MOLECULAR SPECTROSCOPY

Nicolet Continuμm Infrared Microscope

Infrared Microscopy Excellence

Crystal-clear Visible Microscopy

Superior Purity Infrared Spectroscopy

New Dimensions in Imaging Software

Comprehensive Sampling Solutions

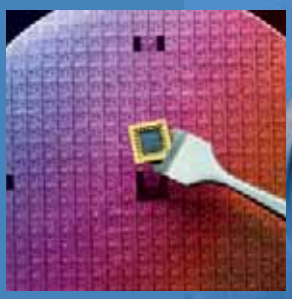
Part of Thermo Fisher Scientific

Thermo SCIENTIFIC

The Power Of Infrared Microscopy

Pharmaceuticals

Polymers



Microelectronics

Chemicals

Forensics

Packaging

Textiles

Art Restoration

Thermo Scientific: Innovative Infrared Microscopy

Thermo Fisher Scientific is your infrared microscopy partner. For decades, our innovative products have been chosen for more labs and solved more problems than any other manufacturer's. Our high-performance microscopes, combined with our powerful software and comprehensive sample preparation offerings, provide you with complete microscopy solutions. All of this, packaged with the support and the experience you expect from a world-class leader, offers you the ultimate microscope for your needs.

Your Applications

Infrared microscopy combines the power of FT-IR spectroscopy and the beauty of optical microscopy sample viewing into one convenient sampling tool. It provides visual observation of microscopic samples and chemical characterization of most organic and inorganic compounds. Infrared microscopy is one of the most useful material characterization tools to get the right answer – no matter what the application or the sample.

The characterization of micro samples is a common requirement for any quality control, analytical services or research laboratory in pharmaceuticals, polymers, packaging, coatings, chemical or textiles. Within these labs, infrared microscopy addresses many important steps in the process:

- ***Failure analysis***
- ***Product consistency verification***
- ***Reverse engineering***
- ***Research and development***

Infrared microscopy allows the measurement of bulk, surfaces, and composite structures expanding its powerful capabilities to unlimited material science applications including:

- ***Forensic analysis***
- ***Surface analysis***
- ***Art conservation***
- ***Mineralogy***
- ***Biochemistry***
- ***Homeland security***

The highest confidence in material characterization can be obtained from a wide range of samples including:

- ***Particles***
- ***Inclusions***
- ***Tissues***
- ***Liquid traces***
- ***Fibers***
- ***Laminates***
- ***Coatings***

Thermo Scientific Nicolet Continuμm Infrared Microscope

The Nicolet™ Continuμm™ infrared (IR) microscope is a research quality tool designed for today's multi-purpose labs. It provides both high-performance IR sampling and unparalleled visible-light microscopy.

