



PORTABLE FTIR

Portable FTIR - ToronFTIR™ P7800

ToronFTIR™ P7800 is a portable FTIR spectrometer that brings high-resolution infrared analysis to on-site material identification and quality control. The instrument reads the molecular fingerprint of a sample and matches it against reference spectra, so operators confirm what a material is at the point of need rather than shipping samples to a central lab. A wide 7800 to 350 cm^{-1} range covers the near- and mid-infrared regions where most organic and polymer bands appear. The P7800 suits teams that move between benches, departments, and sites and want consistent results at each stop.

The ToronFTIR™ P7800 pairs a stable optical platform with a bundled analysis suite that holds more than 200,000 reference spectra plus quantitative modules and standard-curve models. A signal-to-noise ratio better than 20,000:1, with an optional configuration better than 45,000:1, supports clean spectra on low-concentration samples. Sealed, moisture-protected optics and a temperature and humidity monitoring system keep the instrument steady as ambient conditions change from one location to the next.

The ToronFTIR™ P7800 serves medical and healthcare labs, environmental monitoring teams, food and agricultural producers, and pharmaceutical and biopharmaceutical manufacturers. Universities and research institutes use the same platform for teaching and multi-component analysis. Flexible detector and beamsplitter options let a single instrument cover routine identification and more demanding trace work.

APPLICATIONS

Portable FTIR - ToronFTIR™ P7800 Applications

The ToronFTIR™ P7800 supports rapid material identification and quality control across health, environmental, food, and industrial settings.

- Medical and Healthcare: identifies materials and verifies medical-grade polymers, consumables, and packaging against reference spectra.
- Pharmaceutical and Biopharmaceutical: confirms raw materials, excipients, and active ingredients during incoming inspection and release testing.
- Environmental Monitoring: identifies petroleum and animal or plant oils in water and screens organic contaminants in field samples.
- Food and Agricultural Products: verifies additives, checks packaging materials, and screens for adulteration in production and inspection.
- Petroleum and Lubricant Analysis: monitors in-service oil condition and measures biodiesel FAME content through bundled quantitative modules.
- Materials Science and Polymers: characterizes plastics, resins, coatings, and composites during development and quality control.
- Academic and Research Laboratories: teaches infrared spectroscopy and supports multi-component analysis across departments.



Standards

The ToronFTIR™ P7800 is designed and built to align with internationally recognized infrared methods, and its bundled quantitative modules correlate with the test methods below.

- ASTM E2412 - Standard Practice for Condition Monitoring of In-Service Lubricants by Trend Analysis Using Fourier Transform Infrared (FT-IR) Spectrometry
- EN 14078 - Liquid Petroleum Products: Determination of Fatty Acid Methyl Ester (FAME) Content in Middle Distillates: Infrared Spectroscopy Method

FEATURES

Portable FTIR - ToronFTIR™ P7800 Key Features

The ToronFTIR™ P7800 combines a stable optical platform with flexible sampling and data tools for on-site and multi-site work.

- Wide Spectral Coverage: scans 7800 to 350 cm^{-1} across the near- and mid-infrared, with an optional 7800 to 650 cm^{-1} configuration.
- High Signal-to-Noise Ratio: better than 20,000:1 as standard, with an optional configuration better than 45,000:1 for trace work.
- High Wavenumber Accuracy: $\leq 0.01 \text{ cm}^{-1}$ supports repeatable peak positions and reliable library matching.
- Sealed, Moisture-Protected Optics: fully enclosed interferometer and detector compartments hold performance as ambient conditions change.
- Gold-Plated Corner-Cube Mirrors: integrated, adhesive-free moving and fixed mirrors resist drift during transport and use.

- Flexible Detector and Beamsplitter Options: an MCT cooled detector and a ZnSe beamsplitter are available for demanding sensitivity and range needs.
- Extensive Spectral Library: more than 200,000 reference spectra, quantitative modules, and standard-curve models speed identification and quantitation.
- Intelligent Environmental Monitoring: real-time temperature and humidity tracking alerts operators before conditions risk the instrument.
- Modern Data Interface: high-speed USB 2.0 and 3.0 with Windows 7, 10, and 11 support for straightforward data handling.
- Turnkey Setup and Support: supplied ready to run, with installation, commissioning, and after-sales support included.

