



Laser Dicer

ML200

MAHOH DICING MACHINE



Received the 10 BEST Awards
(the first prize in the Assembly
Equipment category)



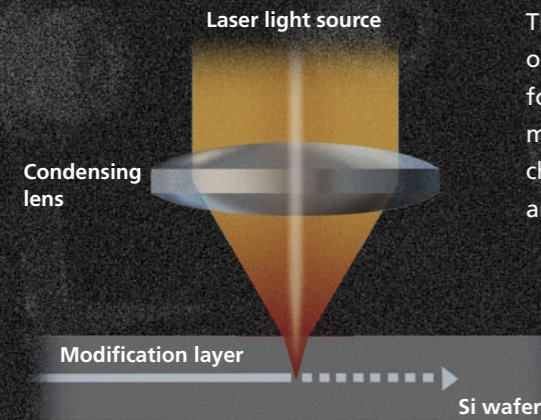
TOKYO SEIMITSU

Laser Dicing Machine

ML200 MAHOHDICING MACHINE

The MAHOHDICING Principle

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

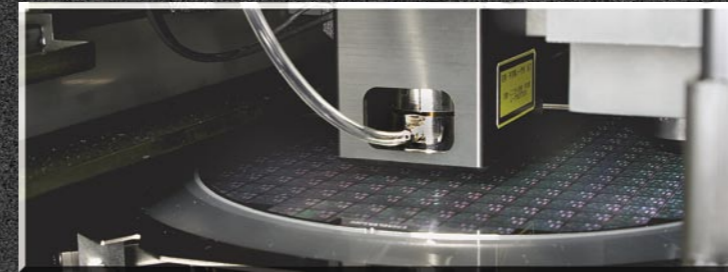


The ML200 uses multiphoton absorption – the optical damage phenomenon that occurs when the strength of laser light is radically increased – with laser light focused on the inner part of the material to be processed. By doing this an internal modification layer is formed, and this is used as the basic 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.



High Quality Processing Dicing of thin wafers (30 μm) made possible

The ML200 makes high speed dicing (300 mm/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

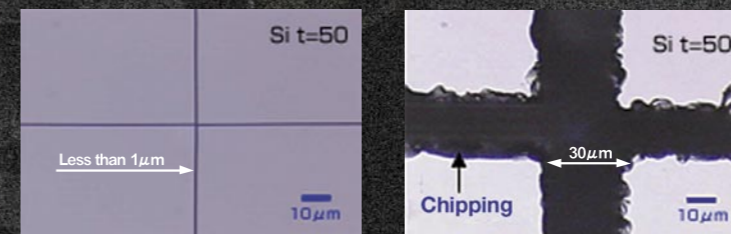
Dices 4 Times Faster than Blade Dicing

The ML200 is able to dice thin wafers of thickness 100 μm 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 ML200, 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

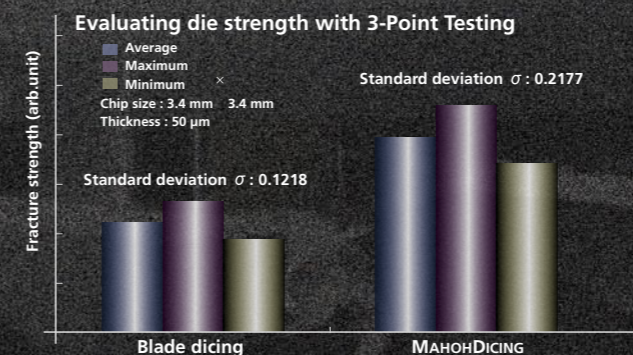


MAHOHDICING

Conventional blade dicing

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.



Dices 4 Times Faster than Blade Dicing

The ML200 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

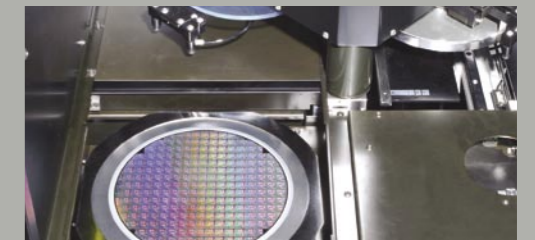
When irradiating the reverse side with a laser, the wafer can be conveyed by support handling.



