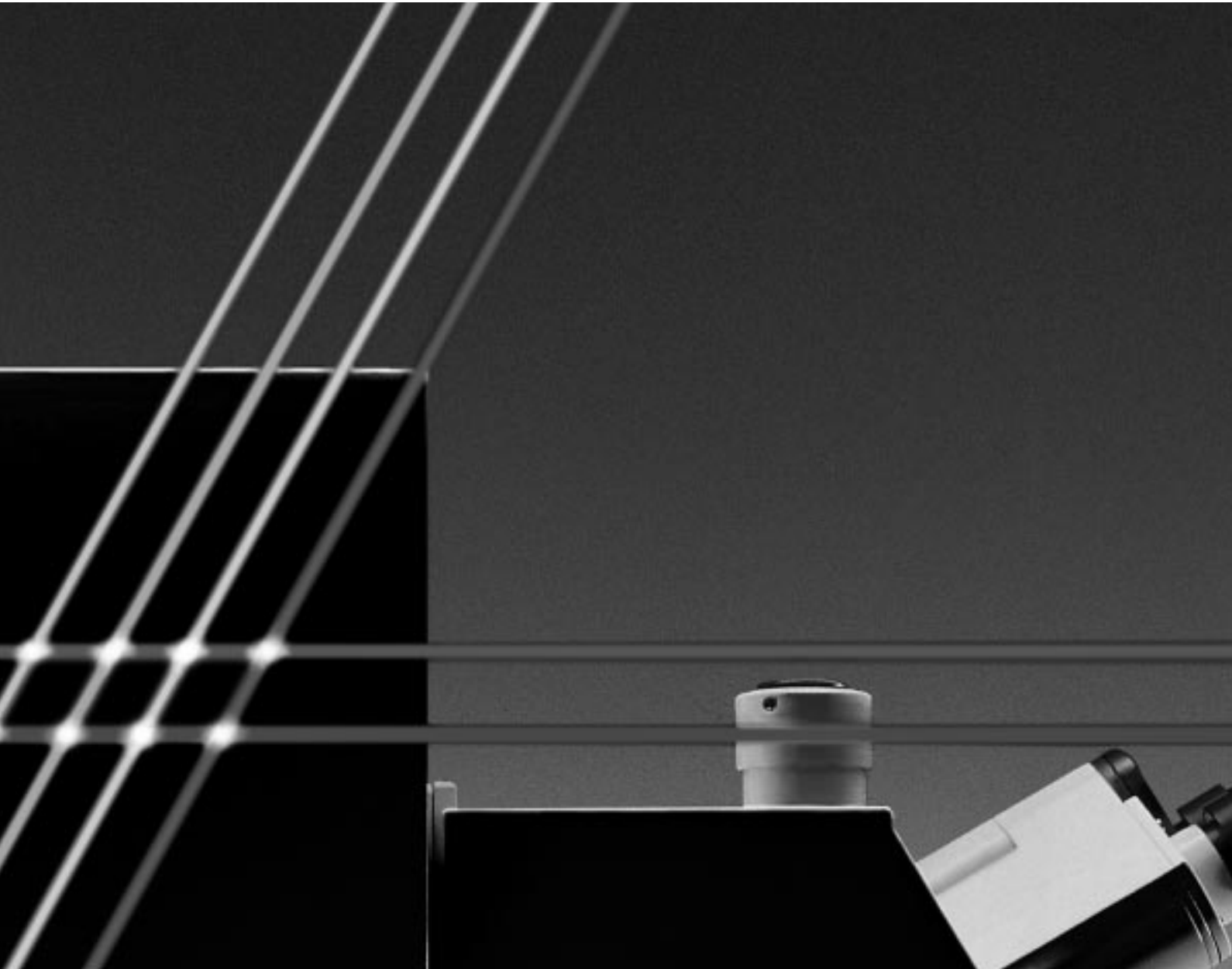


# **LSM 510**

## **Laser Scanning Microscope**



**The Confocal Materials Tester**



# LSM 510 - from the Pioneer of Laser Scanning Microscopy.

Backed by more than 150 years of innovation in optics and more than 15 years of experience in all applications of laser scanning microscopy, the **LSM 510** is the perfect synthesis of confocal microscopy and a powerful, motor-driven research microscope – either the upright Axio-plan 2 or the inverted Axiovert 100 M. Everything from Carl Zeiss.

