FemtoLAB

ALL-IN-ONE R&D PLATFORM FOR LASER MICROMACHINING

- Rapid prototyping
- Combined processes
- Submicron resolution
- Novel approach

WORKSHOP OF PHOTONICS

Key applications:

- Surface and volume micro- and nano- structuring
- Femtosecond laser ablation (FSLA)
- Laser grooving
- Multiphoton polymerization (MPP) | direct laser writing (DLW)
- Laser cutting & drilling
- Micromachining on optical fibers

Technical specifications

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Recommended materials	All materials: glass, sapphire, silicon, ceramics, metal, plastic, optical fibers etc.
Laser	High power ultrashort pulse IR, Green, UV laser
Optical path selection	Automated
Samples size	Compatible with up to 160 mm x 160 mm designs
Smallest feature size	200 nm
Positioning system	XYZ mechanical axes, positioning accuracy +- 0.3 µm featuring continuous wafer level patterning
Scanning system	Galvo system for all laser wavelengths
Vision	Real-time visualisation and positioning camera with feature recognition
Metrology	Integrated microscope
Sample handling	Manual with automatic alignment
Holder	Sample holder for flat structures (vacuum suction based) with additional holder for optical fibers
Fume extraction system	Included
Accessories	Power control, polarization state control
Software	Entire system control via single GUI.
Supported file formats	- 2D/3D model import: STL, DXF, DWG, AMF, PLT, FAB - Bitmap support: BMP, GIF, JPG, JPEG, PNG - Text files as a table array: TXT, RTF, TE
Construction	Granite base with passive vibrations isolation, built on optical table(optional stand-alone design)
Cooling	Water cooled laser, air cooled system and electrical cabinet
Dimensions, mm (L x W x H)	1500 x 1350 x 1400
Weight	1100 kg
Power supply	2x 220 VAC, 16 A

Custom or application optimized design available upon request.

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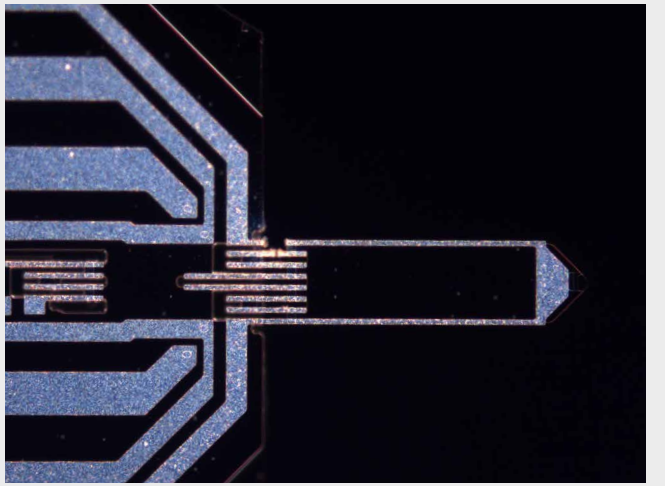
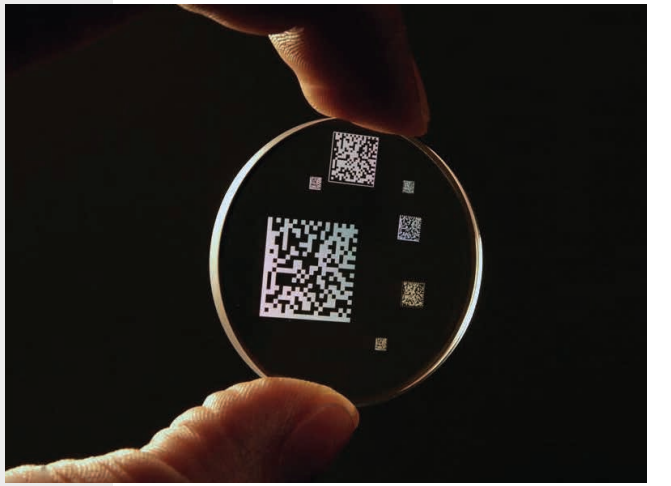
Working in the femtosecond laser field and exploring various research areas, it is crucial to have machine flexibility to tune it for different applications.

