www.disco.co.jp

- This catalog outlines the standard specification for this equipment and may differ from the specification of products equipped with special accessories and specifications.
- The specification of an individual product may change due to technical improvements. Please confirm the specification details when placing your order.
- For further information regarding each product, please contact your local DISCO sales representatives.

# Product Lineup

## Kiru

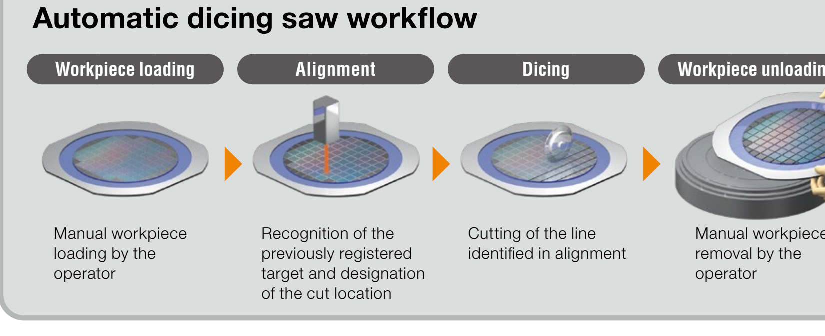
## Kezuru

## Migaku

# Blade Dicing Saw

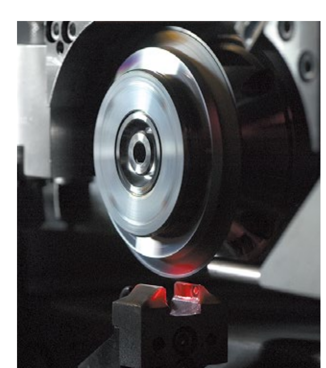
## Automatic Dicing Saw

**Automatic cutting and manual handling**



| | | | DAD324 | DAD3221 | DAD3231 | DAD3431 | DAD3241 | DAD3351 | DAD3651 | DAD3361 | DAD3661 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Compact model for ø150 mm wafers | Standard automatic model for ø150 mm wafers | Highly flexible configuration to meet processing needs | High precision model with X-axis air slider | Standard automatic model for ø200 mm wafers | Flexibility for diverse application needs | Ultracompact facing dual configuration | Highly extensible equipment for ø300 mm and 250x250 mm workpieces | Dual spindle mounted equipment with support for processing large package substrates |
| Max workpiece size | | mm | **ø150** | **ø150** | **ø150** | **ø150** | **ø200** | **ø200** | **ø200** | **ø300** | **ø360/□360** |
| Spindle | Layout | | Single | Single | Single | Single | Single | Single | Facing dual spindle | Single | Facing dual spindle |
| | Output | kW | 2.0 at 40,000 $min^{-1}$ | 2.0 at 40,000 $min^{-1}$ | 2.0 at 40,000 $min^{-1}$ | 2.0 at 40,000 $min^{-1}$ | 1.8 at 60,000 $min^{-1}$ | 1.8 at 60,000 $min^{-1}$ | 1.8 at 60,000 $min^{-1}$ | 1.8 at 60,000 $min^{-1}$ | 1.8 at 60,000 $min^{-1}$ |
| | Max revolution speed | $min^{-1}$ | 40,000 | 40,000 | 40,000 | 40,000 | 60,000 | 60,000 | 60,000 | 60,000 | 60,000 |
| X-axis | Max cutting speed | mm/sec | 0.1 - 800 | 0.1 - 800 | 0.1 - 800 | 0.1 - 300 | 0.1 - 800 | 0.1 - 1,000 | 0.1 - 1,000 | 0.1 - 1,000 | 0.1 - 1,000 |
| Y-axis | Index step | mm | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 |
| | Positioning accuracy | mm | Within 0.005 / 160 | Within 0.005 / 160 | Within 0.005 / 160 | Within 0.0015 / 160 | Within 0.002 / 210 | Within 0.002 / 260 | Within 0.002 / 260 | Within 0.002 / 310 | Within 0.002 / 400 |
| Z-axis | Repeating accuracy | mm | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 |
| Utilities | Dimensions (W×D×H) | mm | 490 × 870 × 1,670 | 490 × 870 × 1,670 | 650 × 950 × 1,670 | 730 × 900 × 1,670 | 650 × 950 × 1,670 | 880 × 1,000 × 1,800 | 790 × 790 × 1,800 | 880 × 1,000 × 1,800 | 1,350 × 1,200 × 1,800 |
| | Weight | kg | Approx. 420 | Approx. 420 | Approx. 550 | Approx. 600 | Approx. 550 | Approx. 1,100 | Approx. 1,040 | Approx. 1,100 | Approx. 1,550 |

### Optional Accessories

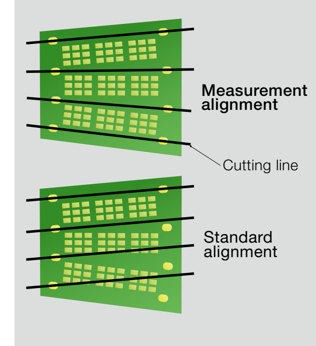


#### Noncontact setup

Blade tip position relative to the chuck table surface is detected by an optical sensor.
Processing quality is stable since the blade wear can be measured at any time during processing.

#### Blade breakage sensor

Processing is stopped immediately if blade breakage occurs to minimize potential workpiece damage.




#### Measurement alignment

Detects the correct cutting location for workpieces with cutting lines that are not properly aligned due to warpage from baking and curing steps.

#### Ultrasonic-wave dicing unit

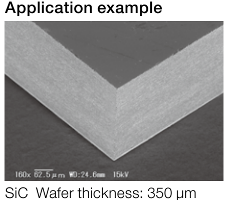
Ultrasonic-wave pulses promote active self-sharpening of the blade to ensure high quality and high speed processing of difficult to- cut materials such as SiC and glass.

**U09**
**U18**

Special blade for ultrasonic-wave dicing

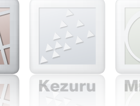
• Blade with built-in oscillator

**Application example**


SiC Wafer thickness: 350 µm

| Applicable material | SiC, glass, alumina ceramic, etc. |
|---|---|
| Bond type | Electroformed |

Note: Please consult a DISCO sales representative for information regarding which optional accessories are supported for each model.




# Blade Dicing Saw

## Fully Automatic Dicing Saw

**Automatic wafer transfer, alignment, cutting, and cleaning & drying**

### Fully automatic dicing saw workflow

- **Loading**: The workpiece is removed from the cassette and transferred to the chuck table
- **Alignment**: Recognition of the previously registered target and designation of the cut location
- **Dicing**: Cutting of the line identified in alignment
- **Cleaning & Drying**: Spinner table cleaning & drying
- **Unloading**: The workpiece is stored in the cassette after the cleaning & drying process is complete

**DFD6240** — Reduced-footprint fully automatic single-spindle dicing saw for ø200 mm wafers

**DFD6341** — Standard equipment which supports ø200 mm wafer processing

**DFD6450** — Next generation parallel dual dicing saw for a wide range of applications

**DFD6363** — 2-way transfer* flagship model Also supports DBG half-cuts

**DFD6561** — Space-saving with a reduced maintenance area

**DFD6760** — Dual chuck table configuration to minimize standby time for maximum efficiency

| | | Unit | DFD6240 | DFD6341 | DFD6450 | DFD6363 | DFD6561 | DFD6760 |
|---|---|---|---|---|---|---|---|---|
| Max workpiece size | | mm | ø200 | ø200 | ø200 | ø300 | ø300 | ø300 |
| Spindle | Layout | | Single | Facing dual | Parallel dual | Facing dual | Facing dual | Facing dual |
| | Output | kW | 1.2 at 60,000 min$^{-1}$ | 1.2 at 60,000 min$^{-1}$ | 1.0 at 60,000 min$^{-1}$ | 1.8 at 60,000 min$^{-1}$ | 1.8 at 60,000 min$^{-1}$ | 1.2 at 60,000 min$^{-1}$ |
| | Max revolution speed | min$^{-1}$ | 60,000 | 60,000 | 60,000 | 60,000 | 60,000 | 60,000 |
| X-axis | Feed speed range | mm/sec | 0.1 - 600 | 0.1 - 1,000 | 0.1 - 600 | 0.1 - 1,000 | 0.1 - 1,000 | 0.1 - 1,000 |
| Y-axis | Index step | mm | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 |
| | Positioning accuracy | mm | Within 0.003 / 210 | Within 0.002 / 210 | Within 0.003 / 250 | Within 0.002 / 310 | Within 0.002 / 310 | Within 0.003 / 310 |
| Z-axis | Repeating accuracy | mm | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 |
| Utilities | Dimensions (W×D×H) | mm | 900 × 1,190 × 1,800 | 1,180 × 1,080 × 1,820 | 1,120 × 1,500 × 1,600 | 1,200 × 1,550 × 1,800 | 1,240 × 1,550 × 1,960 | 1,200 × 1,900 × 1,800 |
| | Weight | kg | Approx. 1,200 | Approx. 1,500 | Approx. 1,400 | Approx. 1,800 | Approx. 1,500 | Approx. 2,750 |

