

General Specifications LGS 200

Axes

Type	XY-Table, with separate axes on granite base
Drive	Linear motors
Useable working area	240 x 240 mm
Maximum stroke (XxY)	600 x 400 mm
Precision	+/- 3 µm
Repeatability	1 µm
Maximum axis speed	1000 mm/s
Acceleration	1G
Index	0.1 µm

Laser (can be installed outside of clean room)

Laser types	Solid state Nd:YAG pulsed
Wavelength	1064nm, 532nm
Average power	100W
Beam transmission	Optical fibre, core diameter 150 µm

Water Pump (can be installed outside of clean room)

Type	Two-cylinder pressure amplifier
Water flow	0.05 l/min
Water pressure	20-500 bars
Pressure transmission	Flexible water hose
Jet nozzle diameter	30, 35, 40, 50, 60, 75 and 100 µm

Vision System

Type	Pattern matching
Magnification	Two-level (high/low magnification)
Optical magnification	0.58 x 7.0
Illumination	Coaxial LED lightening
Automatic alignment	By image processing, alignment time <5s

Workpiece

Wafer size	6" to 8"
Wafer thickness	Any thickness

Cleaning Station LGS 200 C, A

Cleaning	DI water jet (high-pressure and megasonic optional)
Drying	Front and back side

Loading Station LGS 200 A

Cassettes	max. 3 wafer cassettes (6" and 8") Single wafer drawer
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Utilities

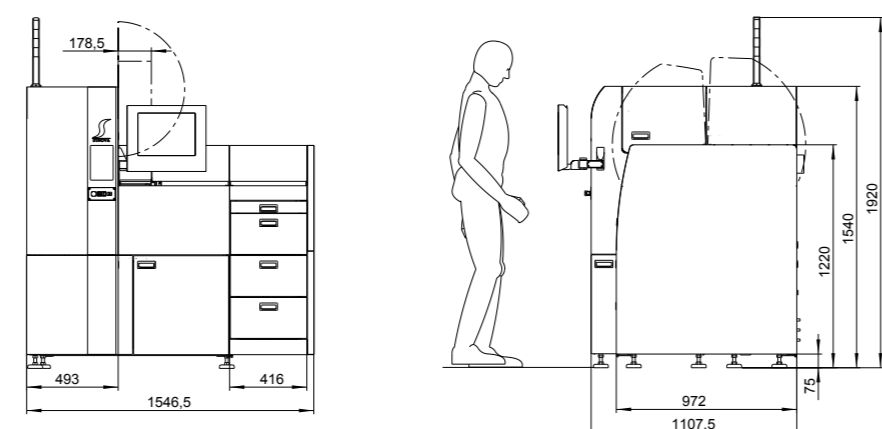
Electrical power	3 x 400V and 1 x 230V, 50/60 Hz
Power consumption	20kVA
Air pressure	5-6 bars, oil free
Water flow for cooling	max. 15 l/min, max 16°C, industrial water
Water flow for cutting	max. 0.05 l/min, <0.3 µm, degassed
Water flow for cleaning	max. 1 l/min, DI-water, <0.3 µm

Dimensions/Weight

LGS 200 M (WxD, weight)	1140 x 820 mm	approx. 800 kg
LGS 200 C (WxD, weight)	1140 x 1100 mm	approx. 900 kg
LGS 200 A (WxD, weight)	1546 x 1107.5 mm	approx. 950 kg
Laser (WxD)	2550 x 650 mm	approx. 900 kg
Water pump (WxD)	1300 x 700 mm	approx. 350 kg

Options

Transformer
Water treatment system
Chiller
Stage mapping



The above specifications are subject to change without notice due to technical improvement. The Laser Grinding System incorporates the worldwide patented technology of water jet guided laser, invented at the Swiss Federal Institute of Technology, Lausanne, Switzerland. This machine conforms to CE regulations.



Laser Grinding System

Powered by Laser Microjet®

Discover the Synova

Laser Grinding System

SYNOVA
Innovative Laser Systems

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Expand your capabilities with the latest development in Laser Technology

SYNOVA

The Laser MicroJet®

Contained within a hair-thin water jet through total internal reflection, the Laser MicroJet® beam surpasses today's laser and water cutting technologies.