With an extensive background in process development Workshop of Photonics understands how critical it is to match the demand of different research teams involved and enable their all needs.

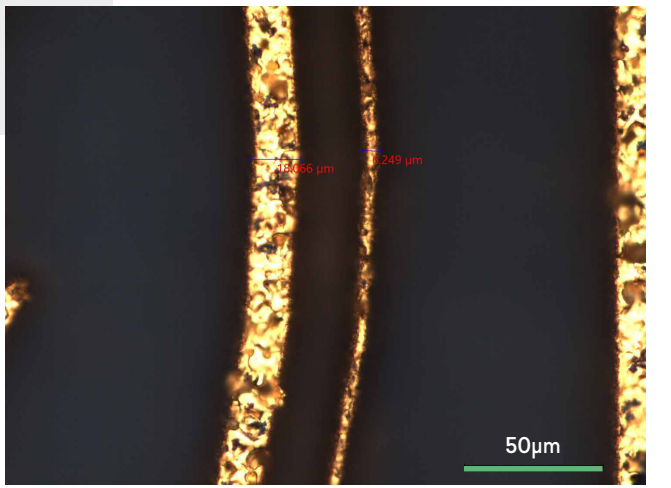
Herewith we offer FemtoLAB – a femtosecond laser micromachining workstation - for a universal use.



Laser cutting. Narrow and wide cuts of a silicon cantilever



Laser marking. Written directly inside the object (glass) by making refractive index irregularities without damaging the surface



Laser marking | selective gold layer removal. Gold, thickness ~10 µm, bottom layer ceramic substrate

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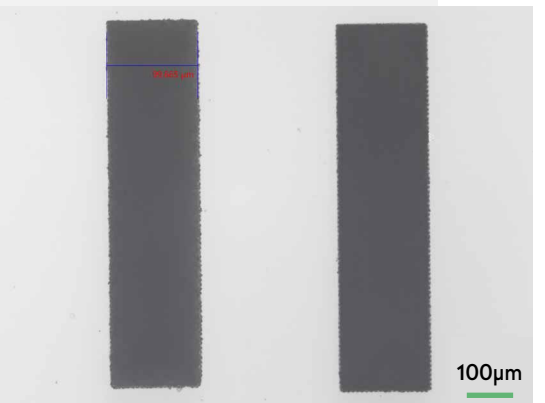
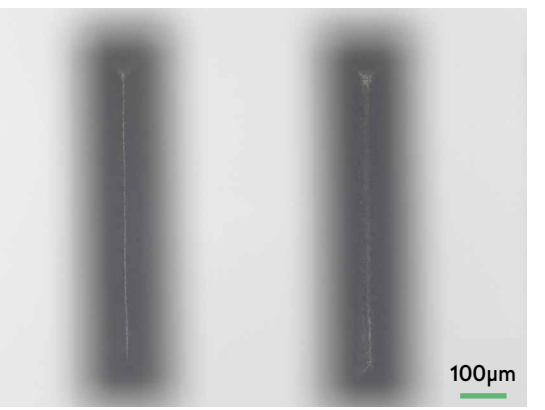
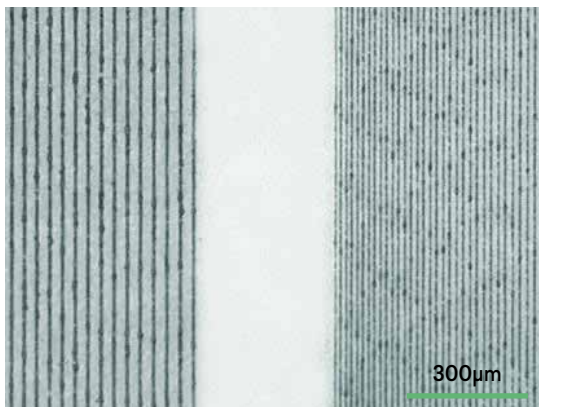
Benefit from:

- Finest resolution
- Complex 3D objects
- Cost effective
- Small footprint

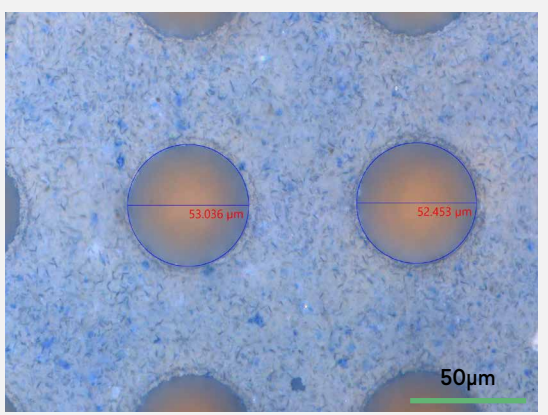


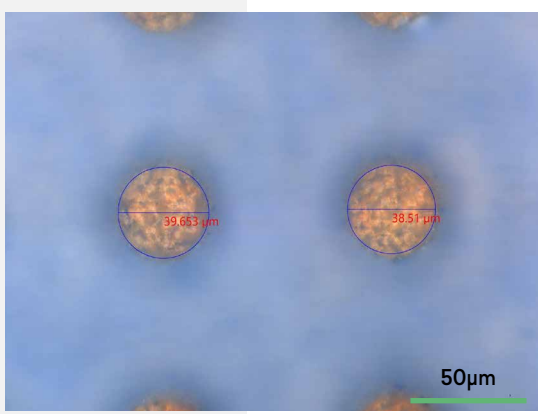


500 µm thick Borofloat 33 glass sample after ablation of 100 µm slit and steam cleaning at 20x, top view surface and bottom of processing

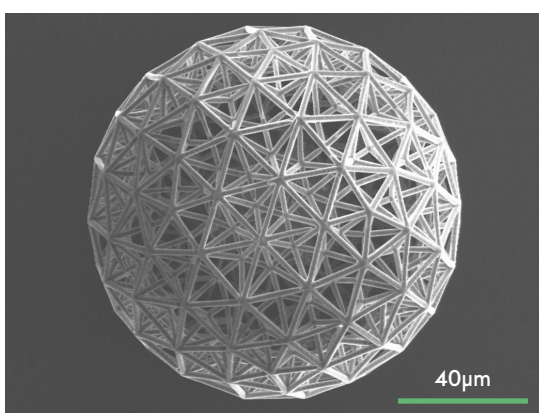


Surface and volume micro- and nano- structuring





Blind holes drilling in multi layered sandwich like substrate - 25 µm thickness dielectric layer (blue color) drilling to gold layer (yellow color)



Multiphoton polymerization (MPP)

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A perfect choice for scientific laboratories and R&D centers

“After 10 years of experience, working with your femtosecond system, my honest opinion is more than positive, and we are satisfied with the product. Compared to other systems, ours “full optional facility” allows us to explore valuable processing on many different materials. This is an added value for the research in IIT!”

Luigino Criante
Technology Researcher
Istituto Italiano di Tecnologia Genoa, Italy

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Technische Universität Berlin

TECHNISCHE UNIVERSITÄT DRESDEN

iit ISTITUTO ITALIANO DI TECNOLOGIA

清華大學 Tsinghua University

University at Buffalo

WOP
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18+ years of expertise

in femtosecond laser micromachining with high focus on glass

Full - service solution

Prototyping
Scaling production
Laser system development

6 in-house and 2 licensed patents

enabling cutting - edge technologies

Continuous R&D studies

with academic and research partners

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