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NEXXUS

FULLY INTEGRATED FT-IR SPECTROMETERS



Thermo Nicolet

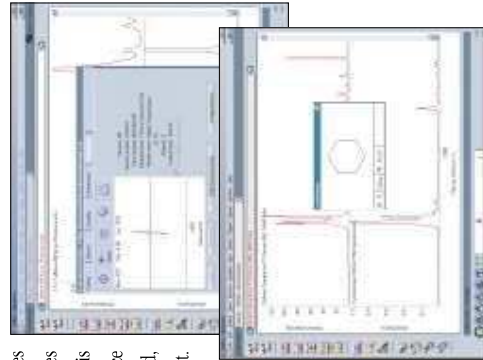
The Truly Smart System



The Thermo Nicolet Nexus[®] spectrometers are the highest performance Fourier transform infrared (FT-IR) systems available. Design excellence and smart system components are the keys. Thermo Nicolet has paid special attention to every detail of the Nexus spectrometer to make all of your analyses as hassle-free as possible. Nexus ensures reproducible results because the baseplate is precision cast, the optics are pinned in place and the major components are optimized, user-replaceable and always in alignment.

Nexus provides real-time feedback on all aspects of sample analysis with Thermo Nicolet's exclusive Enhanced Synchronization Protocol (E.S.P.) technology.

These Nexus advantages allow the system to achieve amazing levels of stability and reproducibility over time, while maintaining flexibility and upgradability.



Superior Optics

All Nexus spectrometers can be configured for multiple spectral ranges, giving you complete experimental flexibility.

- Far-IR
 - Mid-IR
 - Near-IR
 - UV-Visible
- Plus, Nexus uses computer-based expertise to recognize when you change an optical component. It automatically updates spectral ranges, sensitivity and experimental parameters, providing fast turnaround time between experiments.



Smart Beamsplitters

The Nexus spectrometer automatically recognizes which beamsplitter is installed as soon as it is inserted into the interferometer. The Nexus system aligns it for optimum performance and sets the instrument parameters for the correct spectral range. Thermo Nicolet's unique beamsplitter options allow you to sample from the near-infrared to the far-infrared using just two beamsplitters — the exclusive XT-KBR[™] beamsplitter from 11000 - 375 cm⁻¹ and the patented far-infrared Solid Substrate beamsplitter down to 20 cm⁻¹. Measuring across multiple spectral ranges has never been easier!



Smart Detectors

The Nexus smart system also recognizes which detectors have been installed and where they are located. Electrical connection is made as soon as the detector is plugged into the pinned detector position, and the correct beam path is set automatically. There are no switches, adjustments or changes required to the hardware or software for the detector to be ready to use. Plus, Thermo Nicolet offers the widest range of standard and custom detectors for any FT-IR application. Changing, adding or moving detectors is a snap!



External Beam Options

Up to five external beams are available on every Nexus spectrometer allowing for left-, right- and front-mounted accessories and detectors, along with an emission port. All external beam mirrors are motorized and controlled through the software allowing for rapid reconfiguration of the system.



Environmental Options

The Nexus offers a purge option and a sealed and desiccated option to meet the needs of your climate, laboratory environment and sample type. The unique Nexus Smart Purge option optimizes and speeds up purge recovery without requiring you to close off manual purge ports. Smart Purge senses when you are changing samples and automatically turns up the purge. This ensures more rapid recovery of purge — in a few seconds!



Smart Accessories[™]

Snap a Smart Accessory into your Nexus and you will find uncompromising sampling performance. Using innovative technology unique to Thermo Nicolet spectrometers, Smart Accessories provide the highest optical throughput and sampling flexibility. Smart Accessories are pinned in place and permanently aligned, ensuring your results are reliable and reproducible. The smart system automatically recognizes the accessory and loads the correct operating parameters for your unique experiment. It then performs a set of quality checks to verify that the accessory and system are working optimally. There is a Smart Accessory for almost any sampling need:



- Transmission
- Diffuse reflectance
- Single bounce ATR
- Multiple bounce ATR
- Mid-IR fiber optics
- Near-IR fiber optics
- Corrosive-resistant HAIR
- Research-grade HAIR
- Research-grade diffuse reflectance
- Near-IR diffuse reflectance
- Diamond crystal HAIR
- Specular reflectance



Smart Accessories are the cornerstones to successful sample handling. Thermo Nicolet's Smart Accessory standard is supported by major accessory vendors including Thermo Spectra-Tech.

