

Spectrum IR Series

for Mid-, Near- and Far-Infrared Spectroscopy



the **winning platform**

from simple analysis to advanced research solutions

Raise your IR expectations.



Choose Performance and Quality to Put Your Lab on Top

Known worldwide for the most successful analytical FT-IR series, PerkinElmer is at the forefront of superior IR technology. And the Spectrum IR Series of instruments and accessories is no exception. Now with the latest enhancements to this benchmark platform, Spectrum extends its capabilities into even more advanced, more demanding applications. So whether your lab specializes in QA/QC troubleshooting or is more focused on research, you can count on more reliable, consistent, reproducible results.

Choose the Spectrum configuration best suited to your application need.

Spectrum 100 FT-IR

The industry standard in laboratory IR

Spectrum 100N FT-NIR

For high-performance NIR testing

Spectrum 100 Optica

A unique instrument designed for measurements requiring the highest ordinate accuracy

Spectrum 400 mid- and near-IR

A single optical bench combination of all the benefits from the Spectrum 100 with the Spectrum 100N

Spectrum 400 mid- and far-IR

A full-featured FT-IR system with advanced far-IR capability

You and PerkinElmer. A winning combination.



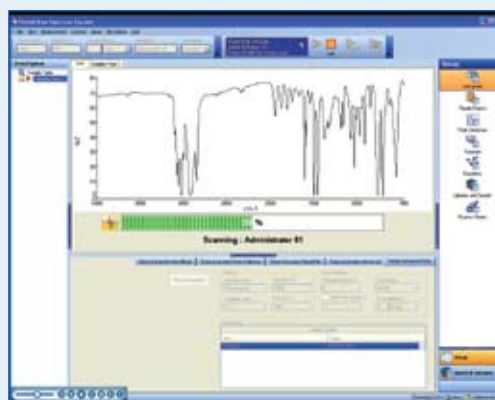
Rely on Acclaimed Spectrum Platform Technology – for All Your Applications

Choose the Spectrum™ Series of mid-, near- and far-IR Fourier Transform spectrometers for its superior spectroscopic performance and design quality. And stay with this winning platform for dependable, consistent, trouble-free operation through years of service. From material identification, quantitative analysis, through advanced applications, the Spectrum Series' comprehensive software suite allows you to focus on what matters most – results.



Chemicals and Materials

- Confirm identity of incoming raw materials
- Identify product contaminants
- Troubleshoot problems in manufacturing or in the field
- Realize cost-effective QA method development from raw material to final product inspection
- Gain a better understanding of the properties of advanced materials, with a wide range of sampling options

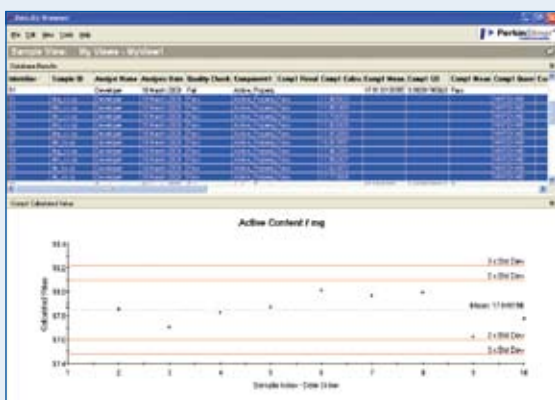


The new Spectrum Express™ software has a powerful, intuitive interface allowing users to easily acquire data. The powerful Process Chain functionality allows for even complex data processing to be simplified to a single mouse click.



Pharmaceuticals

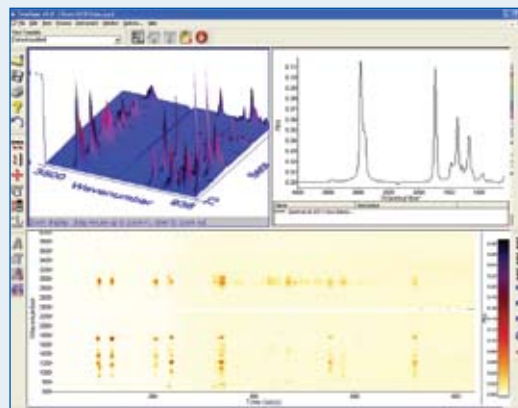
- Check identity and quality of raw materials, intermediates and final product manufacturing
- Handle all troubleshooting and counterfeit studies with a huge toolbox of software tools and sampling accessories
- Facilitate rollout of methods to your manufacturing sites through excellent method transferability and reduced training costs
- Control product quality from formulation development through in-process batch conformity
- Exceed all FDA technical requirements for 21 CFR Part 11 compliance



AssureID™ is the industry-leading workflow acquisition and analysis interface with results charting and full 21 CFR Part 11 compliance option. This software interface is the most powerful solution for QA/QC screening and qualification.

