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DISCO Terms Dictionary

Precision Processing Tools

Rev. 1.00

Training Center
Global Training Department
DISCO Corporation

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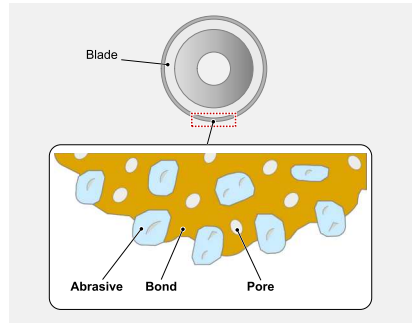
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Three Elements of Abrasive Products

Category: Diamond (General)

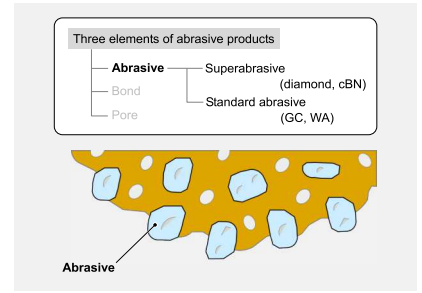
The three elements that make up an [abrasive](#) product: abrasive, [bond](#), and [pore](#).



Abrasive

Category: Diamond (General)

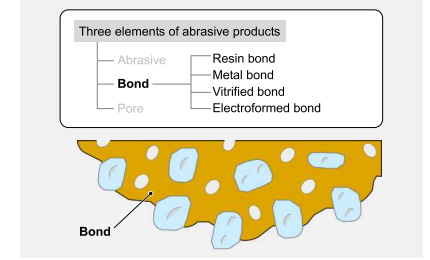
One of the [three elements of abrasive products](#). It is one of the materials that makes up an abrasive product, and its role is to directly process the workpiece. Diamond and [cBN](#) are called [superabrasives](#); [GC](#) and [WA](#) are called [standard abrasives](#).



Bond

Category: Diamond (General)

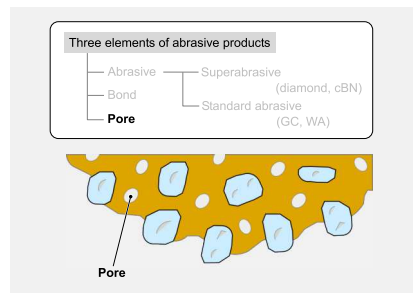
One of the [three elements of abrasive products](#). The material that secures [abrasives](#) to manufacture blades and wheels. Bonds are categorized as [resin bond](#), [metal bond](#), [vitrified bond](#), or [electroformed bond](#). Workability and processing quality are influenced by the characteristics of the bond.



Pore

Category: Diamond (General)

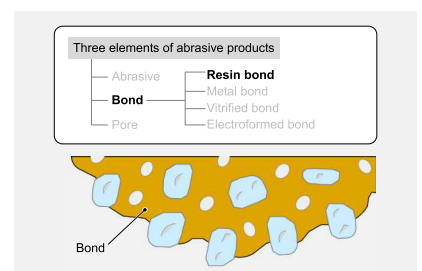
One of the [three elements of abrasive products](#). Pores are air pockets in the [bond](#) that binds [abrasives](#), such as diamond or [cBN](#).



Resin Bond Resinoid Bond

Category: Diamond (General)

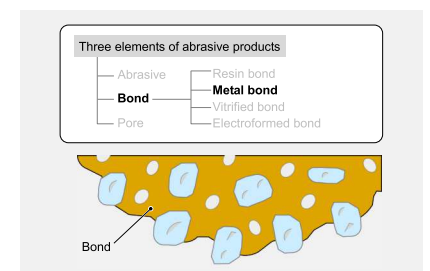
One type of [bond](#). The main component is resin, and it is sometimes mixed with [filler](#) and cured. Resin bond has the weakest abrasion resistance out of all bond types. It has high elasticity and can reduce damage to the workpiece.



Metal Bond

Category: Diamond (General)

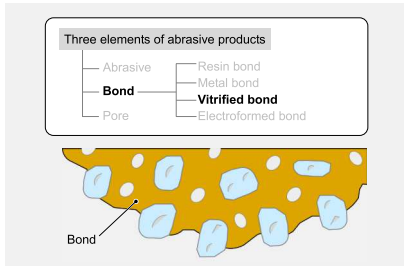
One type of [bond](#). Multiple types of metallic powders and diamond or [cBN](#) are mixed, and then molded and cured with powder metallurgy. Metal bond has a higher abrasion resistance than [resin bond](#).



Vitrified Bond

Category: Diamond (General)

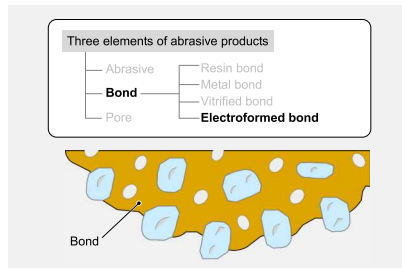
One type of [bond](#), consisting of glassy or ceramic materials. Vitrified bond has a higher abrasion resistance than [resin bond](#). It also has high rigidity and allows for stable processing during high load processing.