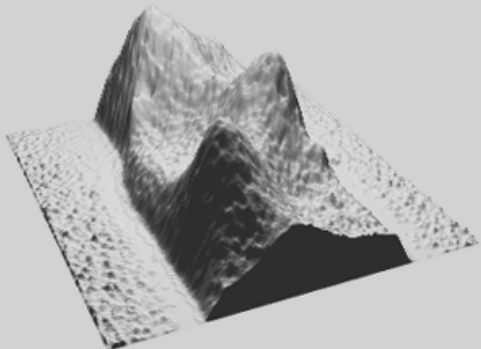
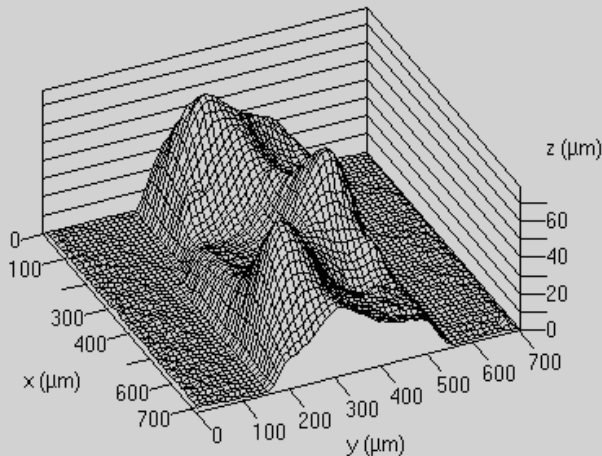
## Non-contact scanning.

The **LSM 510** opens up the third dimension to materials research and quality inspection. By reflected light, it depicts, registers and measures minute surface textures in a non-contact, non-destructive fashion. Without lengthy specimen preparation. Without requiring a high-vacuum system. Leaving your specimens or components intact. Saving time and cost.

And that is not all: The **LSM 510** makes many engineering materials reveal their microstructures in depth, down to a few hundred micrometers below the surface, thanks to autofluorescence. Where this is lacking, fluorescent markings can be applied to illuminate deep holes and microfissures.

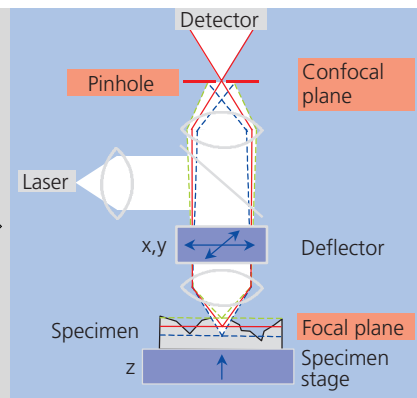
## Brilliant, laser-sharp images.

The **LSM 510** resolves no less than 2048x2048 pixels. Together with scanning fields of unbeatable size, this allows you to image even large overview pictures without losing any information. Four independent 12-bit analog-to-digital converters providing up to 4096 brightness levels give you ample control and variation capability to optimize a wide range of images.



◁ Magnetic layer, applied by silk-screen printing.  
Specimen:  
Innovent e.V. Jena  
Top: Grid presentation  
Bottom: Surface rendering

▷ Confocal beam path for reflected light (schematic)