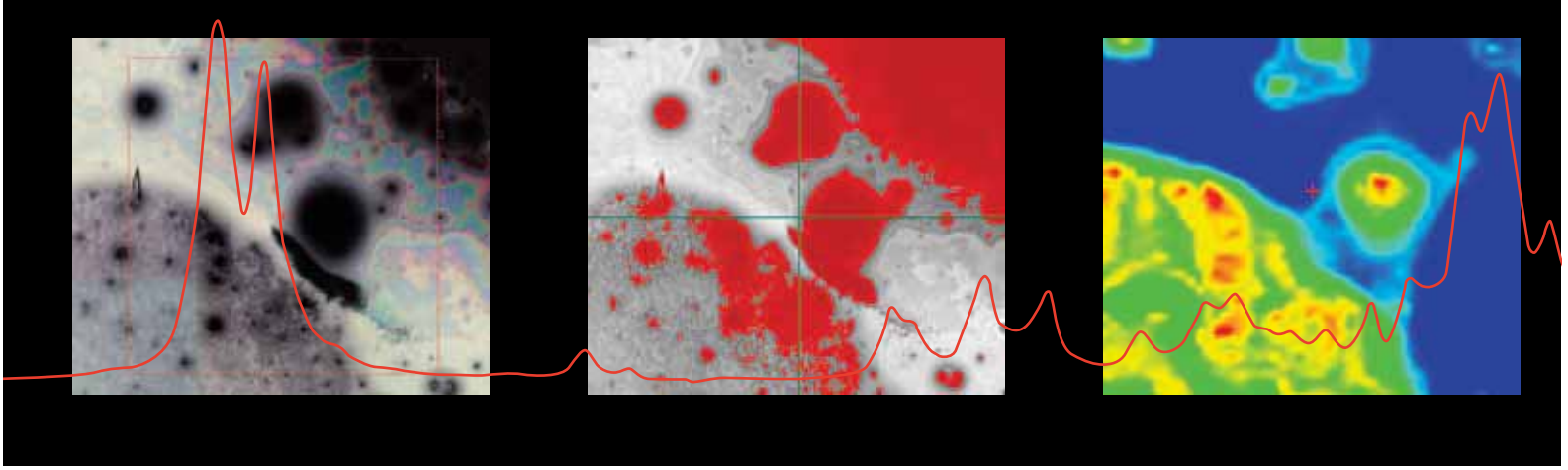
- ***Exceptional visual observation quality***
- ***Best spatial resolution***
- ***Unsurpassed spectral purity***
- ***High sensitivity***
- ***Expandability***

Accurate sampling is assured with features like Thermo Scientific TruView™, which provides a continuous view of the sample simultaneous with data collection, ensuring total confidence in forensic science studies and error-free operation in any application. The Reflex™ aperture provides redundant infrared masking, which minimizes the effects of diffraction. Optional configurations provide you with a microscope that fits the needs of your analysis at the time of purchase or enhancements whenever your needs change. The Continuμm microscope utilizes powerful sampling technology – ready to assist you in unlocking the mysteries of your sample.

FT-IR Microscopy Excellence

Thermo Fisher Scientific proudly takes you on a journey into the world of infrared microscopy…

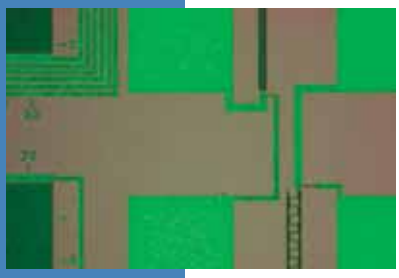
…where not seeing – is just guessing.




CONTINUUM
Thermo
DELL

UNBEATABLE PERFORMANCE

High Performance Optical Microscopy



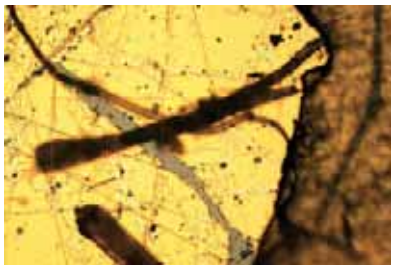
Sharp sample images are essential for revealing fine structure in both visible and infrared microscopy analysis. The Nicolet Continuμm IR microscope's optical design combines infinity-corrected optics, the finest quality optical components, and visual enhancement tools for any kind of sample.

- **Infinity Corrected Optics** – provide a uniform sharp focused image.
- **Brightfield Köhler Illumination** – provides research-grade optical microscopy viewing for reflection and transmission independently.
- **Infinity Corrected Visible Objectives** – provide multiple sample magnification, 1 micron visual resolution and perfect focus in a wide field of view.
- **Reflachromat™ Optics** – provide crystal clear and sharp images when using salt windows, support materials and compression cells.
- **Differential Interference Contrast (DIC)** – reveals the fine structure of low contrast samples with no need for staining.
- **Visible Polarization** – helps identify sample structures, crystal forms and distribution.
- **Fluorescence Illumination** – highlights sample areas active to chromophores.