Electroformed Bond

Category: Diamond (General)

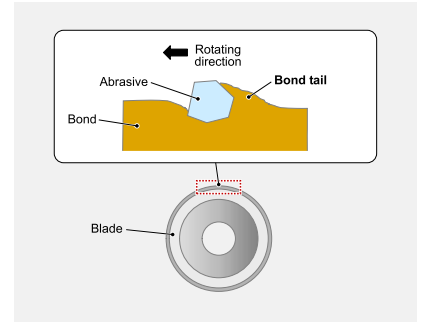
One type of [bond](#), manufactured by plating through electroforming. It possesses high cutting ability.



Bond Tail

Category: Dicing Blade

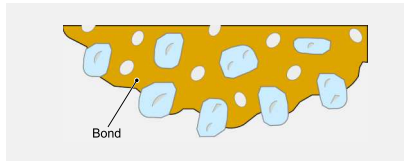
Condition in which the [bond](#) is piled up on the opposite side of the [abrasive](#) from the rotation direction. This phenomenon occurs in particular with very sharp blades.



Filler

Category: Diamond (General)

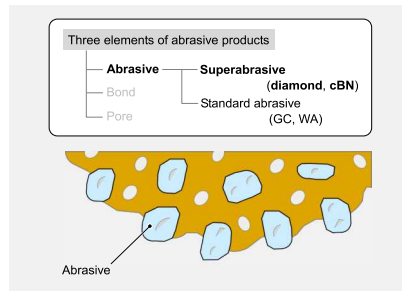
Filler is a material added to [bond](#). Bond performance changes based on the type of filler added. Filler can promote [self-sharpening](#) and allow for electrical conductivity.



Superabrasive

Category: Diamond (General)

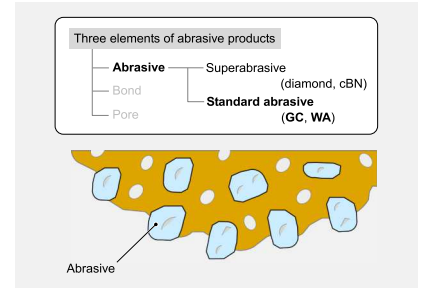
Diamond and [cBN](#) are superabrasives. [GC](#) and [WA](#) are [standard abrasives](#).



Standard Abrasive

Category: Diamond (General)

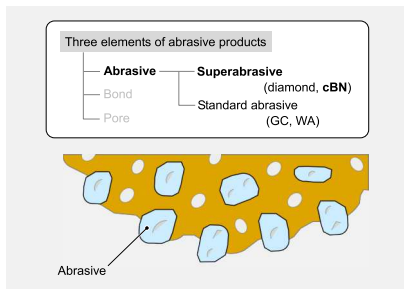
Refers to [GC](#) and [WA](#). Diamond and [cBN](#) are called [superabrasives](#). Standard abrasives experience more fracturing compared with superabrasives and have a shorter lifespan.



cBN

Category: Diamond (General)

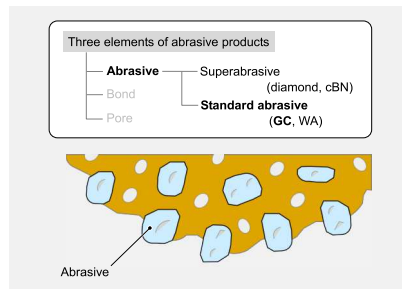
The acronym for [cubic boron nitride](#). [cBN](#) is the hardest material next to diamond and is more resistant to heat than diamond. It is used to process metal materials.



GC

Category: Diamond (General)

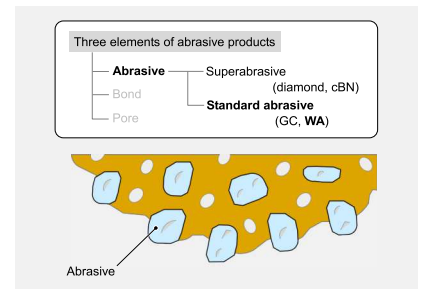
The acronym for [green silicon carbide](#). At DISCO, GC is mainly used as the material for [dresser boards](#), and is also used for [truing blades/wheels](#) and for [dressing](#).



WA

Category: Diamond (General)

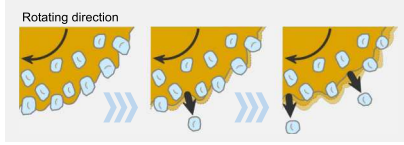
The acronym for [white fused alumina](#). At DISCO, WA is mainly used as the material for [dresser boards](#) and is also used for [truing blades/wheels](#) and for [dressing](#).



Self-Sharpening

Category: Diamond (General)

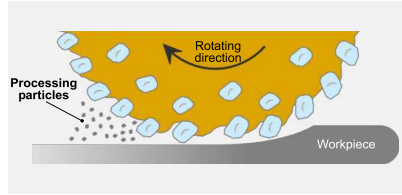
In this process, the [processing particles](#) discharged during processing scrape and wear away the [bond](#) on the processing surface. Then, the worn [abrasives](#) fall off, and new abrasives are exposed at the surface to act as the [cutting edge](#).



Processing Particles Cutting Particles Contamination

Category: Diamond (General)

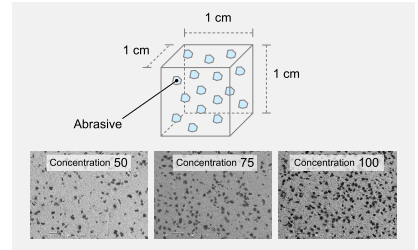
Mixture or pieces of the processed workpiece removed during dicing, grinding, or polishing. Also refers to water for processing that includes this contamination or mixture.