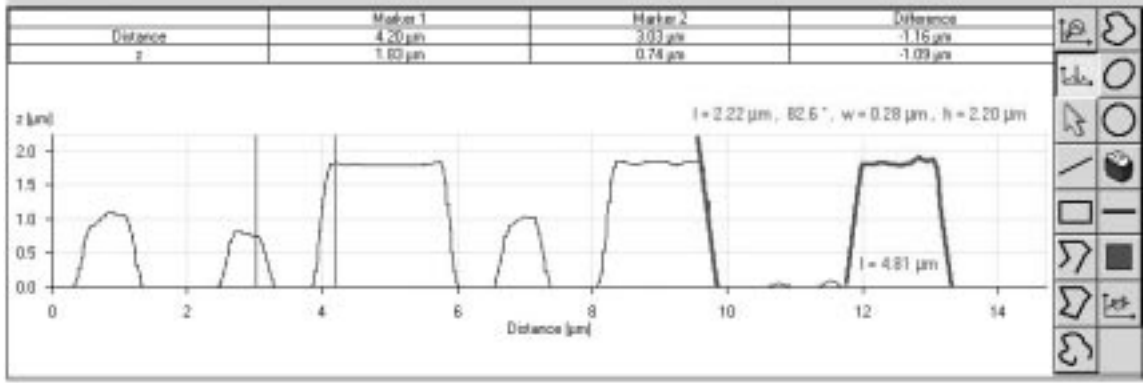




LSM 510

Axioplan 2





Profile presentation with measurement functions of the LSM 510 Topography software package

**Controlled complexity.**

The **LSM 510** comes with tailor-made software for full system control. With all controls motorized, fully automatic materials testing is exceptionally easy, and routine jobs can be performed efficiently.

To reproduce results at any time, day after day, all you need to do is to press a button.

You can save and reload a set of operating variables, including complex examination procedures.

**Operating simplicity at two levels.**

Confocal microscopy has its own laws. It is useful to know them, but if you don't, it's no problem either: The **LSM 510** software offers you two levels of operation:

The plain version of the operator interface guides you to the correct results with a minimum of instructions, graphical user prompting, and automatic setting of many parameters – the ideal tool for day-to-day routine. Simply follow the system's recommendations, or override them manually as your specimens require.

The expert level provides in-depth control for individual settings of functions and parameters – the perfect tool for the advanced user and unusual specimen structures.

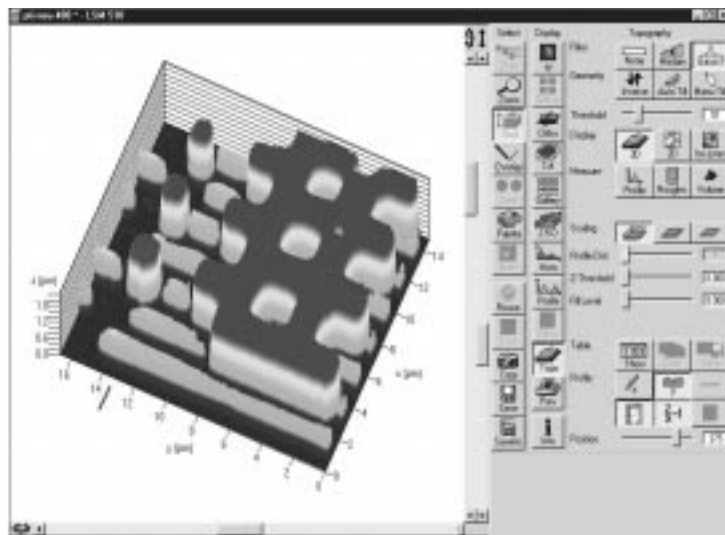
**Abundance of presentation modes, enhancements, measurements.**

The optional **LSM Topography** package converts, within seconds, a stack of confocal image slices into the type of view that reveals the most details of interest. Whether 3D or profile presentation, surface rendering or gradient mode, you can print the image out on paper or record it on film.

