TOKYO SEIMITSU

MAHOH DICING MACHINE

ML200PLUS

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

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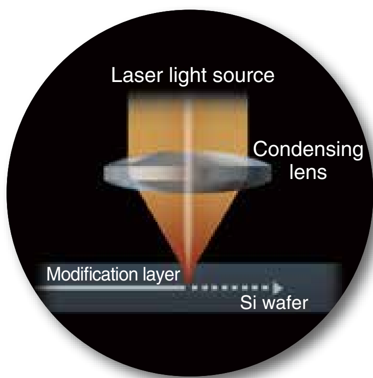
The MAHOHDICING Principle

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



The ML200PLUS 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.

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

SDE
HAMAMATSU

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 redically minimized.

■ **Completely Dry Process**

As a completely dry process is used, this prosessing technology is perfectly suited to devices averse to moisture, such as optical devices.

High Throughput

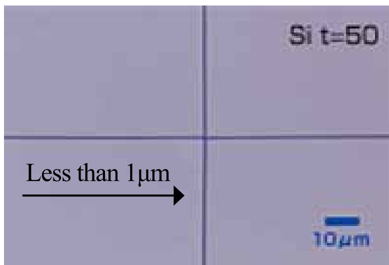
■ **Dices 4 Times Faster than Blade Dicing**

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.

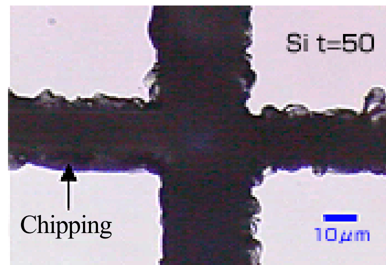
Large Increases in Chip Yield

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.

■ **Conparison of Chip Surfaces**



MahohDicing

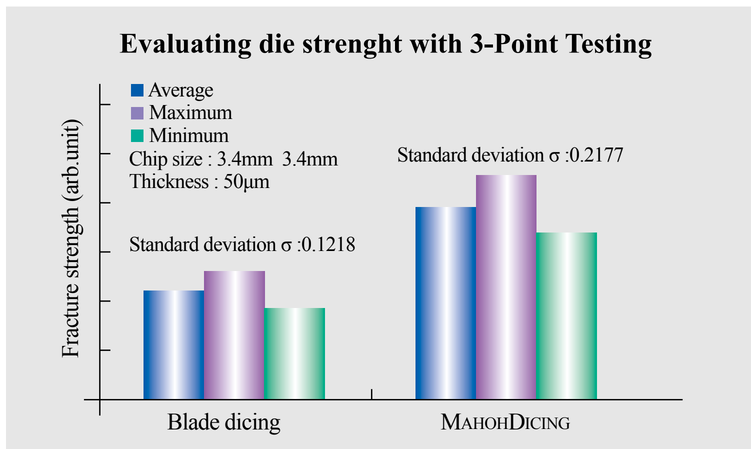


Conventional blade dicing

Inproved Yield

■ **Inprovements 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 strengh 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 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

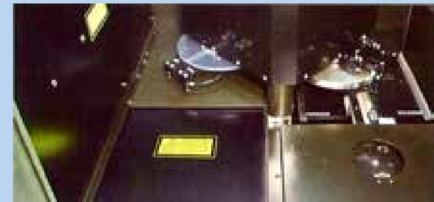
When irradiating the reverse side with a laser, the wafer can be conveyed by support handling.

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

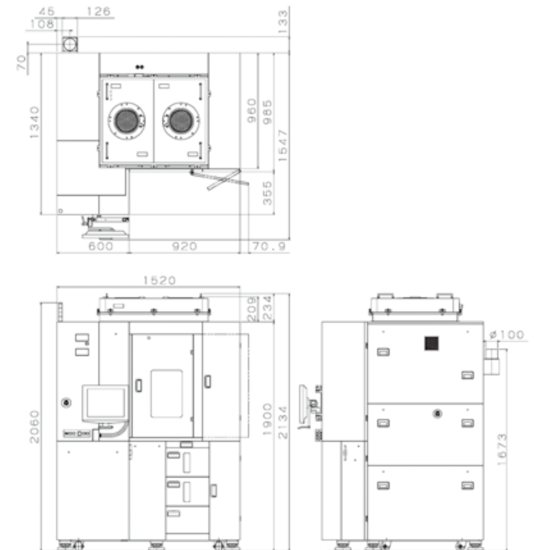
● Specifications

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 rete	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 accrracy	0.002/240mm
Z-axis	Stroke	8.5mm
	Driving speed	max.10mm/s
	Positioning resolution	0.0001mm(closed-loop control)
	Positioning accrracy	0.001mm/1mm

● Others

Power supply	Supply voltage : Selected from 200/220/240/380/415 VAC ± 10% 3 phase, 50 to 60 Hz.
Power consumption	4.7kVA
Copressed 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
Dimentions	1520^{W} × 1340^{D} × 1900^{H}mm
Weight	1750kg

● External View



TOKYO SEIMITSU CO., LTD.

International Marketing Dept. **Japan Tel: 81 (42) 642-0381 Fax: 81 (42) 631-5234** **http://www.accretech.jp**

North America

Accretech America Inc.
(Head Office)
Tel: 1 (214) 459-1688 Fax: 1 (214) 459-1696
(Fremont Office)
Tel: 1 (510) 344-5411 Fax: 1 (510) 344-5410
(Boise Office)
Tel: 1 (208) 429-6500 Fax: 1 (208) 429-6555

Europe

Accretech (Europe) GmbH
(Head Office / Germany)
Tel: 49 (89) 546788-0 Fax: 49 (89) 546788-10
(Dresden Office)
Tel: 49 (351) 89024-11 Fax: 49 (351) 89024-12
(French Office)
Tel: 33 (476) 04-4080 Fax: 33 (476) 04-0730
(Milan Office)
Tel: 39 (02) 92112357 Fax: 39 (02) 92111477

Korea

Accretech Korea Co., Ltd.
Tel: 82 (31) 786-4000 Fax: 82 (31) 786-4090

Taiwan

Accretech Taiwan Co., Ltd.
Tel: 886-3-5531300 Fax: 886-3-5531319

Malaysia

Accretech (Malaysia) Sdn. Bhd.
(Head Office)
Tel: 60 (3) 5632-7488 Fax: 60 (3) 5632-7489
(Kulim Office)
Tel: 60 (4) 4930082 Fax: 60 (4) 4930082

Singapore

Accretech (Singapore) Pte. Ltd.
Tel: 65 (6853) 5119 Fax: 65 (6484) 4327

Thailand

Tokyo Seimitsu (Thailand) Co., Ltd.
(Semiconductor)
Tel: (66) 2 982 8337, 8338 Fax: (66) 2 982 8339

China

Accretech (China) Co., Ltd.
(Head Office / Shanghai)
Tel: 86 (21) 3887-0801 Fax: 86 (21) 3887-0805
(Wuxi Office)
Tel: 86 (510) 8522-3533 Fax: 86 (510) 8101-7346
(Suzhou Office)
Tel: 86 (512) 6265-6436 Fax: 86 (512) 6265-6435
(Shenzhen Office)
Tel: 86 (755) 2515-9842 Fax: 86 (755) 2515-7737
(Chengdu Office)
Tel: 86 (28) 8738-2279 Fax: 86 (28) 8738-2279
(Beijing Office)
Tel: 86 (10) 8447-7011 Fax: 86 (10) 8447-7010

C-92-546-E-1305