Thermo Scientific Nicolet iN10 Infrared Microscope

Beyond automation – a breakthrough in infrared microscopy simplicity

The Thermo Scientific™ Nicolet™ iN™10 infrared microscope sets the benchmark for modern, productive and cost-effective infrared microanalysis. The efficient optical design of the integrated Nicolet iN10 and a novel approach to instrument operation provides users of all skill levels greater access to this valuable technique.



The Thermo Scientific Nicolet iN10 infrared microscope features an efficient optical design for optimum performance. Its integrated design allows the analysis of microscope samples without the need for an FT-IR spectrometer.

With its intuitive Thermo Scientific™ OMNIC™ Picta™ user interface, users with little prior experience in microscopy or spectroscopy are able to quickly and effectively collect sample data to characterize microscopic materials. OMNIC Picta assists users in driving to the proper sample area, while "wizard" software guides users through common processes.

Nicolet iN10 Infrared Microscope Benefits

The Nicolet iN10 is an integrated infrared microscope, where an innovative optical design and intuitive operation bring tangible benefits and cost savings to infrared microscopy. It provides the simplicity of an FT-IR spectrometer with the ability to measure samples down to a few microns. The Nicolet iN10 provides these benefits:

- Samples as small as 50 microns can be analyzed with no need for liquid nitrogen (LN), anytime, safely and at lowered operating costs.
- With no need for an FT-IR spectrometer, you save valuable laboratory space, and budget.
- Built-in intelligence minimizes the learning process, automates instrument validation, and provides chemical, physical and distribution information through easy-to-follow procedures, letting you focus on the answers.
- When speed, resolution, and more analytical power become critical, the Nicolet iN10 infrared microscope grows with you. Using an MCT detector, motorized stage or Micro ATR enables you to identify materials as small as 3 microns.
- Add the Thermo Scientific™ Nicolet™ iZ™10 FT-IR module to get full spectrometer capabilities, at minimal cost.

The superior video capturing technology built into the Nicolet iN10 microscope, the integral computer controlled automation, and the dual monitor capability, allow you to access all system settings from the computer. Even the joystick for the motorized stage is controlled through the OMNIC Picta interface, to let you save space, time and focusing on your tasks.

Configure Your Nicolet iN10 to Meet Your Requirements

- Direct contact sampling with MicroTip ATR
- Sensitivity enhancement with LN-cooled MCT detector
- Manual or motorized stage
- Best viewing comfort with dual monitor operation
- Enhanced viewing with motorized visible polarizer