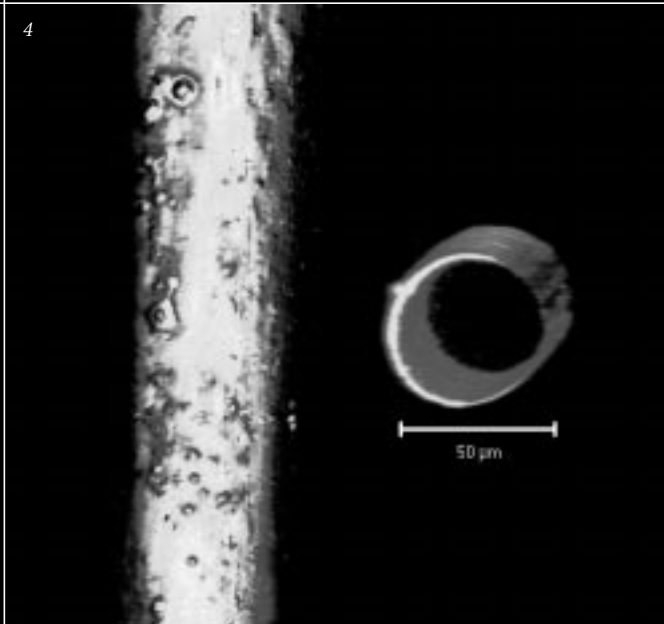
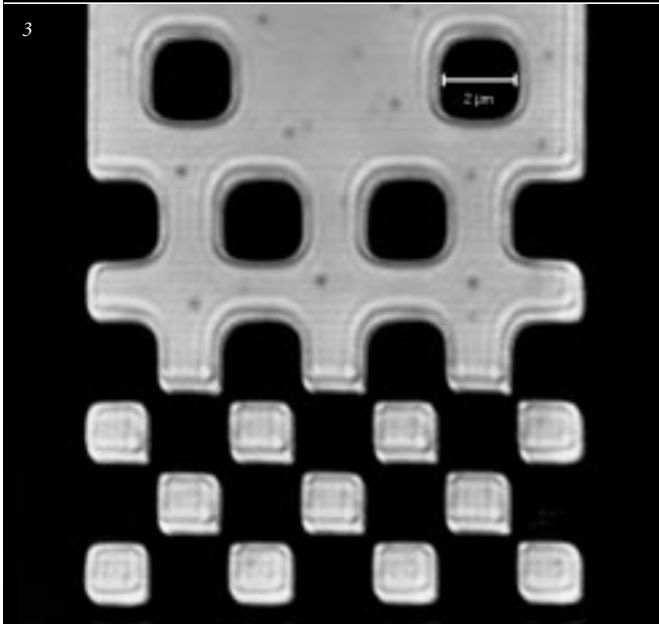
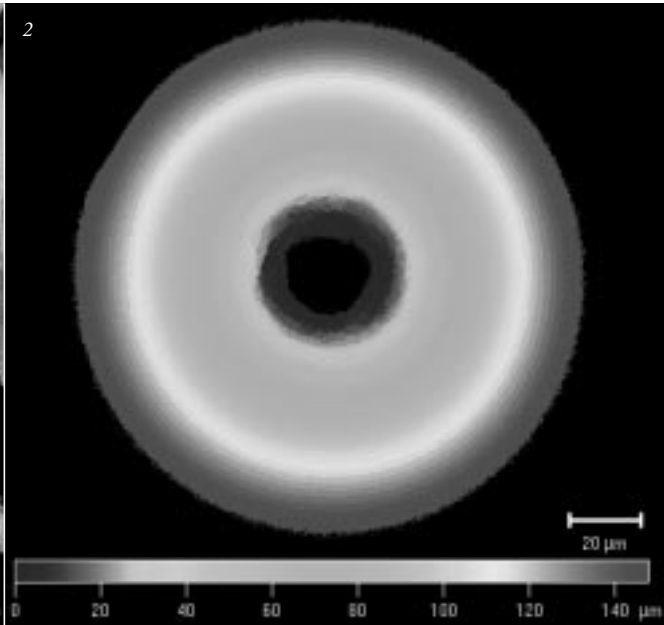
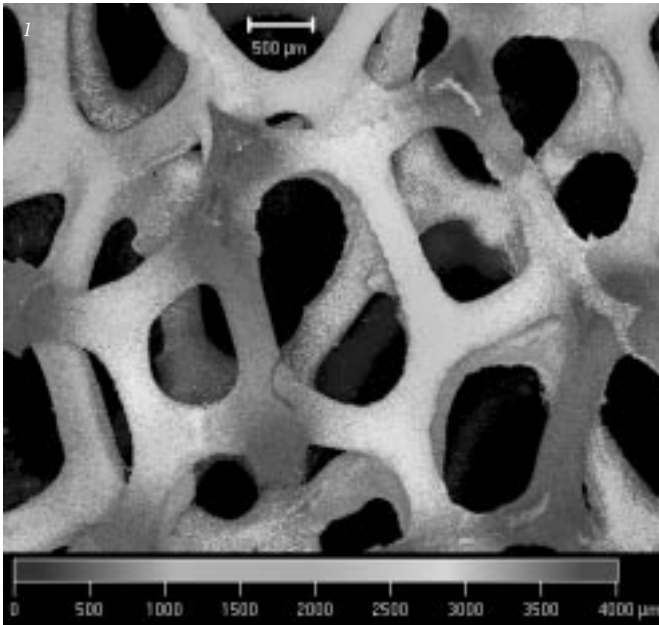
Minor corrections? No problem. Rotate, expand, invert or tilt the image. Filter it, enhance its color, convert it to black & white, or apply user-defined height color coding. Add contours, XYZ or XY scales. The choice is yours.

