in precision grinding operations on carbide dies, rolls and carbide wear parts. Resin bonds are the best choice for the precision finishing of ceramics as well as grinding tungsten carbide and ceramic thermal spray coatings. When combined with CBN, resin bonds can be used for grinding high-speed steels, tools and die steels, and superalloys with above HRC 50.

EHWA offers our customers the latest and highest quality resin-bonded wheels available today. Our extensive R&D and expertise in manufacturing diamond tools since 1975 are evident in all our products. EHWA provides complete line of resin-bonded wheels such as cylindrical grinding wheels, creep feed wheels, tip sawing grinding wheels, insert grinding wheels, and etc., and are reliable for mass-production of ground parts, wet or dry, with consistent high finish surface.

EHWA pledges to serve and satisfy the demands of our global customers with high quality and reliable products at the most competitive price, speedy delivery, and faithful warrant service.



Double disk grinding wheels



Creep feed grinding wheels



Carbide insert grinding wheels

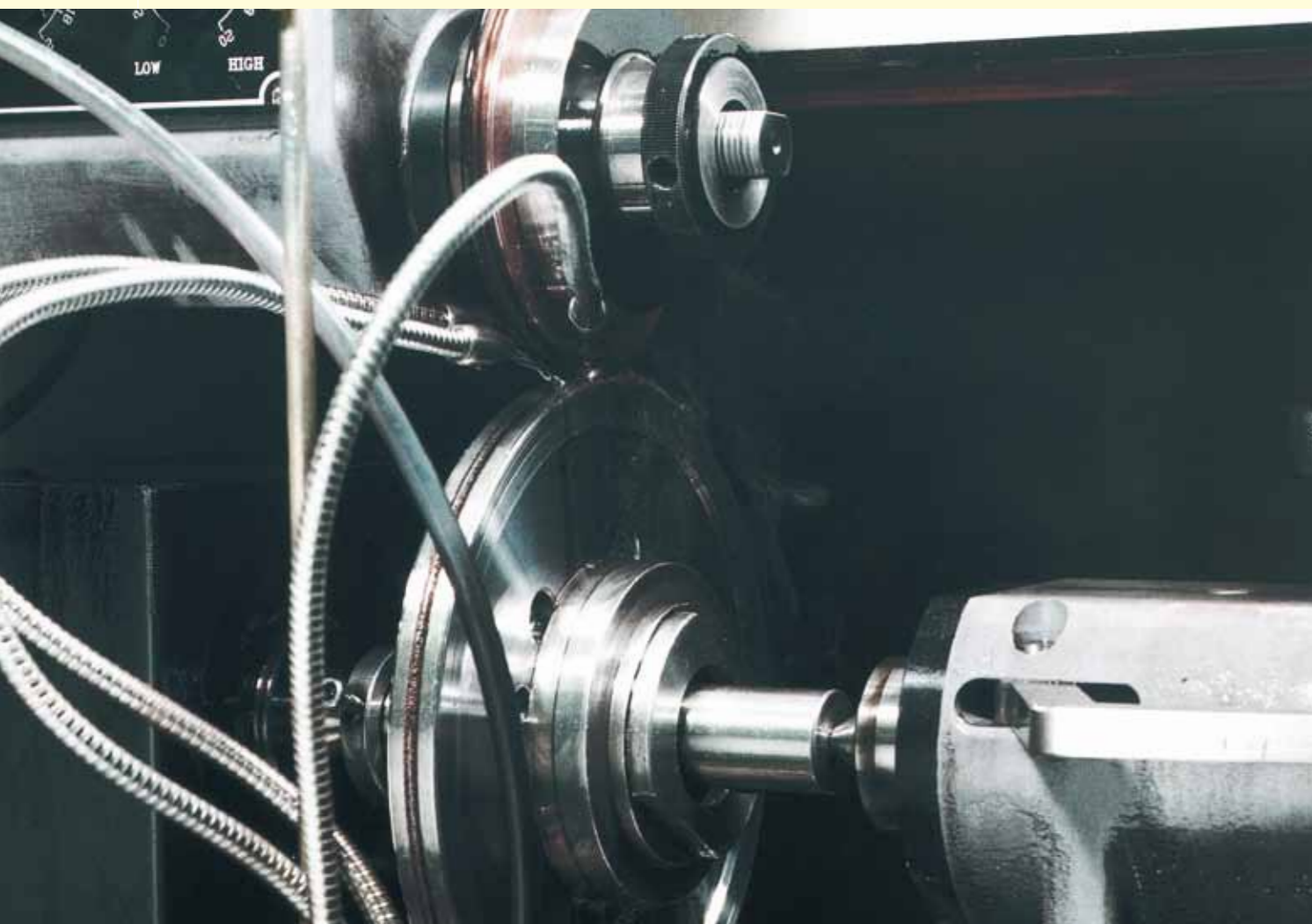


Centerless wheels

Metal Bonded Wheels

The invention of glass is arguably one of the most important and useful discoveries in our history. Glass provides us with aesthetics and ability to see beyond closed and limited space. Glass is used in every corner of the world for immeasurable applications. Life without glass would be unimaginable. The endless applications and shapes of glass products are possible by the use of special tools.

The manufacture of glass for any application is obviously a delicate process and not as easy as one may think. Special metal-bonded diamond wheels were invented to grind and shape various kinds of glass. These tools are designed to effectively and efficiently grind glass for uses such as television broun tubes, auto-glass, architectural glass, glasses and etc...



EDM profiling of pencil edging wheel



Glass edging wheels



Honing stones



Lens grinding wheels



Diamond carpenter-saw, crystal grinding wheels



Ferrite grinding wheels