Concentration

Category: Diamond (General)

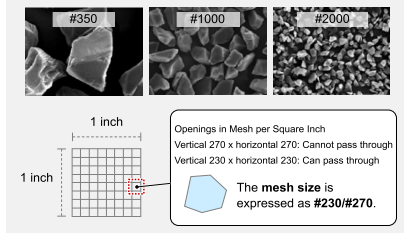
A measurement of [abrasives](#) per cm³ in the abrasive layer. A high concentration contains more abrasive. For example, when the abrasive content is 25%, the concentration is expressed as 100.



Mesh Size

Category: Diamond (General)

The unit used to indicate the size of [abrasives](#). Generally, mesh size is written as # (mesh) followed by a number, with a bigger number indicating a smaller abrasive. The size of abrasive is classified by checking whether it can pass through a certain size mesh. This measurement method is the origin of the word "mesh size."



Hub/Base Aluminum Hub/Base

Category: Diamond (General)

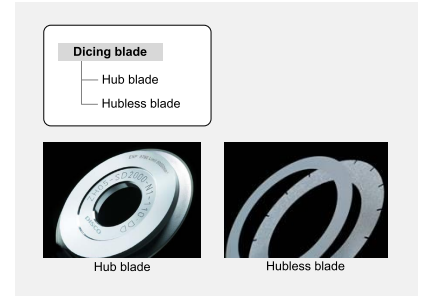
A metal substrate that secures the [abrasive](#) layer of [hub blades](#) and [grinding wheels](#).



Dicing Blade

Category: Dicing Blade

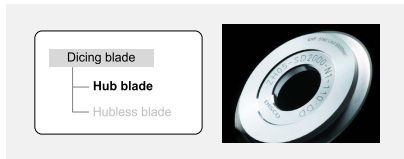
A precision processing tool, used with dicing saws to groove and dice for all "Kiru" (dicing) processes. It consists of diamond [abrasives](#) and [bond](#), which binds the abrasives. There are two types of dicing blades: [hub blades](#) and [hubless blades](#).



Hub Blade

Category: Dicing Blade

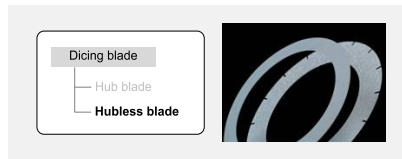
A [dicing blade](#) with an [aluminum hub](#). The hub makes even thin blades easy to handle, and hub blades are mainly used for dicing silicon wafers or compound semiconductor wafers.



Hubless Blade

Category: Dicing Blade

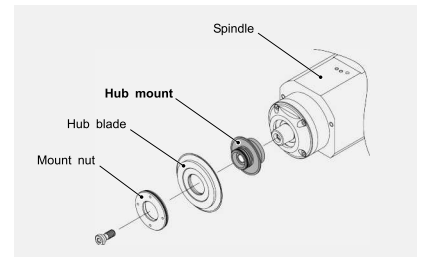
A washer-type [dicing blade](#) without an [aluminum hub](#), used with a [flange](#). It is mainly used to singulate electronic materials and electronic parts (glass, ceramics, and various semiconductor packages).



Hub Mount

Category: Dicing Blade

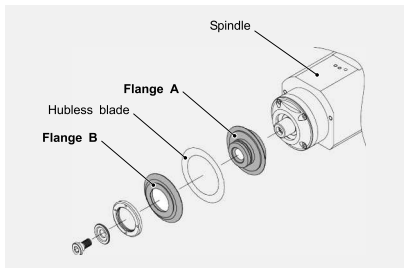
A securing jig used to mount and secure the [hub blade](#) to the spindle of the dicing saw.



Flange

Category: Dicing Blade

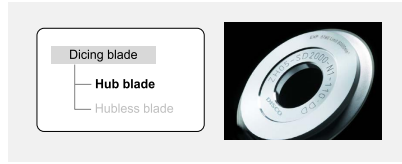
A securing jig used to mount and secure a [hubless blade](#) to the spindle of a dicing saw.



Prime Grade

Category: Dicing Blade

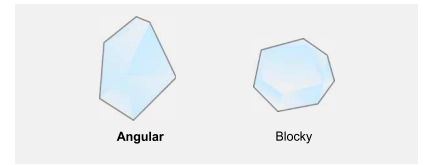
This grade enables the selection of [hub blade](#) patterns such as [concentration](#), [kerf](#) width, and blade exposure with higher accuracy than regular products. Processing quality and variation in blade life can be managed.



Angular

Category: Diamond (General)

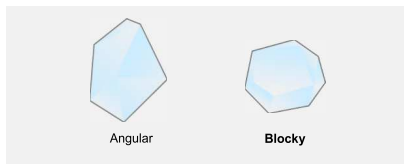
One type of [abrasives](#) shape (mainly diamond). Long and thin, with a high [aspect ratio](#). The opposite is [blocky](#).