Academia and Research

- Combine with complex experimental setups using auxiliary input beam and extended beam option
- Quickly reconfigure the flexible design for multiple areas of research or more than one research group
- Enjoy ease of use with software ideal for students, researchers and technicians
- Perform reaction monitoring using fast-scanning capabilities
- Conduct the most challenging research projects, with high sensitivity and extremely high stability
- Perform far-IR characterization of synthesized materials, semiconductors and novel materials



Research applications are supported by Spectrum, Timebase™ and SpectrumImage™ packages. This powerful data acquisition and processing suite covers all your research needs.

Spectrum 100/100N FT-IR

NIR

IR

Trusted Performance for All Your Materials Verification and Identification Needs

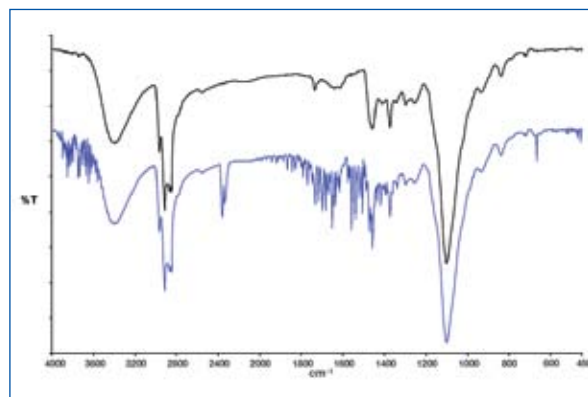
The combination of software and advanced engineering delivers ease of use and performance to address even the most demanding applications, making the Spectrum 100 the most successful FT-IR spectrometer ever. And if you need the flexibility of a dual-range instrument or your lab is involved with advanced research, you can feel confident selecting the 400 series to deliver the same proven platform as the celebrated 100 platform.

Benchmark-quality results and reproducibility

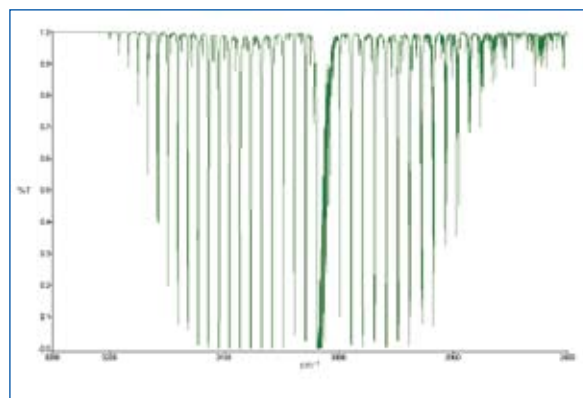
- Kinematically mounted optics ensure perfect optical alignment, delivering consistent results
- Built-in intelligence to control and monitor measurements, alerting the user to potential analysis errors
- Precision-engineered, rugged zero-alignment sampling accessories with automatic self-test routines reduce inconsistencies due to sampling or operator errors
- Patented, advanced atmospheric compensation algorithm removes spectral interferences due to H_2O and CO_2 , increasing the reproducibility of spectral data and minimizing purge requirements

Unmatched ease of use brings increased productivity to your laboratory

- LCD display, Go Button and sample table functionality allow users to analyze multiple samples conveniently and at the instrument
- Using mouse, keyboard or barcode input, configurable intelligent software provides an easy-to-use interface that minimizes training and ensures consistent operation day-to-day and user-to-user
- Smart, zero-alignment modular accessories are quickly interchangeable, maximizing instrument uptime
- Industry-leading AssureID software enables simple workflow-driven operation for even the most demanding applications
- Choice of internal or external diffuse reflectance (NIRA) for increased sampling flexibility



Atmospheric Vapor Compensation (AVC) software was pioneered with the Spectrum 100. Our unique advanced algorithm does not require the collection of reference spectra for effective real-time water vapor suppression and operates over varying resolutions and instrument settings.



The benefits of improved wavelength precision using internal HeNe laser referencing are uniquely extended to wavelength accuracy and lineshape using an improved patented gas-phase spectral referencing system – Absolute Virtual Instrument.

Reliability for peace of mind

- Fixed mirror-pair interferometer design is immune to the effects of tilt and shear present in commercial instruments that incorporate a linear moving mirror construction
- Field-proven interferometer design incorporates a simple, non-critical bearing for unmatched interferometer longevity and reliability
- Electronically stabilized source hot spot increases long-term measurement stability and source longevity

Powerful product and process troubleshooting

- A wide range of sampling accessories provides the flexibility to measure almost any solid, liquid, powder or paste across the whole mid-/near-IR range
- Choice of high-performance IR microscopes allows identification of tiny impurities in virtually any matrix