The applications of metal bonded wheels are unlimited. In addition to glass grinding, applications have extended to grinding and sharpening carbide tipped saws, ferrite, ceramic, tungsten carbide, auto-parts, quartz, stone, and etc....

In the late 1970's, EHWA started to design and manufacture edge wheels for grinding of auto-glass, and all sizes of broun tubes, from 14 inches to 33 inches. From the early 1990's, EHWA successfully began manufacturing high quality edge wheels for grinding liquid glass, which is mostly used in the semi-conductor industry. Thereafter, EHWA began producing electrolysis grinding wheels to meet the needs of the high-tech industries.

EHWA is committed to the continued development of high quality metal bonded wheels to meet the diverse needs of our valuable customers worldwide.

Vitrified Bonded Wheels

There is a great demand for special bonded wheels that are harder than both resin and metal bonded wheels, for the use in automated equipment and systems, which both resin and metal bonded wheels will not suffice. These highly demanded bonded wheels must be durable with extended life and be self-truing and self-dressing in order to sustain maximum performance over long periods of heavy use. Vitrified-bond technology is today's answer.

A vitrified bond is actually a ceramic bond. It is extremely hard, yet free cutting, and combines the better characteristics of both resin and metal bonds. It provides a longer tool life, effective grinding, and high productivity to provide maximum performance with minimum maintenance.



Vitrified CBN wheel for camshaft

Since the late 1980's, EHWA has developed high quality vitrified-bonded CBN wheels for grinding auto-parts, such as constant velocity ball joints. Thereafter, EHWA expanded the development of vitrified-bonded wheels for many different applications such as for grinding high precision machine parts, bearings, gears, tools and dies, semi-conductors, ceramics, cermets, and in particular, cutting tools fabricated out of PCD or PCBN.

Today, the demand for vitrified-bonded wheels is sharply increasing in various high-tech industries. EHWA has put forth its best efforts to develop better quality and high-performance vitrified-bonded products to meet all diversified industrial applications.



