

Infrared Spectroscopy



Key Features

- Absolute transmission accuracy
- Specialized components to block stray reflections
- Advanced electronics for high fidelity signal sampling
- High degree of control over source image allows optimization of measurement parameters
- Abscissa precision better than 0.01 cm^{-1}

Spectrum 100 Optica FT-IR Spectrometer

Introduction

Recognizing the need for the highest level of ordinate accuracy, the Spectrum™ 100 Optica is an FT-IR spectrometer developed specifically to meet the demands of the optical filters and specialty glass and coatings industries.

PerkinElmer has used its extensive experience with the optical industry to develop the Spectrum 100 Optica – a purpose-built FT-IR for accurate measurement of optical filter and high refractive index materials. This advanced system incorporates features designed to minimize or even remove common sources of ordinate error in FT-IR so users can now exploit the benefits of FT-IR and achieve higher levels of photometric accuracy than ever before.

Unique design for optical measurements

Spectrum 100 Optica addresses known FT-IR issues with optical design features to prevent unwanted reflections reaching the detector, advanced digital signal processing, special detector considerations and more. In addition, optical filter measurements have varying requirements – for example, some emphasize blocking region characteristics, others require high transmission band-pass region accuracy. To address this, the system allows the operator to better optimize the conditions for a particular requirement by allowing an extra degree of control over both the beam size and the divergence at the sample position. For example, a given measurement of a relatively thick optical filter might be concerned with absolute bandpass accuracy. Here, minimal beam divergence at the sample is preferred. Alternately another sample might require low noise/low artifact measurement in the blocking regions where a higher beam divergence would deliver lower noise results more quickly. Spectrum 100 Optica provides additional optical flexibility to optimize measurement conditions to suit the application requirement.

Ensuring confidence in results

PerkinElmer has used two approaches to verify the accuracy of the Spectrum 100 Optica.

First, we have compared measured transmittance values for materials with those calculated from their refractive index values. Second, we have compared measured values with those obtained by a national standards laboratory (NIST®) for given samples. For germanium, for example, transmission measurements on the same samples at NIST® are essentially identical with those of the Spectrum 100 Optica and well within 0.25 %T over the region 5000-900 cm^{-1} (2-11 μm). Comparison of the transmittance values measured with those calculated for zinc selenide and calcium fluoride are even better.

Measurements in filter blocking regions are particularly impressive on the Spectrum 100 Optica FT-IR system. Artifact levels of <0.005 %T can be demonstrated with this system. This is to be contrasted with dispersive systems where a stray light of <0.1 %T is a typical specification.

To ensure guaranteed specifications on ordinate accuracy and in addition to the extensive standard FT-IR testing, every Spectrum 100 Optica is tested at the factory for common FT-IR errors using traceable high index ordinate standards in both filter band-pass and stop-band regions.

Move up to the Spectrum 100 Optica

If you need to perform highly demanding optical measurements in the IR region you can now exploit some of the many benefits of a modern FT-IR spectrometer system. These include abscissa calibration tied to an internal HeNe reference laser to provide an achievable precision of ca 0.008 cm^{-1} , smart sampling capability allowing a wide range of accessories for standard FT-IR analysis, and state of the art 32- and 64-bit compatible instrument control and data manipulation software.

Powered by PerkinElmer

For over sixty years, PerkinElmer has manufactured and serviced laboratory instruments across the globe. Although technologies have advanced, our commitment to excellence in service and support has remained. Our global team of factory-trained service professionals provides a variety of service products including preventative maintenance, validation support and training.

To discover more about the Spectrum 100 Optica, visit www.perkinelmer.com/spectrum100optica

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