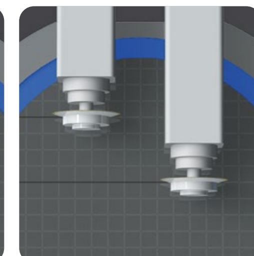
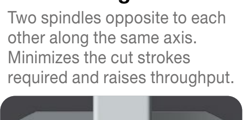
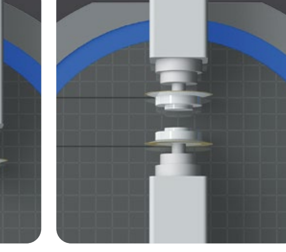
*Frame/wafer dual-type transfer mechanism (Option)

### Spindle layout

**Single**
Single spindle layout

**Parallel dual**
Two spindles mounted in parallel to facilitate a wide range of applications.

**Facing dual**
Two spindles opposite to each other along the same axis. Minimizes the cut strokes required and raises throughput.

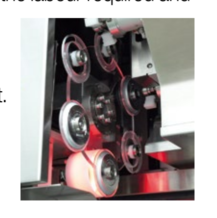
### Optional Accessories

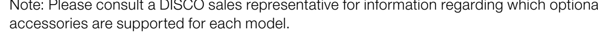
**Cassette and tape frame**

High precision products to facilitate stable production from tape mounter to die bonder. Meets the ø300 mm wafer SEMI standard.

**Automatic blade changer**

Conducts blade change and resumes cutting fully automatically. Minimizes the labour required and raises the utilization rate of the equipment.



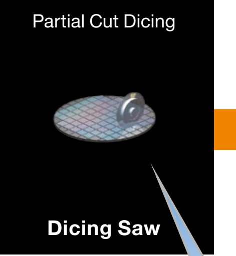


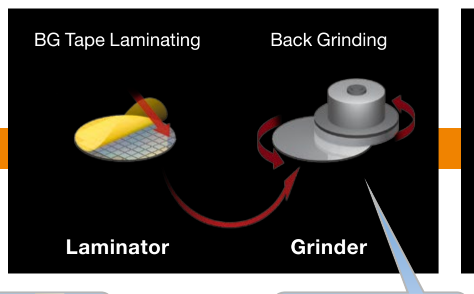
Note: Please consult a DISCO sales representative for information regarding which optional accessories are supported for each model.

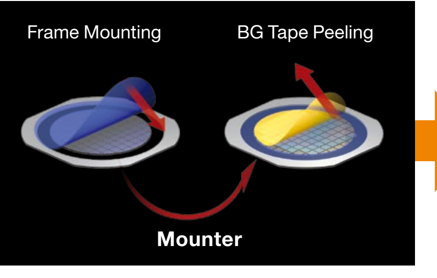
### DBG
Dicing Before Grinding

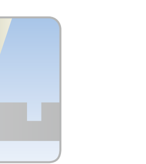
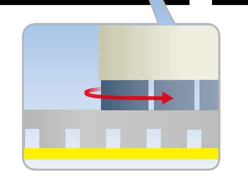
**What is DBG?**

The reverse of the conventional "Backside grinding Wafer cutting" process. Wafer half cut is performed first, then the die are separated through backside grinding. Die can be produced from large-diameter wafers by minimizing backside chipping and wafer damage during die separation (dicing).



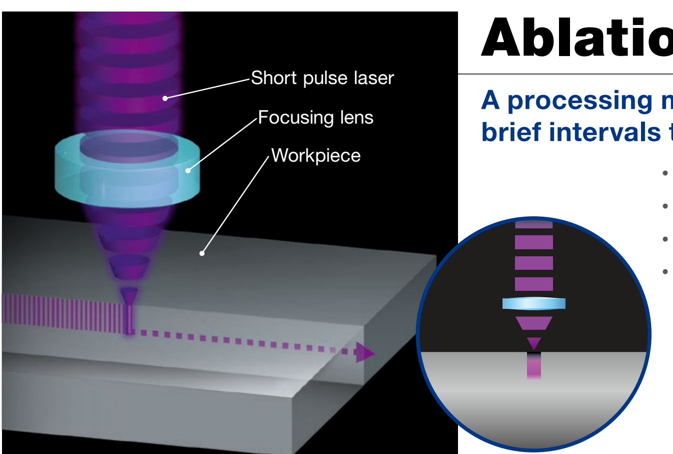




# Laser Saw

## Ablation Process

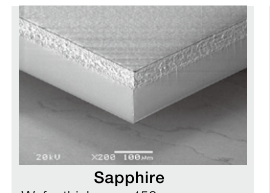



**A processing method utilizing high-intensity laser irradiation in brief intervals to perform cutting.**

- Little to no heat damage to the workpiece.
- Non-contact processing with low impact and load.
- Ideal for hard workpieces that are very difficult to process.
- Able to reduce streets down to 10 μm in width. (depends on workpiece conditions)

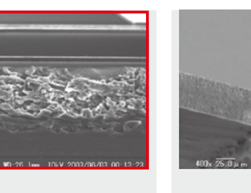
### Ablation process example

**Scribing**



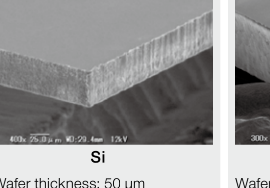
Sapphire
Wafer thickness: 150 μm

**Grooving**

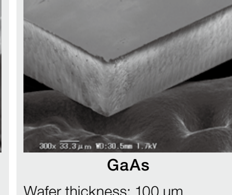


Low-k
Wafer thickness: 200 μm
Feed speed: 600 mm/s π cut

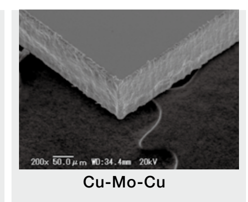
**Full cut**



Si
Wafer thickness: 50 μm
Feed speed: 500 mm/s 3 passes



GaAs
Wafer thickness: 100 μm
Feed speed: 140 mm/s 1 pass



Cu-Mo-Cu
Wafer thickness: 120 μm

### DFL7161

High product quality and high throughput grooving

### DFL7160

Supports DAF cutting after DBG

| | | | DFL7161 | DFL7160 |
|---|---|---|---|---|
| Max workpiece size | | mm | ø300 | ø300 |
| Processing method | | | Fully automatic | Fully automatic |
| X-axis | Max feed speed | mm | 1.0 - 1,000 | 0.1 - 600 |
| Y-axis | Positioning accuracy | mm | Within 0.003 / 310 | Within 0.003 / 310 |
| Utilities | Dimensions (W×D×H) | mm | 1,560 × 1,550 × 1,800 | 1,200 × 1,550 × 1,800 |
| | Weight | kg | Approx. 2,300 | Approx. 1,750 |

### HogoMax

**HogoMax**

Water soluble protective film to prevent debris adhesion to the wafer surface during ablation

Applying HogoMax to the device surface reduces thermal adhesion of debris from laser ablation to increase reliability and yield.