Blocky

Category: Diamond (General)

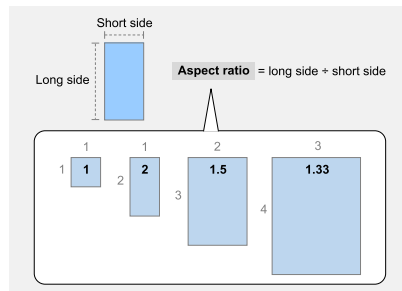
One type of [abrasives](#) shape (mainly diamond). It has excellent processing performance and is generally coarse, with a [mesh size](#) of #320 or lower.



Aspect Ratio

Category: Diamond (General)

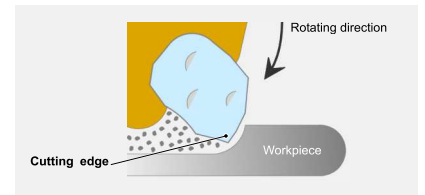
A scale to express the ratio of the long side to the short side. The formula is "long side divided by short side." A larger figure means that the shape is long and thin. The closer the value is to 1, the closer the shape is to a square (or round for [abrasives](#)).



Cutting Edge

Category: Diamond (General)

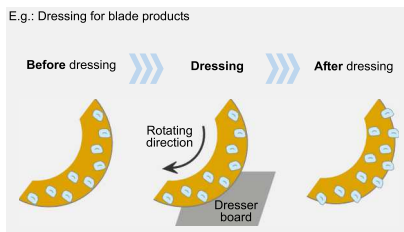
The sharp edge of the [abrasives](#) that processes the workpiece during grinding or dicing. Wear to the cutting edge during processing causes its processing performance to deteriorate.



Dressing

Category: Diamond (General)

The process used to remove the [bond](#) around the [abrasives](#) to expose the abrasives. A specific [dresser board](#) is necessary for each [mesh size](#).



Dresser Board

Category: Diamond (General)

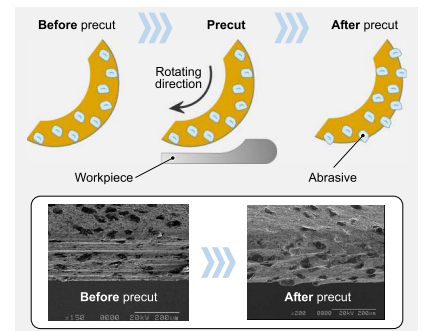
An item processed for [dressing](#). Generally manufactured using [standard abrasives](#).



Precut

Category: Diamond (General)

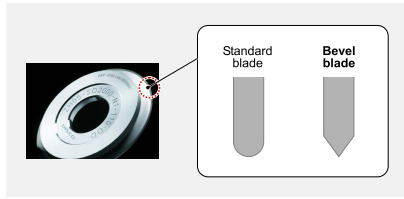
The conditioning process before actual processing to optimize the [dressing](#) of the [abrasives](#).



Bevel Blade

Category: Dicing Blade

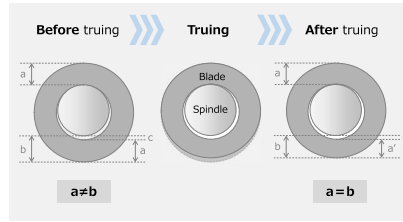
A type of [dicing blade](#) with an angled tip. Grooving a workpiece using a bevel blade is called bevel cut.



Truing

Category: Dicing Blade

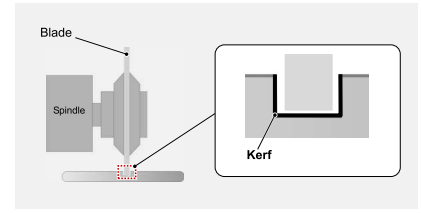
An operation in which a [dicing blade](#) processing surface is corrected in concentric circles against the spindle axis. When a blade is rotated at a high speed while mounted [eccentrically](#), there is an adverse impact on processing quality.



Kerf

Category: Dicing Blade

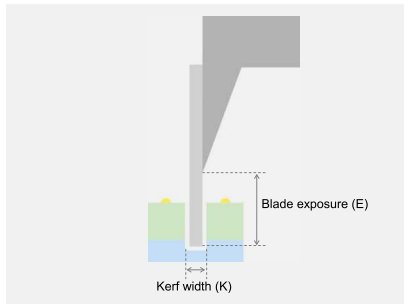
Grooves made in a workpiece during processing using a [dicing blade](#).



E/K Ratio

Category: Dicing Blade

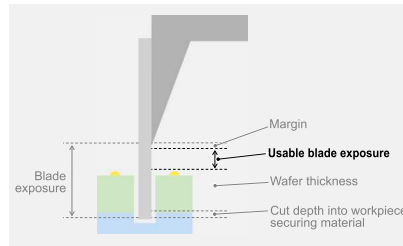
Ratio of blade exposure to [kerf](#) width calculated for [hub blades](#) before shipment. The formula is "blade exposure (E) / kerf width (K)"



Usable Blade Exposure Effective Blade Exposure

Category: Dicing Blade

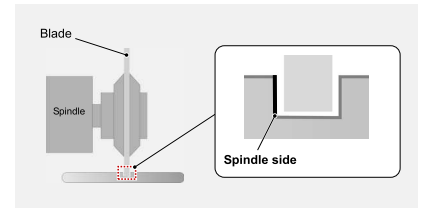
The maximum [wear amount](#) from the start to the end of blade use. The amount is calculated by subtracting the margin, the workpiece thickness (including protrusions such as bumps), and the cutting depth into a workpiece securing material from the blade exposure.



