

ALASING
MICROSYSTEMS

LABCORE



**CUSTOMIZABLE LASER PROCESSING MACHINE
FOR HIGH ACCURACY APPLICATIONS**



LARGE AREA, HIGH
PRECISION PLATFORM



LASER AGNOSTIC &
MULTI-WAVELENGTH



MODULAR &
APPLICATION DRIVEN

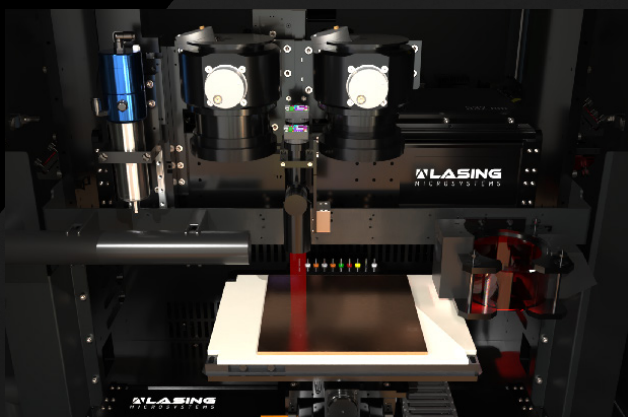


HYBRID MOTION &
ADVANCED OPTICS



OPTIONAL IN SITU 3D
METROLOGY

THE MODULAR PLATFORM FOR ADVANCED LASER MICROMACHINING



LABCORE is a **modular, laser-agnostic micromachining platform** designed for high-precision laser processing across a wide range of applications.

It combines a high-stability mechanical architecture with a fully configurable optical and motion platform, enabling the integration of multiple laser sources and processing heads within a single Class-1 enclosure.

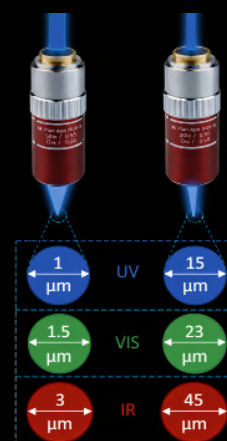
An optional in-situ **3D confocal interferometer** allows fabrication and metrology to be performed within one automated workflow, making LABCORE ideal for R&D laboratories, technology centers and pilot production lines.

KEY SPECIFICATIONS

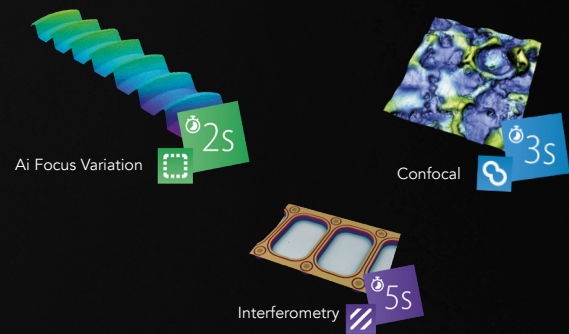
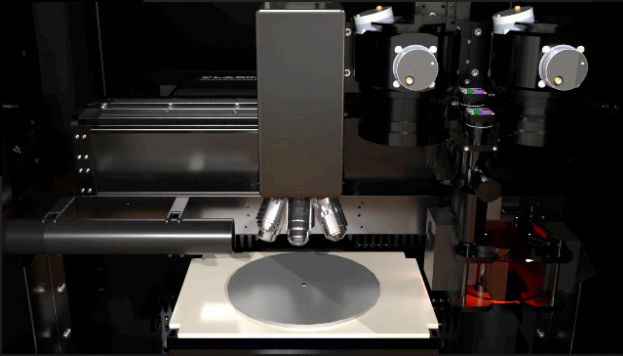