Without HogoMax With HogoMax

## Stealth Dicing

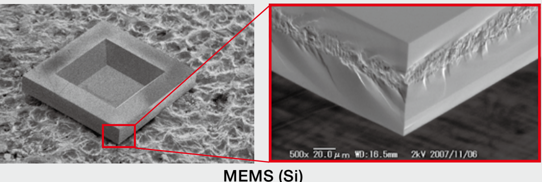
**A processing method that focuses a laser within the workpiece to form a modified layer. Die separation is achieved with a tape expander.**

- Controls cutting waste because only a subsurface layer is processed. This is suitable for workpieces that are vulnerable to contamination.
- A dry process that does not require cleaning, suitable for applications (such as MEMS) that are vulnerable to mechanical load.
- Extremely narrow kerf widths allow significant reductions in street width.

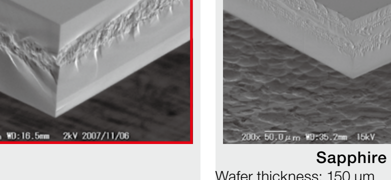
DISCO's stealth dicing laser saws incorporate an SD engine, which has a modularized laser and dedicated optical system. The SD engine has been developed for DISCO by Hamamatsu Photonics K.K..

STEALTH DICING and SDE are registered trademarks of Hamamatsu Photonics K. K.

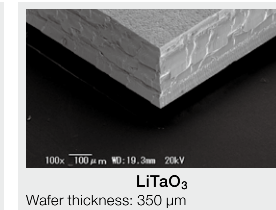
### Stealth dicing process example



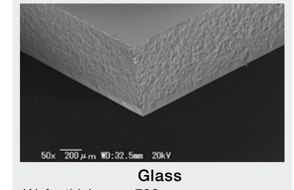
MEMS (Si)
Wafer thickness: 100 μm



Sapphire
Wafer thickness: 150 μm



$LiTaO_3$
Wafer thickness: 350 μm



Glass
Wafer thickness: 700 μm

### DFL7341

Realizes high productivity for sapphire and MEMS processing

### DFL7362

High-speed, high-quality processing of ultra-thin Si
Supports a variety of processes

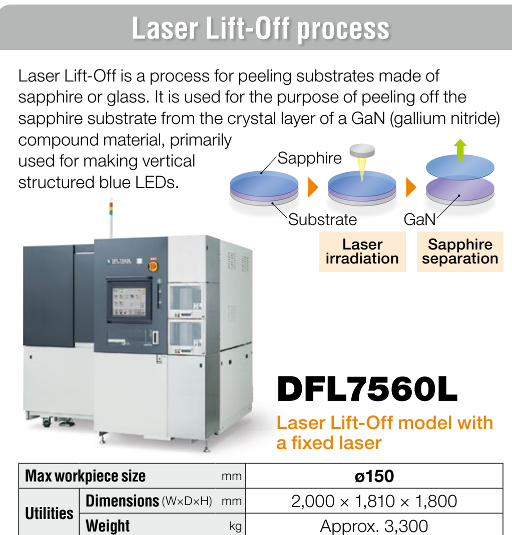
### DFL7360FH

Dedicated tape frame transfer model

| | | | DFL7341 | DFL7362 | DFL7360FH |
|---|---|---|---|---|---|
| Max workpiece size | | mm | ø200 | ø300 | ø300 |
| Processing method | | | Fully automatic | Fully automatic | Fully automatic |
| X-axis | Max feed speed | mm | 1.0 - 1,000 | 0.1 - 2,000 | 1.0 - 1,000 |
| Y-axis | Positioning accuracy | mm | Within 0.003 / 210 | Within 0.003 / 310 | Within 0.003 / 310 |
| Utilities | Dimensions (W×D×H) | mm | 950 × 1,732 × 1,800 | 1,600 × 2,755 × 1,800 | 1,100 × 2,100 × 1,990 |
| | Weight | kg | Approx. 1,800 | Approx. 2,850 | Approx. 2,090 |

### Laser Lift-Off process

Laser Lift-Off is a process for peeling substrates made of sapphire or glass. It is used for the purpose of peeling off the sapphire substrate from the crystal layer of a GaN (gallium nitride) compound material, primarily used for making vertical structured blue LEDs.




### DFL7560L

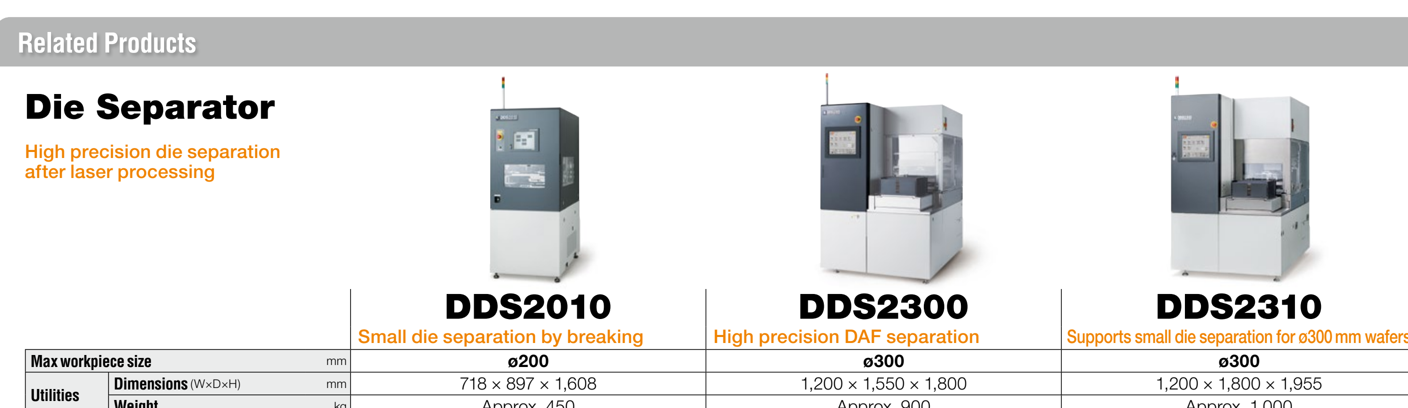
Laser Lift-Off model with a fixed laser

| | | | DFL7560L |
|---|---|---|---|
| Max workpiece size | | mm | ø150 |
| Utilities | Dimensions (W×D×H) | mm | 2,000 × 1,810 × 1,800 |
| | Weight | kg | Approx. 3,300 |

### Related Products

## Die Separator

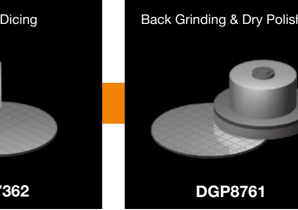
High precision die separation after laser processing

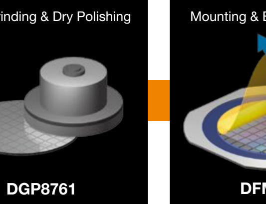


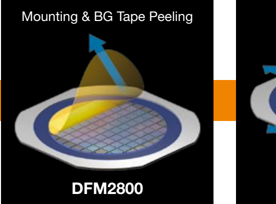
| | | | DDS2010 | DDS2300 | DDS2310 |
|---|---|---|---|---|---|
| | | | Small die separation by breaking | High precision DAF separation | Supports small die separation for ø300 mm wafers |
| Max workpiece size | | mm | ø200 | ø300 | ø300 |
| Utilities | Dimensions (W×D×H) | mm | 718 × 897 × 1,608 | 1,200 × 1,550 × 1,800 | 1,200 × 1,800 × 1,955 |
| | Weight | kg | Approx. 450 | Approx. 900 | Approx. 1,000 |

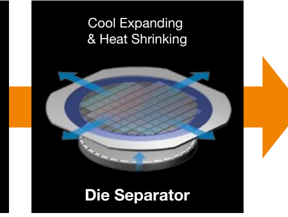
### SDBG

Stealth Dicing Before Grinding



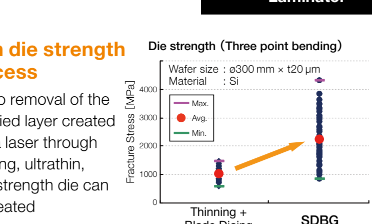



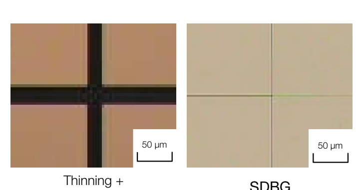

**High die strength process**

Due to removal of the modified layer created with a laser through grinding, ultrathin, high-strength die can be created




**Increase in die yield per wafer**

Stealth dicing does not require space on the wafer to be allocated for cutting as the kerf width is almost 0.
As a result, street width can be greatly reduced and the number of die obtainable per wafer can be increased.

