

HDPRO

THE MOST COMPACT LABORATORY FOR HIGH PRECISION
LASER APPLICATIONS

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ADVANCED LASER PROCESSING **HAS ALWAYS COME WITH TRADE-OFFS**

MORE CAPABILITY. **MORE COMPLEXITY**

Advanced processes often require multiple technologies and system components.

MORE VERSATILITY. **MULTIPLE SETUPS**

Different materials, geometries and processing scales demand different setups.

MORE INTEGRATION. **LARGER FOOTPRINT.**

Processing, positioning, vision and metrology increase the system footprint.

WHAT IF WE DON'T HAVE TO CHOOSE?

ULTRA COMPACT ALL IN ONE

A high-precision laser micromachining platform that integrates processing, positioning, vision, metrology and automation in a single system.

A COMPLETE MICROMACHINING LAB
IN ONE COMPACT PLATFORM.



ADVANCED CAPABILITIES. COMPACT FOOTPRINT.

AUTOMATED SURFACE ANALYSIS

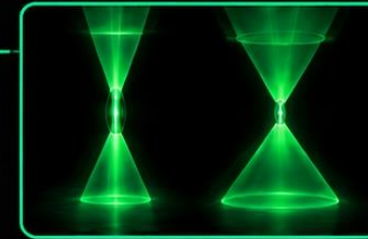
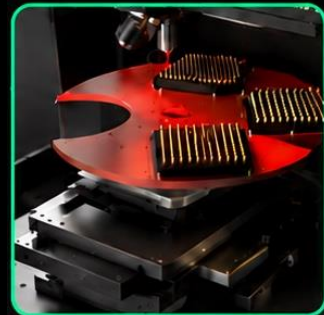
Optical profilometry-based analysis of the processed area.

6 AXIS MOTION CONTROL

High precision 6 axis stages (X-Y-Z – Rot – Tip – Tilt).



850 mm



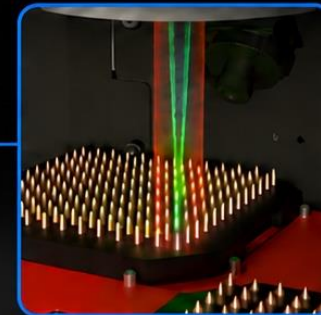
VARIABLE BEAM SIZE

Adjustable laser beam size (1x to 3x with same objective).

UV · VIS · IR

HIGH PRECISION PROCESSING

Spot sizes down to 1µm with UV wavelength.



750 mm

650 mm

LASER SPECIFICATIONS

NANOSECOND

High energy for a wide range of materials and applications.

PULSE WIDTH

< 15 ns

355 nm

UV

0.4 W – 8 μ J
3 W – 30 μ J (HP)
2 W – 100 μ J (HE)

532 nm

VIS

1 W – 20 μ J
2.5 W – 30 μ J (HP)
1 W – 100 μ J (HE)

FEMTOSECOND

Ultrashort pulses for highest precision and minimal thermal effects.

PULSE WIDTH

< 400 fs (1030 nm)
< 350 fs (515 nm)
< 800 fs (343 nm)