Rapid characterization of new materials

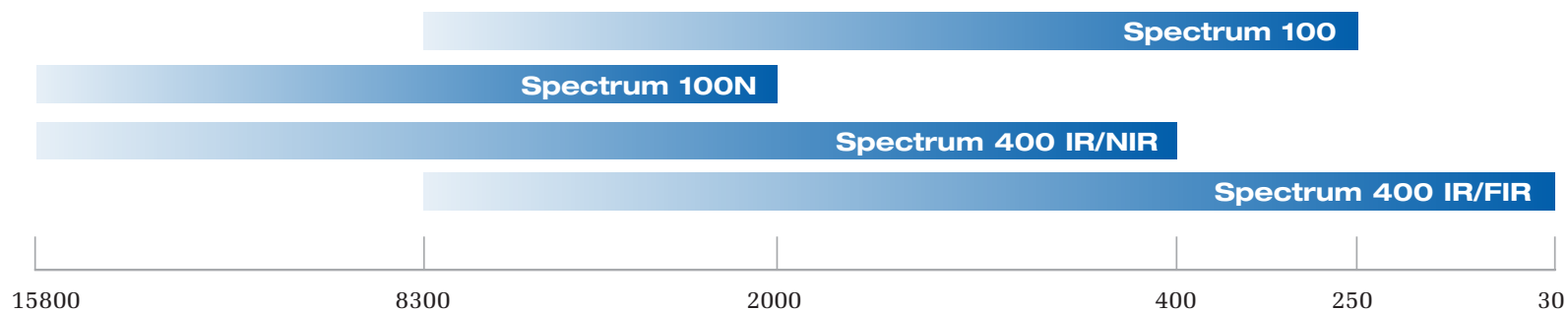
- A range of software tools, including automatic spectral interpretation, library searching and unique COMPARE™ algorithms with PASS/FAIL output, allows materials to be identified quickly and easily

- Fast scanning enables reaction kinetics and manufacturing processes to be studied
- High-performance mid- and near-IR imaging options provide rapid characterization of product formulations in a large range of samples including polymers, biomaterials and pharmaceutical formulations
- Simple, powerful AssureID intelligent method development software increases productivity

Advanced system design throughout the Spectrum Series ensures performance is second to none

- State-of-the-art digital signal processing reduces signal artifacts and improves response linearity, providing the highest level of spectroscopic performance
- Exclusive optics maximize source output, increasing signal-to-noise ratio without sacrificing source lifetime
- High-quality, low-angle, aspheric off-axis optics minimize aberrations and provide the highest optical efficiency for the most demanding measurements

Choose from the winning Spectrum Series and gain a system that is scalable, upgradeable and equipped for all your future needs.



Our dual-range instruments offer all of the features and benefits of the Spectrum 100 series, and more.

Spectrum 400 FT-IR/FT-NIR

NIR

IR

Dual Range for Optimized Method Development and Materials Testing

Unlike single beamsplitter systems, the Spectrum 400 delivers unmatched mid-IR and near-IR performance in a single instrument without compromise.

With the Spectrum 400 you can

- Increase your lab's productivity with the best of both mid-IR and near-IR
- Lower the cost of acquiring two instruments, reduce training and save valuable bench space
- Leverage faster method development and enjoy more robust testing procedures with an extensive suite of software

Productive, reliable materials characterization and method development

- Mid- and near-IR methods on a common platform help in comparing and selecting the most suitable sampling techniques and measurement conditions for the application
- Automated setup and range switching enable you to quickly move onto your next sample without manual reconfiguration