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	Specification	Benefit
Sample Viewing		
Illumination	Independent reflection and transmission electronic LED illuminators, software controlled. Separate LED illumination for aperture.	Uniformly illuminated wide field of view. Allows viewing in reflection and collection of non transparent materials in transmission. Separate illumination for the aperture allows error-free operation.
Video Image	High resolution 1/3 inch color digital camera USB2 with 1024 × 768 XGA low-noise CCD. Real-time 500 micron field of view.	Crisp, vivid color, high definition video imaging and mosaic acquisition. Image can be exported to a second monitor for best viewing comfort.
Real-time IR Spectrum	Thermo Scientific™ TruView™ – simultaneous view of sample aperture positioned, even during collection	Observe sample and spectrum, without obscuration from masking aperture, in real time, for total confidence in results
Microscope Optics		
Gold Coated Optics	Gold coating of infrared beam conditioning, reflection/transmission, detectors and aperture mirrors	Superior sensitivity and maximum efficiency in any infrared sampling mode allows room temperature liquid-nitrogen free analysis
Aperture	Off-axis, rotating, motorized knife edge aperture	Computer controlled and separately illuminated, for aperture visualization before and during acquisition of data
IR/Visible Objective and Condenser	Permanently aligned 15×, 0.7 N.A. (half angle range 20° to 43.5°). Objective with built-in purge collar ring and dovetail mount for Slide-On ATR crystal. Working distance 16 mm.	High numerical aperture provides best performance with light scattering samples. No need for X-Y condenser centering; automatic focus adjustment for transmission analysis and auto-park.
Sample Thickness	Up to 20 mm with standard sample holders	Allows the analysis in reflection and ATR of samples as thick as 20 mm with no need to remove condenser. Over 20 mm samples can be measured, depending on the overall size.
ATR Option	Slide-On MicroTip Ge ATR crystal. Microscopy optimized multi-coated crystal design (throughput >50%), 27° average angle.	Precise mounting allows both ease of cleaning and accurate targeting. Enables sampling of 3 microns, or less sample-size.
Integrated FT-IR Optics		
Interferometer	Dynamically aligned high-speed interferometer. High speed collection up to 10 scans per second @ 16 cm^{-1} 0.4 cm^{-1} maximum resolution (with Nicolet iZ10 external module)	Provides best short and long-term stability, moving mirror tilt and share errors-free. High throughput for best sensitivity in any sampling mode and detector. Ultrafast collection of data.
Beamsplitter	Multi-coated KBr/germanium	Spectral range 7600–375 cm^{-1}
Infrared Source	EverGlo air-cooled long lasting source, externally mounted	High throughput and easy to replace
Optics	Sealed and desiccated, optionally purged	Dessicants and humidity indicator side panel, for easy user replacement. System can be optionally purged.
Calibration Laser	HeNe with built-in power supply	Best wavelength calibration
External Beam	Right side external beam	Allows connection to the Nicolet iZ10 module with flexible, full-size macro sampling compartment.
Detectors		
Standard	Microscopy optimized room temperature DTGS. Spectral range 7600–450 cm^{-1}	Specifically designed for infrared microscopy, allows collection of data in any sampling mode (transmission, reflection and ATR), with no need for liquid nitrogen and samples as small as 50 microns. Extended range allows analysis of inorganics and fillers.
Optional	Exclusive design liquid nitrogen cooled MCT-A. Spectral range 7800–650 cm^{-1}	Long lasting vacuum lifetime, 16 hours liquid nitrogen hold time provides, overnight acquisition of large maps. MCT allows collection of samples as small as 10 microns.

Standard sample plate with gold disc and transmission locations for automated background collection





Thermo Scientific™ ValPro™ system performance verification plate with transmission, reflection and ATR traceable standards; gold disk and transmission locations for background collection

	Specification	Benefit
Automations		
Aperture	Standard	Fully automated, computer controlled
Condenser Focus/Park	Standard	Automatic adjustment in transmission, auto-park in reflection and ATR modes to enable up to 20 mm sample thickness analysis and simplify system setup
Sample Focus	Standard	Fully automated, computer controlled
Reflection/Transmission	Standard	Fully automated, computer controlled
ATR Contact Alert	Standard	Integrated, with digital display readout of applied pressure and custom selectable threshold for highest ATR mapping uniformity
Infrared/Viewing Mode	Not required	Simultaneous view and collection through dichroic mirrors does not require automation or user selection
Detector Selection	Standard	Fully automated, computer controlled
Motorized Stage	Optional	High speed 2.75 × 5" motorized stage and virtual joystick software control provide precision and ergonomic design. Includes slide plate holder with built-in gold mirror and void position for automatic background collection in reflection and transmission.
Visible Polarizer	Optional	Fully automated, computer controlled
ValPro System Performance Verification	Optional	Fully automated, computer controlled
Stages		
Manual		Quick-release mount 2 × 3" X-Y stage
Motorized		Quick-release mount 2.75 × 5" X-Y stage (hardware joystick optionally available)
Performance Features		
Signal-to-noise @ 100 µm, 2100–2000 cm^{-1}, 4 cm^{-1} Resolution, 2 minutes	Better than 25,000:1 with cooled detector	Most samples require just few seconds of collection time. Superior sensitivity for challenging samples and smallest particles.
Spectral Range	7600–650 cm^{-1}	Mid-band MCT-A detector allows superior sensitivity in any sampling mode, and optimal spectral range
Validation and Performance Qualifications		
ASTM method	Transmission, Reflection and ATR	Ensures confidence in results, in any sampling mode in compliance to internationally accepted FT-IR performance verification method
European Pharmacopoeia Methods	Transmission, Reflection and ATR	Ensures confidence in results, in any sampling mode in compliance to European Pharmacopoeia FT-IR performance verification method
Reference Standards	NIST Traceable polystyrene standards. Standards plate in protective case and traceability documentation.	Ensure traceability to internationally accepted references
Validation Mode	Manual	Convenient validation kit, for manual stage
	Fully automated (requires motorized stage)	Validation kit and procedure for transmission and reflection operation. If ATR test is included, requires manual displacement of crystal in place and removal of background acquisition.