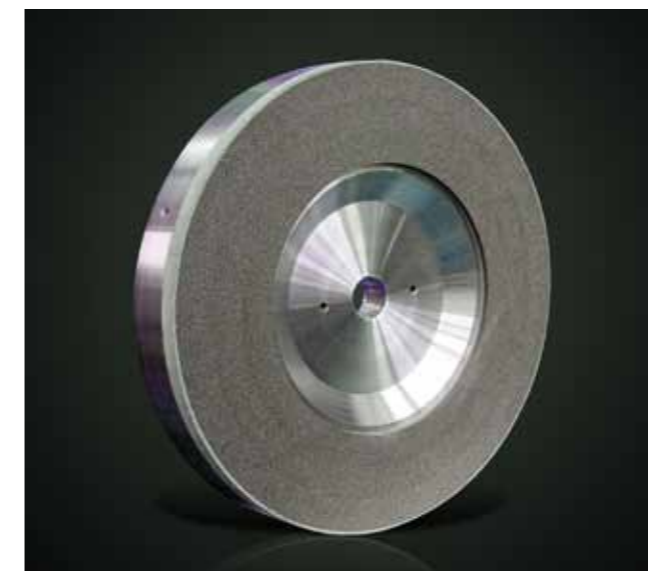
Constant velocity ball joint grinding wheels



Bearing grinding wheels and honing stones



PCD / PCBN insert grinding wheels



Double disk grinding wheels



Injection nozzle grinding wheels

PCD and PCBN Tools

Today's modern industrial society continues to push the development and uses of new and advanced materials, and high precision machining to new heights. Along with the improvements in producing processes and difficulties that arise from machining new and advanced materials, there is an increasing demand for new forms of cutting tools that go beyond the conventional cutting tools such as those made out of high speed steel, tungsten carbides, cermet, and ceramics.

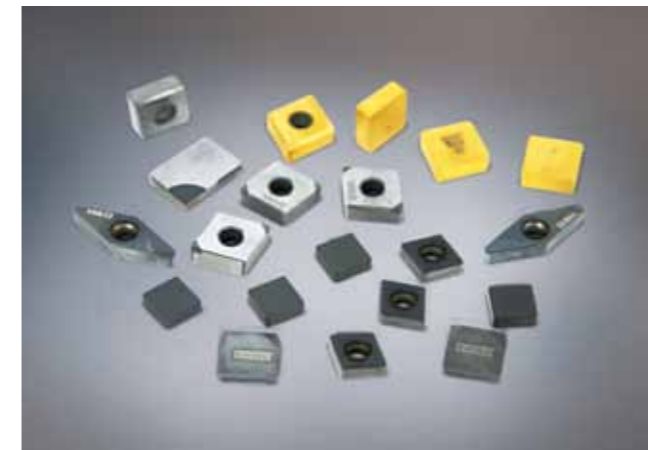
Polycrystalline Diamond (PCD), is a synthetic diamond product that is produced by sintering selected diamond particles with a metal matrix using very sophisticated temperature and high pressure technology. The PCD is by its nature, high in uniform hardness, and also more abrasive and shock resistant in all directions than natural diamonds because of its random-oriented structure of the diamond particles.



Piston grooving tools

Polycrystalline Cubic Boron Nitride (PCBN) is an artificially synthesized material, its hardness is exceeded only by the diamond. However, unlike diamond, PCBN is stable under conditions of high temperature (up to 1000 °C), normally seen when machining hardened ferrous or super alloy materials. PCBN tools permit metal cutting a feeds and speeds that are much higher than conventional cutting tools.

EHWA is committed to investing in R&D and is striving to improve not only the life of cutting tools made of PCD and PCBN, but also to provide a high level of finishing. EHWA PCD and PCBN cutting tools are highly regarded by customers worldwide from the aircraft industry, auto industry, iron and steel industry, precision watch industry, to electric and electronic industries. EHWA will continue to improve tool performance through our steady R & D works to satisfy our valuable customers throughout the world.