Spectrum 400 FT-IR/FT-FIR

IR

FIR

Flexible and Expandable Performance for Advanced Industrial and Research Labs

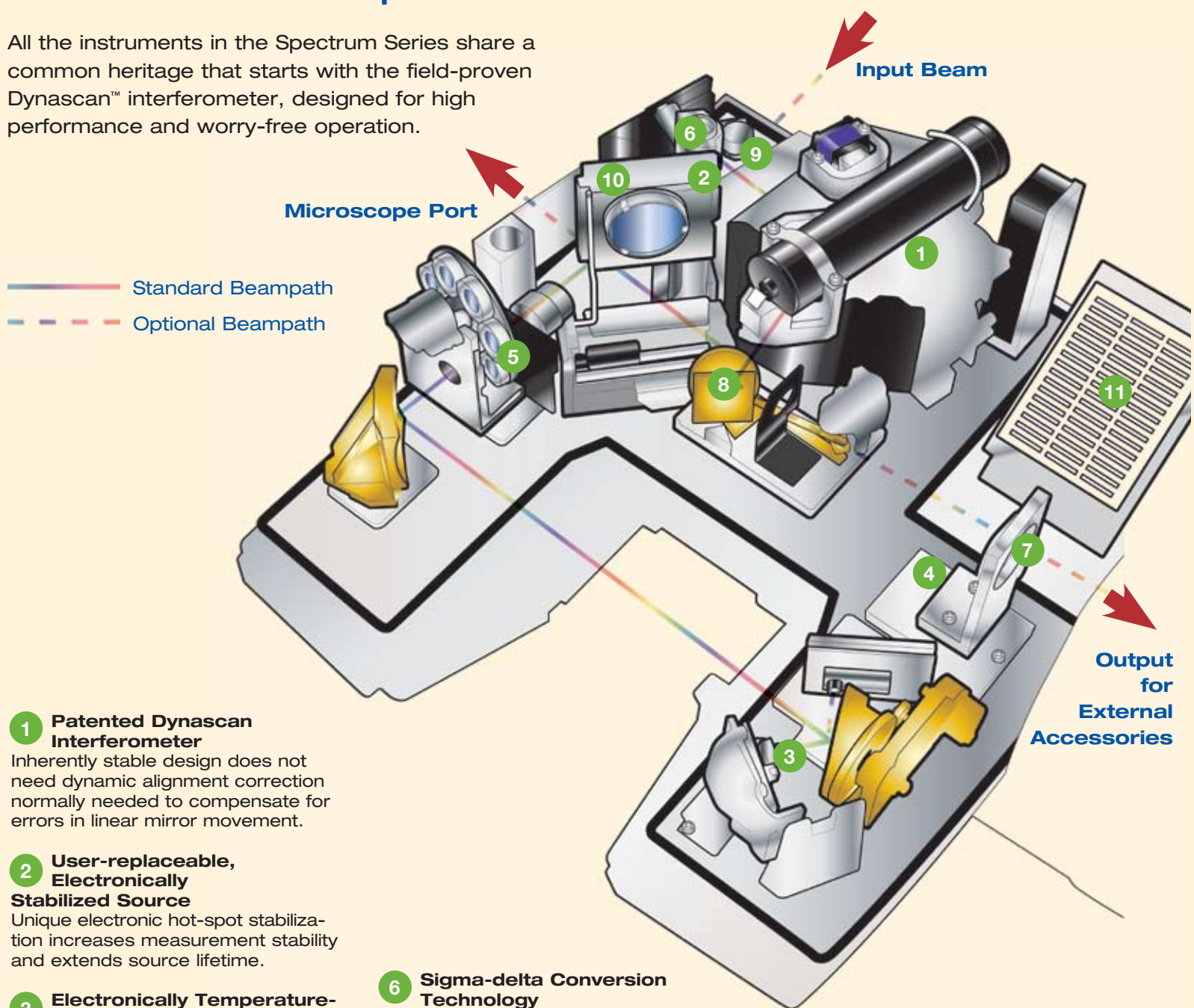
The Spectrum 400 FT-IR/FT-FIR gives you the ability to extend your IR capabilities into the FIR region using a single optical bench. By using the automatic beamsplitter changeover, the Spectrum 400 FT-IR/FT-FIR delivers a new level of ease for far-IR measurements. The built-in system flexibility makes the Spectrum 400 FT-IR/FT-FIR the ideal choice for research environments performing specialized experiments that require customized system components.

Spectrum 400 FT-IR/FT-FIR advantages

- High-performance interferometer with dedicated multilayer FIR beamsplitter provides best performance over the ca. 700-30 cm^{-1} region
- High-efficiency independent purge systems for interferometer and sample area minimize purge stabilization time
- Fully motorized beamsplitter and detector changeover provide easier, faster switch from mid-IR to far-IR operation

Inside the Spectrum Platform

All the instruments in the Spectrum Series share a common heritage that starts with the field-proven Dynascan™ interferometer, designed for high performance and worry-free operation.



1 Patented Dynascan Interferometer
Inherently stable design does not need dynamic alignment correction normally needed to compensate for errors in linear mirror movement.

2 User-replaceable, Electronically Stabilized Source
Unique electronic hot-spot stabilization increases measurement stability and extends source lifetime.

3 Electronically Temperature-stabilized DTGS Detectors
Ensure excellent reproducibility and accuracy no matter what the ambient laboratory temperature.

4 Second-detector Expandability
Provides the ability to increase sensitivity by adding, for example, a cooled MCT detector.

5 Variable J-stop
Limits beam divergence to provide optimal measurements at ALL resolutions including intermediate settings, unlike conventional fixed J-stops.

6 Sigma-delta Conversion Technology
For superior fidelity signal sampling, as compared with conventional ADCs.

7 Focusing Optics for Second Sampling Station
Enables two sampling modules to be installed simultaneously, eliminating the need to switch accessories between measurements.

8 Upgrade to Microscopy and Imaging Capabilities
Automated mirror can be installed to direct the beam into any PerkinElmer microscope or imaging system.

9 Dual-source Mechanism
Rapid IR to NIR switchover.*

10 Beamsplitter-changing Mechanism
Automatically changes between the IR and NIR or FIR beamsplitter without user intervention.*

11 Integrated PSU and Electronics
No need for separate power supply unit.

Accessories for the Spectrum 100 and 400

In addition to the sample transmission accessory that comes standard with every instrument, the Spectrum Series features more optimized sampling options than any other FT-IR system. The result – maximum flexibility for whatever application your lab needs.

