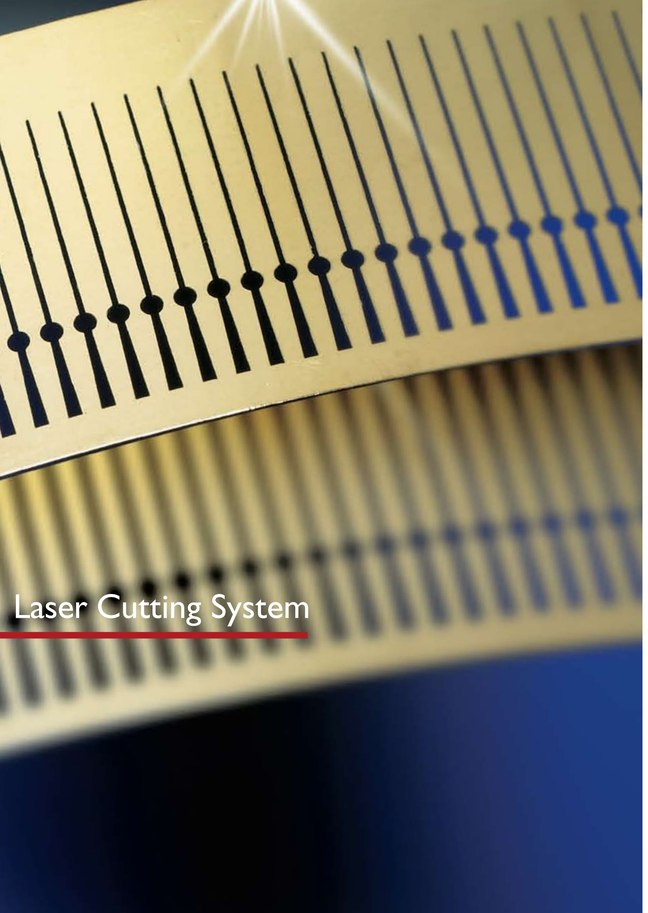
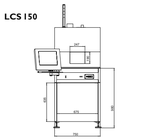
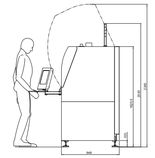
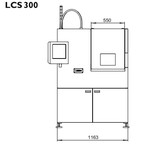


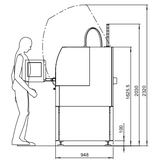
LCS 150





LCS 300





General Specifications

	LCS 150	LCS 300
Axes		
Type	XY-Table, joint axes on granite base	XY-Table, with separate axes on granite base
Drive	Linear motors	Linear motors
Useable working area	150 x 150 mm	300 x 300 mm
Maximum stroke	160 x 210 mm	600 x 400 mm
Precision	+/- 5 µm	+/- 3 µm
Repeatability	2 µm	1 µm
Maximum axis speed	300 mm/s	1000 mm/s
Acceleration	0.5 G	1 G
Laser		
Laser types	Diode pumped solid state Nd:YAG pulsed	
Wavelength	1064 nm, 532 nm	
Average power	50 W - 200 W (various laser sources available)	
Beam transmission	Optical fibre, core diameter 100 µm-200 µm	
Water Pump		
Conductivity	~ 5-20 MOhm cm	
Water flow	Up to 0.5 l/min	
Water pressure	Up to 500 bars	
Jet nozzle diameter	30µm to 500µm, depending on the application	
Utilities		
Electrical power	AC 230V, 1 phase, 50/60Hz	
Power consumption	2.5 kVA	
Compressed Air	5-6 bars, oil free	
Water flow for cooling	max. 8-15 l/min, (depending on the laser)	
Water flow for cutting	max. 0.05 l/min, de-ionised, filtered, degassed	
Dimensions/Weight		
Dimensions (WxDxH)	750x948x1626.5 mm	1163x948x1626.5 mm
Weight	approx. 350 kg	approx. 700 kg
Options	Water treatment system Chiller Stage mapping tool (LCS 300 only) Rotary axis, z-axis Chuck with vacuum External cleaning station Pattern recognition software Water-cooled objective for hard-material applications	

The above specifications are subject to change without notice due to technical improvement.
The Laser Cutting 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.