Intuitive Interaction

Sampling Ergonomics

Thermo Nicolet takes great pride in showing you what's under the cover of the finest FT-IR spectrometer available.



Form and Function

Superior Performance By Design

SPECTRA 3000 PERFORMANCE COMPARISON

Parameter	Artisan Technology Group	Other
Dynamic Alignment	Yes	No
High Throughput	Yes	No
Smart Beam Splitters	Yes	No
Smart Detectors	Yes	No
Smart Sources	Yes	No
Smart Cast Optics	Yes	No
Smart Software	Yes	No
Smart Accessories	Yes	No
High Performance Interferometer - Dynamic Alignment	Yes	No
System Validation	Yes	No
High Performance Electronics	Yes	No
Smart Beam Splitters	Yes	No
Smart Cast Optics	Yes	No
Smart Software	Yes	No
Smart Sources	Yes	No
Smart Detectors	Yes	No
Smart Accessories	Yes	No
High Performance Interferometer - Dynamic Alignment	Yes	No

HIGH PERFORMANCE ELECTRONICS

- High speed, digital signal processing (DSP) controlled
- Highly reprogrammable
- Energy efficient

SYSTEM VALIDATION

- Automated and manual system validation using built-in test programs
- Non-volatile spectral history files, log files, and report notebooks

VESTRIA-PIEZO TECHNOLOGY

- Best performance in the industry
- Better than 0.2 mm positional stability
- 5 to 1,000 Hz phase modulation
- 65 to 5.5 MHz phase modulation amplitude

SMART BEAM SPLITTERS

- Beam splitter auto-recognition
- Beam splitter range
- Beam splitter alignment
- A variety of beam splitter options for full spectral range coverage
- Long beam splitters in less than 15 seconds

HIGH PERFORMANCE INTERFEROMETER - DYNAMIC ALIGNMENT

- Dynamic alignment - a MUST for research FTIR
- Exceptional high-resolution line shapes
- Superior long term and short term stability
- Easy beam splitter interchange mechanisms
- Advanced diagnostics for peak performance

SMART ACCESSORIES

- Accommodates all commercially available accessories
- Smart large sweep sample environment cable during dynamic alignment
- Automatic accessory recognition and experiment setup
- High throughput, high performance Spectra 3000
- Spectral quality checks on every sample (system)
- Multimodal materials and training

STANDARD ACCESSORIES

- Accommodates all commercially available accessories
- Smart large sweep sample environment cable during dynamic alignment
- Compatible with Thermo Spectra 3000 accessories for the added benefit of accessory recognition
- Multimodal materials and training

SMART DETECTORS

- Automatic detector recognition and beam path setup in any configuration
- Detectors for all applications: Mid IR, Near IR, FTIR, IVHS
- Robust, high performance, stainless steel design, "box top" design, 18-hour hold time

SMART SOURCES

- More efficient fiber water cooled sources
- Highest optical throughput
- Longest lifetime (five-year warranty)

PRECISION CAST OPTICS

- Pinpoint in place - no adjustments or glue
- Automatic optimization of optical signal
- Installation, testing and optimization of any geometry in less than 15 seconds
- Up to five external beam ports

SYSTEM SOFTWARE

- Windows computer driver
- Windows 95, 98, ME, NT, 2000
- Network compatible
- Universal and flexible OS/UNIX software
- Intuitive interface

MANUFACTURING EXCELLENCE

- 100,000 verified designs and manufactured hardware and software
- More than 10,000 installed FTIR systems worldwide

CONTINUING SUPPORT

- Maintenance contracts
- Validation programs
- A variety of training options
- Internet support
- Continuously trained field service experts

Exceptional Sensitivity

Flexibility & Upgradeability



The Nexus spectrometer has full upgrade potential. Thermo Nicolet is the only FT-IR spectrometer manufacturer who can offer you true upgradeability from the basic unit to a fully loaded advanced research system at any time as your needs change.

This is possible because all Nexus spectrometers share a common optics and electronics platform. Start with the basic Nexus spectrometer, and when your needs grow, you can add multiple beamsplitters, detectors and sources for expanded spectral range. You can add microscopy, gas chromatography/FT-IR (GC/FT-IR), thermogravimetric analysis/FT-IR (TGA/FT-IR), FT-Raman and polarization modulation (PEM module) capability. You can even add step scan capabilities to your system for advanced applications such as time resolved spectroscopy (TRS), dynamic polymer rheology and phase modulation photoacoustic spectral (PAS) depth profiling.