IR* FIR* Diffuse Reflectance

- Simplifies analysis of powders and difficult solid materials
- Range of sampling tools enables the easiest sample preparation
- Automatic sample positioning improves measurement sensitivity

NIR* IR* Liquid Sipper

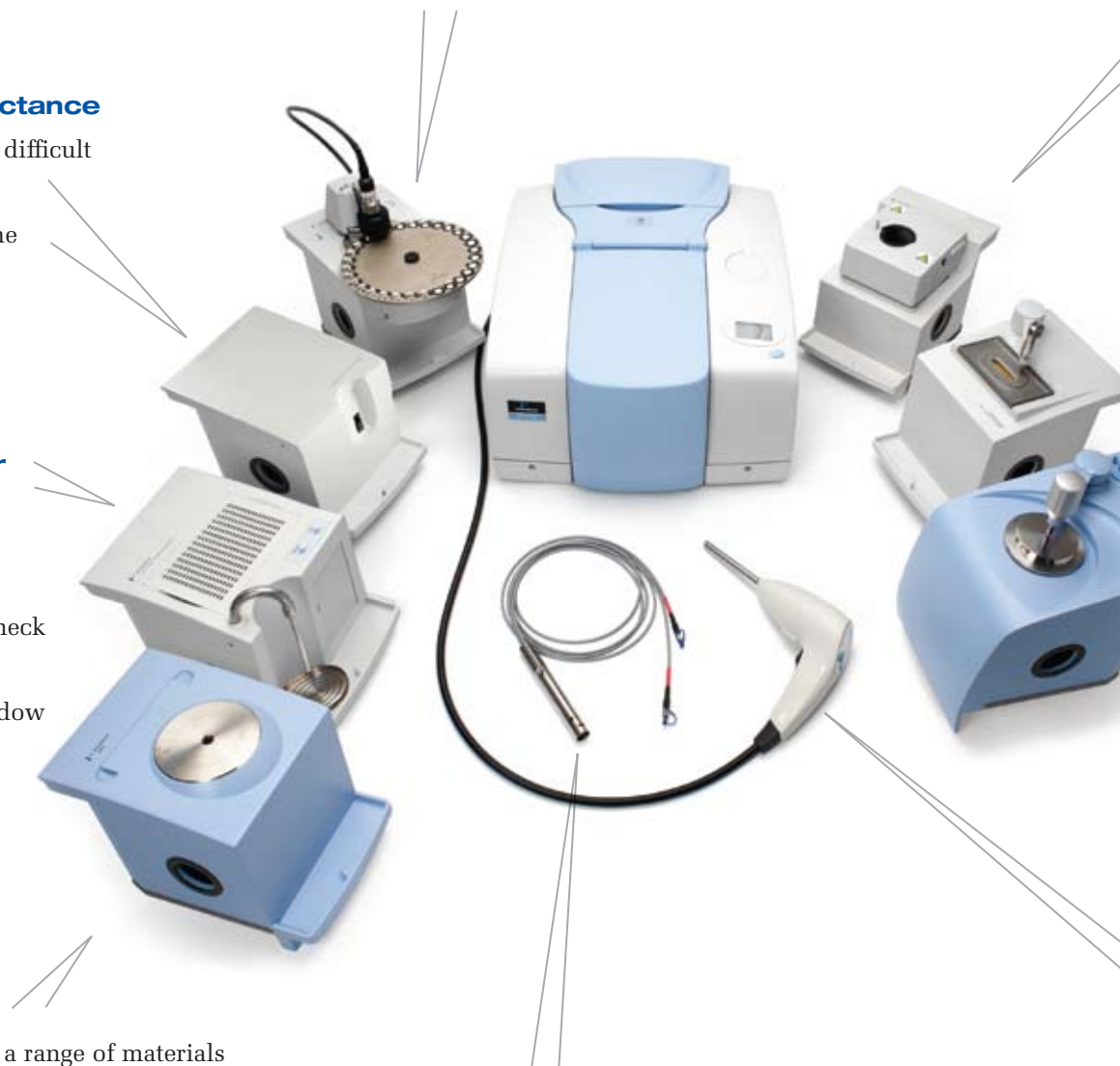
- Automated sampling removes the need for time-consuming, manual filling of cells
- Built-in software contamination check helps reduce errors in analysis
- Available with a range of cell window materials and pathlengths

NIR* IR† NIRA

- Eliminates sample preparation for a range of materials
- Measures solids, liquids, powders, gels and pastes within containers, such as blister packs, glass vials and polyethylene bags
- Self-referencing (interleaved) functionality increases reproducibility and ease of use

NIR* Tablet Autosampler

- 30-position autosampler for powders or tablets
- Patented custom mold system provides the highest reproducibility
- Transmission and reflectance modes enable full-tablet characterization



NIR* Remote Liquids Probe

- Allows remote transmission measurement of liquid samples, providing the ability to measure directly in reaction vessels
- Includes a universal interface for compatibility with a wide range of probes

* Most suitable
† Suitable

IR* **TG-IR Interface**

- Combines FT-IR and thermo-gravimetric analysis
- Facilitates identification of the breakdown products of decomposition and combustion analyses
- Unique gas transfer design ensures the highest sensitivity and minimizes sample contamination