Unique Range of Objectives

The Nicolet Continuμm IR microscope offers a wide selection of visible and IR/Visible objectives:

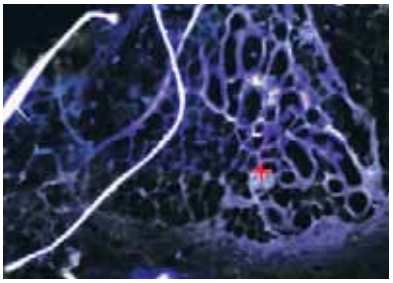
- **4X, 10X, 20X and 40X Visible Objectives** – Infinity-corrected objectives provide multiple magnification and best quality video-capturing image archiving.
- **15X Cassegrain IR/Visible Optics** – Infinity-corrected traditional IR/Visible optics.
- **15X and 32X Reflachromat Optics** – Infinity-corrected IR/Visible optics with proprietary spherical aberration compensation design.



Defect on polyester fiber textile

Video Image Capturing

The Nicolet Continuμm IR microscope uses a CCD color digital camera with USB 2.0 technology for video capturing which provides high resolution, high signal-to-noise, and the highest fidelity images of the sample's fine structure.



Fluorescence image of biological tissue

Polymer laminate (left) and scratched sample surface under DIC (right)

Images on the previous pages, respectively from left to right: video image, image analysis, and chemical imaging of adhesive and ink contaminations on a reflective substrate sample; fluorescence and DIC images of various samples, on the second page.

Jnparalleled Infrared Performance

ccurate Micro Sampling

ıe Reflachromat optics ensure perfect matching the IR/Visible beams, which is an essential step r achieving accurate and pure results. There are veral other benefits of the Nicolet Continuμm IR icroscope infrared optical design which let you hieve a superior spectral purity and spatial solution.

The Reflex aperture provides diffraction-limited ıectra by masking both the pre- and post-sample ıage with one aperture assembly.

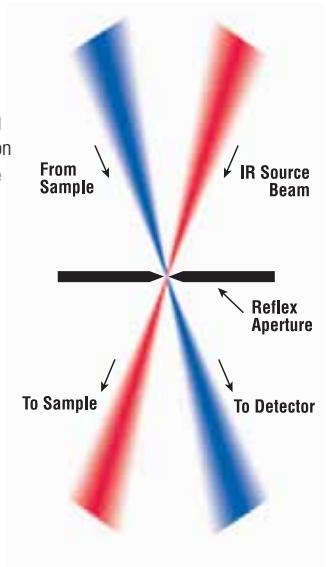
- Highest resolving power for the most challenging samples
- Easily position the aperture onto the sample image
- Redundant aperture performance through a single aperture

TruView Optics (Simultaneous View/Collect) lows the simultaneous viewing and spectral collec-ɔn of the sample providing the highest confidence your results. What you see is what you get.

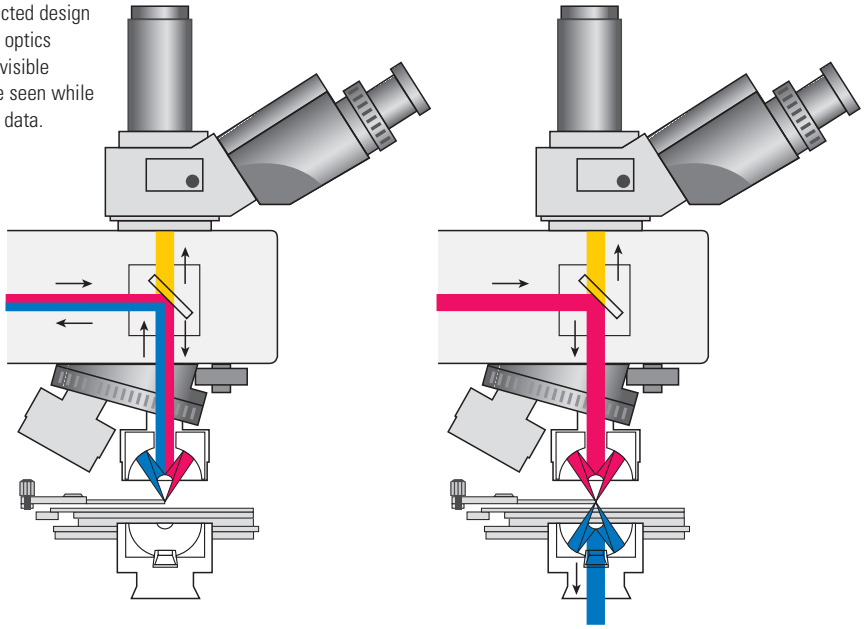
Combining TruView with the spectral collection eview mode, you can even get results "on the fly" hile moving the sample. This is the most effective ımple screening you can get from an infrared icroscope.

