SPECIFICATIONS

Infrared Spectroscopy

Spectrum Two FT-IR Spectrometer

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Introduction

The PerkinElmer SpectrumTwo™ is a laboratory performance, yet robust and portable FT-IR system platform enabling users to configure simple, reliable IR solutions. A range of "plug-and-go" sampling accessories and application packages ensure the best solution for a range of applications. Whatever your specific IR analysis requirements, the Spectrum Two delivers outstanding performance and reliability to provide high performance, dependable IR measurement solutions.

PerkinElmer Spectrum Two FT-IR spectrometers are built to the highest ISO-9001 manufacturing standards. This document presents technical information and typical performance specifications for the Spectrum Two instruments based on recent factory tests.

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For the Better

OPTICAL PERFORMANCE		
Wavelength Range	8,300 – 350 cm^{-1} optimized, proprietary KBr beamsplitter	6500-550 cm^{-1} with ZnSe optics
Spectral Resolution	0.5 cm^{-1} standard	
Wavelength Precision	Better than 0.01 cm^{-1} at 3000 cm^{-1}	
Wavelength Accuracy	0.1 cm^{-1} at 3000 cm^{-1}	
Signal-to-noise	9,300:1 peak-peak, 5 seconds 32,000:1 peak-peak, 1 minute	14,500:1 peak-peak, 5 seconds 50,000:1 peak-peak, 1 minute with optional performance pack

OPTICAL SYSTEM	
General	Long-life sealed and desiccated optical unit incorporating Opticsguard™ design, Vibration isolated baseplate.
Interferometer	Rotary Michelson interferometer, High stability, self-compensating for dynamic alignment changes due to a tilt and shear.
Optics	Kinematically mounted, zero alignment optics , with high reflectivity and a low-angle off axis design. Proprietary OpticsGuard system for extended desiccant life and additional optical component protection.
Detectors	High linearity room temperature detector (standard) Temperature-stabilised room temperature DTGS detector optional.
Source	Long-life source with proprietary hot-spot stabilization. User replaceable from outside instrument
Beamsplitter	Proprietary extended range KBr.
Desiccant	Long-life desiccant system accepts disposable packs. Software controlled desiccant status indicator.
Validation	Software controlled validation wheel option containing a polystyrene reference material, traceable to a NIST standard for wavenumber accuracy and a Schott NG11 filter for ordinate repeatability.
Optical Windows	KBr (standard), ZnSe option for exceptionally high humidity environments

DATA SYSTEM AND ELECTRONICS	
Signal sampling	Over-sampling delta-sigma converter.
Communication	USB, wireless and TCP/IP interface allows direct connection with LAN. Instruments can be configured with wireless router communication.
Calibration Transfer	Absolute Virtual Instrument (AVI) option – actively standardizes instrument response to further improve repeatability and protect data integrity.
Atmospheric compensation	Minimizes effect of atmospheric water and CO_2 on the sample spectra without the need for reference or calibration spectra. Operates at various instrument setttings without having to recalibrate the correction.
Accessory recognition	Spectrum Two accessories are automatically detected as soon as they are locked into the sampling area. Instrument parameters are optimized for the installed accessory. Accessories information stored with spectral data.
Error Trapping	All sample spectra are checked for common spectroscopic and sampling problems. Key instrument components are continuously monitored.
Component Checks	Individual component checks under software control can be executed on-demand or automatically scheduled at preset times/intervals
Powersave mode	Instrument standby and power-up can be automatically scheduled.

BENCH DETAILS	
Size	450 mm x 300 mm x 210 mm (W x D x H).
Weight	13 kg
Power supply	Universal voltage power supply enables operation from mains. Optional rechargeable battery pack for remote operation, chargeable from mains or car battery. Optional power pack also serves as an Uninterrupted Power Supply (UPS).
Operating Range	5-45 ˚C
Typical desiccant lifetime	5 years at 25 ˚C and 90% relative humidity

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. Optional Spectrum Touch functionality optimised for touchscreen operation allows simple user interface for turnkey operation with selected applications.
Sample Table	Increases productivity by enabling multiple samples to be defined in batches facilitating 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. Send To Word functions for simple formatting via Microsoft Word.
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. Cell Pathlength data command, enables effective handling of cell pathlength with demountable transmission cells.
Scanalyse™	Enables real time update of spectral information plus results to provide faster feedback of information data status.
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, and chemometrics-based quantitative prediction.
Validation	Instrument performance, user configurable system suitability routines and international Pharmacopeia test methods available in standard software. 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. Spectrum Touch user interface software for exceptional ease of use in touchscreen-driven and handheld PC driven systems.
User training	Instrument use, common maintenance and software operation. Context-sensitive help provides assistance throughout the software. Optional packages include IR Introductory Kit for faster self-learning, Educational Package for more comprehensive learning and on-site assisted learning programs.
Optional Software packages	
21 CFR Part 11	Spectrum 10 Enhanced Security™ (ES) software meets the technical requirements for the FDA's 21 CFR Part 11 with SQL database audit trail and data storage/retrieval.
Sample Analysis Workflows	AssureID™ software designed for FT-IR materials testing and product verification. Simple turnkey Compare, SIMCA, quantitative analyses with user defined instructions and reports can be readily configured. OLE-DB compliant data storage with ES and non-ES versions available for 21CFR11 compliance.
Quantitative analysis	Spectrum Quant for chemometrics-based quantitative method development. Includes Expert Assist for method troubleshooting.
Validation CD	Data validation CD contains test algorithm descriptions, test data and results for data transform algorithms. Comprehensive IQ/OQ documentation and services available.

Optional Application and Learning Packages	
Accelerated learning	IR Introductory Kit, Educational Package and on-site assisted learning options available. Application-specific packages and options tailored for pharmaceuticals analysis, polymer analysis, nutraceuticals, used oils, fuels and environmental hydrocarbon analysis available. See separate literature in individual packages for further details.

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