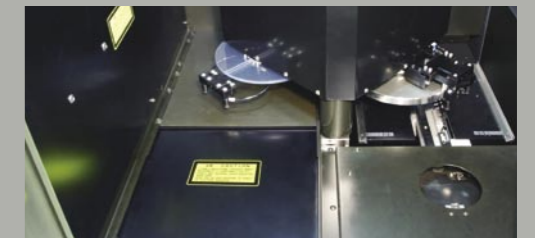
New and improved support frame handling

Safety Slide Cover

During laser irradiation, work can be performed safely by opening and closing the slide cover.



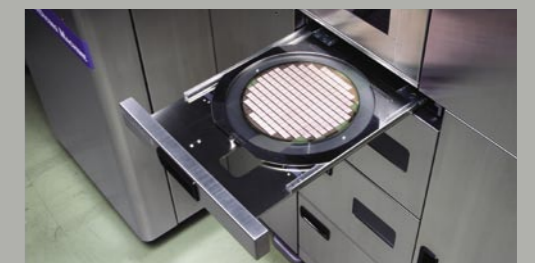
Slide cover opened



Slide cover closed

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.



Inspection stage, used for checking the results of dicing

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 ML200 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 DI water is used. As no contamination occurs, cleaning processes are also unnecessary.

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



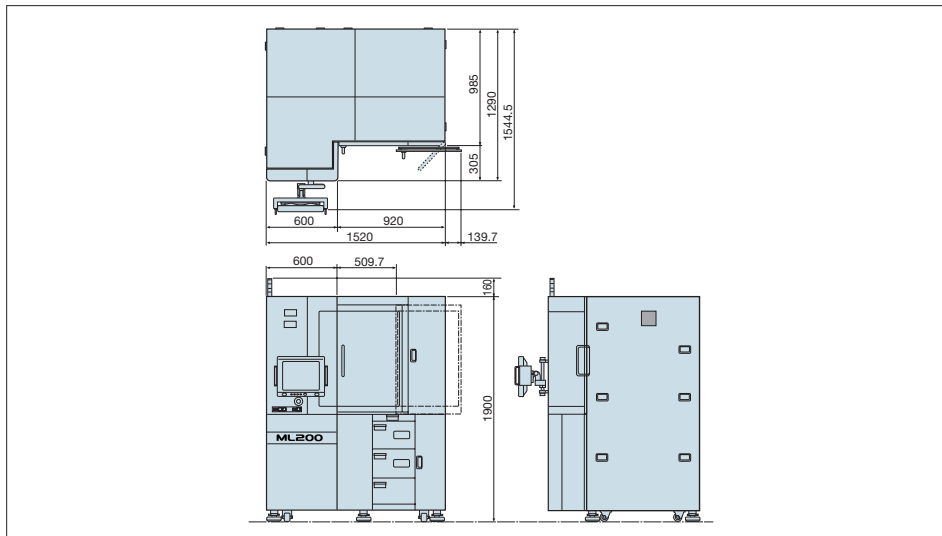
ML200 MAHOHDICING MACHINE Specifications

Applicable Wafer Size		Circular Wafer: 2 to 8 inches diameter
Applicable Frame Size		5-inch to 8-inch diameter frame
X-axis	Stroke	419 mm
	Cutting feed rate	0.1 mm to 600 mm/sec
	Positioning resolution	0.002 mm
	Straightness	0.0015 mm / 210 mm (both horizontal and vertical)
Y-axis	Stroke	320 mm
	Driving speed	100 mm/sec max
	Positioning resolution	0.0002 mm (closed-loop control)
	Positioning accuracy	0.002 mm / 250 mm
Z-axis	Stroke	9 mm
	Driving speed	20 mm/sec max
	Positioning resolution	0.0001 mm (closed-loop control)
	Positioning accuracy	0.001 mm / 1 mm

Others

Power Supply	Supply voltage: Selected from 200/220/240/380/415 V AC \pm 10% 3 phase, 50 to 60 Hz.
Power consumption	4.0 kVA max
Compressed Air	Pressure: 0.5 to 0.7 MPa
N ₂ Gas	Pressure: 0.5 to 0.7 MPa
Thermal regulator for water for Laser cooling	Pressure: 0.2 to 0.5 MPa
Dimensions	1,520 ^W × 1,290 ^D × 1,900 ^H mm
Weight	1,600 kg

ML200 MAHOHDICING MACHINE External View



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Specifications and other descriptions may be changed for product improvement without any notice.