1030 nm

IR

10 W – 100 μ J

515 nm

VIS

5 W – 50 μ J

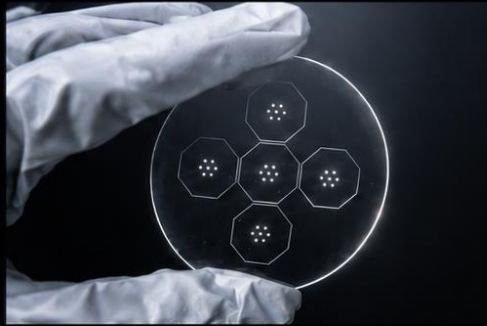
343 nm

UV

10 W – 25 μ J

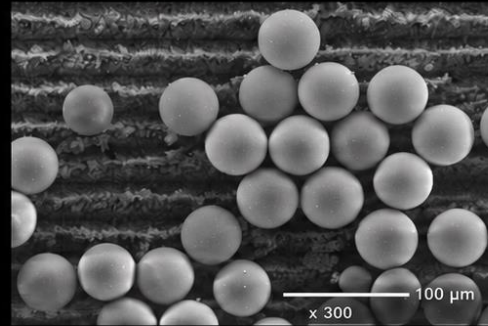


FROM PRECISION ENGINEERING TO REAL APPLICATIONS



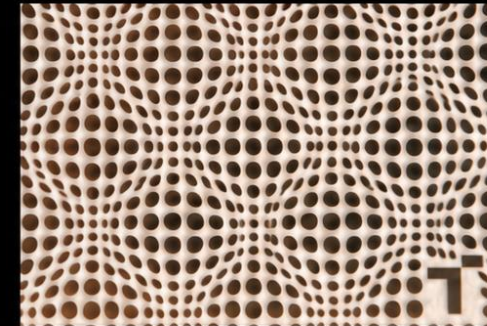
GLASS

Microstructuring / Drilling



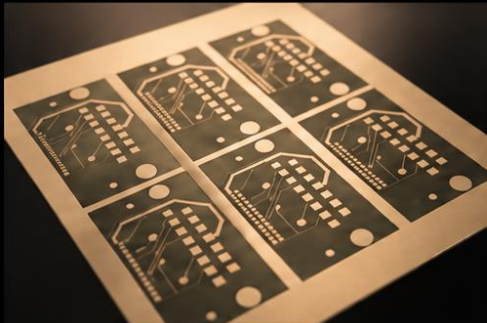
FUNCTIONAL SURFACES

Micro & nano structuring



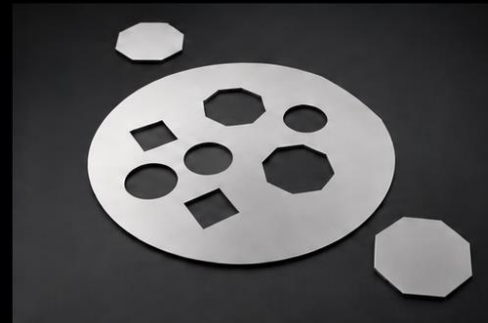
PATTERNING

Functional patterns



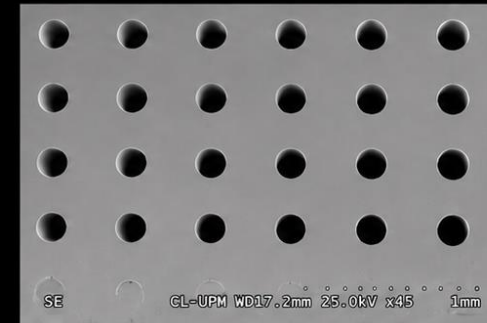
PCB

Prototyping / Fine features



MICROFABRICATION

Cutting / Complex geometries



PRECISION DRILLING

High aspect ratio structures

ONE PLATFORM. ONE CONTROL ENVIRONMENT.

The screenshot displays the LASING MICROSYSTEMS software interface, which is a unified control environment for a robotic system. The interface is divided into several functional panels:

- Process Control (Left Panel):** Features a 'Live Image ORB ImageProcessing' window showing a grid of circular targets. Below this, there are controls for 'Pattern' (Circle), 'Width (mm)' (0.000), 'Height (mm)' (0.250), 'Position (mm)' (0.000), and 'Fill Pattern'. A 'Show Processed Image' section shows a thresholded version of the image.
- Vision & Alignment (Central Panel):** The 'Vision Area' displays a large, high-resolution image of a target with concentric circles. To the left of this area are 'General Info' and 'Rotation Stages' (80.4°, 0.000°) and 'Tip Tilt Stages' (-0.251°, 0.175°). To the right is a 'Mark Reference Crosses' section with a list of steps including 'First movement to load', 'First movement to processing', 'New sample Auto-Tilt', 'Search BL Corner and AF', 'Align Crosses 1', 'Cross Reference 1', 'Cross Reference 2', 'Cross 3 (Copy)', 'Mark Circles 1', 'Search BL Corner and AF 1', 'Align Crosses 1', 'C1', 'Move To Load 1', 'Robot Sample Walk 1', 'Move To Processing 1', 'Mark Circles 2', 'Search BL Corner and AF 2', 'Align Crosses 2', 'C2', 'Move To Load 2', 'Robot Sample Walk 2', 'Move To Processing 2', 'Mark Circles 3', 'Search BL Corner and AF 3', 'Align Crosses 3', 'C3', 'Move To Load 3', 'Robot Sample Walk 3', 'Move To Processing 3', and 'Mark Circles 4'.
- Automated Analysis (Right Panel):** Shows a grid of circular targets. Below the grid, there are 'Area Selection' controls, 'Video Device' (USB Camera), 'Settle Time (ms)' (100), 'Resolution Factor' (1.0), 'Area Scale (%)' (25), 'FDOV (mm)' (1.12 x 1.81), 'Resolution' (900 x 664), and 'Dimensions' (15 x 9). A 'Save' button is at the bottom.
- Central Vision Area:** A large, high-resolution image of a target with concentric circles, used for precise positioning and alignment.

