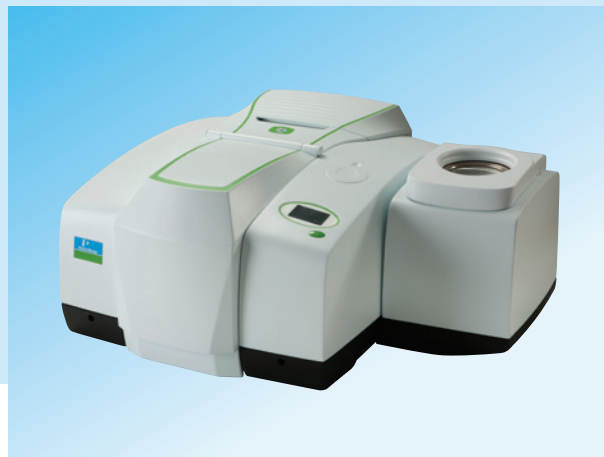


Technical Specifications for the Frontier FT-NIR Spectrometer

Infrared Spectroscopy



Frontier™ with external NIRA

Introduction

PerkinElmer FTIR spectrometers are built to the highest ISO-9001 manufacturing standards. This document presents confirmed performance specifications based on 100% product factory testing. All instruments will meet or achieve better than these confirmed specifications, under normal conditions of use as described in the user manual.

The PerkinElmer Frontier™ systems are the gold standard in FT-IR and FT-NIR spectrometers, enabling laboratories to obtain the highest quality and most reproducible data with exceptional ease. A broad range of “plug-and-go” sampling accessories and software packages ensure the best solution for a range of applications. Whatever your specific laboratory requirements, the Frontier delivers best in class accuracy, precision and reliability, ensuring the utmost confidence in your results.

Optical Performance			
	Transmission System (standard)	Reflectance System (with NIRA)	Reflectance System (Solids Remote Fiber Probe)
Wavelength range	680 - 4800 nm (ca 14700-2000 cm ⁻¹)	700 - 2500 nm (ca 14300 - 4000 cm ⁻¹)	700 - 2450 nm (ca 14300-4100cm ⁻¹)
Spectral Resolution	0.1 - 6.4 nm at 1000 nm (1 cm ⁻¹ to 64 cm ⁻¹)	0.1 -6.4 nm at 1000 nm (1 cm ⁻¹ to 64 cm ⁻¹)	0.1 - 6.4 nm at 1000 nm (1 cm ⁻¹ to 64 cm ⁻¹)
Wavelength Accuracy	0.028 nm at 1670 nm (0.1 cm ⁻¹ at 6000 cm ⁻¹)	0.028 nm at 1670 nm (0.1 cm ⁻¹ at 6000 cm ⁻¹)	0.028 nm at 1670 nm (0.1 cm ⁻¹ at 6000 cm ⁻¹)
Wavelength Repeatability	Better than 0.004 nm at 1390 nm (0.02 cm ⁻¹ at 7200 cm ⁻¹)	Better than 0.004 nm at 1390 nm (0.02 cm ⁻¹ at 7200 cm ⁻¹)	Better than 0.004 nm at 1390 nm (0.02 cm ⁻¹ at 7200 cm ⁻¹)
Signal-to-noise	Typically < 10 uA RMS noise around 1600 nm over 250 nm range for 1 minute scan.	Typically < 15 uA RMS 1600 nm over 250 nm range 1 minute scan.	Typically < 20 uA RMS 1600 nm over 250 nm range 1 minute scan.

Optical System	
General	Sealed and desiccated optical unit. Vibration-isolated baseplate.
Interferometer	Improved Michelson interferometer, self-compensating for dynamic alignment changes due to tilt and shear, incorporating high reflectivity gold-coated optics.
Source	Air-cooled, pre-aligned tungsten halogen source. User replaceable.
Beamsplitter	Proprietary wide-range, multi-layer calcium fluoride.
Detectors	Transmission: temperature-stabilized fast recovery deuterated triglycine sulfate (FR-DTGS). Reflectance: temperature-stabilized indium gallium arsenide. Other options available.

Software	
General	A single software platform incorporates all of the functions required for infrared analyses; instrument control, data manipulation and analysis, and flexible report utilities. A suite of optional software packages provide advanced capabilities or functions designed for specific application areas.
Sample Table	Increases productivity by enabling multiple samples to be defined in batches. Integrates with Go button allowing remote continuous operation.
User Interface	Password-protected user login function. Access to methods and routines, menu, toolbar and toolbox functions can be controlled by a supervisor.
Reports	Quick print facility for graphs, spectra and results windows. User defined templates can be created to enable custom printed and electronic reports.
Processing	1st-4th derivative with a variable filter, smooth (Savitsky-Golay, moving average and triangular), difference, normalization, A, %T, %R, KM, LOG (1/R), ordinate modes, cm ⁻¹ , nm and micron abscissa modes, +, -, *, /, difference, baseline correction, smooth, deconvolution, normalize, interpolate, blank, Kramers-Kronig, ATR correction, peak table, peak height and peak area.
Materials testing	Patented COMPARE™ spectral comparison algorithm and Euclidean searching. Spectral searching against commercially available or customer-developed libraries.
Quantitative analysis	Single frequency, method development software. Spectrum includes Beer's Law, PLS and PCR quantitative prediction.
Validation	Instrument performance and user configurable system suitability routines available as standard. Instrument Scheduler facility allows auto-programming of instrument validation testing.
Macros	Macro Editor and Equations Editor provide the ability to setup sequences of data collection and custom spectral processing. These procedures can then be stored and repeated using a single mouse click.
User training	Use, common maintenance and software operation. Context-sensitive help provides assistance throughout the software.

Additional Software Modules Available

Materials checking	Patented COMPARE™ spectral comparison, designed specifically for QC applications. Euclidean search, SIMCA plots also available.
Quantitative analysis	Optional method development software for PLS and PCR quantitative method development. Includes Expert Assist for method troubleshooting.
Validation	Optional software validation supplements available.

Data System

Communication	TCP/IP interface allows direct connection to PC or LAN. Systems are given their own unique address and can be controlled over the internet.
Signal sampling	Oversampling delta-sigma converter.

Sampling

Reflectance	On-board Near-Infrared Reflectance Analysis (NIRA) system. For fast, convenient sampling featuring wide-collection geometry, extensive recognition and self-checking.
Transmission	Wide range of cuvettes, cells and disposable cells available. Spectrum Sipper system is also available for convenient transmission liquid sampling.
Remote liquids	Allows remote transmission measurement of liquid samples.
Remote solids	Fiber optic probe enables the remote sampling of solids or powders. Available in 2, 5 or 10 meter fiber lengths.

Bench Details

Size	520 mm x 600 mm x 300 mm (W x D x H)
Weight	34 Kg
Sample Compartment	Full size sample compartment with quick-release cover and service access.

PerkinElmer, Inc.
940 Winter Street
Waltham, MA 02451 USA
P: (800) 762-4000 or
(+1) 203-925-4602
www.perkinelmer.com



For a complete listing of our global offices, visit www.perkinelmer.com/ContactUs

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