External and Advanced Experiment Options

- Infrared Microscopy
- FT-Raman
- GC/FT-IR
- TGA/FT-IR
- PEM module (IRRAS, VCD, VLD)
- Step Scan
- *in situ* TRS
- Phase modulation PAS
- Sample modulation (polymer stretching)



Every Nexus spectrometer can take advantage of all advanced capabilities available, whether part of the original system configuration or added at a later date

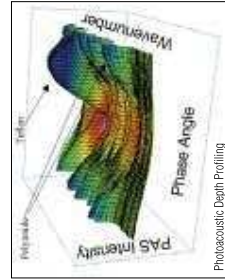
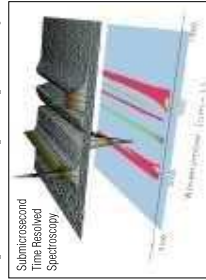


Advanced Applications

The Nexus 870 incorporates the highest performance interferometer available in the industry. The new enhanced Vectra-Piezo™ interferometer is a unique design that is superior for both linear scan and step scan experiments. For kinetics applications, the Nexus 870 spectrometer can reach speeds up to 75 spectra/sec at 16 cm⁻¹.

The design of the Vectra-Piezo interferometer is optimized for both time-resolved and phase-resolved step scan experiments. The piezoelectric transducer driven phase modulation provides optimal performance for photoacoustic depth profiling and dynamic polymer rheology experiments. Integrated DSP demodulation provides up to six channels of information from a single experiment without requiring any expensive lock-in amplifiers.

During step scan, the Vectra-Piezo moving mirror has the best positional accuracy in the industry. This accuracy is critical for time-resolved, amplitude modulation, phase modulation and sample modulation step scan experiments where precise positioning of the moving mirror is critical to the ultimate signal-to-noise ratio of the experiment. Unlike traditional air-bearing interferometers that are highly sensitive to external vibrations, the Vectra-Piezo is nearly immune to normal laboratory vibrations and acoustic noise. Thus, the Vectra-Piezo can be used for the most sensitive step scan experiments without requiring an expensive optical table.



Best Performance in the Industry

- Unrivalled mirror position stability
- Piezo-driven phase modulation
- Multi-channel integrated DSP demodulation
- Rapid scanning to 75 spectra/sec
- Time-resolved to <10 nsec
- Photoacoustic depth profiling
- Dynamic polymer rheology



Components, such as the laser, source and detectors, are user-changeable and pre-aligned. This maximizes flexibility, reduces the cost of system maintenance and eliminates complicated alignment.

86% of the S&P 500 companies that use FT-IR have chosen Thermo Nicolet.

"Thermo Nicolet's FT-IR technology has allowed us to use infrared spectroscopy for quantitative analysis for the very first time. This largely came about because of the incredible reproducibility of the data."

"Instrument flexibility is very important to me. I view accessories as tools in my toolbox. Since I never know what new problems I am going to be faced with each day, I value the ability to choose whatever tool I need to get the job done."

"The Thermo Nicolet TQ Analyst™ software is by far the best quantitative analysis tool in the industry."

"I have been a Thermo Nicolet customer for more than 17 years. Thermo Nicolet has always provided me with the best equipment available to solve my problems."

"My company has more than 75 standard IR methods that are used on a daily basis for quality control. The advanced macro writing capability of OMNIC software allows us to program complete methods with ease and total control."

"Last year we upgraded our spectroscopic capabilities to include step scan for photoacoustic depth profiling, PM-IRRAS and the Continuum™ microscope."

More Sampling Options



For over 30 years, Thermo Nicolet has led the way in providing high-performance, high-quality FT-IR spectrometers for analytical and research laboratories. With more than 10,000 installed FT-IR spectrometers and an unparalleled reputation, it is no surprise that Thermo Nicolet is rated the best FT-IR company for –

- ▶ *High quality*
- ▶ *Trusted service and support*
- ▶ *Reliability and durability*
- ▶ *Ease of use of its instruments*
- ▶ *Design innovation*
- ▶ *Superior instrument performance*

The Nexus combines Thermo Nicolet's expertise in FT-IR with our innovative smart system approach to help you be faster and more productive, and to provide you with the best answers to your analysis questions.

Nexus \nek-ses\ n., **1.** A means of connection, link or tie. **2.** A connected series or group. [Lat. nectere, to bind]

Thermo Nicolet

Thermo Nicolet has direct subsidiary offices in North America, Europe and Japan.

To complement these direct subsidiaries, Thermo Nicolet maintains a network of representative organizations throughout the world.

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