During machining, the work pieces are cooled by the water jet at the cutting interface, resulting in "cold laser cutting", with little or no thermal damage and very few material changes.

At the same time, low water jet pressure ensures that virtually no mechanical force is exerted during processing, allowing rapid, damage-free production of delicate and composite parts.

As a result, the Laser MicroJet® achieves a precise cut over the entire depth of the work piece, leaving a fine, clean surface.

This exceptionally high quality of cut is made possible by the long working distance and constantly focused parallel laser beam.

In the field of high-precision machining of sensitive materials, stringent requirements for fine and small structures demand a new process: Laser MicroJet® is the solution.

Choose Laser MicroJet® and expand your micro-machining capabilities today.



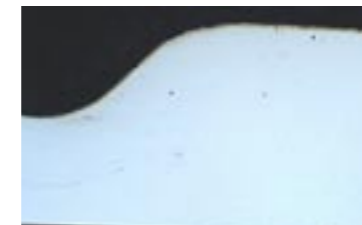
Cold Laser Power for: Cutting, Grinding, Drilling, Grooving and Scribing



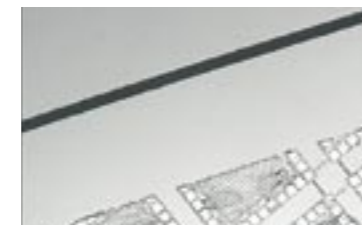
Founded in 1997, Synova is an experienced supplier of state-of-the-art laser solutions for industrial micro-machining applications, serving the semiconductor, electronic and medical markets. Each Synova machine features the unique Laser MicroJet® technology which was invented by Synova. With its headquarters in Lausanne, Switzerland, Synova is a privately owned company with subsidiaries in North America and in the Asia/Pacific region.



After back grinding, thin wafers are very brittle. Their edge contains micro-cracks due to the thinning process, making them subject to breakage during handling. Removal of the wafer edge, using a gentle technology, increases the wafer strength.



A few hundred micron ring was cut out of this 8-inch silicon wafer. The resulting wafer presents a smaller diameter and better fracture resistance as micro-cracks have been removed.



This thick wafer was grooved in such a way that the damaged edge will be removed during the back grinding step. The 140-µm deep groove was performed at 25 mm/s.



The edge of this 625-µm thick silicon wafer was 75-µm deep, trimmed at a width of 300 µm. This approach prevents a sharp edge from forming after back grinding. The operation takes only 240 seconds for 8-inch wafers and 300 seconds for 300-mm wafers

Clean & Gentle

Built upon Synova's Laser MicroJet® technology, which offers a water-jet cooling capability, the wafer is void of thermal (i.e., no heat-affected zone, no oxidation and no discoloration) and mechanical damage. Thanks to its exceptional advantages, the Laser MicroJet® is the only process able to increase thin-wafer strength in an efficient and easy way. The technology removes most of the micro-cracks, generated by back grinding, on the outer edge of the wafer without generating stress. The water jet not only prevents contamination and burrs – the water flow removes all waste products in the cut – but is also an environmentally friendly system that is free of gas emissions and consumes a negligible amount of water.

Fast & Accurate

The LGS 200 offers high mechanical precision with a tolerance of less than 3 µm, and can follow any contour using a narrow beam diameter as small as 25 µm. Moreover, high axis speeds are possible, reaching 1000 mm/s. In particular, cutting speeds for thin materials (i.e., 50-µm thick silicon) have topped 300 mm/s running through the silicon in one pass. Laser grinding of the wafer edge is achieved in minimal time without damage.

Versatile & Modular

Synova's LGS is a flexible system, with its easy setting changes, different laser sources to meet the exact requirements of a specific application and wide range of nozzle diameters, water pressure, etc. Change of wafer size (for example 6 inch to 8 inch) is possible without any modification. Laser grinding of any edge profile and of any contour is possible. Edge grinding of both thin and thick wafers is also possible and can be performed either before or after back grinding. In addition to flat or notch cutting, the machine can perform drilling, scribing, grooving, dicing, thinning, and marking of untaped wafers.

Easy to Use

With a long working distance (up to 100 mm), focus control is unnecessary, making the LGS easy to use. Compared to conventional cutting methods, the LGS requires neither cutting gas nor protective layers. Moreover, post-treatment is eliminated. Additionally, a large color flat screen with a touch panel system allows comfortable operation of all machine functions.