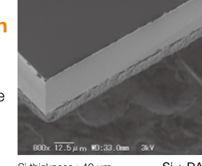



Thinning + Blade dicing

SDBG

**High quality DAF separation**

High grade DAF separation in combination with the Die Separator



Si thickness : 40 μm
DAF thickness : 10 μm
Si + DAF

Kiru Kezuru Migaku

# Grinder, Polisher, and Surface Planer

## Grinder

High precision ultrathin backgrinding

## Grinder / Polisher

Wafer backgrinding and polishing

## Polisher

Equipment for polishing wafer backsides

**DAG810** — A compact and versatile automatic single spindle grinder

**DFG8340** — Supports small-volume grinding with high precision

**DFG8540 / DFG8560** — Standard dual-spindle grinder

**DFG8830** — Quad-spindle grinder designed to process hard materials such as sapphire and SiC

**DFG8640** — High-precision dual-axis equipment which supports hard and brittle materials including $LiTaO_3$ and SiC

**DGP8761** — Integrated backgrinding and stress relief for both enhanced productivity and ultrathin processing

The DFP8761HC supports high cleaning processes for applications such as TSV.

**DFP8141** — CMP polisher specialized for processing hard and brittle materials such as sapphire and SiC

**DFP8140** — Realizes chemical-free dry polish stress relief

| | | | DAG810 | DFG8340 | DFG8540 | DFG8560 | DFG8830 | DFG8640 | DGP8761 | DFP8141 | DFP8140 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Max workpiece size | | mm | ø200 | ø200 | ø200 | ø300 | ø150 | ø200 | ø300 | ø200 | ø200 |
| Spindle | Number of axes | | 1 | 1 | 2 | 2 | 4 | 2 | 3 | 1 | 1 |
| | Output | kW | 4.2 | 4.2 | 4.2 | 4.8 | 6.3 | 6 | 6.3 | 7.5 | 4.8 |
| | Revolution speed | min-1 | 1,000 - 7,000 | 1,000 - 7,000 | 1,000 - 7,000 | 1,000 - 4,000 | 1,000 - 4,000 | 1,000 - 7,000 | 1,000 - 4,000 (Z1, Z2), 1,000 - 3,000 (Z3) | 500 - 2,000 | 1,000 - 4,000 |
| Number of chuck tables | | | 1 | 2 | 3 | 3 | 5 | 3 | 4 | 2 | 1 |
| Utilities | Dimensions (W×D×H) | mm | 600 × 1,700 × 1,780 | 800 × 2,450 × 1,800 | 1,200 × 2,670 × 1,800 | 1,400 × 3,322 × 1,800 | 1,400 × 2,500 × 2,000 | 1,000 × 2,800 × 1,800 | 1,690 × 3,315 × 1,800 | 900 × 2,584 × 2,000 | 1,200 × 2,670 × 1,800 |
| | Weight | kg | Approx. 1,300 | Approx. 2,500 | Approx. 3,100 | Approx. 4,000 | Approx. 6,000 | Approx. 3,500 | Approx. 6,700 | Approx. 3,100 | Approx. 1,900 |

## Surface Planer

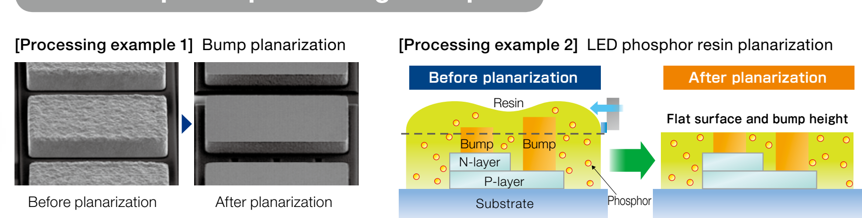
Ultrahigh-precision planarization of ductile materials using a diamond bit

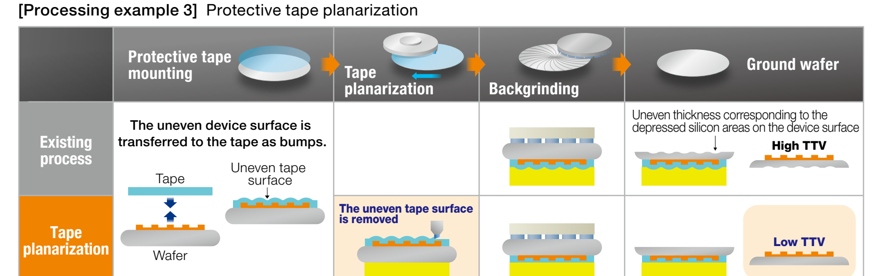
**DAS8920 / DAS8930** — Compact automatic models ideal for small lot production and R&D

**DFS8910** — Fully-automatic model for ø200 mm wafers

**DFS8960** — Fully-automatic dual spindle model for ø300 mm wafers

| | | | DAS8920 | DAS8930 | DFS8910 | DFS8960 |
|---|---|---|---|---|---|---|
| Max workpiece size | | mm | ø200 | ø300 | ø200 | ø300 |
| Spindle | Number of axes | | 1 | 1 | 1 | 2 |
| | Revolution speed | min-1 | 100 - 5,000 | 100 - 5,000 | 100 - 5,000 | 100 - 5,000 |
| Number of chuck tables | | | 1 | 1 | 1 | 2 |
| Utilities | Dimensions (W×D×H) | mm | 500 × 1,235 × 1,800 | 730 × 1,570 × 1,800 | 1,200 × 2,670 × 1,800 | 1,400 × 3,312 × 1,870 |
| | Weight | kg | Approx. 800 | Approx. 1,600 | Approx. 2,400 | Approx. 5,000 |



| | | | DFM2800 |
|---|---|---|---|
| Max workpiece size | | mm | ø300 |
| Utilities | Dimensions (W×D×H) | mm | 2,150 × 2,643 × 1,800 |
| | Weight | kg | Approx. 3,100 |

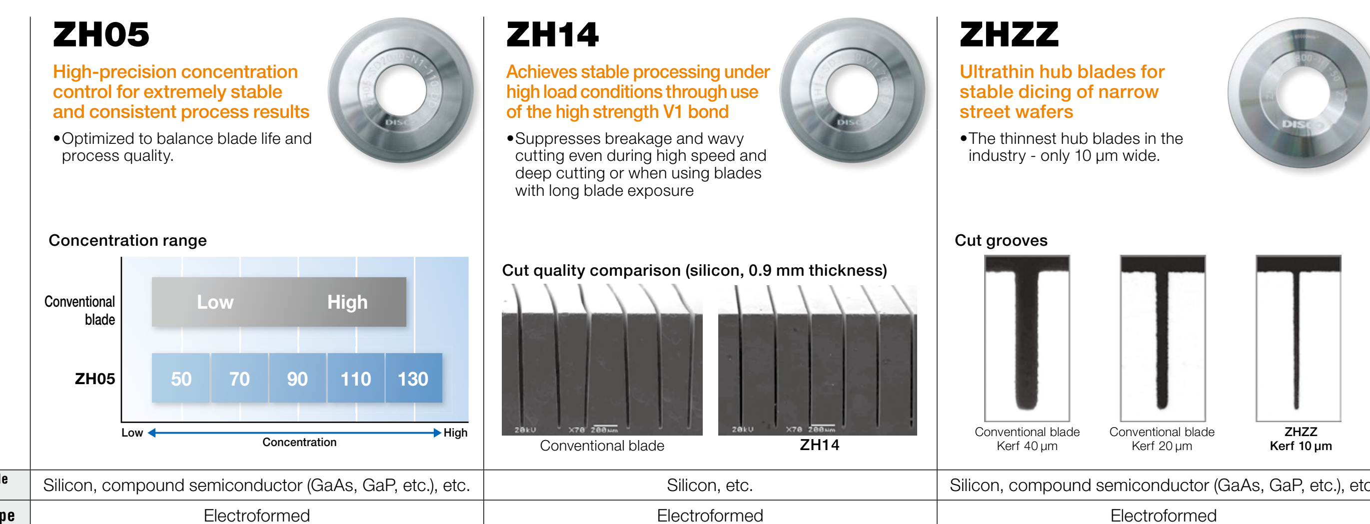
Kezuru Migaku

Kiru Kezuru Migaku

# Dicing Blade

## Hub Blade

**The combination of an ultra-thin diamond blade and an aluminum hub provides enhanced operational efficiency and stable cutting results**



### ZH05

High-precision concentration control for extremely stable and consistent process results

- Optimized to balance blade life and process quality.

