

FI-RXF100-RE

FI-RXF100-RE FTIR Emission Spectrometer

A standalone FTIR spectrometer for infrared emission spectroscopy, with an integrated emission platform for accessories and reference blackbodies, two detector positions and a focused or parallel beam path. 500–5000 cm^{-1} as standard, extendable to 12500 cm^{-1} .

Best for: Emissivity of materials, sources and hot samples — ceramics, glass, building materials, solar collector tubes, textiles and plasmas.

500–5000 cm^{-1}

Standard range

12500 cm^{-1}

Near-IR extension, up to

2 cm^{-1}

Resolution, better than

12 kg

Weight



Overview

Infrared emission spectroscopy obtains spectral information from a material directly and non-destructively, and complements transmission, reflection, ATR and diffuse reflectance. Because the sample itself is the infrared source, it reaches cases the other methods cannot: surfaces unsuited to transmission, highly corrosive or opaque samples, the spectral characteristics of emitting sources, large objects, distant targets, ultra-high-temperature samples and plasmas.

The FI-RXF100-RE is a standalone FTIR emission spectrometer with an integrated emission platform that takes different emission accessories and reference blackbodies, for characterising materials at different temperatures. The main unit has two detector positions for switching between detectors at any time, and the beam path can be set up focused or parallel to suit the sample. Internal optics can also be exchanged to extend the range into the near-infrared, for emission measurements of near-infrared sources.

Features

- Interferometer: advanced Michelson interferometer, permanently aligned beam path, excellent stability
- Solid-state laser: stable performance, service life over 10 years
- Emission source: focused beam path; the user's sample, a heat source or a blackbody
- Beamsplitter: ZnSe beamsplitter and ZnSe windows, protected against moisture (KBr or quartz beamsplitter optional)
- Detectors: two built-in detector positions — room-temperature detector, or cooled MCT or InGaAs — switched automatically by the software
- Beam path: dedicated, compact emission optics that reduce radiation losses and raise throughput
- Emission accessories: customised to the measurement

Specifications

Spectrometer	
Spectral range	500–5000 cm^{-1} standard; 400–7500 cm^{-1} or 400–10000 cm^{-1} optional, or extended into the near-infrared to 12500 cm^{-1}
Spectral resolution	Better than 2 cm^{-1} ; 8 cm^{-1} is typically used
Measurement	Sample placed at the focal point; choice of temperature controllers or blackbodies
Operating conditions	–5 to 40 °C; 0–100 % RH
Power	100–240 V AC, 50–60 Hz, 20 W
Weight	12 kg
Dimensions (W × D × H)	44 × 33 × 18 cm, including the emission shield

Reference blackbody IR-563/301	
Temperature range	50–1050 °C
Temperature control accuracy	0.1 °C
Maximum aperture	1 inch
Emissivity	> 0.99
Source type	Cavity blackbody
Apertures	8 selectable apertures

Applications

- Emission spectra of materials
- Emissivity calculation
- Emission from burning moxa
- Emission spectra of ceramic plates at different temperatures
- Testing of physiotherapy devices
- Testing of (near-)infrared sources
- Spectra of ultra-high-temperature samples
- Plasma emission
- Emission studies of acupuncture points
- Emission of glass and building materials
- Emission of solar collector tubes
- Emission of textiles

Measurement notes

How an emission measurement is made depends on the form of the sample:

- Thin films: mount the film on a metal substrate to reduce emission from the substrate
- Keep samples thin and gas concentrations low, to avoid spectral distortion from self-absorption
- Where background radiation is strong, subtract it before calculating the emissivity of the sample
- If the sample releases gas during the measurement, add a purge to the emission set-up to limit its effect on the spectrum

Emissivity at room temperature

For materials at room temperature there is another route: measure the reflectance spectrum with an FI-RXF series spectrometer and a reflection or integrating-sphere accessory, then obtain the emissivity of opaque materials from Kirchhoff's law and conservation of energy. Ask us for details of this method.

Figures



IR-563/301 reference blackbody: cavity source, 50–1050 °C, eight apertures.

Request a quotation

Tell us what you measure and we will configure the FI-RXF100-RE — sampling accessories, detector and libraries — for it.

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