MAHOH DICING MACHINE

ML200PLUS

High performance laser dicing machine for 200mm wafers with SDE.

TOKYO SEIMITSU
The **MAOH DICING Principle**

We have developed a dicing machine equipped with stealth dicing technology (developed by Hamamatsu Photonics) as a stealth dicing engine, exhibiting excellent performance.

The ML200PLUS uses multiphoton absorption—the optical damage phenomenon that occurs when the strength of laser light is radically increased—by laser light focused on the inner part of the material to be processed. By doing this an internal modification layer is formed, and this is used as the basic mechanism for separating chips. Put another way, wafers adhering to the dicing tape are irradiated by a laser, and through expansion of the dicing tape, wafer separation is conducted.

"Stealth Dicing" technology is new laser dicing technology developed by Hamamatsu Photonics.
High Quality Prosessing

- **Dicing of thin wafers (30μm) made possible**
The ML200PLUS makes high speed dicing (300mm/s) of thin wafers possible.

- **Minimal Chipping**
  Chipping has been radically minimized.

- **Completely Dry Process**
  As a completely dry process is used, this processing technology is perfectly suited to devices averse to moisture, such as optical devices.

High Throughput

- **Dices 4 Times Faster than Blade Dicing**
The ML200PLUS is able to dice thin wafers of thickness 100μm or thinner at a speed of 300 mm/s, contributing significantly to improved throughput.

Large Increases in Chip Yield

The kerf loss necessary for blade dicing has been reduced to 0 μm with ML200PLUS, and dramatic reduction in dicing street width has been made possible. This technology pushes chip yield per wafer to the maximum limit.

- **Comparison of Chip Surfaces**

![Comparison of Chip Surfaces](image)

Improved Yield

- **Improvements Made in Flexural Strength**
  As wafers are cut internally, avoiding any damage to the wafer surface, chipping on the bottom surface of the wafer is minimized, flexural strength is improved, and breaking strength when wafers are picked during the packaging process is improved, improving tact in the die bonder process as well as contributing to better yield.

![Evaluating die strength with 3-Point Testing](image)

- **Dices 4 Times Faster than Blade Dicing**
The ML200PLUS is able to dice thin wafers of thickness 100 μm or thinner at a speed of 300 mm/s, contributing significantly to improved throughput.

- **High Reliability**
  Equipped with Wafer Support Handling
  When irradiating the reverse side with a laser, the wafer can be conveyed by support handling.

- **Safety Slide Cover**
  During laser irradiation, work can be performed safely by opening and closing the slide cover.

- **Equipped with Inspection Stage**
  In the inspection process, which is indispensable to the dicing process, specific wafers can be taken off of the inspection stage automatically. Additionally, after inspection wafers can be returned to the stage and stored automatically in their original cassette slots.

- **Reduced Operations Costs**
  **No Waste Water Disposal Required**
  When processed, the modification layer is formed within the Si, meaning that dust is radically reduced, and resources are not spent on waste water disposal costs.

  **No Blade Replacement Required**
The ML200PLUS does not use blades, meaning that blade costs are reduced, and labor is not required for blade replacement and quality control of blade wear and tear.

  **No Dicing Water Required**
The process is completely dry, meaning that no water is used. As no contamination occurs, cleaning processes are also unnecessary.
Applicable wafer size: Circular wafer: φ8" to φ12"

Applicable flame size: 5-inch to 8-inch diameter frame

X-axis
- Stroke: 421.5mm
- Cutting feed rate: 0.1mm to 600mm/sec
- Positioning resolution: 0.002mm
- Straightness: 0.0015mm/210mm (both horizontal and vertical)

Y-axis
- Stroke: 365mm
- Driving speed: max. 80mm/s
- Positioning resolution: 0.0002mm (closed-loop control)
- Positioning accuracy: 0.002/240mm

Z-axis
- Stroke: 8.5mm
- Driving speed: max. 10mm/s
- Positioning resolution: 0.0001mm (closed-loop control)
- Positioning accuracy: 0.001mm/1mm

Power supply
- Supply voltage: Selected from 200/220/240/380/415 VAC ± 10% 3 phase, 50 to 60 Hz.
- Power consumption: 4.7kVA
- Compressed air Pressure: 0.5 to 0.7 MPa
- N2 gas Pressure: 0.5 to 0.7 MPa
- Cooling water for thermal regulator (for Laser cooling): Pressure: 0.2 to 0.5 MPa
- Dimensions: 1520mm × 1340mm × 1900mm
- Weight: 1750kg

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