Concentration range



### ZH14

Achieves stable processing under high load conditions through use of the high strength V1 bond

- Suppresses breakage and wavy cutting even during high speed and deep cutting or when using blades with long blade exposure

Cut quality comparison (silicon, 0.9 mm thickness)



### ZHZZ

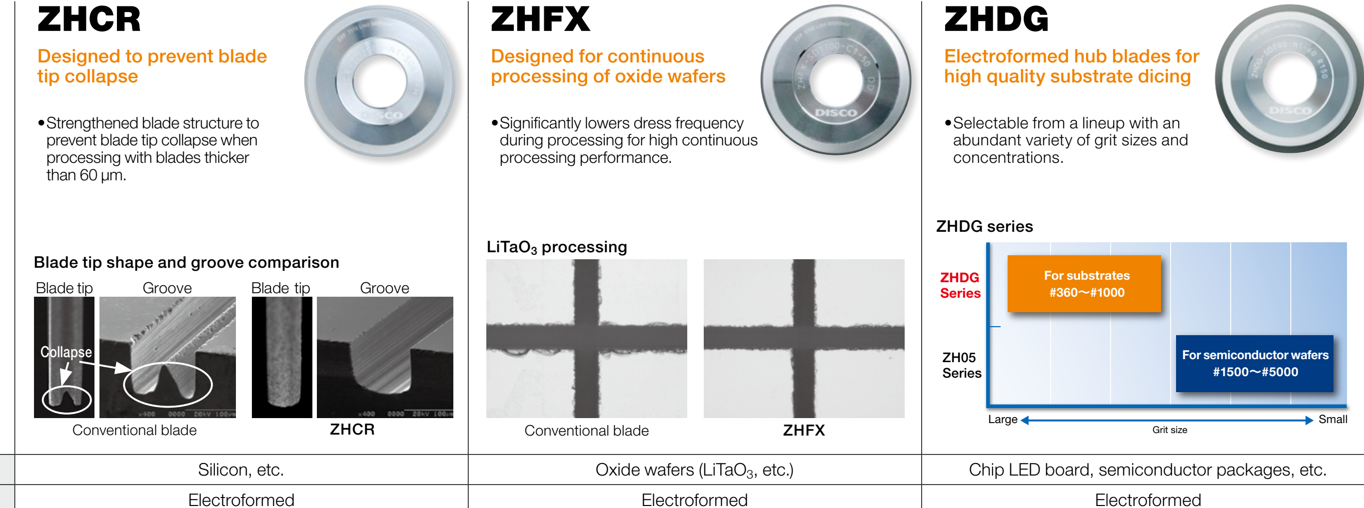
Ultrathin hub blades for stable dicing of narrow street wafers

- The thinnest hub blades in the industry - only 10 µm wide.

Cut grooves



| | ZH05 | ZH14 | ZHZZ |
|---|---|---|---|
| Applicable material | Silicon, compound semiconductor (GaAs, GaP, etc.), etc. | Silicon, etc. | Silicon, compound semiconductor (GaAs, GaP, etc.), etc. |
| Bond type | Electroformed | Electroformed | Electroformed |



### ZHCR

Designed to prevent blade tip collapse

- Strengthened blade structure to prevent blade tip collapse when processing with blades thicker than 60 µm.

Blade tip shape and groove comparison



### ZHFX

Designed for continuous processing of oxide wafers

- Significantly lowers dress frequency during processing for high continuous processing performance.

$LiTaO_3$ processing



### ZHDG

Electroformed hub blades for high quality substrate dicing

- Selectable from a lineup with an abundant variety of grit sizes and concentrations.

ZHDG series



| | ZHCR | ZHFX | ZHDG |
|---|---|---|---|
| Applicable material | Silicon, etc. | Oxide wafers ($LiTaO_3$, etc.) | Chip LED board, semiconductor packages, etc. |
| Bond type | Electroformed | Electroformed | Electroformed |

### Related Products

## Color Case, Case Holder for Hub/Hubless Blade

**Color Case**

Cases for hub and hublessblades which prevent blade mounting errors. Using color cases, the possibility of blade mounting errors can be reduced when different types of blades are used for each equipment and spindle.

Color Case for Hub Blade

Color Case for Hubless Blade

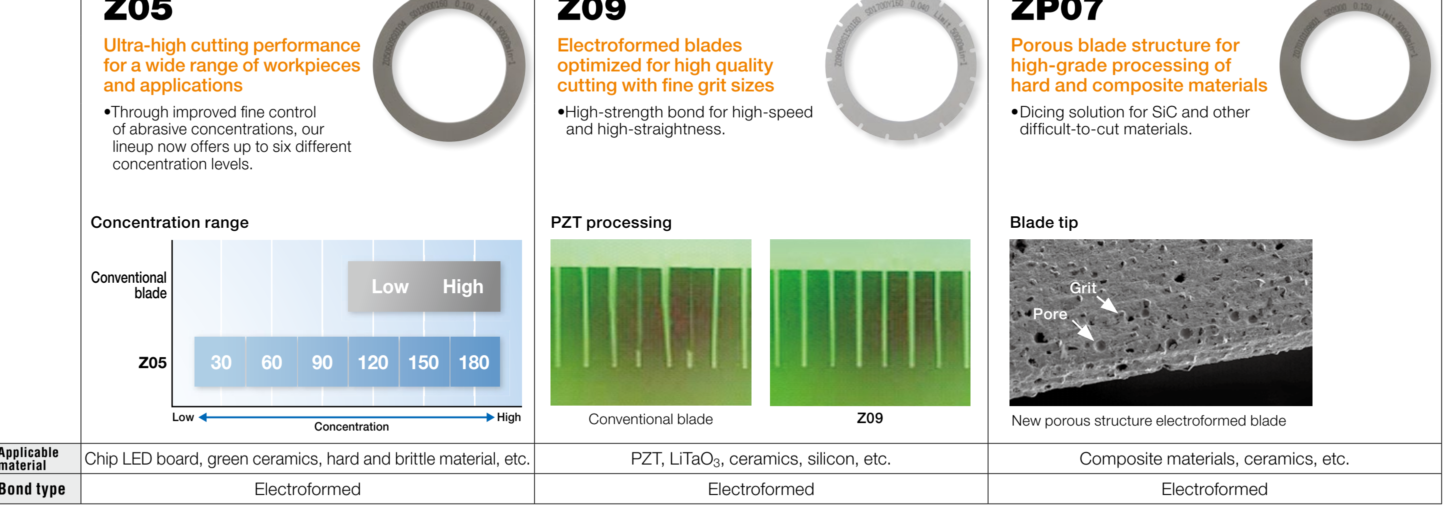
**Case Holder**

Case holders can be attached to the equipment to hold the cases for the blades being used. Using the same color holders and cases improves blade type recognition. These can be used for both hub and hublessblades.

Case Holder

## Hubless Blade

**Bond type, blade thickness, grit size and outer diameter can be selected to meet processing requirements for a variety of workpieces such as silicon, glass or ceramics.**



### Z05

Ultra-high cutting performance for a wide range of workpieces and applications

- Through improved fine control of abrasive concentrations, our lineup now offers up to six different concentration levels.

Concentration range



### Z09

Electroformed blades optimized for high quality cutting with fine grit sizes

- High-strength bond for high-speed and high-straightness.