Spindle Side

Category: Dicing Blade

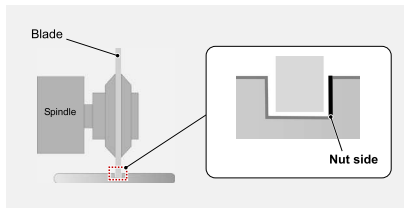
The side of a processed workpiece [kerf](#) that is on the same side as the interface between the blade and the [hub mount](#) (or [flange A](#)).



Nut Side

Category: Dicing Blade

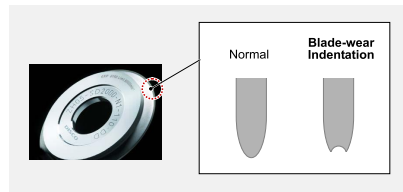
The side of a processed workpiece [kerf](#) that is on the same side as the interface between the blade and the mount nut (or [flange B](#)).



Blade-Wear Indentation

Category: Dicing Blade

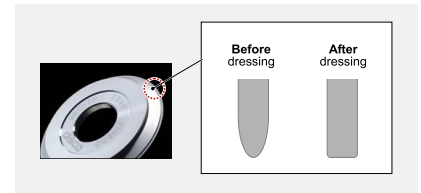
The center of the tip of a [dicing blade](#) that has become concave due to wear during processing.



Flat Dress

Category: Dicing Blade

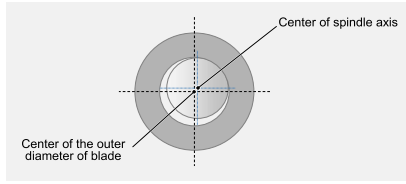
A [dressing](#) method that makes the tip of a [dicing blade](#) flat in a dicing saw.



Runout Eccentricity

Category: Dicing Blade

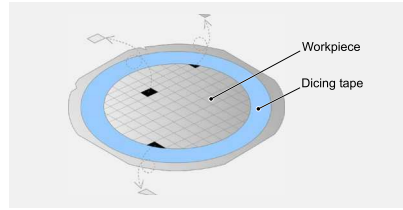
When the centers of the outer diameter of a blade and of the spindle axis are deviated.



Die Flying

Category: Dicing Blade

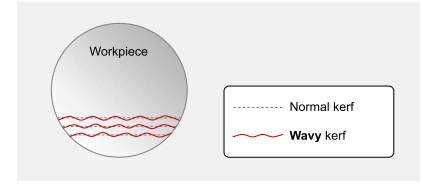
Phenomenon in which singulated workpiece detaches from the dicing tape and flies off.



Wavy Cutting Wavy Cut

Category: Dicing Blade

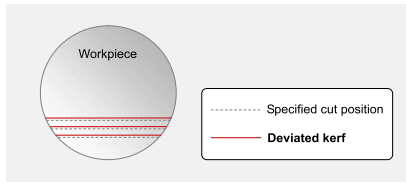
A kerf that makes a wavy path when the workpiece is observed from the top.



Kerf Deviation Kerf Shift Kerf Displacement

Category: Dicing Blade

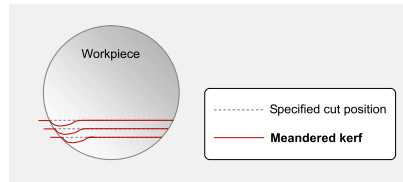
When a dicing blade does not cut into specified cut positions of a workpiece and the center of the kerf is deviated.



Meandering

Category: Dicing Blade

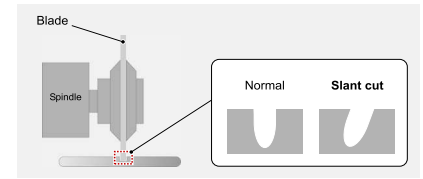
When a cut line is displaced or meandered at the start and end of cutting.



Slant Cutting Slant Cut

Category: Dicing Blade

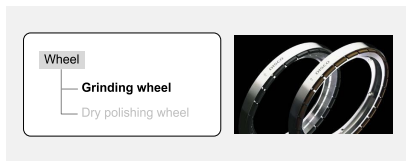
When a dicing blade does not cut into the workpiece vertically, and consequently the kerf becomes slanted.



Grinding Wheel

Category: Grinding Wheel

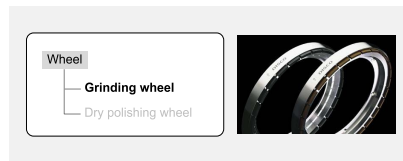
A wheel mounted on a grinder and used in "Kezuru" (grinding) processes, which are processes for thinning or flattening workpieces, such as silicon wafers or compound semiconductor wafers.



Rough Grinding Wheel

Category: Grinding Wheel

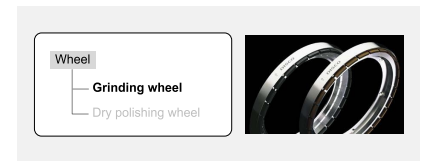
A grinding wheel used for rough grinding with an emphasis on processing efficiency. The workpiece surface roughness after grinding is coarse due to the large abrasives used in the wheel.