Inserts



Side cutters



Boring tools



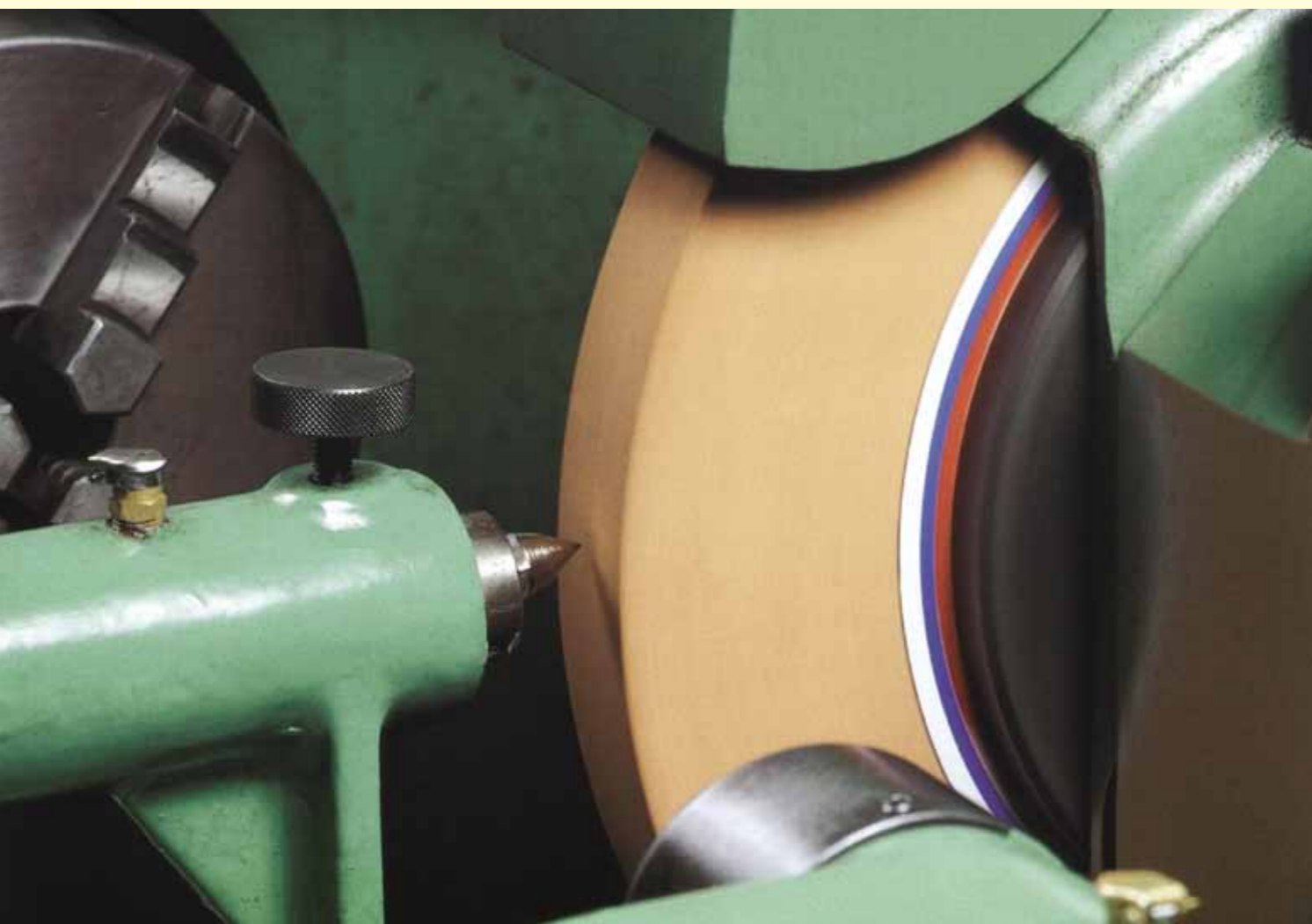
Endmills



Cutting tools

Diamond Dressers

The importance of dressing and truing abrasive grinding wheels can never be over-emphasized. Dressing will restore the exposure and cutting ability of the abrasives on the wheel surface. Dressing must be performed after truing or whenever the wheel surface becomes loaded or glazed, or loses its cutting ability. Dressing removes the unwanted residue, such as braze and steel particles, from the wheel surface. Dressing also removes small portions of the bond material and exposes the abrasives, thus allowing for effective cutting action. Truing is the procedure for eliminating any unwanted 'run-out' once the wheel has been mounted. Truing is best done wet.