WORKING AREA	Up to 400 x 300 x 150 mm
RESOLUTION	XY < 1nm / Z < 10nm
REPEATABILITY	XY < 100nm / Z < 50nm
ACCURACY	XY < 1μm / Z: < 0.5μm
AVAILABLE LASER SOURCES	Nanosecond, picosecond, femtosecond
SUBSTRATE HOLDER	Application-dependent, custom-made for each
MINIMUM LASER SPOT SIZE	Down to 1 μm (optics and material dependent)
EXTERNAL DIMENSIONS	< 1240 mm x 1750 mm x 2400 mm (WxDxH)
WEIGHT	< 1800 kg
CONTROL UNITS	2X workstations with 23" monitor and TFT (touch)

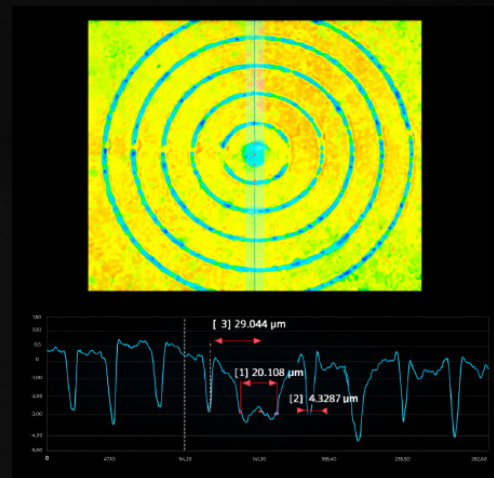
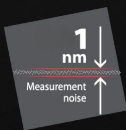
	IR	GREEN	UV
Labcore-ps-ns	ns: 80W - 1 mJ ps: 35W- 150 μJ	ns: 60W - 1 mJ ps: 18W-75 μJ	ns: 20W – 200 μJ ps: 10W- 50 μJ
Labcore-fs-ns	ns: 80W - 1 mJ fs: 35W- 150 μJ	ns: 60W - 1 mJ fs: 18W-75 μJ	ns: 20W – 200 μJ fs: 8W- 40 μJ



HIGH RESOLUTION 3D OPTICAL PROFILER WITH TRIPLE TECHNOLOGY

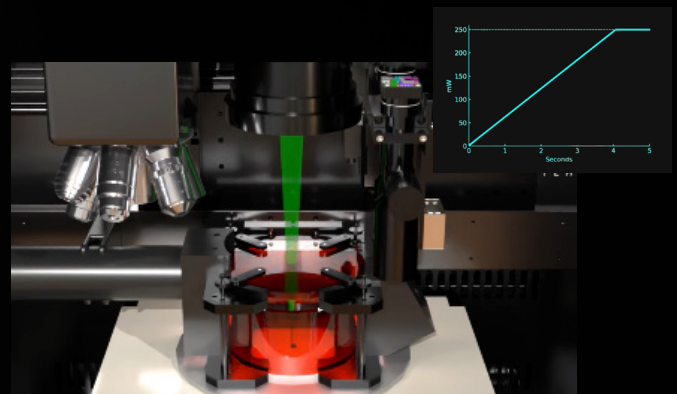


- From 5X to 100X objective magnifications.
- Motorized torret with up to 7 objectives.
- Vertical resolution down to 1 nm in DZ.
- Horizontal resolution down to 0.25 μm .
- Automatic stitching of full working area.
- Advanced and intuitive 3D measurement software.
- Automatic report generation (PDF, CSV, 3D format).



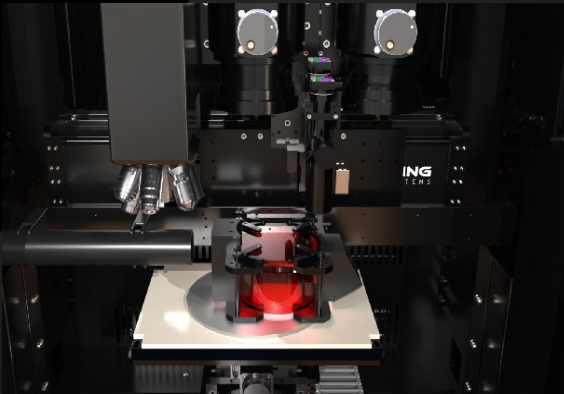
MEASURE THE MACHINE PERFORMANCE

- Closed loop power measurement on working area.
- Closed loop laser beam alignment algorithms.
- Automated data generation of the critical variables.
- Automatic report generation (PDF, CSV, 3D format).