THEORY & METHOD

Theory and Method

Fourier transform infrared spectroscopy identifies materials by measuring how they absorb infrared light. Each chemical bond vibrates at characteristic frequencies, so the pattern of absorbed wavelengths forms a molecular fingerprint unique to a material. The ToronFTIR™ P7800 records all infrared wavelengths in a single measurement rather than scanning one at a time, which shortens analysis and gives a strong signal at the detector. This speed matters when an operator needs an answer on-site rather than after a lab queue.

The instrument builds each spectrum with a Michelson interferometer. A moisture-protected KBr beamsplitter divides the infrared beam into two paths that reflect off a fixed and a moving mirror. Recombining the beams at varying path differences produces an interferogram, and a Fourier transform converts it into a readable absorbance spectrum. A semiconductor laser tracks the moving mirror for accurate wavenumber calibration across the full 7800 to 350 cm^{-1} range.

Design choices keep results stable away from a controlled lab. Integrated gold-plated corner-cube mirrors hold alignment without adhesives, and fully enclosed interferometer and detector compartments shield the optics from humidity and airborne contaminants. A temperature and humidity monitoring system alerts the operator when conditions drift, which

helps protect the instrument during transport and field use.

TECHNICAL SPECIFICATIONS

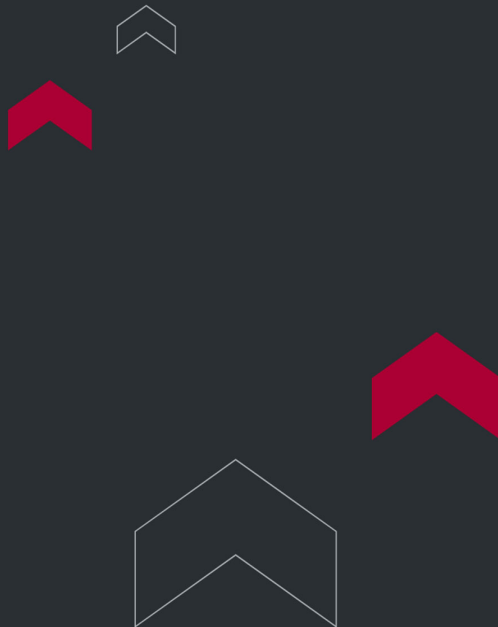
Portable FTIR - ToronFTIR™ P7800 Technical Specifications

Parameter	Specification
Spectral Range	7800 to 350 cm ⁻¹ (optional 7800 to 650 cm ⁻¹)
Signal-to-Noise Ratio	Better than 20,000:1 (optional better than 45,000:1)
Wavenumber Accuracy	≤ 0.01 cm ⁻¹
Detector	Infrared detector; optional MCT (mercury cadmium telluride) cooled detector
Laser	Semiconductor laser; optional HeNe laser
Beamsplitter	Multi-layer coated KBr with moisture-proof coating; optional ZnSe
Infrared Source	Long-life, high-intensity, air-cooled IR source
Scanning Speed	Microcomputer-controlled, continuously adjustable, multiple selectable speeds
Optical Bench	Integrated design with fully enclosed interferometer and detector compartments
Interferometer Mirrors	Integrated gold-plated corner-cube (moving and fixed), adhesive-free
Reference Spectral Library	≥ 200,000 spectra
Data Interface	High-speed USB 2.0 / 3.0
Operating System	Windows 7 / 10 / 11
Environmental Control	Intelligent temperature and humidity monitoring with real-time alerts

Parameter	Specification
Design Compliance	EMC electromagnetic compatibility design

Standard Configuration

Item	Quantity	Description
FTIR Analyzer Main Unit	1	Main spectrometer unit with integrated optical bench
Tablet Press	1	For pressing KBr sample pellets
Pellet Die Set	1 set	13 mm inner diameter, no-demold design
Detachable Liquid Cell Set	1 set	KBr windows, 30 × 5 mm
Spectral-Grade KBr	50 g	For pellet and window preparation
Agate Mortar Set	1 set	Sample grinding and preparation
Electronic Dry Cabinet	1	Moisture-controlled storage for optics and consumables
Control Terminal	1	i5 or higher CPU, ≥ 1 TB HDD, ≥ 21.5-inch display, keyboard and mouse



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