- Collect and view simultaneously
- Error-free operation
- Sample screening

ıal masking is hieved with a ngle physical erture – offering aximum resolution hile being simple use.

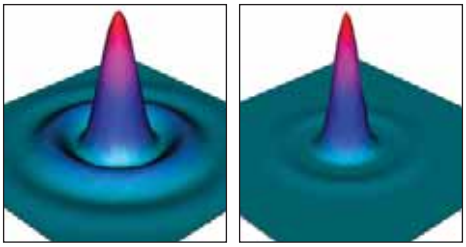


Infinity-corrected design and TruView optics allow sharp visible images to be seen while collecting IR data.

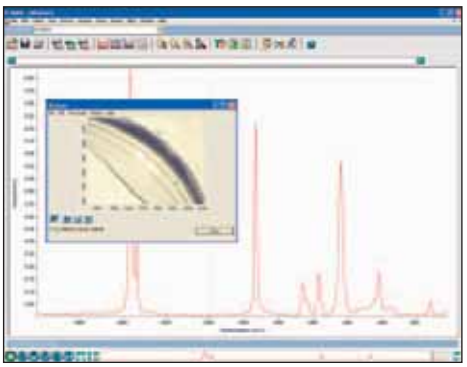


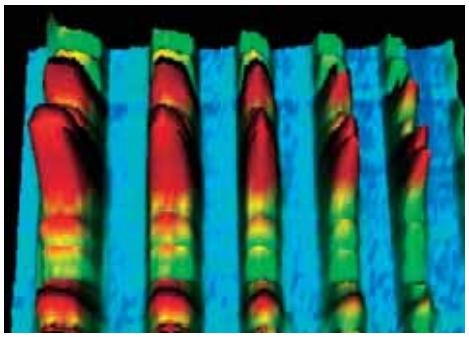
Most samples can be easily measured with 15X optics and the mid-band MCT-A detector. However, the Nicolet Continuμm IR microscope lets you increase its resolving power anytime by adding 32X optics and a 50-micron MCT-A detector for the characterization of samples smaller than 10 microns. When the spectral information in the low-frequency region is really important to fully characterize your sample, the Continuμm's dual detector stage allows you to expand the range down to 400 cm^{-1} enhancing your analytical power by adding a wide range MCT-B. This allows you to take advantage of the extended range measuring inorganics, fillers and other materials which may reveal the difference you were looking for.

- Optimize your microscope for your most frequent samples
- Increase sensitivity for very small samples
- Expand the spectral range for full sample characterization



Energy profiles of single and dual aperture designs. Dual aperture design (right) eliminates most of stray-light.





Spatial resolution achievable with the Slide-On Tip ATR Objective (Photoresist target. Latter profile < 5 μm wide)

Exceptional Versatility

- Removable Nosepiece
- Köhler Illumination for Reflection and Transmission
- Manual, Mapping and Heated Stage
- Brightfield, Darkfield and Polarized Light
- 4X, 10X, 20X and 40X Visible Objectives
- 15X and 32X IR/Visible Optics
- Slide-On ATR and ATR Objectives
- Grazing Angle Objective
- DIC and Fluorescence Illuminations
- Wide and Mid-band MCT Detectors
- 50 µm MCT and InGaAs Detectors
- Side Port Reflectance

Expand Your Sampling Capabilities

Analyze your sampling needs and find the perfect match.