Forming diamond dresser

In general, there are four types of dressers: 1) single point diamond dressers; 2) multi-point diamond dressers; 3) forming diamond dressers; and 4) impregnated diamond dressers.

1. Single-point Diamond Dressers

This type of dresser is made by sintering a selected diamond crystal with a metal matrix in a steel shank. The point of the set diamond is concentric with the shank.

2. Multi-point Diamond Dressers

This type of dresser is made by sintering two or more diamonds with a metal matrix to provide multi-diamond points for dressing larger and wider abrasive wheels. There are many advantages for multi-point diamond dressers. The multi-points allow the spreading of resistance, thus reducing frictional heat, extending tool life, reducing likelihood of early failure, and allowing for faster dressing.

3. Forming Diamond Dressers

This type of dresser is made by sintering a high quality mono-diamond crystal with a metal matrix in a steel shank, and then grinding into various shapes such as a conical point with radius, facet, or profile.

4. Impregnated Diamond Dressers

This type of dresser is made by sintering a mixture of selected diamond particles with a metal matrix. This provides a longer tool life, is very economical, and is ideal for use with larger and wider abrasive wheels.

EHWA is committed to developing all kinds of diamond dressers by applying up-to-date technology for supporting our customers around the world.



Multi-point diamond dressers



Impregnated diamond dressers



Forming diamond dressers

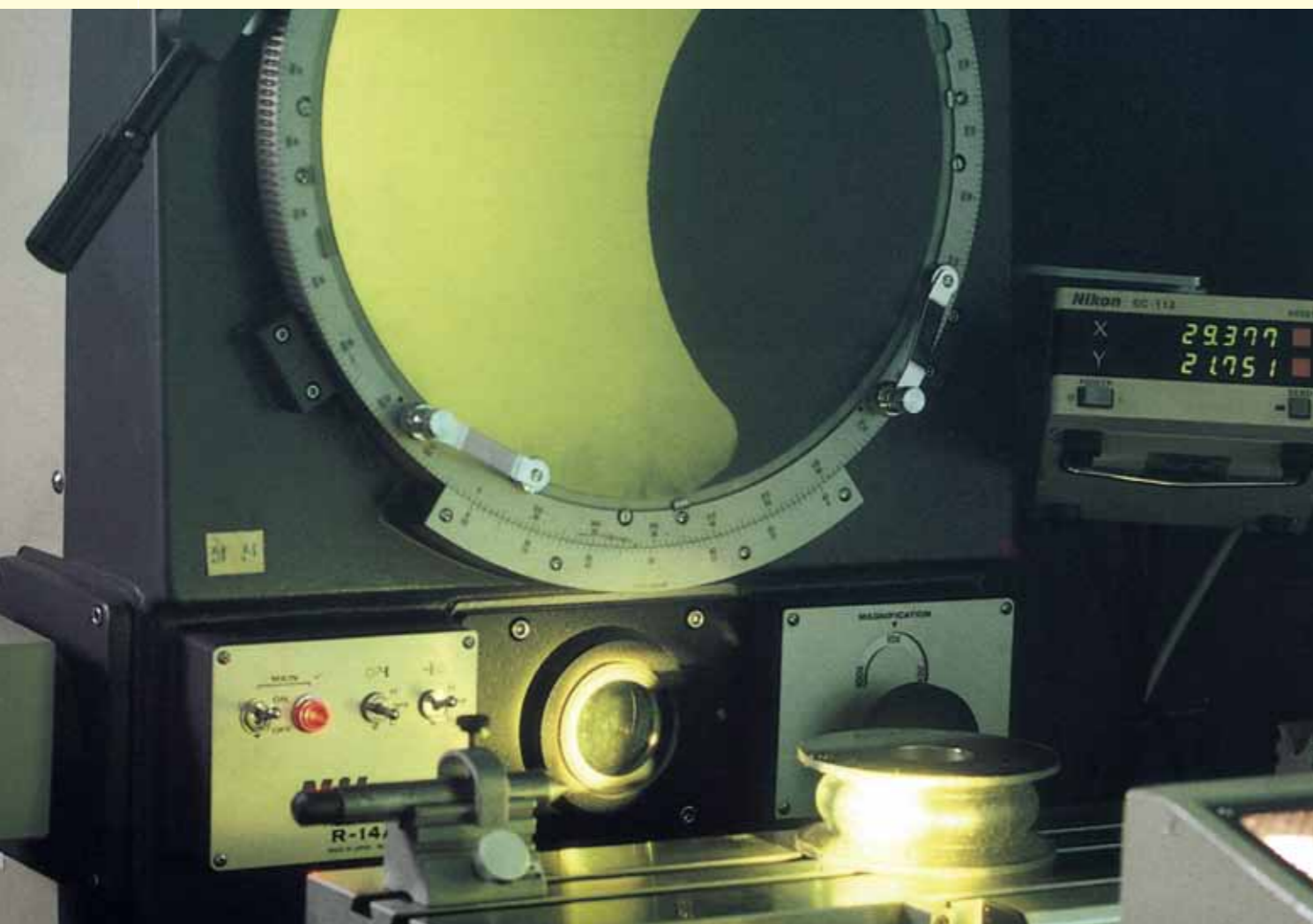


ZENESIS® Technology

Electroplated Tools

Electroplated diamond or cubic boron nitride (CBN) tools are made up of a basic single layer or multi-layers (depending on application) of either diamond or CBN particles that are bonded to the tool surface using a nickel matrix. This bonding process allows for the manufacture of various tools with different forms and contours.

Electroplated diamond tools have high exposure and concentration of diamond/CBN particles, which make them denser than diamond/CBN tools made by other processes. This provides high stock removal and high efficiency for free cutting and grinding materials such as non-ferrous metals, hardened steels, FRP, ceramics, and composite materials.



Profile check of electroplated tool



Brake lining grinding wheels

Since 1992, EHWA has manufactured all kinds of high quality of electroplated tools using the latest equipment and updated facilities, in order to meet the growing demand for these products from various industries worldwide. In addition to conventional nickel-plated tools, EHWA also produces state-of-the-art reverse-nickel-plated diamond rotary dressers for the auto and aircraft industries, and nickel-plated wafer dicing blades for the semi-conductor industry. EHWA will continue to engineer and develop electroplated diamond/CBN tools for our valuable customers worldwide.



