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DISCO Terms Dictionary
Precision Processing Tools

Rev. 1.00
Three Elements of Abrasive Products

Category: Diamond (General)

The three elements that make up an abrasive product: abrasive, bond, and pore.

Abrasives

Category: Diamond (General)

One of the three elements of abrasive products. It is one of the materials that make up an abrasive product, and its role is to directly process the workpiece. Diamond and CBN are called superabrasives. SiC and Al2O3 are called standard abrasives.

Bond

Category: Diamond (General)

One of the three elements of abrasive products. The material that secures abrasives in manufacture. Types include metal-bonded, vitrified-bonded, and electroplated bonded. 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 passages in the bond that limits abrasives, such as diamond or CBN.
**Vitrified Bond**

Category: Diamond (General)

One type of bond, consisting of glass 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-speed processing.

**Electroformed Bond**

Category: Diamond (General)

One type of bond manufactured by plating through electroforming. It possesses high cutting ability.

**Bond Tail**

Category: Diamond (General)

Condition in which the bond is peeled off on the opposite side of the abrasive from the rotation direction. This phenomenon occurs in particular with very sharp abrasives.

**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-healing and allow for electroconductive.

**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 much faster wear 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, Al DISCO. GC is mainly used as the material for dressing tools and is also used for facing, lapping, and for honing.

**WA**

Category: Diamond (General)

The acronym for white fused alumina, Al DISCO. WA is mainly used as the material for dressing tools and is also used for facing, lapping, and for honing.
**Self-Sharpening**

Category: Diamond (General)

In this process, the processing particles discharged during processing scrapes away the top of the processing surface. Then, the wash abrasive is fed off, and new abrasives are exposed at the surface to act on the cutting edge.

**Processing Particles**

Category: Diamond (General)

**Cutting Particles**

**Contamination**

Category: Diamond (General)

Mixture or pieces of the processed particles 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 cm² in the abrasive slurry. A high concentration contains more abrasives. For example, when the abrasive content is 25%, the concentration is expressed as 250.

**Mesh Size**

Category: Diamond (General)

The unit used to indicate the size of abrasives. Generally, mesh size is written as 20 # (mesh) followed by a number, with a bigger number indicating a smaller abrasive. The size of abrasives 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**

Category: Diamond (General)

**Aluminum Hub/Base**

A metal substrate that assumes the aluminum layer of hub blades and hubless blades.

**Dicing Blade**

Category: Dicing Blade

A precision dicing tool used with dicing saws to groove and slice off all “non” dicing processes. A contact of Diamond abrasive and blade, which lasts the abrasives. There are two types of dicing blades: Hub Blade and Hubless Blade.

**Hub Blade**

Category: Dicing Blade

A dicing blade with an aluminum hub. The hub makes even this blade easy to handle, and hub blades are mainly used for dicing silicon wafers or compound semiconductor wafers.

**Hubless Blade**

Category: Dicing Blade

A wash-type dicing blade without an aluminum hub, used with a flange. It is mainly used to dicing 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 blades to the spindle of the dicing saw.
Flange
Category: Diamond (General)
A securing jig used to mount and secure a hub blade to the spindle of a dressing saw.

Prime Grade
Category: Diamond (General)
This grade enables the selection of hub blade patterns such as configuration, leaf width, and blade exposure with higher accuracy than regular products. Processing quality and variation in blade tip can be managed.

Angular
Category: Diamond (General)
One type of abrasive shape (mainly diamond). Long and thin, with a high aspect ratio. The opposite is blocky.

Blocky
Category: Diamond (General)
One type of abrasive shape (mainly diamond). The opposite is angular. It has excellent processing performance and is generally coarse, with a rough size of R50 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 evaluation.

Cutting Edge
Category: Diamond (General)
The sharp edge of the abrasive that possesses the workpiece during grinding or dressing. 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 abrasive to expose the abrasives. A specific dresser must be necessary for each type of abrasive.

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 abrasive.

E.g., Dressing for blade products
Before dressing  Dressing  After dressing

For dressing blade  For grinding wheel

Before precut  Precut  After precut
**Bevel Blade**

Category: Dicing Blade

A type of dicing blade with an angled tip. Growing a wafer using a bevel blade is called bevel cut.

**Truing**

Category: Dicing Blade

An operation in which a dicing blade processing surface is corrected by concentric diamonds against the wafer side. When the blade is rotated at a high speed while mounted temporarily, there is an adverse impact on processing quality.

**Kerf**

Category: Dicing Blade

Grooves made in a waferpiece during processing using a dicing blade.