PZT processing



### ZP07

Porous blade structure for high-grade processing of hard and composite materials

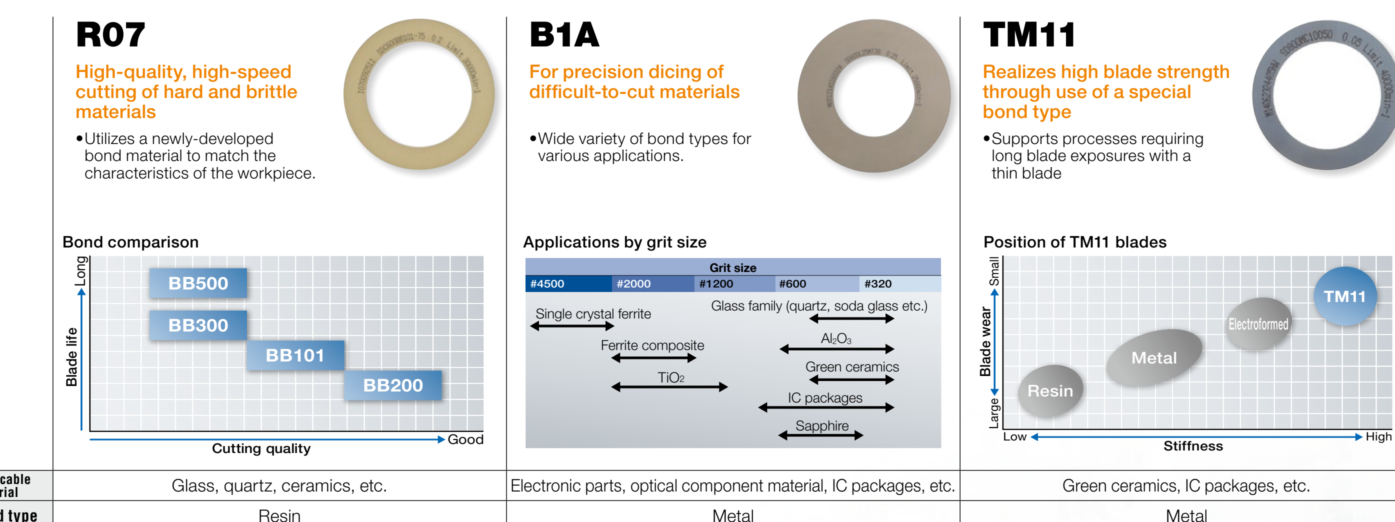
- Dicing solution for SiC and other difficult-to-cut materials.

Blade tip



New porous structure electroformed blade

| | Z05 | Z09 | ZP07 |
|---|---|---|---|
| Applicable material | Chip LED board, green ceramics, hard and brittle material, etc. | PZT, $LiTaO_3$, ceramics, silicon, etc. | Composite materials, ceramics, etc. |
| Bond type | Electroformed | Electroformed | Electroformed |



### R07

High-quality, high-speed cutting of hard and brittle materials

- Utilizes a newly-developed bond material to match the characteristics of the workpiece.

Bond comparison



### B1A

For precision dicing of difficult-to-cut materials

- Wide variety of bond types for various applications.

Applications by grit size



### TM11

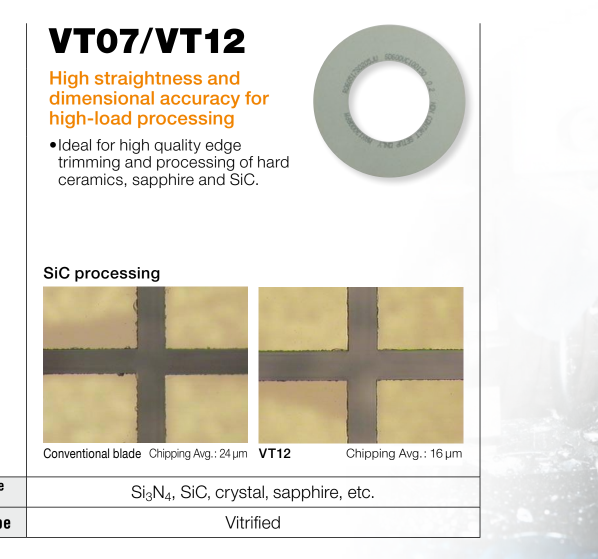
Realizes high blade strength through use of a special bond type

- Supports processes requiring long blade exposures with a thin blade

Position of TM11 blades



| | R07 | B1A | TM11 |
|---|---|---|---|
| Applicable material | Glass, quartz, ceramics, etc. | Electronic parts, optical component material, IC packages, etc. | Green ceramics, IC packages, etc. |
| Bond type | Resin | Metal | Metal |



### VT07/VT12

High straightness and dimensional accuracy for high-load processing

- Ideal for high quality edge trimming and processing of hard ceramics, sapphire and SiC.

SiC processing



| | VT07/VT12 |
|---|---|
| Applicable material | $Si_3N_4$, SiC, crystal, sapphire, etc. |
| Bond type | Vitrified |

Kiru

Kiru Kezuru Migaku

# Grinding Wheel

## GF13

**Improved productivity and grinding quality**
**Grinding wheel for semiconductor wafers**

- Supports SDBG processing

Product lineup

| Applications | | Bond | Grit size |
|---|---|---|---|
| Silicon | Rough grinding | Resin | SDC340, SD340 |
| | | Vitrified (SDBG processing) | SD400, SD600 |
| | Fine grinding | Resin | SD2000 |
| | | Vitrified | SD4800, SD6000, 45D |

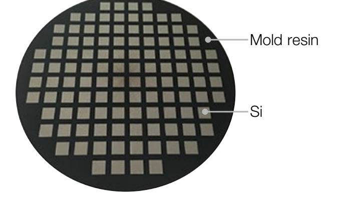
**Applicable material:** Silicon, SiC, $LiTaO_3$, GaAs

## GFCP

**Simultaneous grinding of different materials**
**Wheel for package grinding**

- Supports package grinding with various specifications using customizable vitrified bonds.