Dual screen operation enables you to view a full screen mosaic, zoom in and out and use the joystick while running OMNIC Picta software



Eject button and Slide-View of OMNIC Picta allow simple and fast sample loading

	Specification	Benefit
OMNIC Picta w/Manual Stage		
Real Time Spectral Preview	Preview sample spectrum, sample image and aperture, while scanning	Survey sample to find best location to collect final data; ensures results and location consistency; allows continuous sample screening while moving the stage (manual or motorized)
Real Time Preview and Search	Dynamic library searching of preview spectra	Enables real-time identification of samples, while in preview mode
Automations	Focus, condenser focus and park, dual detector, reflection/transmission, aperture, external beam, illuminations	Total control of the microscope from workstation PC
Autofocus and Autoillumination	Adjusts focus and illumination for best viewing	Lowers optimal sample viewing setting skills, increases speed
Dual Screen Operation	Allows export of the video image or the mosaic image to a second monitor. Detachable joystick interface can be exported as well.	Improves comfort in viewing and magnifies sample for easier observation of details
Infrared Energy Optimizer	Adjusts optics for infrared reflection or transmission analysis	Eliminates the need for condenser adjustment or parking by user; lowers infrared microscopy skills requirement
ATR Contact Control	Built-in pressure monitoring sensor device with custom adjustable maximum pressure	Eliminates crystal damages; standardizes the pressure applied to multiple points increasing spectral uniformity; adjustable pressure to fit wide range of samples
Polarizer Control	Motorized polarizer and motorized rotatable analyzer	(Optional) Allows insertion and control of visible polarization viewing enhancement from workstation PC
Operating System	Windows® XP or Windows 7	
Patented OMNIC Picta Wizards[1] (requires motorized stage)		
Sample Locator	Slide View navigator automatically moves sample to the focus point	Lowers microscopy skill requirements. Greatly simplifies loading and locating samples. Move directly to sample locations on common slide formats using Slide View Graphical interface.
Mapping Controls	Discrete, line and map scans	Multiple random points, cross sections and areas map collection. No need to specify reference location for reflection or transmission background collection minimizes infrared microscopy skill requirements.
Particle Wizard	Measures particle(s) size, sets best fit aperture, collects spectrum and background, search spectrum against library	Provides material identification, size, percentage of distribution and chemical image of particles within an area, automatically. Simplifies particle analysis for any type of use.
Inclusions Wizard	Similar to particle analyzer but designed to remove spectral contribution from embedding material	Minimizes or removes the need for delamination or particles extraction from bulk. Improves microscope usability lowering skills requirement.
Random Mixtures Wizard	Extracts multiple chemical maps from a raw map	Provides self extraction of distribution information of multiple materials within an area. Displays material identification, total area and distribution, for each material identified. Enables chemical mapping usability to any type of user.
Laminates Wizard	Applicable to line maps, identifies layers and calculates thicknesses by spectral match	Provides thickness and material identification of laminates and paint chips by chemical properties. In conjunction with image analysis, provides dual thickness confirmation (video image and chemical image).
Other		
Power Requirements	100–240 V AC 47–63 Hz 3.2 amp.	
Regulatory Approvals	CE ETL	
Dimensions	622 mm × 653 mm × 533 mm (W × D × H)	
Warranty	12 month, full warranty, complete system	

1. U.S. Patent No. 7,496,220

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PS51510_E 06/13M