Once you have the optically perfect image you want, you can delve into quantitative details: Measure distances, heights, curvature radiuses, angles, areas, volume shares, roughness characteristics, ... – all of this is fully integrated in the **LSM 510** operator interface for interactive processing.

Display window and menu bar of the LSM 510 Topography software package



# LSM 510 - The Ideal Materials Tester.



1 Open-cell foam ceramics,  
height-coded presentation  
Specimen: FhG-IKTS Dresden

3 Photoresist, UV-exposed,  
projection onto a plane.  
Specimen: IPHT Jena

2 Drawing die for bond wires,  
height-coded presentation

4 Polyethylene fiber,  
left: reflected light,  
right: fluorescence

# LSM 510

## Laser Scanning Microscope.

<b>Microscopes</b>	Upright Axioplan 2 MOT or Inverted Axiovert 100 M. Stands and all accessories (ICS objectives, filters etc.) are fully compatible.
Z drive	DC servomotor with optoelectronic coding, smallest step size 100 nm
Fine focusing stage HRZ 200	High-precision galvanometric stage, focusing range $\pm 100 \mu\text{m}$ , smallest step size < 10 nm, repeatability 40 nm; permits continuous Z scans with up to 10 Hz
XY scanning stage	Motorized, range 100 mm x 100 mm, smallest step size 0.25 $\mu\text{m}$
<b>Scanning Module</b>	Two independent galvanometric scanning mirrors
Resolution	Up to 2048 x 2048 pixels
Zoom	0.7x to 8x, infinitely variable
Field size	Up to 14.4 mm (with zoom factor 1x and 1.25x/0.04 Plan-Neofluar objektive)
Detectors	Simultaneous for up to four channels, 4 PMTs for reflected light/fluorescence, 1 PMT for transmitted light, monitor diode
Pinholes	One variable pinhole each for up to four confocal channels
Dynamic range	12 bit A/D converter per detection channel
<b>VIS laser module</b>	Visual light fiber coupling, polarization-preserving single-mode fiber, thermally stabilized AOTF for beam attenuation of all visual light lasers HeNe laser 633 nm, 5 mW HeNe laser 543 nm, 1 mW Ar laser 458 nm, 488 nm, 514 nm, 25 mW ArKr laser 488 nm, 568 nm, 30 mW
<b>UV laser module</b>	UV fiber coupling, polarization-preserving single-mode fiber, UV AOTF for laser beam attenuation Ar UV laser 351 nm, 364 nm, 80 mW
<b>Electronics module</b>	Control electronics for scanning module, laser module and microscope
<b>Computer</b>	High-end INTEL® computer, ample RAM, large-capacity hard disk, high-resolution true color graphic card, large-diagonal monitor, keyboard, mouse
<b>Software</b>	Windows NT; LSM software for operating the microscope, the scanning laser modules and the scanning module, for image data acquisition, presentation, processing and archiving. Options: Topography and 3D for LSM

For further details, please contact:

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