Fine Grinding Wheel

Category: Grinding Wheel

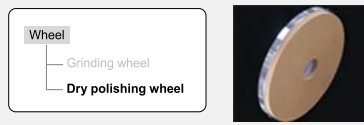
A grinding wheel that grinds a workpiece by a small amount using fine abrasives and removes the damage layer generated by rough grinding (a process called fine grinding).



Dry Polishing Wheel

Category: Dry Polishing Wheel

A dry polishing wheel is mounted on a polisher and removes microscopic grinding marks generated during backgrinding. The wheel is used to perform "Migaku" (polishing) processes. The wheel removes residual stress on the workpiece surface without water or chemical fluids, improving die strength.



Stress Relief

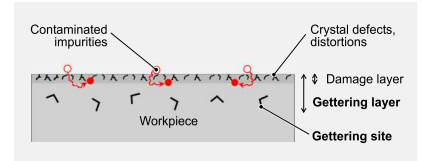
Category: Diamond (General)

The process of removing the stress layer (damage layer) on the workpiece surface and improving die strength.

Gettering Site Gettering Layer

Category: Dry Polishing Wheel

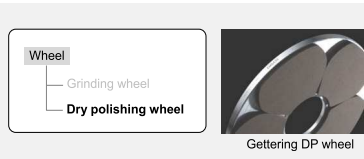
A gettering site serves to capture and contain metal impurities such as Cu. A gettering layer is a generic term for the layer that forms on the ground surface or polished surface and in which impurities, crystal defects, and distortions exist. The damage layer is located in the upper layer of the gettering layer.



Gettering DP Wheel

Category: Dry Polishing Wheel

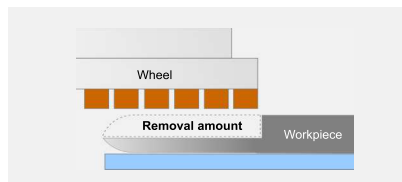
A dry polishing wheel that forms crystal defects and distortions (gettering sites) on the ground or polished surface.



Removal Amount Removal Volume Removed Thickness

Category: Grinding Wheel / Dry Polishing Wheel

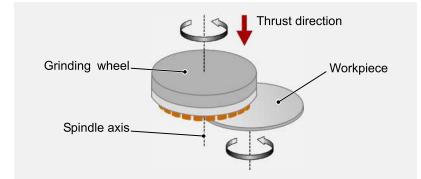
Amount removed from a workpiece (grinding/polishing amount) by processing using a grinding wheel (grinding) or dry polishing wheel (polishing).



In-Feed

Category: Grinding Wheel

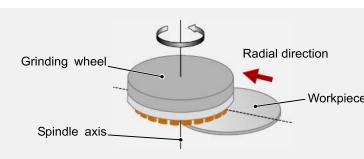
A grinding method that feeds a grinding wheel in the thrust direction against the spindle axis for a rotating workpiece. Grinding is performed using an inclined and umbrella-shaped chuck table so that only a half arc of the grinding wheel contacts the workpiece. Compared with the creep-feed method, the processing load is small and thinning is possible.



Creep-Feed

Category: Grinding Wheel

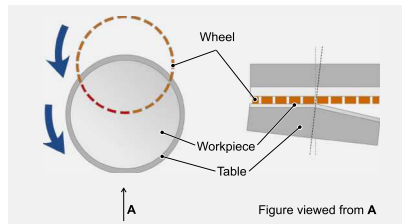
A grinding method that feeds a workpiece in the radial direction against the spindle axis at a low feed rate while maintaining the height direction of the grinding wheel.



Chuck Table Inclination

Category: Grinding Wheel

Inclining an umbrella-shaped chuck table so that grinding can be performed using the half arc of a wheel, lowering the processing load for in-feed grinding. Also refers to the inclination angle of the chuck table.



Segment

Category: Grinding Wheel

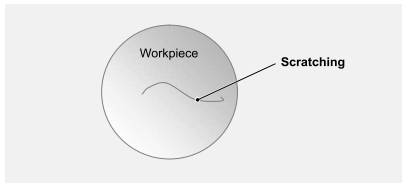
Diamond-layered section (wheel segments) of a grinding wheel.



Scratching

Category: Grinding Wheel

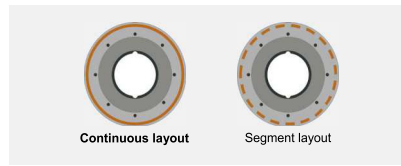
One type of processing defect and a general term for damage occurring on the ground surface of a workpiece.



Continuous Layout

Category: Grinding Wheel

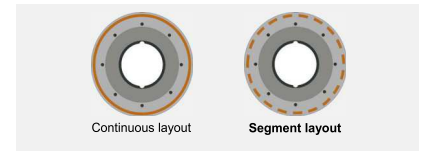
A layout of [grinding wheel segments](#) that puts no space between wheel segments. The purpose is to avoid segment cracking and to improve processing quality.



Segment Layout

Category: Grinding Wheel

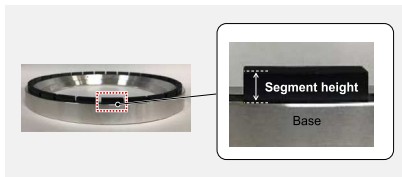
A layout of [grinding wheel segments](#) that puts a certain amount of space between wheel segments.