ATR, Slide-On ATR, Grazing Angle, and Side Port Objectives

Versatility

The Nicolet Continuμm IR microscope's removable nosepiece provides the capability to exchange different objectives designed to best fit your sample depending on its size, shape, and thickness. Many samples can even be measured with no sample preparation.

The patented design of the Slide-On ATR Objective (U.S. Patent No. 5,172,182) allows simple in situ exchange of crystals with different materials available for specific sample types and provides the following benefits:

- Sample position reproducibility
- Easy cleaning to avoid cross-contamination
- ATR survey mode
- Cost effective, replaceable crystals
- Uncompromised transmission, reflection and ATR in a single objective
- Infinity-corrected optical design
- Proprietary spherical aberration compensation

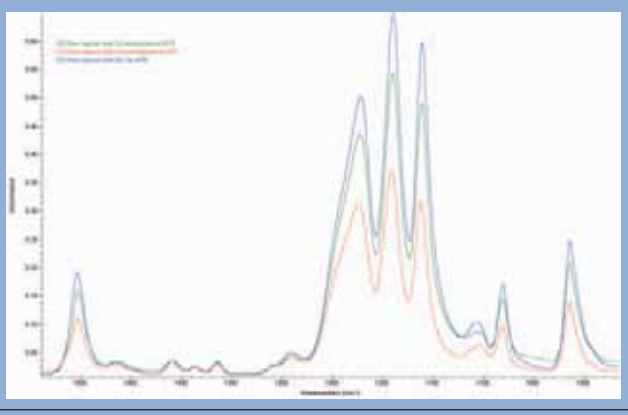
The Slide-On ATR Objective is a perfect choice for several applications including:

- Surface analysis/depth profiling
- Coatings on non-reflecting substrates
- Inclusions in resins, polymers and rubber materials
- Art and historical artifacts
- Microelectronics
- Forensics
- Defect analysis
- Residuals inside depressions

Power & Flexibility

The ATR Objective adds the power of seeing the sample through its ZnSe or diamond crystal. The grazing angle objective allows the measurement of sub-micron thickness layers, while the Side Port Reflectance Accessory (which works in conjunction with the 15X Reflachromat or the Slide-On ATR Objective) allows the measurement of large samples which will not fit on the stage.

Improve your spatial resolution with the powerful combination of the 50 micron MCT-A, 32X Reflachromat. And for imaging microscopy capabilities, add the fast mapping stage and the OMNIC™ Atlμs™ software to your configuration.



Depth of penetration of the Slide-On hemispherical and Tip ATR crystals. The Tip ATR crystal angle of incidence provides the greatest depth. The combination of the three crystals provides a depth range, depending on the sample, from 0.4 to about 0.8 micron at 2000 cm^{-1}.

