LUMOS Stand-alone FTIR microscope with full automation

The LUMOS is an advanced FTIR microscope. It is designed to combine a clear visual inspection with outstanding infrared spectroscopic performance while providing maximum user convenience.

- Stand-alone FTIR microscope with full automation
- Easy handling and convenient workflow
- Motorized ATR crystal (ATR = Attenuated total reflection)
- Large working distance; for big and bulky samples
- Superb visual image and highest quality IR

Easy to Use - by Design.

For the LUMOS, Bruker seamlessly integrated an FTIR spectrometer into an optical microscope. It is designed to provide the user with maximum ease of use and straightforward workflow. To achieve that, all moveable components inside the LUMOS are motorized and digitally connected, resulting in unprecedented automation.

A Major Innovation - the Motorized ATR Crystal.

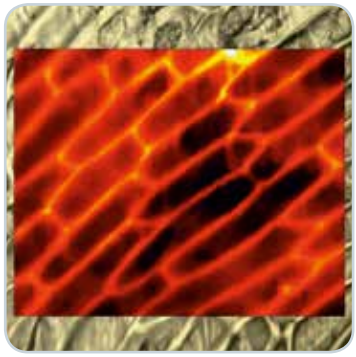
One of the most crucial LUMOS features is the motorized ATR crystal within the objective. This unique feature makes all measurements, including those in ATR mode, fully automated. The integrated pressure sensor ensures that the pressure of the crystal on the sample remains constant throughout your measurements, resulting in reliable and reproducible imaging and mapping experiments.

Working in Regulated Industries - Validation Simplified.

The LUMOS includes fully automated instrument tests for operational (OQ) and daily performance (PQ) qualification. Its software (OPUS) complies with GMP/GLP/cGMP regulations and FDA guidelines, e.g. 21 CFR p11. Instrument qualification according to the European (2.2.24), U.S. (<854>) and Japanese (2.25) pharmacopoeia is available.

The LUMOS provides plenty of working space and distance for large samples such as this halved piston from a diesel engine.

For macro sampling the LUMOS can optionally be equipped with the MACRO UNIT.



IR image shows the distribution of lipids within onion tissue.

Automation

All moveable components of the LUMOS are motorized and networked. This includes:

- ATR crystal
- Transparent knife-edge aperture
- Condenser
- Vis polarizer + Vis analyzer (option)
- X, Y-Stage (option)
- Z-drive
- Change from IR and Vis mode
- Change of numerical aperture in IR and Vis mode
- Electronic recognition of stage plates

Workflow and software

Powered by Bruker´s IR spectroscopic software OPUS, the LUMOS guides its users step-by-step through the whole measurement process. Whether data acquisition, processing, evaluation, visualization or reporting - OPUS takes FTIR to a whole new level.

Obtained data is stored into a single convenient file that contains all the information obtained during the experiment. This includes visual images, spectral data, sample information as well as data history. Even large mapping and imaging data can be easily processed directly in OPUS and many univariate and multivariate methods for data evaluation are available. You can display your IR images in 2D or 3D as well as on top or next to your sample´s visual images. For the identification of unknown components spectra can be picked individually from the IR mapping/imaging data, and compared to Bruker´s extensive spectral reference libraries.

Macro sampling

For the investigation of bulk material a MACRO UNIT can be connected to the left side of the LUMOS. To provide sampling flexibility for almost all kinds of solid, liquid and gaseous samples, various QuickSnap™ modules for transmission, diffuse and specular reflection as well as attenuated total reflection (ATR) are available.

Low cost of ownership

- Reliable permanently aligned RockSolid™ interferometer with long life time (> 10 years)
- Diode laser with long life time (> 10 years)
- Infrared light source with long life time (> 5 years)
- LED illumination
- Low energy consumption
- Purged air not required
- Compact footprint (width x depth = 30 x 52 cm)

LUMOS

The LUMOS includes an 8x objective which is used in transmission, reflection and ATR mode. In transmission and reflection the ATR crystal is retracted into the objective. For data acquisition in ATR the crystal is positioned into the IR focus by an encoded piezo drive. An integrated pressure control ensures the constancy of the pressure applied from the crystal to the sample which is essential for mapping and imaging experiments.

Bruker Optik is ISO 9001 and ISO 13485 certified.

Laser class 1 product

Technologies used are protected by one or more of the following patents:
DE102004025448; DE19940981

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