NIR† IR* **HATR**

- Delivers automatic recognition of top-plate crystal material, crystal angle and serial number
- Displays the force applied to sample, ensuring analysis reproducibility
- A wide range of optional top-plate materials and angles of incidence is available

NIR† IR* **UATR**

- Simple universal IR sampling
- Provides automatic recognition of top-plate crystal material, number of reflections and serial number
- Unique kinematic top-plate mounting and electronic force gauge ensure unmatched reproducibility
- Multiple replaceable sample top-plates for the highest measurement flexibility

NIR* **Remote Solids Probe**

- Allows sampling of powders or solids up to 10 meters from the instrument
- Advanced handset user interface with scan trigger and LCD display increases productivity by allowing continuously remote operation
- Design facilitates easy and rapid decontamination and is electrically safe for use in hazardous environments
- ATEX compliant

Specialized Applications

In addition to the range of standard sampling options, the optical flexibility of the Spectrum Series enables PerkinElmer to offer a unique range of more specialized accessories.



Polarized UATR

- UATR with adjustable polarizer
- Powerful tool for structure determination, teaching the fundamentals of IR spectroscopy and understanding crystal orientation and polymer chain orientation



Input Beam

- For measuring samples by emission
- For characterization of external sources
- Pre-interferometer sampling
- Infrared remote sensing using telescope



General-Purpose Optical Bench

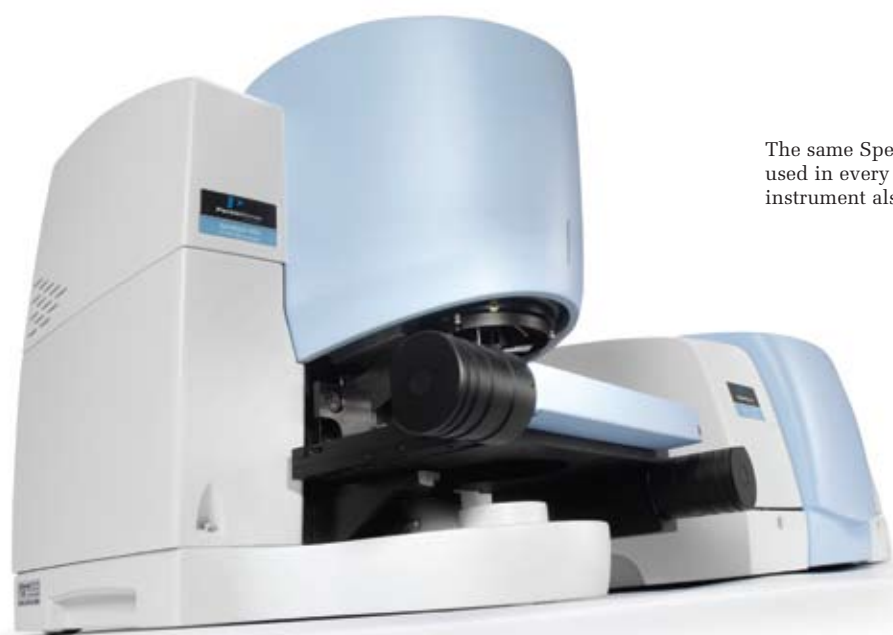
- Designed to accommodate extra-large or specialized sampling systems, such as cryostats or high-vacuum systems
- Characterization of detectors
- Measurements using custom detectors



IR Specular Reflection Set

- For the measurement of IR emissivity of architectural glass to EN standards
- Accommodates large sample sizes
- Includes pre-calibrated, traceable reflection standards and emissivity calculation software

Spotlight: The Most Productive, Highest Performance Laboratory FT-IR Imaging System in the World



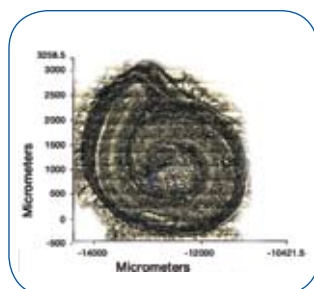
The same Spectrum Series interferometer platform used in every Spectrum 100 and Spectrum 400 instrument also powers Spotlight™ technology.

Spotlight 200 FT-IR Microscope and Spotlight 400 FT-IR/NIR Imaging System

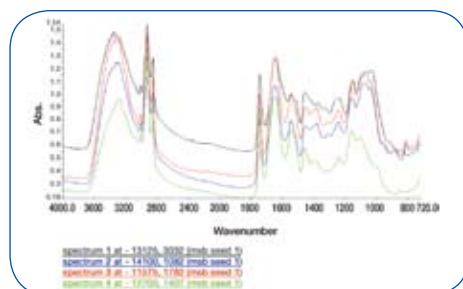
Upgrade your Spectrum 100 or 400 spectrometers to include industry-leading microscopic or imaging functionality.