Segment Height

Category: Grinding Wheel

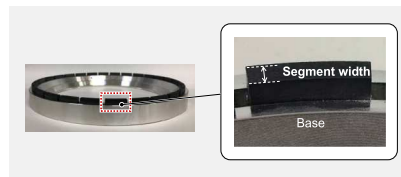
The amount of a [grinding wheel segment](#) protruding from the [base](#).



Segment Width

Category: Grinding Wheel

The surface of a [grinding wheel segment](#) that contacts the workpiece and the segment dimension diametric to the wheel.



Self-Grinding

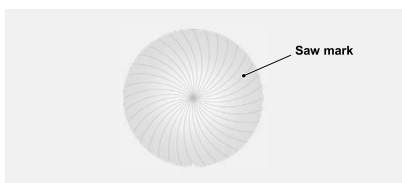
Category: Grinding Wheel

Performed to maintain grinding accuracy by correcting the inclinations of the chuck table and the spindle. The upper surface of the chuck table is removed within the equipment by mounting a self-grinding wheel. This process is called self-grinding because part of the equipment itself is being ground, not a workpiece.

Saw Mark

Category: Grinding Wheel

Deep grinding marks that are generated on the surface of a workpiece.



Surface Roughness

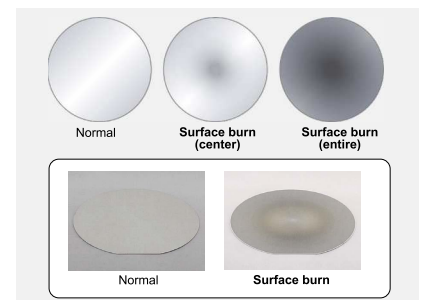
Category: Wheel (General)

Values calculated by measuring irregularities on the ground or polished surface of a workpiece. Results are displayed with average and/or maximum height.

Surface Burn

Category: Grinding Wheel

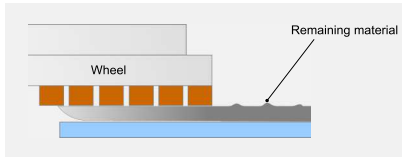
One type of processing defect. Processing load increases when diamond [abrasives](#) in [segments](#) have dropped off and/or worn out, leading to irregular heating. The heating causes discoloration of the ground/polished surface of a workpiece.



Sparkout

Category: Grinding Wheel

A process that smooths the ground surface by removing remaining material using elastic deflection when a workpiece has reached a specified thickness. The process is carried out while maintaining the wheel height (Z-axis location) and without processing the surface further in the Z-axis direction.



Escape Cut

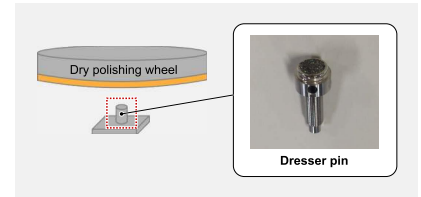
Category: Grinding Wheel

A process in which the [grinding wheel](#) slowly ascends after [sparkout](#). This affects the condition of the processed surface.

Dresser Pin

Category: Dry Polishing Wheel

A consumable tool that is mounted on a polisher and performs [dry polishing wheel dressing](#).



Wheel Life

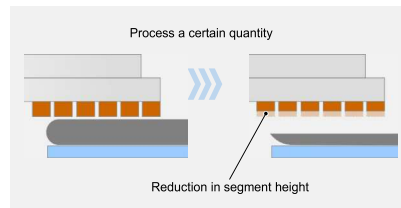
Category: Wheel (General)

The number of workpieces that can be processed by one wheel.

Wear Amount

Category: Wheel (General)

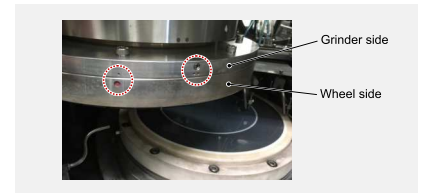
The wheel wear amount per workpiece(s) or [removal amount](#). In general, this is expressed through the reduction in [segment height](#).



Guide-Mark

Category: Wheel (General)

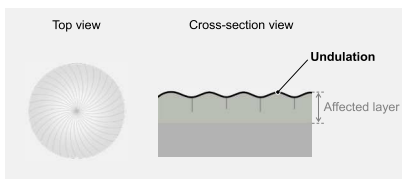
Used as reference for positioning when mounting a wheel onto a grinder.



Undulation

Category: Grinding Wheel

One type of processing defect. A cyclic undulation on the surface of a workpiece, in which a color difference (contrasting density) that can be visually observed appears on the ground surface.



Corrosion Dissolution

Category: Diamond (General)

When a [bond](#) component is eluted due to the impact of deionized water used during processing, lowering [segment/blade strength](#). This phenomenon is observed especially in [electroformed bond](#) and [vitrified bond](#).

Unbalance Amount

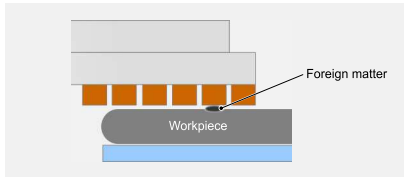
Category: Wheel (General)

The amount of displacement between the center of gravity of the rotating parts and the rotating center.