Below the interface, three icons represent the core capabilities:

- PROCESS CONTROL:** Full system control from a single interface.
- VISION & ALIGNMENT:** High-precision positioning and process setup.
- AUTOMATED ANALYSIS:** Integrated monitoring and data-driven evaluation.

LPS integrates system control, precision positioning, process execution and analysis in one unified software environment.

INTEGRATED • AUTOMATED • FLEXIBLE • USER-ORIENTED

INTEGRATED 3D METROLOGY

From laser processing to surface measurement and analysis.



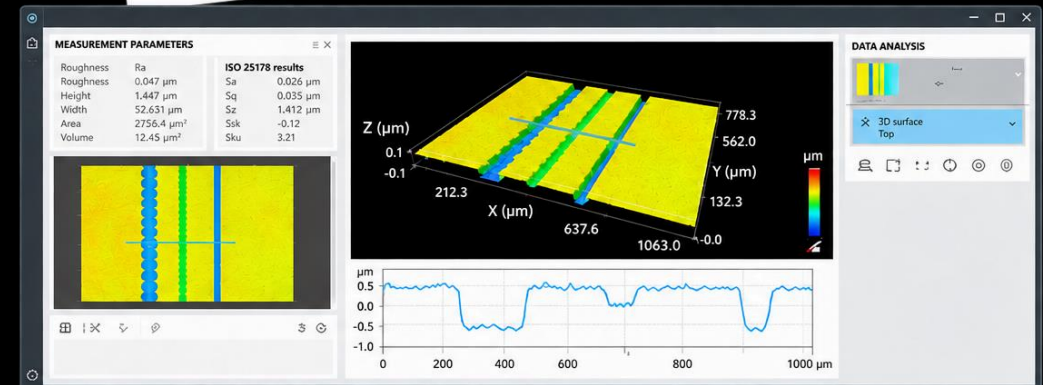
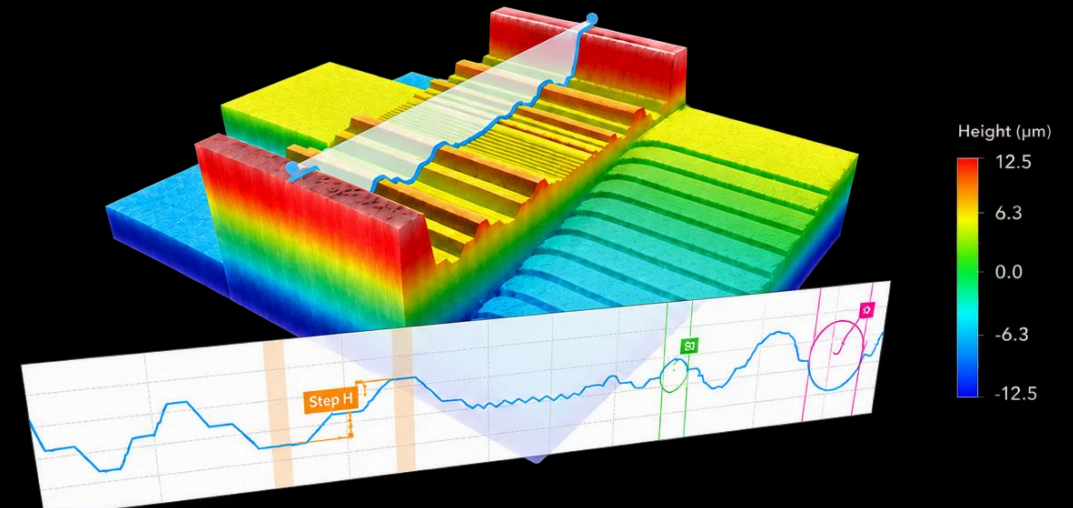
1 nm
VERTICAL RESOLUTION