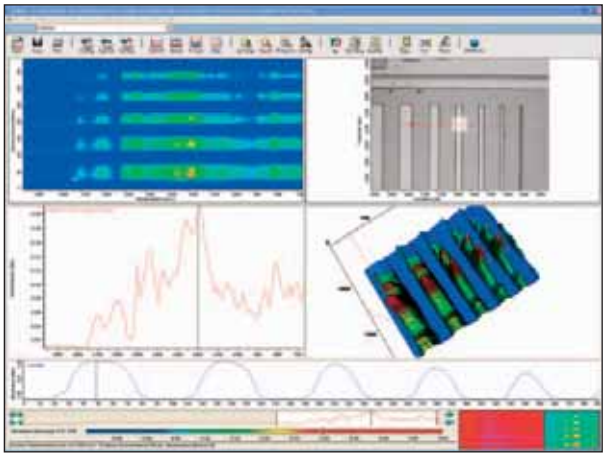
Locate, Identify And Quantify

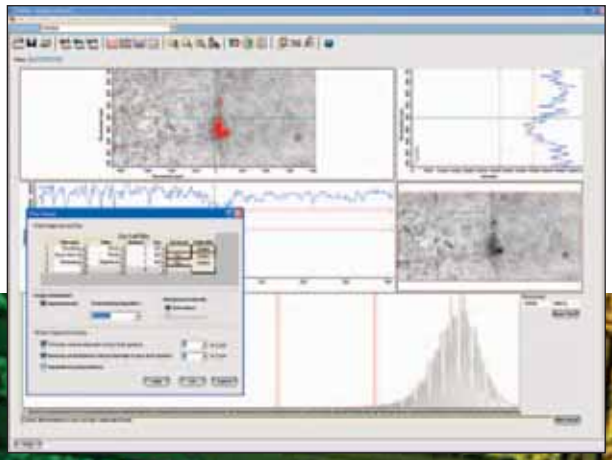
OMNIC Atlμs Imaging Software

The Nicolet Continuμm IR microscope's superior performance is completed by the exceptional capabilities of OMNIC Atlμs software and the fast mapping stage. The Nicolet Continuμm IR microscope is able to provide chemical identification, sample distribution and full sample information of physical properties.

OMNIC Atlμs software provides data collection, processing and visualization in one powerful, yet easy-to-use software package. The software is fully integrated with the OMNIC Professional Software Suite from Thermo Fisher Scientific, providing the very best in spectral manipulation, database searching and chemometrics.

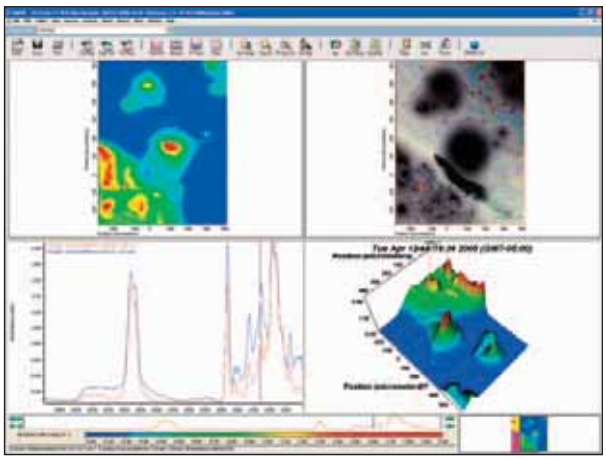
OMNIC Atlμs provides the most powerful infrared chemical imaging tools available on the market for the extraction of physical, chemical and spatial information from your sample. While image analysis is widely used in microscopy to provide dimensions, shape, and the distribution of sample features, OMNIC Atlμs extends this powerful capability by applying image analysis to both video and chemical images of the sample.





The information extracted from the video image is comparable to what can be obtained from a research-grade optical microscope. The image analysis applied to chemical images extracted from the sample provides physical and chemical information specifically for each component, including:

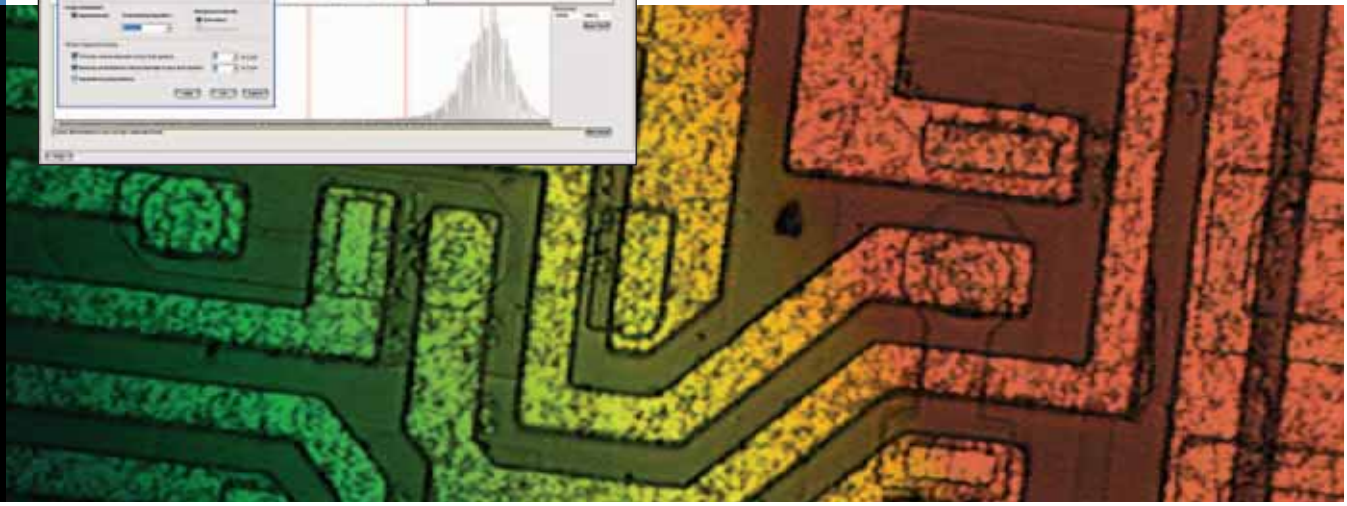
- **Number and size of sample features** – particles, fibers and irregularly shaped objects
- **Physical information** – length, diameter, area and much more
- **Image analysis of a chemical image** – specific information for each material identified in a matrix
- **Total distribution of each material** – semi-quantitative information with no need for calibration