Being Caught

Category: Grinding Wheel

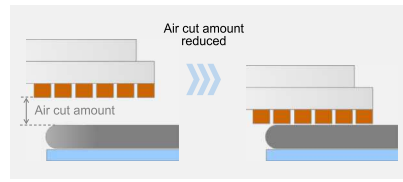
In grinding, when foreign matter on a workpiece is caught by a [grinding wheel](#), which can lead to workpiece [scratching](#) and/or breakage.



Wheel Impact

Category: Wheel (General)

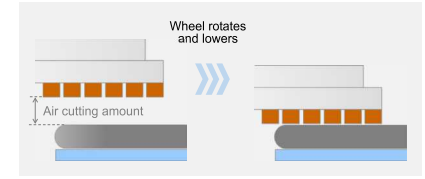
When a wheel collides with a workpiece at a high speed while descending because the [air cut](#) amount is lower than expected due to setup errors and/or workpiece thickness variations.



Air Cutting Air Cut

Category: Grinding Wheel

A process in which a [grinding wheel](#) rotates and lowers at the same feed speed as used for processing from a position higher than the workpiece thickness.



Slipping

Category: Grinding Wheel

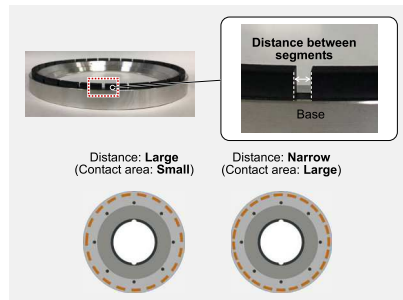
When a [grinding wheel](#) cannot cut into a workpiece due to insufficient spindle axis torque.



Distance between Segments

Category: Grinding Wheel

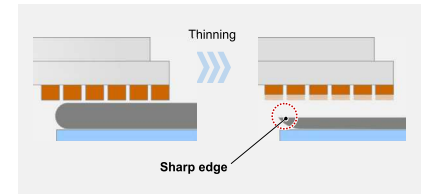
Distance between neighboring [segments](#) of a [grinding wheel](#). Adjusting the distance makes it possible to change the segment contact area against the workpiece, optimizing the processing capability of the wheel.



Sharp Edge

Category: Grinding Wheel

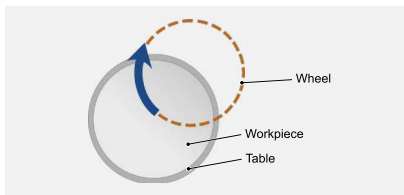
When the cross-sectional shape of the edge becomes sharp during thinning of a workpiece. Also refers to the sharpened section itself.



In-to-Out Grinding

Category: Grinding Wheel

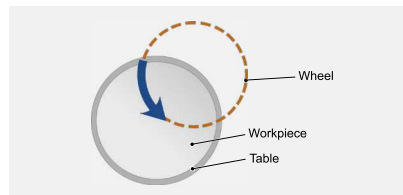
When a [grinding wheel](#) grinds from the center to the edge of a workpiece.



Out-to-In Grinding

Category: Grinding Wheel

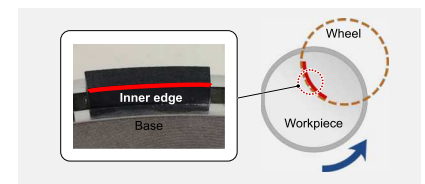
When a [grinding wheel](#) grinds from the edge to the center of a workpiece.



Segment Inner Edge

Category: Grinding Wheel

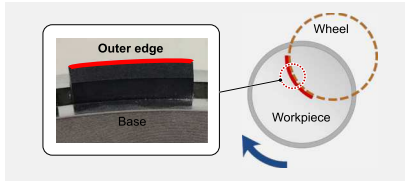
The inner edge of a [segment](#) as well as the grinding method in which the inner edge becomes a processing point.



Segment Outer Edge

Category: Grinding Wheel

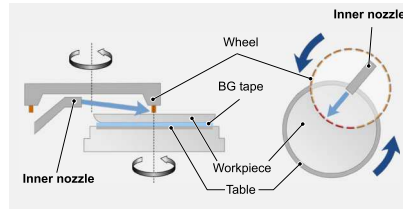
The outer edge of a [segment](#) as well as the grinding method in which the outer edge becomes a processing point.



Inner Nozzle

Category: Grinding Wheel

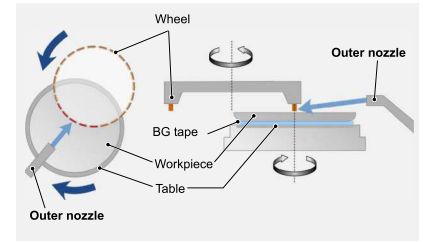
A nozzle that supplies water directly to the processing point during [segment inner edge](#) processing.



Outer Nozzle

Category: Grinding Wheel

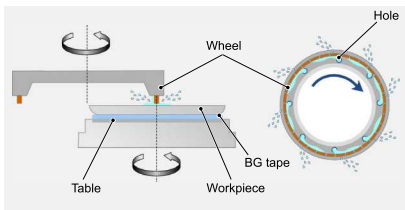
A nozzle that supplies water directly to the processing point during [segment outer edge](#) processing.



Wheel Coolant

Category: Grinding Wheel

Water supplied from the spindle to the processing point through holes in the wheel [base](#).



Edge Chipping

Category: Grinding Wheel

Cracking that occurs at the edge of a workpiece, mostly during rough grinding.