2D + 3D
SURFACE ANALYSIS

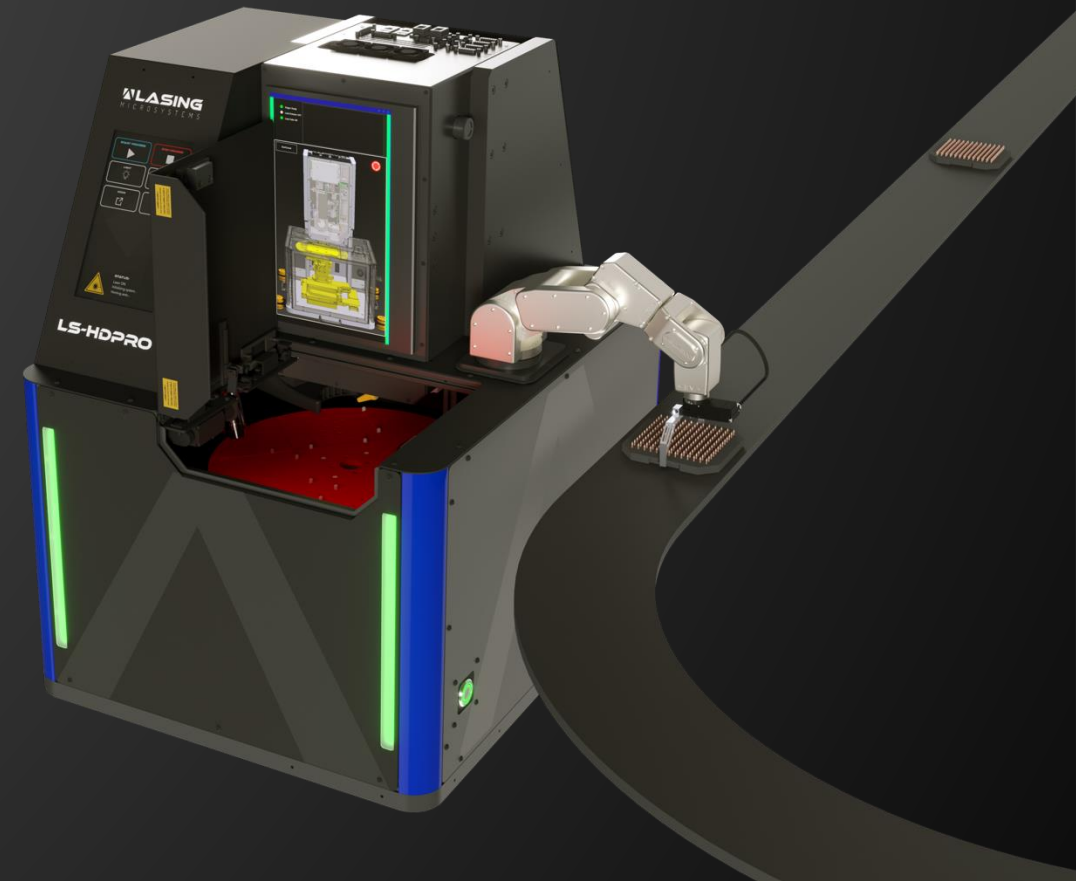


PROFILE
DIMENSIONAL & ROUGHNESS ANALYSIS



ENGINEERED AROUND REAL-WORLD DEMANDS.

Developed around the real-world demands of
advanced laser micromachining.





THANK YOU!

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