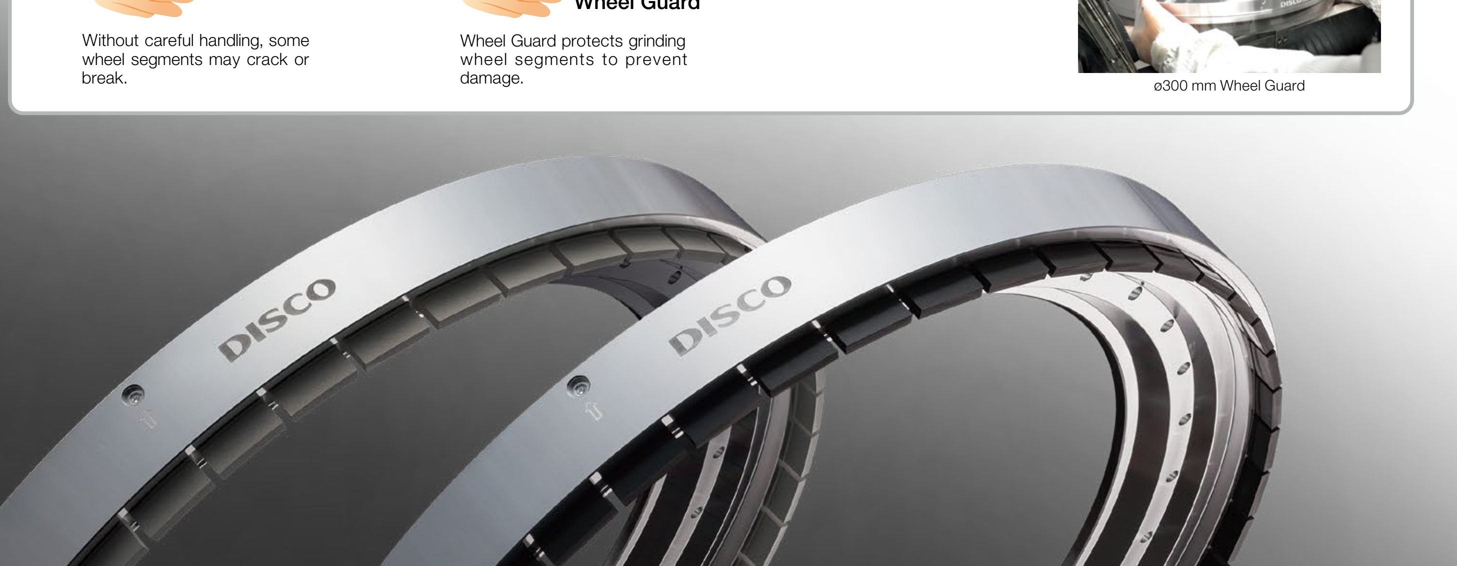
Example of Si + mold resin grinding




Example of Cu + mold resin grinding

*Magnified image

**Applicable material:** Semiconductor packages, etc. (composite materials, such as silicon, resin, metal)

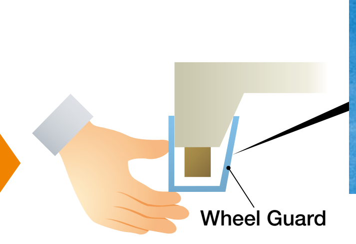


## Related Products

### Wheel Guard

Protects wheel segments for streamlined wheel replacement and easier handling.

Without careful handling, some wheel segments may crack or break.




Wheel Guard protects grinding wheel segments to prevent damage.

ø200 mm Wheel Guard

ø300 mm Wheel Guard

Kiru Kezuru Migaku

# Dry Polishing Wheel

## DP08

**For chemical-free stress relief**

- Support for the Dicing Before Grinding process (DBG) as well as normal wafer polishing.

TEM damage comparison

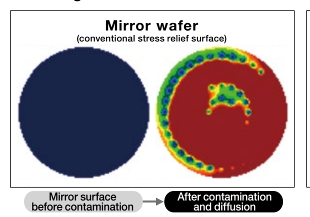
Ground using a #2000 wheel | DP08

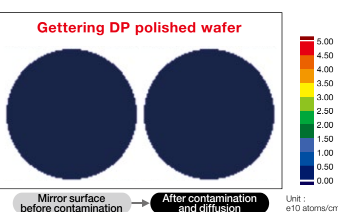
**Applicable material:** Silicon

## Gettering DP

**High die strength equal to normal processing while maintaining gettering performance**

Gettering effect



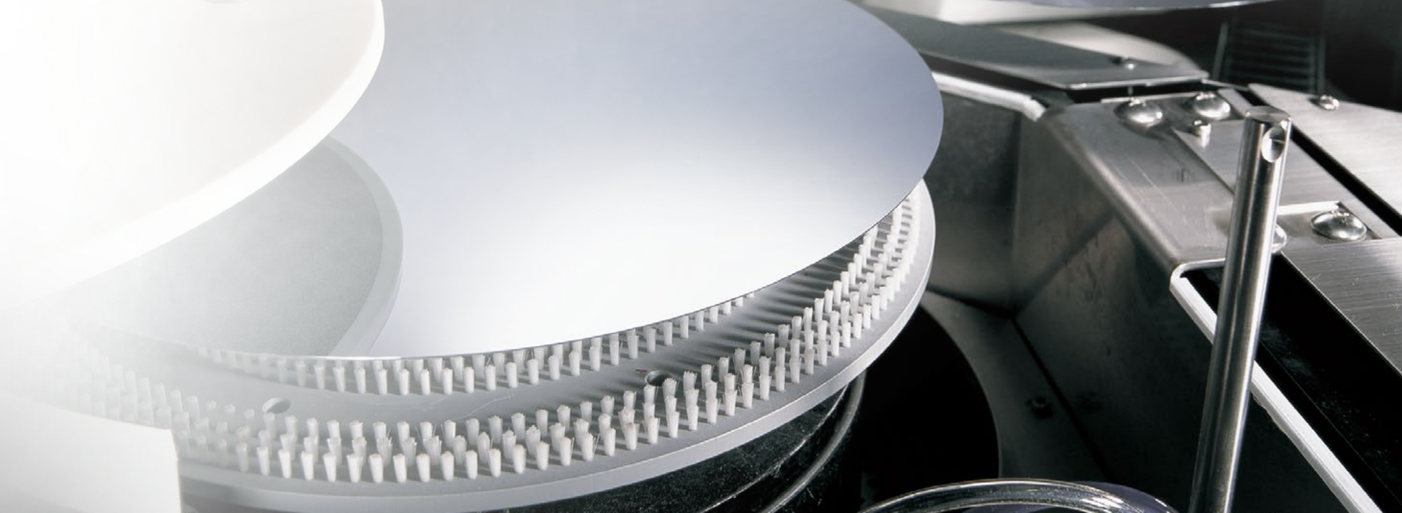

**Applicable material:** Silicon

## Processing examples of various materials (Surface roughness data)

*Data measured using AFM

Proven track record of grinding and polishing various materials in addition to silicon

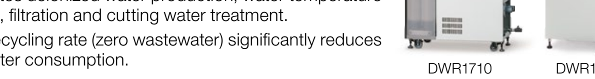
| Sapphire grinding | Sapphire polishing | $LiTaO_3$ grinding | SiC polishing |
|---|---|---|---|
| Ra: 10 nm, Ry: 72 nm | Ra: 1 nm, Ry: 5 nm | Ra: 18 nm, Ry: 106 nm | Ra: 1 nm, Ry: 6 nm |



Migaku

## Deionized Water Recycling Unit

# DWR1710
# DWR1722



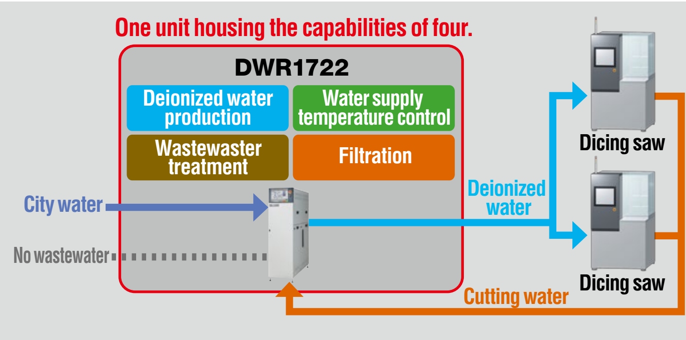
DWR1710 DWR1722

### Multi-function, super-compact deionized water recycling unit for dicing saws

- Integrates deionized water production, water temperature control, filtration and cutting water treatment.
- 99% recycling rate (zero wastewater) significantly reduces city water consumption.

| | | | DWR1710 | DWR1722 |
|---|---|---|---|---|
| Cutting water | Specific resistance value after treatment | MΩ·cm | 12 or higher | |
| | Pumping capacity | L/min | 10 | 25 |
| Spindle coolant water system | Pumping capacity | L/min | N/A | 10 |
| Temperature setting range | | °C | 20 - 25* | 20 - 25 |
| Temperature fluctuation range | | °C | Within 1* | Within 1 |
| Utilities | Dimensions (W×D×H) | mm | 780 x 400 x 1,450 | 450 x 1,600 x 1,656 |
| | Dry weight | kg | Approx. 200 | Approx. 460 |

*When the prepared cooling water temperature is -2 °C lower than the set temperature.