Low Cost of Ownership

The LGS's high throughput capability combined with its damage-free technology increases customers' yields. Additionally, the tool's long production-worthy lifetime, compared to conventional cutting technologies, such as blade saws that require constant replacement, makes this a low cost-of-ownership tool.

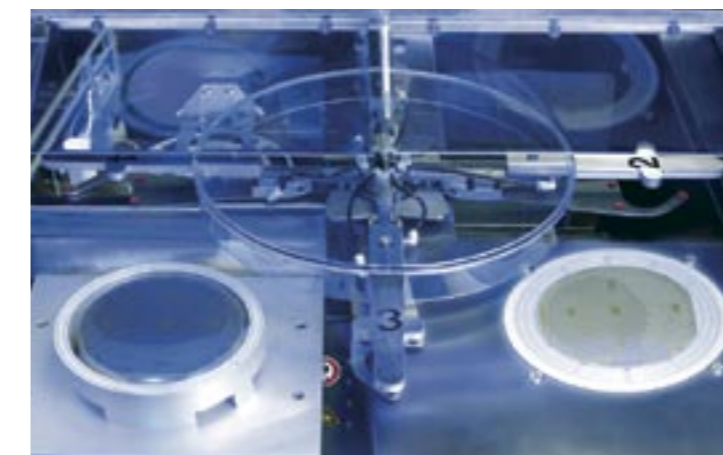
Top-Notch Quality

Each tool is assembled in Switzerland, integrating top quality, high-precision components. The LGS is a Laser-Class-1 machine with full enclosure and an extremely reliable production-proven laser source. In addition to our tool offering, the system includes a worldwide service package consisting of local service and support in the U.S., Europe and Asia.

Laser Grinding System



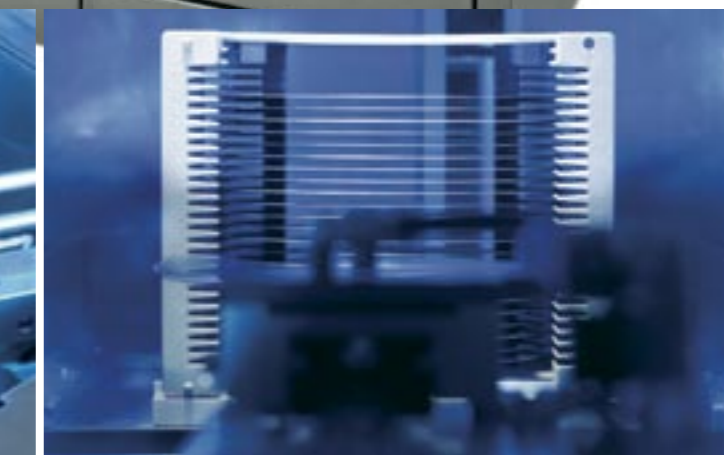
The LGS 200 A is a fully automatic laser edge-grinding system. The LGS is able to remove the wafer edge, which contains micro-cracks from back grinding, without incurring additional damages associated with conventional cutting technologies such as 'dry' lasers and diamond saw blades. Moreover, the system is easy to use with its clear Man Machine Interface (MMI) capability.