Electroplated cutters



Files



Electroplated I.D. wheels



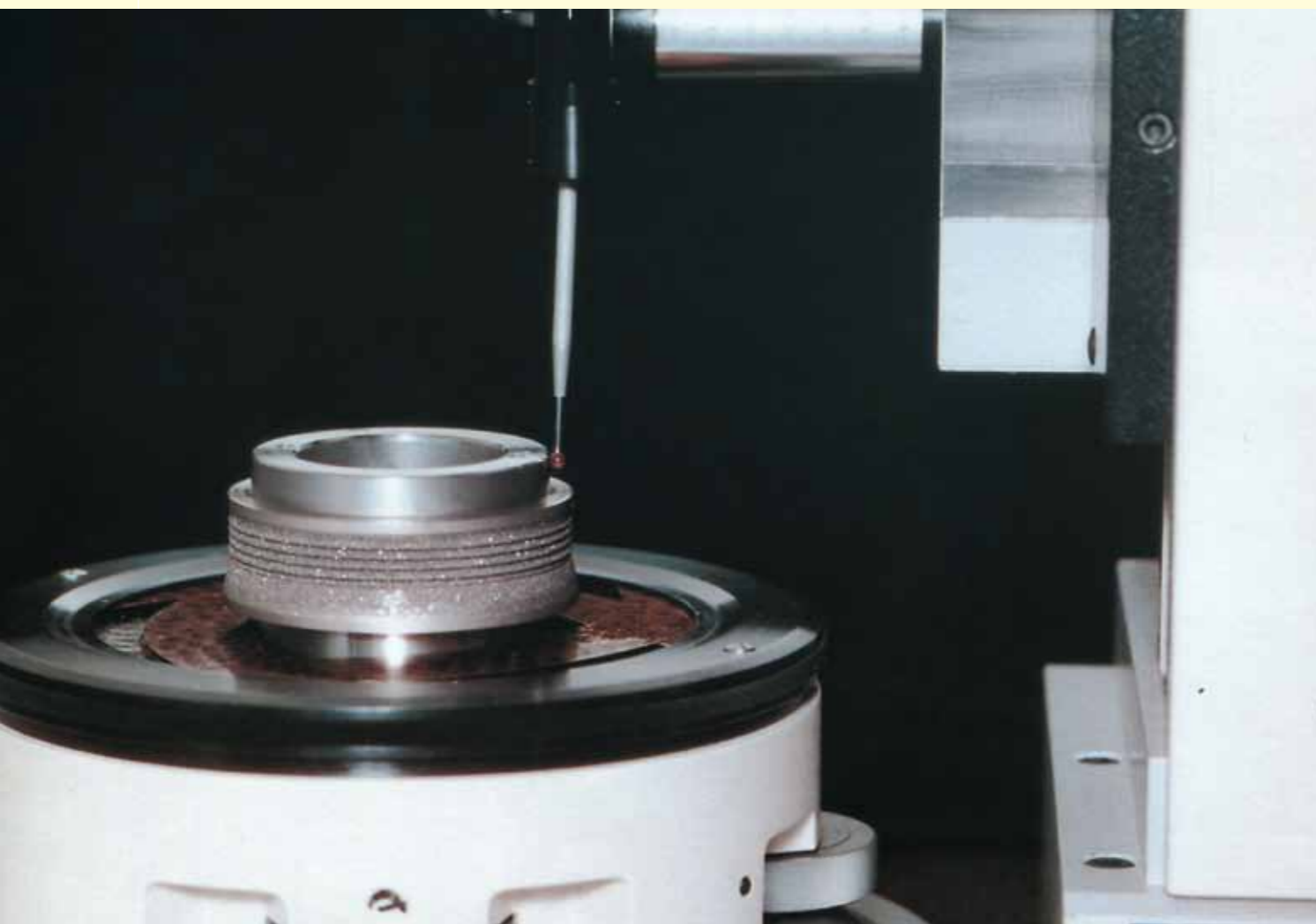
Ferrite grinding wheels

Rotary Dressers

High precision diamond tools are the most effective and practical means for most high-tech industries in the modern world to manufacture high precision machine parts, products, and other equipment. The automobile, aircraft, and turbine industries require extremely high precision machining and grinding tools, especially for application with new and advanced hard materials.

A diamond rotary dresser is a state-of-the-art diamond tool that enables mass production of extremely high precision products, such as engine and turbine parts for the auto and aircraft industries, at very competitive production costs.

Since 1990, EHWA has been able to meet the demand of rotary dressers by aggressively investing millions of dollars and recruiting top engineers for the R&D and manufacturing rotary dressers. In 1992, EHWA successfully completed development and began supplying rotary dresser for the auto and aircraft industries.



Roundness check of rotary dresser

EHWA Diamond Rotary Dressers are engineered to quickly and accurately, dress specific forms into aluminum oxide and silicon carbide grinding wheels for extremely high precision grinding. EHWA Diamond Rotary Dressers are also ideal for dressing conventional abrasive wheels of specific profiles for grinding bearings, screws, and gears.