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**E/K Ratio**

Category: Dicing Blade

Ratio of blade exposure to kerf width calculated for each slice before shipment. The formula is "blade exposure ÷ kerf width " with [E] / [K].

**Usable Blade Exposure Effective Blade Exposure**

Category: Dicing Blade

The maximum width except from the edge to the end of blade use. The amount is calculated by subtracting the width of the usable blade from the total blade width and the cutting depth into a wafer piece securing from the blade exposure.

**Spindle Side**

Category: Dicing Blade

The side of a processed wafer piece that is on the same side as the interface between the blade and the mount nut (see [Image 23]).

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**Nut Side**

Category: Dicing Blade

The side of a processed wafer piece that is on the same side as the interface between the blade and the mount nut (see [Image 23]).

**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 the spindle axes are deviated,

![Diagram of Runout Eccentricity]

**Die Flying**

Category: Dicing Blade

Phenomenon in which a blade or workpiece detaches from the dicing tape and flies off.

![Diagram of Die Flying]

**Wavy Cutting Wavy Cut**

Category: Dicing Blade

A cut that makes a wavy path when the workpiece is observed from the side.

![Diagram of Wavy Cutting Wavy Cut]

**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.

![Diagram of Kerf Deviation Kerf Shift Kerf Displacement]

**Meandering**

Category: Dicing Blade

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

![Diagram of Meandering]

**Slant Cutting Slant Cut**

Category: Dicing Blade

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

![Diagram of Slant Cutting Slant Cut]

**Grinding Wheel**

Category: Grinding Wheel

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

![Diagram of Grinding Wheel]

**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 protrusion used in the wheel.

![Diagram of Rough Grinding Wheel]

**Fine Grinding Wheel**

Category: Grinding Wheel

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

![Diagram of Fine Grinding Wheel]
Dry Polishing Wheel
Category: Dry Polishing Wheel
A dry polishing wheel is mounted on a polisher and removes microscopic grinding marks generated during machining. The wheel is used to perform “flap” polishing processes. The wheel removes residual stress on the workpiece surface without water or chemical fluids, improving the surface.

Stress Relief
Category: Diamond (General)
The process of removing the stress layer (damage layer) on the workpiece surface and improving its 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 dislocations 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 dislocations (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 feed direction against the spindle axis for a rotating workpiece. Grinding is performed using an unshaped or unshaped-shaping workpiece 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
Inducing an unshaped workpiece (chuck table) so that grinding can be performed using the radial axis of a wheel. Inverting the processing load for radial grinding. Also refers to the inclination angle of the chuck table.

Segment
Category: Grinding Wheel
Diamond/Hardened segment (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.

![Scratching Diagram](image)

**Continuous Layout**

**Category:** Grinding Wheel

A layout of grinding wheel segments that leaves no space between wheel segments. This design is used to avoid segment cracking and to improve processing quality.

![Continuous Layout Diagram](image)

**Segment Layout**

**Category:** Grinding Wheel

A layout of grinding wheel segments that leaves a certain amount of space between wheel segments.

![Segment Layout Diagram](image)

**Segment Height**

**Category:** Grinding Wheel

The amount of a grinding wheel segment protruding from the base.

![Segment Height Diagram](image)

**Segment Width**

**Category:** Grinding Wheel

The surface of a grinding wheel segment that contacts the workpiece and the segment dimension diameter to the wheel.

![Segment Width Diagram](image)

**Self-Grinding**

**Category:** Grinding Wheel

Performed to maintain grinding accuracy by correcting the inclination 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.

![Self-Grinding Diagram](image)

**Saw Mark**

**Category:** Grinding Wheel

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

![Saw Mark Diagram](image)

**Surface Roughness**

**Category:** Grinding 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 Roughness Diagram](image)

**Surface Burn**

**Category:** Grinding Wheel

One type of processing defect. Processing burn increases when diamond abrasive segments have dropped off and/or worn out, leading to irregular finishing. The heating causes discolouration of the ground polished surface of a workpiece.

![Surface Burn Diagram](image)
**Sparkout**

Category: Grinding Wheel

A process that smooths the ground surface by removing remaining material using elastic deformation when a workpiece has reached a specified thickness. The process is carried out while maintaining the wheel height (rake 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 cyclical undulation on the surface of a workpiece, in which a color difference (pitting density) that can be visually observed appears on the ground surface.

**Corrosion Dissolution**

Category: Diamond (General)

When a hard component is etched due to the impact of deoxidized water used during processing, leaving a segment width or width. This phenomenon is observed especially in etched-stripped hard and etched hard.

**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 nose 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 honing of a workpiece. Also refers to the sharpened portion 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 wheelhead.

**Edge Chipping**

Category: Grinding Wheel

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