## Automatic cleaning system

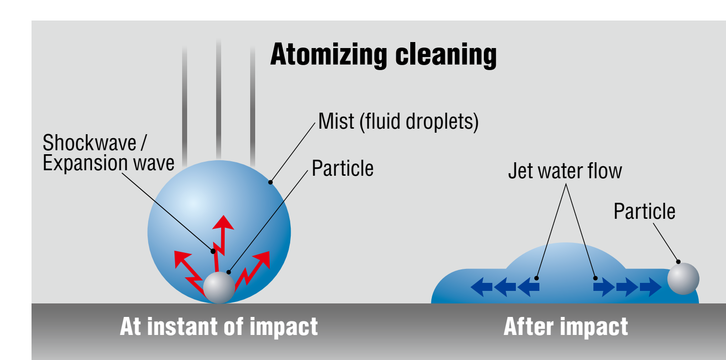
# DCS1441
# DCS1460

DCS1441

### Performs spin cleaning and drying of workpieces processed with a automatic dicing saw

- The highly effective atomizing cleaning nozzle can be installed as an option.
- The cleaning sequence can be fully optimized for any workpiece.

| | | | DCS1441 | DCS1460 |
|---|---|---|---|---|
| Max workpiece size | | mm | ø200 | ø300 |
| Utilities | Dimensions (W×D×H) | mm | 400 x 600 x 1,380 | 500 x 650 x 1,220 |
| | Dry weight | kg | Approx. 120 | Approx. 144 |




## Water Temperature Control Unit

# DTU152/DTU162
# DTU1540/DTU1550

DTU1550

### Optimizes the temperature and pressure of both cutting and cooling water

- Complete water temperature regulation to enhance processing accuracy.
- Significantly reduced water consumption by recirculating cutting water via a particle filtration system. (DTU162)

| | | | DTU152 | DTU162 |
|---|---|---|---|---|
| Cutting water system | Cooling and heating capacity | kW | 6.3, 12.5 | 0.6, 2 |
| | Pumping capacity | L/min | 25 | 10 |
| Spindle coolant system | Cooling and heating capacity | kW | 1.16, 2.5 | 0.6, 0.6 |
| | Cooling capacity | L/min | 6 | 6 |
| Temperature setting range (Cutting water / Spindle coolant water) | | °C | 15 - 30 | 15 - 30 |
| Temperature fluctuation range | | °C | Within 1 | Within 1 |
| Utilities | Dimensions (W×D×H) | mm | 450 x 1,296 x 1,235 | 430 x 900 x 1,500 |
| | Dry weight | kg | Approx. 310 | Approx. 240 |

| | | | DTU1540 | DTU1550 |
|---|---|---|---|---|
| Cutting water system | Cooling and heating capacity | kW | 9.4, 10 | 6.2, 12.5 |
| | Pumping capacity | L/min | 45 | 30 |
| Spindle coolant system | Cooling capacity | kW | Shared with cutting water | 3.0 |
| | Cooling capacity | L/min | | 18 |
| Temperature setting range (Cutting water / Spindle coolant water) | | °C | 15 - 30 | 15 - 30 |
| Temperature fluctuation range | | °C | Within 1 | Within 1 |
| Utilities | Dimensions (W×D×H) | mm | 500 x 780 x 1,650 | 450 x 1,090 x 1,680 |
| | Dry weight | kg | Approx. 270 | Approx. 310 |

## Cutting Water Filtration Unit for Dicing Saws

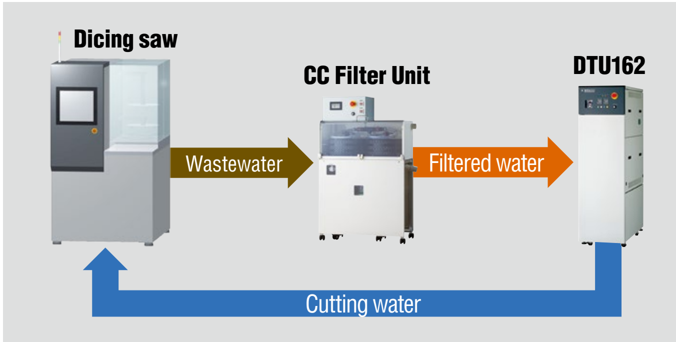
# CC Filter Unit

Dual CC Filter type

### The high-capacity, highly functional CC Filter Unit reduces filtration running costs

- Primary filtration unit to reduce load for cutting water recycling or wastewater treatment.
- Can be combined with the DTU162 to reduce maintenance requirements for cutting water recycling.

| | | | Single | Dual |
|---|---|---|---|---|
| Water flow rate | | L/min | 10 | 20 |
| Utilities | Dimensions (W×D×H) | mm | 400 x 400 x 1,260 | 760 x 374 x 1,260 |
| | Dry weight | kg | Approx. 61 | Approx. 75 |




## Cutting Water Additives for Dicing

# StayClean-A
# StayClean-F
# StayClean-R

### Cutting water additives which prevent issues when dicing

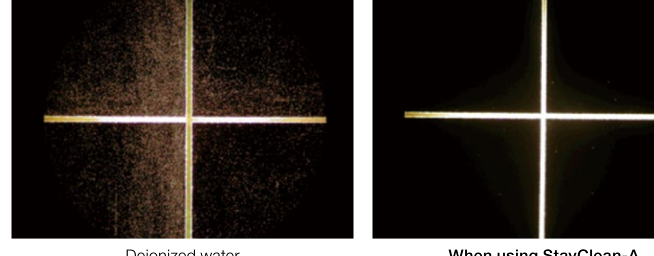
**StayClean-A**
- Prevents particle adhesion

**StayClean-F**
- Prevents the bonding pads from corroding
- Prevents particles from adhering to the pad section

**StayClean-R**
- Prevents the bonding pads from corroding
- Prevents particles from adhering to the pad section
- Can be used in combination with a DI water recycling unit (DWR series)

| | | StayClean-A | StayClean-F | StayClean-R |
|---|---|---|---|---|
| Recommended dilution | times | 1,000 - 2,000 (0.1 - 0.05%) | 1,000 - 10,000 (0.1 - 0.01%) | 1,000 - 10,000 (0.1 - 0.01%) |
| Volume | L | Approx. 10 | Approx. 10 | Approx. 10 |

Reduced particle adhesion



Deionized water | When using StayClean-A

White areas: Adhered particles

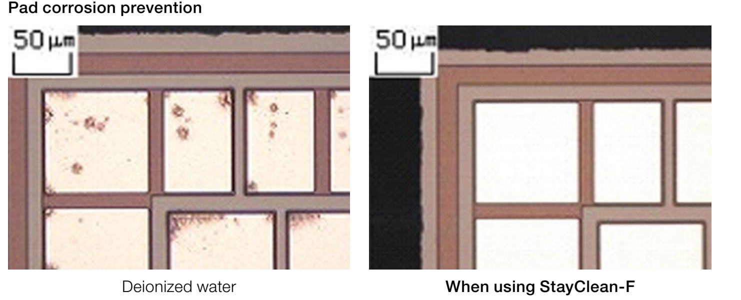
# StayClean Injector

### Dedicated unit for injecting StayClean into cutting water

- Highly accurate dilution control to ratios as low as 1:10,000.
- Automatic bottle replacement enables continuous operation.

| | | | StayClean Injector | Bottle Stocker |
|---|---|---|---|---|
| Flow rate range | | L/min | 2 - 20 | - |
| Cutting water temperature | | °C | 20 - 25 | - |
| Controllable concentration | | % | 0.01 - 0.1 | - |
| Utilities | Dimensions (W×D×H) | mm | 200 x 300 x 500 | 357 x 392 x 440 |
| | Dry weight | kg | Approx. 25 | Approx. 10 |

Pad corrosion prevention




Deionized water | When using StayClean-F

When using StayClean-A or F

StayClean Injector
Deionized water pipe
Cutting Water
Wastewater
Dicing saw

When using StayClean-R

StayClean Injector
Dicing saw
Cutting Water
Deionized water pipe
Wastewater
Deionized Water Recycling Unit DWR1710/DWR1722

## Resistivity Management Unit for Dicing Saws

# $CO_2$ Injector

### Reduces particle adhesion due to charging caused by dicing and device damage caused by static electricity

- Direct control from the dicing saw enables easy operation.
- Applies a multi-stage mixing method to closely track changes in resistivity caused by changes in flow rate.

| | | | Standard specification | Low-resistivity specification |
|---|---|---|---|---|
| Water flow rate | | L/min | 3 - 15 | |
| Resistivity settings range | | MΩ·cm | 0.5 - 1.0 | 0.2 - 0.6 |
| Resistivity fluctuation range * | | | Setting ±10% | Setting ±0.06 MΩ · cm |
| Utilities | Dimensions (W×D×H) | | 328 x 178 x 365 | |
| | Dry weight | | Approx. 13 | |

* The flow rate is constant within the range from 3 to 15 L/min at the supply water temperature from 20 to 25°C