EHWA assures our global customers that we manufacture only the highest quality rotary dressers that are able to meet the highest expectations and requirements of applicable use in any industry.



Engine blade grinding dresser



Injection valve grinding dresser



Tap grinding dresser



Ball joint grinding dresser



D.O.J. grinding dresser

Industrial Applications



Automotive



Camshaft grinding wheels



Injection nozzle grinding wheels



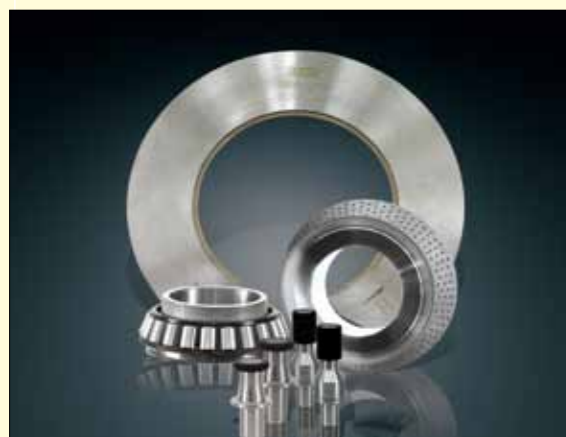
Automotive Components



CV joint grinding wheels



Compressor bearing internal grinding wheels



Bearing & Aerospace



Bearing internal grinding wheels



Engine blade grinding dressers



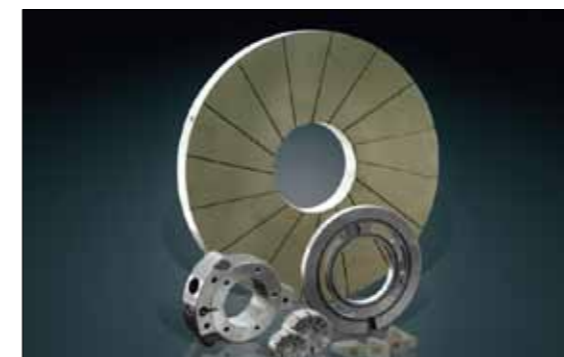
Tool Grinding & Manufacturing



Centerless wheels



Carbide insert grinding wheels



Electrical & Electric Appliances



Double disk grinding wheels



Ferrite grinding wheels



Glass & Optic



Lens grinding wheels



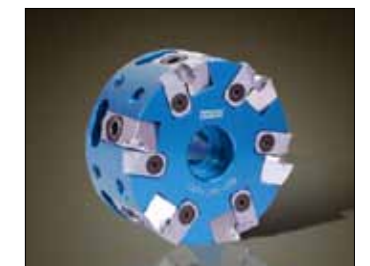
Glass edging wheels



PCD / PCBN Cutting Tool



Endmills



Milling cutters

EHWA diamond tools serve as a promoter of globalization

Since 1975, EHWA DIAMOND has been growing by developing long-term partnerships with customers worldwide and across the industries. EHWA is tirelessly striving to provide the very best customer satisfaction through continuous product innovation and the world class service. Since 1975, EHWA DIAMOND has been growing by developing long-term partnerships with customers worldwide and across the industries. EHWA is tirelessly striving to provide the very best customer satisfaction through continuous product innovation and the world class service. Since 1975, EHWA DIAMOND has been growing by developing long-term partnerships with customers worldwide and across the industries.



EHWA DIAMOND GLOBAL LOCATIONS

KOREA



Osan (Headquarter) Factory, Osan 2 Factory, Dongtan Factory, Pyungtaek Factory, Seochun Factory, Oksan

CHINA



Factory, Shanghai Factory, Weihai Factory, Fujian

GLOBAL



Office, GT, U.S.A. Office, Nagoya, Japan Office, Frankfurt, Germany Office, Thailand Factory, Indonesia

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