- Automatic lens calibration procedures.
- Co-linear laser to perform Dz and Tip-Tilt automatic adjustments.
- Isolation platform with active vibration measurement control.

LASER PROCESSING CAPABILITIES



- Precision laser ablation of metals, polymers, ceramics and glass.
- Thin-film removal, structuring and maskless patterning.
- Surface micro- and nano-structuring, including functional LIPSS.
- Volume modification and internal 3D structuring in transparent materials.
- High-aspect-ratio micro-drilling and TGV fabrication with controlled taper.
- Micro-grooving, scribing, cutting and edge trimming.
- Laser texturing for wettability, tribology and functional surfaces.
- Hybrid laser and mechanical micro-machining workflows (spindle)

INTEGRATED AND ADAPTABLE SOFTWARE SOLUTIONS

- Intuitive clean codeless software.
- Design and import CAD trajectories (dxf, dwg, Gcode, STL, Gerber).
- Import image files.
- Full control of laser parameters.
- Multiple cameras vision system with automatic recognition capabilities.
- 3D profiler functionalities integrated.
- 3D closed loop correction to minimize stitching errors.
- Automatic report generation.
- Remotely accessible video of the working area.



Camera Stitch



Autofocus



Galvo distortion connection



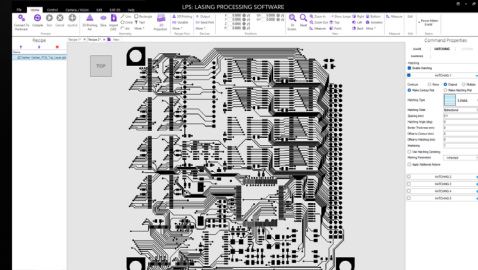
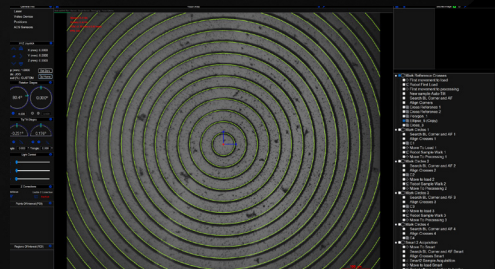
Galvo calibration



Visual inspection

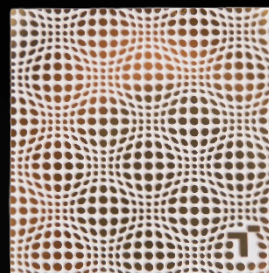


Track view

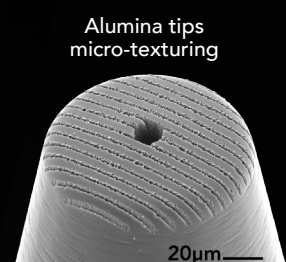


APPLICATIONS

- PCB prototyping, thin-film electronics and maskless circuit fabrication.
- Semiconductor chip de-capsulation and failure analysis.
- Photonics manufacturing, including Fiber Bragg Gratings.
- Battery foil structuring and solar cell patterning.
- Selective Laser-Induced Etching (SLE) for 3D glass microfabrication.
- Through-glass via (TGV) and transparent material processing.
- Functional surface engineering.
- Microfluidic device prototyping in glass and polymers.