SYNOVA
Innovative Laser Systems

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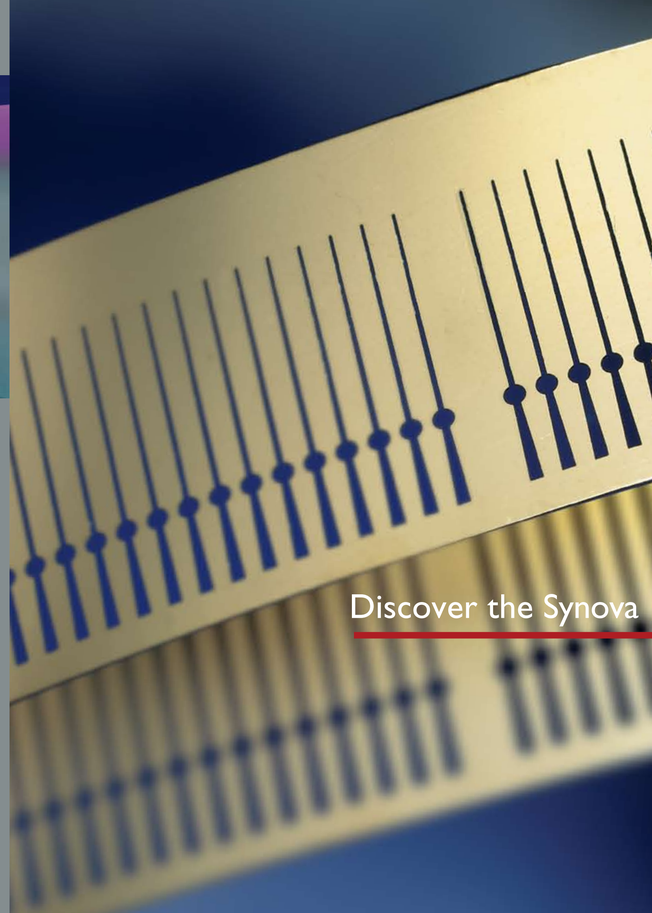
Laser Cutting System

Powered by Laser MicroJet®

Expand your capabilities with the latest development in Laser Technology

SYNOVA



The Laser MicroJet®

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

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, enabling "cold laser cutting", with little or no thermal damage and negligible material changes, resulting in an exceptional high quality cut.

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.

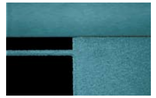
The Laser MicroJet® achieves a precise cut over the entire depth of the work piece, leaving a fine, clean surface thanks to a long working distance and constant parallel laser beam.

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.

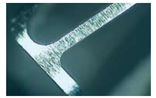
Choose Laser MicroJet® and expand your micro-machining capabilities today.

Founded in 1997, Synova is an experienced supplier of state-of-the-art laser solutions for industrial micro-machining applications, serving the semiconductor, electronic, medical, automotive, watch and solar 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.

The LCS is Synova's most versatile machine. One of its applications is cutting of hard materials for the tooling industry. This 1.6-mm thick insert, consisting of two layers – CBN and WC-Co, was cut in 20-30 mm/min. Edges are smooth and clean. The obtained edge surface quality is better than that obtained by EDM.



Another application is through cutting or edge isolation of silicon PV solar cells. Grooving speeds reach 300 mm/s. This 350-µm thick cell was completely cut at a speed of 80 mm/s.



Medical stents can also be created from thin metal tubes. This shape-memory alloy (Nitinol) stent is shown as cut (no post cleaning). The 200 µm thick complex shape was cut at a speed of 9 mm/s.

The Laser MicroJet® is an omni-directional tool: any shape can be created. This complex design was achieved at 2 mm/s in a 150-µm thick stainless steel sheet.

1

Fast & Accurate

The LCS 300/150 offers high mechanical precision with a tolerance of less than +/-3 µm (5 µm for the LCS 150), and can create almost any aperture shape using a small beam diameter of down to 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.

2

Clean & Gentle

Built upon Synova's Laser MicroJet® technology, which offers a water-jet cooling capability, the work piece is void of thermal (i.e., no heat-affected zone, no oxidation and no discoloration) and mechanical damage. The water-jet not only prevents contamination and burrs with the removal of all waste products in the water flow, but is also an environmentally-friendly system that is free of gas emissions and consumes a negligible amount of water.

3

Easy to Use

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

4

Versatile & Modular

The LCS is Synova's most flexible cutting system for processing a variety of materials such as metals, semiconductors, ceramics, etc. Adding to the system's versatility is its ability to utilize different laser sources to meet the exact requirements of a specific application. Other parameters, such as nozzle diameter, can also be adapted.

5

Low Cost of Ownership

The tool's high throughput capability combined with its damage-free technology increases customers' yields. Additionally, the LCS'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.

6

Top-Notch Quality

Each tool is assembled in Switzerland, integrating top quality, high-precision components. The production-proven laser source used in the LCS is extremely reliable. In addition to our tool offering, the system includes a worldwide service package consisting of local support and service in the U.S., Europe and Asia.

Laser Cutting System

The Laser Cutting System (LCS) is available in two different versions – LCS 300 and LCS 150. The LCS 300 is the larger of the two models (footprint 1 sqm), and is a versatile machine presenting many options such as Z or R-axis or wafer chuck. Conversely, the LCS 150 is a very compact machine with a footprint approximately half the size of the LCS 300. With this version, a mini-pump can be integrated directly into the machine, which has an axis speed of up to 500 mm/s. Various laser sources are available for both systems, allowing up to 200 W.

The cutting head is at the heart of the machine, where the laser is coupled into the water jet. This includes the coupling unit and a camera for automatic alignment. The head is also equipped with a zoom for positioning and visual inspection.

ACTUAL SIZE

ACTUAL SIZE

ACTUAL SIZE