The Spotlight 200 offers IR microscopy in both transmission and reflection modes, and its Micro ATR option provides a spot size as small as 3 μ . Chemical imaging can be performed by sample mapping, and utilizes the motorized sample stage, which is controlled through software or a joystick.

Spotlight data from a tomato seed



Visible image



IR spectrum

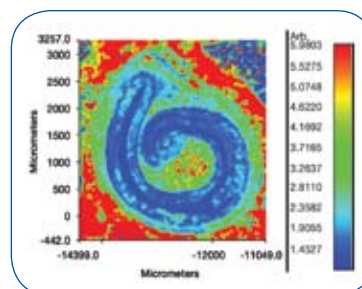


Image showing sugar: lipid ratio

With Spotlight 400, IR imaging is faster, more efficient and more flexible than ever before

The Spotlight 400 can collect 170 high-quality spectra per second, and its unprecedented performance and reliability reflect a number of innovations, including the first Linear Detector Array for Infrared Imaging Microscopes with combined single-pixel MCT detector.

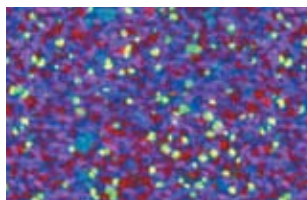
The Spotlight instrument can be used with the Spectrum 100, Spectrum 100N and Spectrum 400, where it demonstrates powerful and unique functionality, serving as both an IR and NIR imager. And since switchover is fully automated, all it takes is the click of a mouse.

Spotlight complements your Spectrum instrument with an imaging system that offers

- The widest spectral range
- Pixel size 50 μ to 1.56 μ
- The highest spatial resolution achievable with FT-IR imaging
- Superior data quality
- Unmatched flexibility
- Image sizes that match your sample sizes

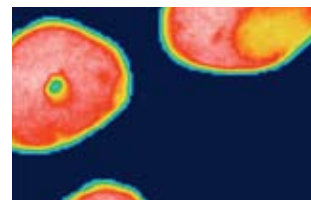
The Spotlight 400 Imaging Systems meet the challenges of many applications

Pharmaceuticals



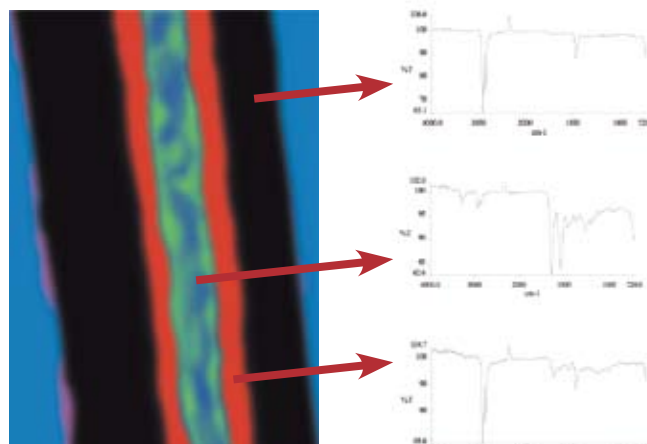
Distribution of ingredients in an over-the-counter pharmaceutical tablet showing particles <math><5 \mu</math> in size with ATR imaging

Academia and Research



ATR image of a hair follicle demonstrating ca. 3 μ spatial resolution

Chemicals and Materials



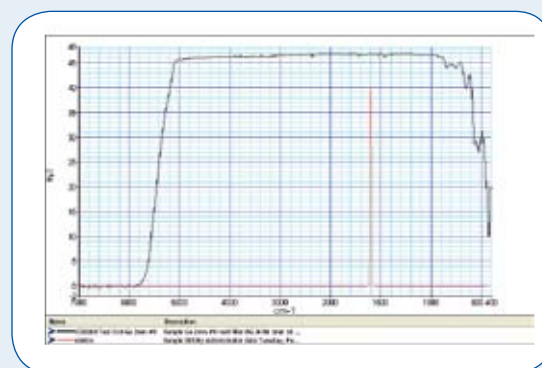
ATR image of a polymer laminate showing individual layers of <math><10 \mu</math> thickness

