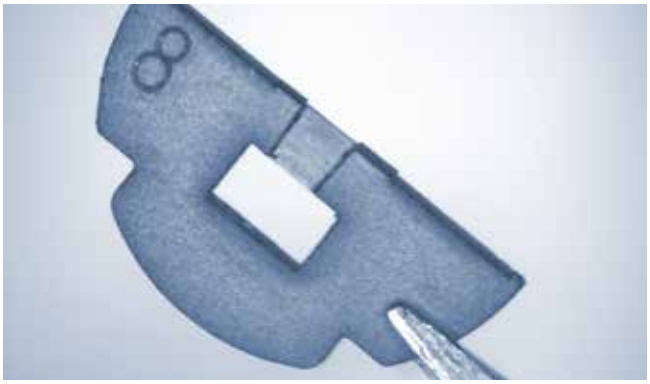
microPREP™

High-Throughput Laser Based Microdiagnostics Sample Preparation

3D MICROMAC

All-New Instrument for Laser Based Sample Preparation

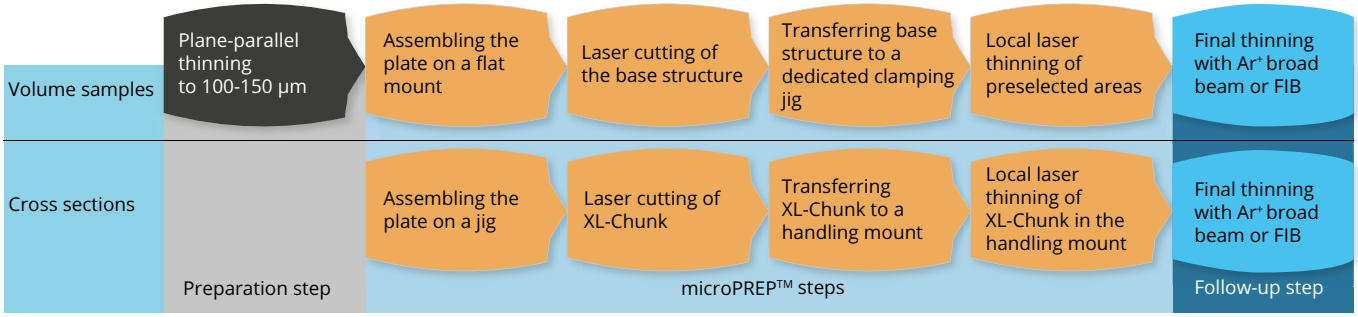
3D-Micromac's all-new microPREP™ is the first instrument to enable fast, clean, and efficient laser ablation available for the preparation of samples for microstructure diagnostics and failure analysis. microPREP™ provides key benefits of micromachining using ultrashort pulsed lasers, particularly low structural damage, high power densities and targeted precision on the micron scale. Thus microPREP™ is up for laser cutting and local laser thinning in semiconductors, metals, ceramics, as well as compounds.



Benefits of microPREP™

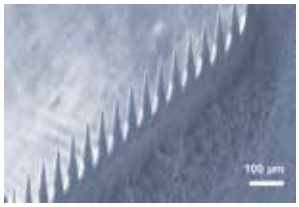
- Shorter time to sample
- Analysis-adopted sample geometry
- Minimized risk of sample loss
- Software recipes for manifold sample geometries and materials
- Reduced FIB capacity requirements
- Enhanced efficiency of existing (TEM) analysis tools

Process-flows



Examples of Application

Large-area, plane parallel thinning



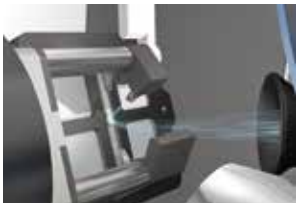
Pillar array in silicon after automated milling

Gentle processing of hetero systems

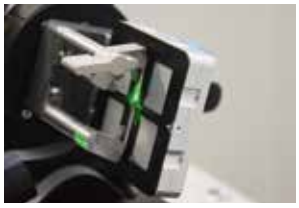
microPREP™ - System Description

microPREP™ is suited for

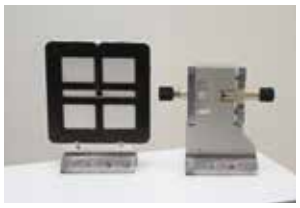
- Fast sample preparation of metals and semiconductors, ceramics and compound materials
- High accuracy target preparation of ± 0.003 mm
- Marking for sample track and trace (DMC, QR code, plain text, etc.)
- Sample preparation for FIB and broad ion beam
- TEM, X-SEM, XRM, APT and micromechanical testing



Air jet for particle removing while laser machining



Contour cutting fixture



Sample fixtures with dovetail guide

Working setup

Workpiece size	• 25 x 25 x 0.1 - 1 mm^3, volume samples on request
Alignment	• Manual work piece alignment with optical measurement system
Positioning	• Process accuracy ± 0.003 mm (XY) • Customized innovative motion concept
Sample fixtures	• Special fixtures with force setting, optional adjusted for each material and sample thickness • Contour cutting 25 x 25 x 0,5 mm^3
Processes	• Contour cutting • Laser thinning
Laser unit	• Integrated pulsed DPSS laser source • Galvanometer scanner • Power measurement on workpiece level
Software microMMI	• Software driven workflow • Intuitive menu guided touch screen operation • Recipe based process control • Multiple user concept by different user levels • Integrated data and sample management
Safety	• Laser class 1 housing with integrated control panel • Integrated exhaust system
Dimensions	• Desktop system: 750 x 800 x 400 mm^3 (L x W x H), approx. 135 kg
Consumables	• Compressed air or inert gases: 25 l/min (6 - 10 bar)
Electrical connection	• 230 V, 50/60 Hz, 8 A • 110 V, 50/60 Hz, 16 A
Options	• Upgradable as stand-alone system • Cross-section preparation/XL-Chunk™ • Various sample fixtures for different tasks and analysis techniques

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