Data acquisition includes video image mosaic collection, discrete points, line maps and area maps in reflection, transmission or ATR. OMNIC Atlμs provides contour display, 3D display, video image and spectrum pane in a seamless, combined and easy-to-use user interface.

Several data-processing tools are available for the extraction of chemical images from your area map experiments:

- **Frequency location** – just move the scroll-bar across the spectrum to get a single-frequency based chemical image in real time.
- **Functional group** – get the chemical image by available functional groups or from your own created ones.
- **Correlation** – select a reference spectrum from your area map and get its distribution in the whole area.
- **Chemometrics** – create chemical images based upon your TQ-Analyst Quant methods (PLS, CLS, and more), Principal Component Analysis or the fully unattended Multivariate Curve Resolution.



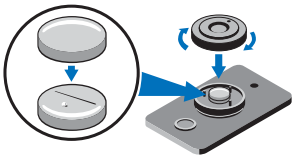
Sample Preparation Accessories

Sample preparation is the secret behind the scenes of successful infrared microscopy analysis. Some samples can be measured with no need for preparation. When preparation is required, knowing and having the right tools makes you an expert in infrared micro sampling, no matter what the sample is.

Some materials can be measured by placing them on a reflective substrate. Samples which are too thick for transmission analysis – or not ideal for ATR analysis – require compression while microscopic drops of liquid require a compatible support material. That's why we offer a wide range of tools specifically designed to let you become an expert in sample handling:

- Sample manipulation kit
- Support windows – for transmission analysis and compression cell
- Aluminum and gold coated slides with multiple spots – for particles and liquids
- Compression cell – for fibers, particles, laminates
- Diamond compression cell – for rigid or thick samples
- Diamond knife – for laminates preparation
- Diamond Micro-plane – for preparation of laminates from polymers, wood and other bulk or coatings

The Nicolet Continuμm IR microscope comes standard with a set of tools which allows you to manipulate fibers, particles, and other objects including blades, tweezers, slides, roller knife, support windows and probes.



Compression cell and fiber sample preparation

Sampling slides and fiber sample rolling preparation

No matter what your sample is...

...we can help!

Thermo Fisher Scientific – The Leader in FT-IR Microscopy

Thanks to its superior design, powerful software, and wide range of sample preparation tools, the Nicolet Continuμm is the world's leading infrared microscope. Not only do you receive a state-of-the-art microscope, but our expertise in application support offers comprehensive training to take you to the next level. First-class service and support allow you to get the most out of your microscope and samples.

The Nicolet Continuμm's unparalleled performance, combined with next generation software and superior support, is a valuable partner for your successful analysis.

In addition to these offices, Thermo Fisher Scientific maintains a network of representative organizations throughout the world.

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