Selective laser-based decapping through transparent substrates



Alumina tips micro-texturing

LASER & OPTICS

COMPATIBLE LASER SOURCES	Nanosecond, picosecond, femtosecond
SUPPORTED WAVELENGTHS	IR/Green combined, independent UV
LASER INTEGRATION	Internal or external customer-supplied laser
MINIMUM LASER SPOT SIZE	Down to 1 μm
BEAM DELIVERY	Galvo-scanner + motorized XYZ stages
FOCUSING OPTICS	From 163 mm focal length and up to 40X high-NA objective
OPTICAL CONFIGURATIONS	Galvo + correction module + objective (up to 500x500 μm field size); galvo + f-theta/telecentric lenses (up to 70x70 mm); axicons
POLARIZATION CONTROL	Manual or automated (linear, circular, elliptical)
POWER MONITORING	Integrated power meter

MOTION & POSITIONING

MOTION AXES	Up to 5 interpolated axes
WORKING VOLUME	Up to 400 x 300 x 150 mm
POSITIONING RESOLUTION (XY/Z)	Granite: XY: 1 nm / 100 nm / < 1 μm Z: 10 nm / 50 nm / < 0.5 μm Stainless-steel: XY: 100 nm / < 1 μm / < 10 μm Z: 1 μm / 3 μm / < 10 μm
VIBRATION MANAGEMENT	Active 6-axis DOF and air passive isolation
NOISE / POSITIONAL ERROR	Up to XY < ± 10 nm (RMS) Up to Z < ± 50 nm (RMS)

VISION & METROLOGY

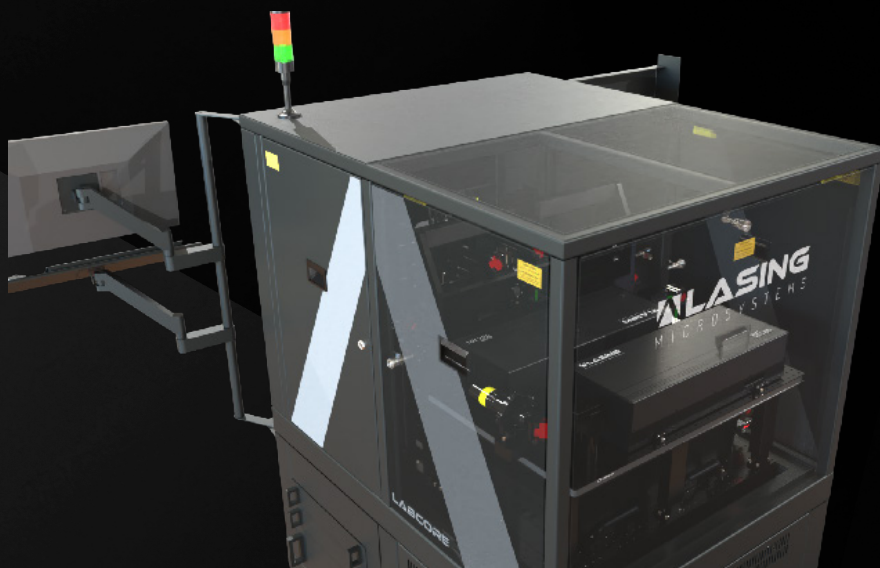
VISION SYSTEM	Co-axial & Parallel Dual high resolution vision systems
VISION FUNCTIONS	Automated field calibration and features recognition
INTEGRATED PROFILER	Confocal interferometer 3D profiler
PROFILER RESOLUTION	Vertical down to 1 nm, lateral down to 200 nm
MEASUREMENT OUTPUT	True 3D surface topography
SAMPLE TRANSFER	Automated transfer between processing & metrology

APPLICATION SPECIFIC FEATURES

PCB PROTOTYPING	Mechanical spindle for drilling and large area scanning optics
PCBs & CHIPS DECAPSULATION	High-capacity fume extraction and spindle tool
SELECTIVE LASER ETCHING (SLE)	Bottom surface reference sensor and optimized 3D design software
BATTERY PROCESSING	Roll-to-roll handling module
FBGS MANUFACTURING	Reel-to-reel fiber handling module

SOFTWARE & AUTOMATION

CONTROL SOFTWARE	Proprietary all-in-one control environment or DMC software optimized for 3D processing
SOFTWARE FUNCTIONS	Laser parameters, motion control, optics & metrology
WORKFLOW	Fabricate --> Measure --> Optimize
CAD SUPPORT	DXF, DWG, GERBER, STL and standard CAD formats



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