Spectrum 100 Optica FT-IR

Specifically designed for highest ordinate accuracy in the IR region

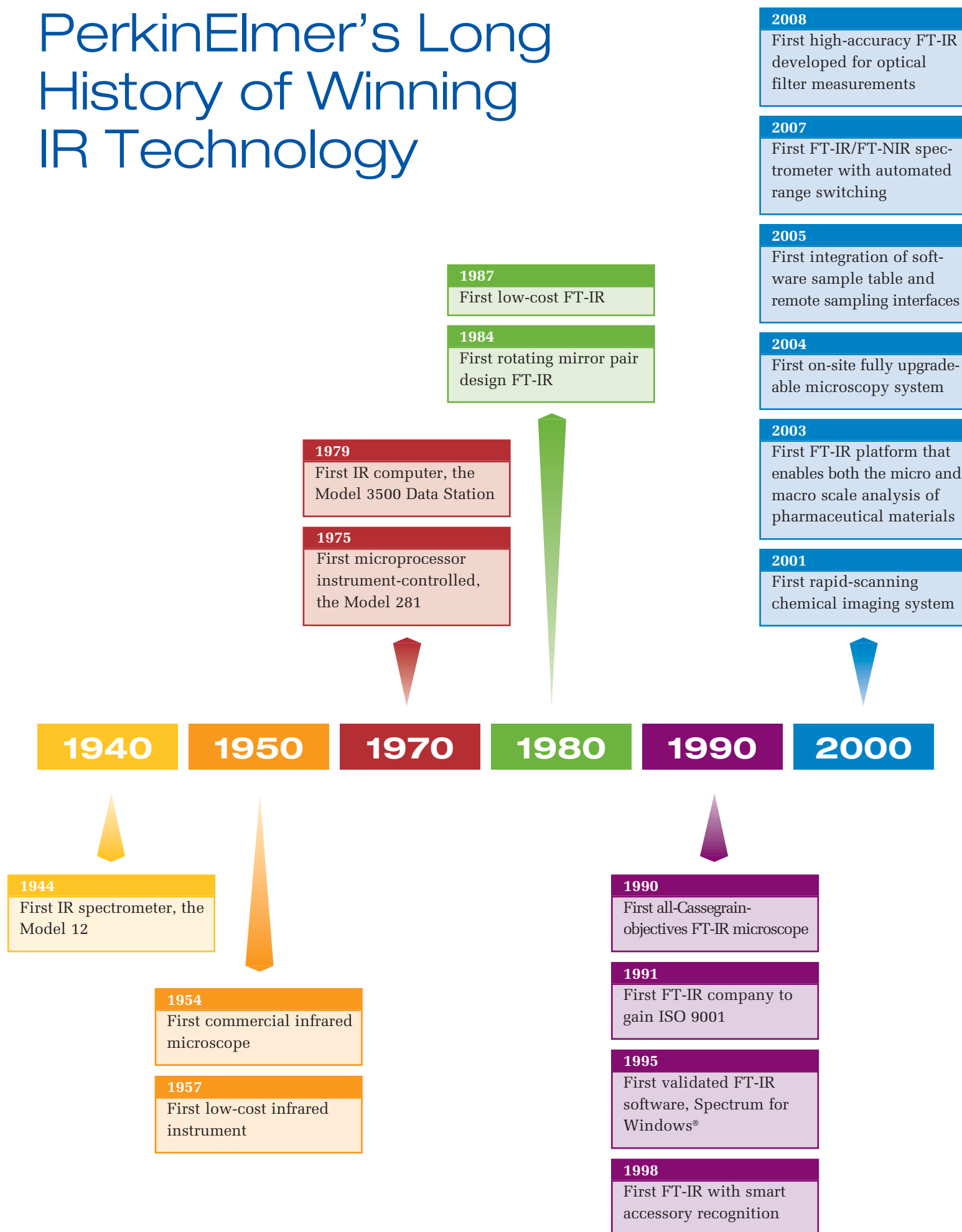
Spectrum 100 Optica is a unique FT-IR spectrometer designed for optical filter, glass and semiconductor measurements which require improved levels of ordinate accuracy and reproducibility.

Over the 5000-400 cm^{-1} range, the Spectrum 100 Optica offers radically improved passband accuracy and stopband transmission accuracy to 6000 cm^{-1} .



Accurate measurements of bandpass filters using Spectrum 100 Optica

PerkinElmer's Long History of Winning IR Technology



Peace of Mind with World-class Service and Support

Here for you today and tomorrow

We pride ourselves on offering total FT-IR solutions for your lab. High-quality engineering, driven by customer values and an extensive testing process, ensure years of trouble-free service.

But just in case, help is right around the corner with our worldwide network of over 1300 certified technicians and service representatives. Our global service capabilities include:

- Preventive maintenance
- In-depth training and certification services
- On-site, on-demand repair
- Validation and qualification needs
- Software and hardware upgrades
- Phone support from personnel operating in 125 countries



Ask your PerkinElmer representative for more information.

Come Out Ahead

The Spectrum Advantage

Setting the Benchmark

For more than 60 years, PerkinElmer has set the industry standard in spectroscopy technology. That tradition continues with the Spectrum IR platform. Whether your lab specializes in near-, mid- or far-infrared applications, the Spectrum Series gives your lab the power to accomplish more.

A Complete Host of Accessories

The Spectrum platform offers you more sampling options than any other FT-IR system. And more options means maximum flexibility for whatever your lab needs.

Global Service and Support

PerkinElmer stands by your side, ready to offer help anytime and anywhere. With an international network of certified support professionals, we're there to help maintain or service your instruments and keep your lab up and running.

For a complete listing of our global offices, visit www.perkinelmer.com/asooffices or visit our Web site at www.perkinelmer.com/ftir.



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