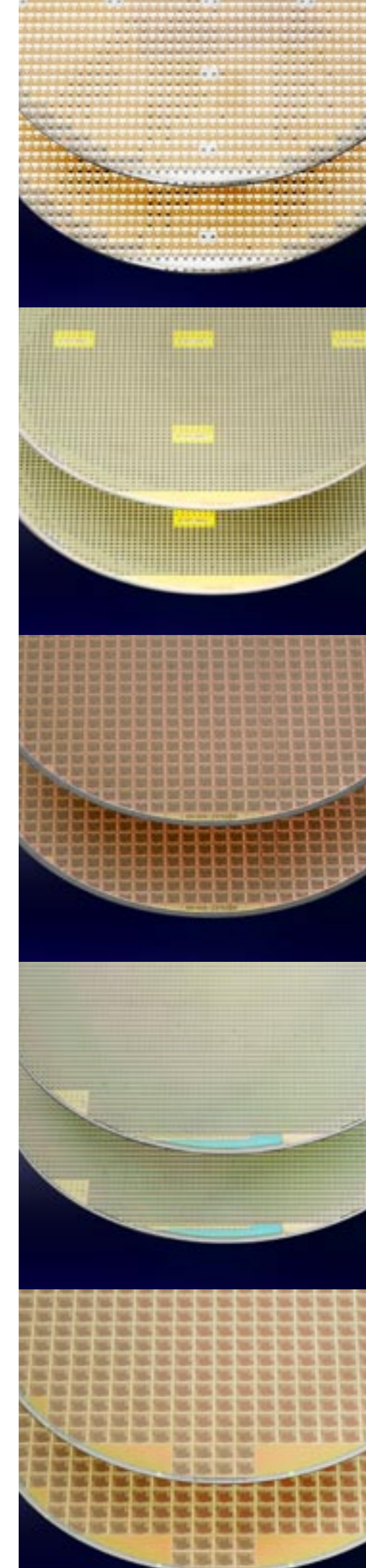
The LGS 200 A incorporates a cassette-loading unit, a cleaning station and a manipulator. These combined set of features allow the gentle, contamination-free transportation of the wafers from one station to the next.

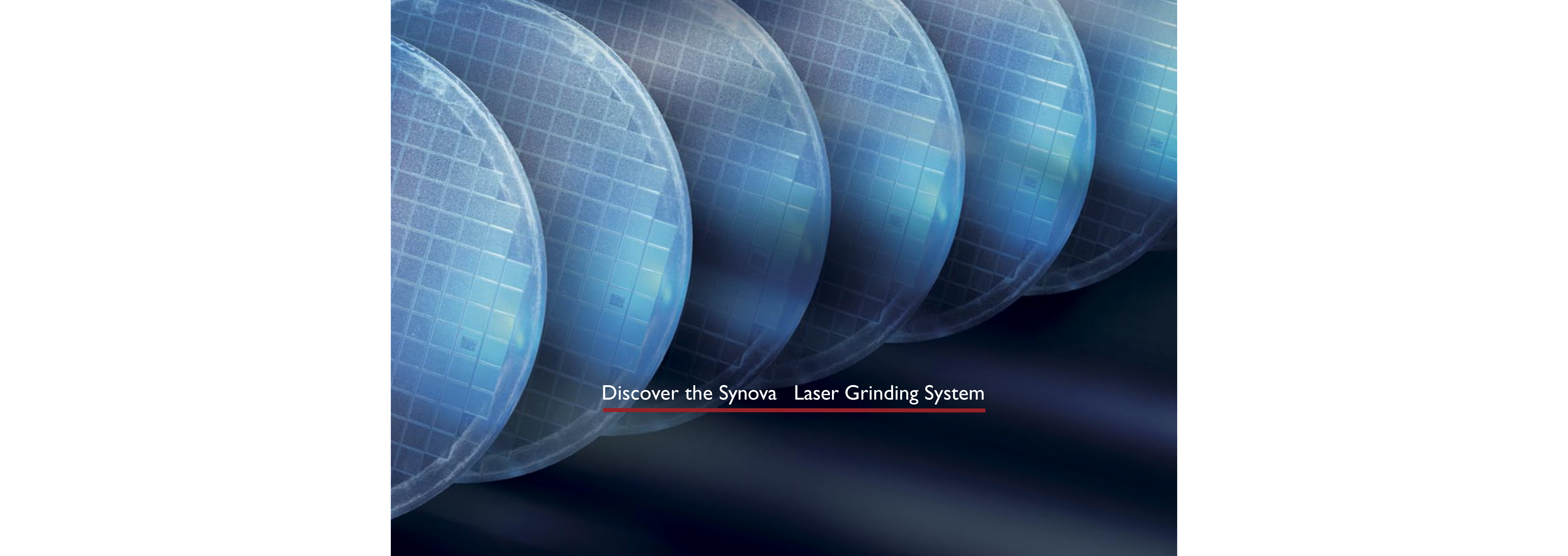


An automatic handling system in the LGS allows for safe wafer transfer to the next manufacturing step – cleaning with either high pressure water or using a megasonic system. This, combined with the tool's small footprint, makes the LGS an easily integrative tool into any production line.



A wafer rack is incorporated into the machine for easy, automatic pre- and post-processing.





Discover the Synova Laser Grinding System