

Laboratory FTIR spectrometers



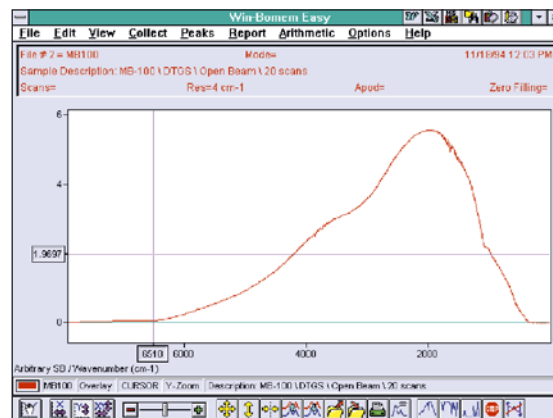
Realize the promise of FTIR

- Sensitivity
 - Peak signal-to-noise ratio >100000: 1 rms with extended signal averaging
- Baseline stability (at room temperature)
 - <0.1% deviation in 100% line short term
 - No long term drift
 - Temperature coefficient < 1% /C at 4000 cm⁻¹
- Purge stability
 - < 0.0001A water vapor variation with minimal time delay using the unique Arid-Zone sample compartment
- Resolution better than 1 cm⁻¹
- Lifetime warranty on scan mechanism
- Windows-based data processing and analysis software included

FTLA2000-100

Economical
High Performance
FTIR

The FTLA2000-100 is the mid-IR member of the highly successful FTLA2000 series of laboratory FTIR spectrometers. It provides higher spectroscopic performance than other similarly priced FTIRs. Because it is permanently factory-aligned and sealed, the FTLA2000-100 has an exceptionally stable spectral response. The spectral reproducibility exceeds the validation guidelines of NIST standard reference material 1921. Analysis methods will transfer directly from one FTLA2000 series FTIR to another without adjustment. The FTLA2000-100 is compatible with all of your favorite accessories. ATR is recommended for analyzing pastes, normal and viscous liquids and diffuse reflectance (DRIFT) is recommended for samples in powder form.

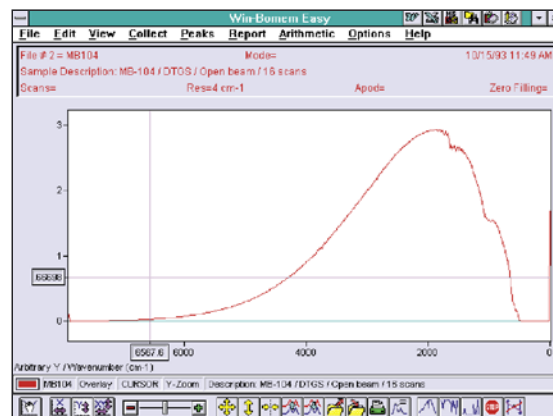


System response with the DTGS detector and SiC source.
The usable spectral range is from 6,500 cm^{-1} to 350 cm^{-1} .

FTLA2000-104

FTIR
Spectrometer
Insensitive to
Humidity

A member of ABB's highly successful FTLA2000 series laboratory FTIR spectrometers, the FTLA2000-104 uses only non hygroscopic optics. It is ideally suited to use in environments where low humidity cannot be assured. It has been successfully employed for at-line QA analysis in factory environments and for field portable analysis applications. It offers outstanding sensitivity in the 6500 to 500 cm^{-1} range. The spectral reproducibility exceeds the validation guidelines of NIST standard reference material 1921. Analysis methods will transfer directly from one FTLA2000 series FTIR to another without adjustment. The most frequent and costly maintenance of FTIRs is the replacement of degraded hygroscopic optics. With the FTLA2000 104 this is eliminated. You can now concentrate your efforts on your analyses, rather than worrying about the spectrometer.



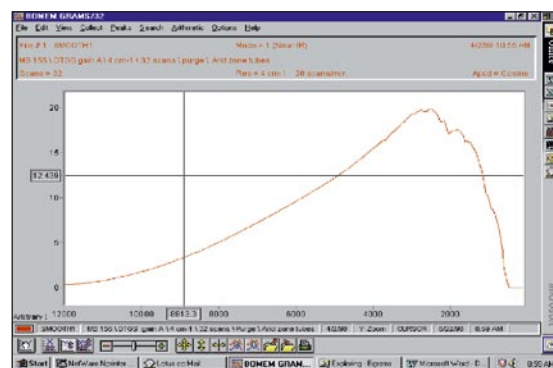
System response with the DTGS detector and SiC source.
The usable spectral range is from 6500 cm^{-1} to 500 cm^{-1} .

FTLA2000-154

Extended Range
FTIR
Spectrometer
Insensitive to
Humidity

The FTLA2000-154 is an instrument designed for people who do not want to make compromises. With a dual source that covers both the near and mid-infrared regions, and an extended-range DTGS detector, this instrument will cover a useable spectral range from 500 to 12,000 cm^{-1} . Its non-hygroscopic optics allow operation in environments where low humidity cannot be assured.

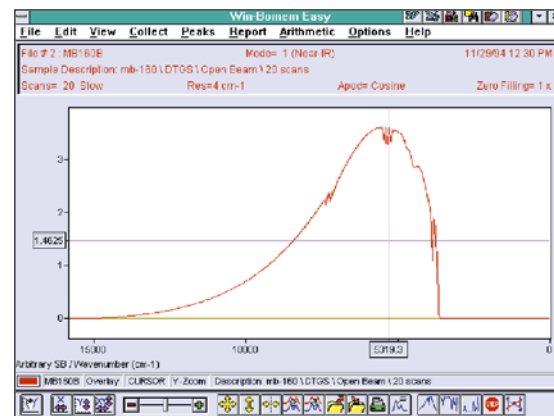
The FTLA2000-154 can be utilized for applications that would require the spectral ranges of the FTLA2000-104 and FTLA2000-160 in the same package.



System response with the DTGS detector and dual SiC quartz halogen source module.
The usable spectral range is from 12,000 cm^{-1} to 500 cm^{-1} .

FTLA2000-160 FTIR for Dedicated Near-IR Analysis

The FTLA2000-160 brings the superior accuracy, repeatability and stability of FTIR to the Near-IR. It is specially designed for economical, dedicated Near-IR analysis. It comes with a built-in quartz halogen source and extended-range DTGS detector. This combination provides excellent results for most analyses performed in the sample compartment. The optional TE-cooled InAs detector is recommended for sampling of strongly scattering samples, diffuse reflectance sampling and fiber optic-coupled sampling. Spectral reproducibility from unit-to-unit closely resembles the repeatability. This is important when developing an analysis method for use with multiple FTIR's. Analysis methods will transfer directly from one MB Series FTIR unit to another without any adjustments. The FTLA2000-160 forms the basis for dedicated analyzers such as the HOval Analyzer, used for OH value determination. Sampling techniques, using temperature controlled, disposable glass vials are ideally suited for the demanding analysis requirements of many organic liquids. Near IR analysis of samples in powder form is done with the PowderSamplir. When samples have a coarse texture the Diffusir is recommended.



System response with the DTGS detector and quartz halogen source.

The usable spectral range is from 14,000 cm^{-1} to 3,800 cm^{-1} .

FTLA series FTIR specifications and features

Specifications at 25 C

- Best resolution: 0.7 cm^{-1} , unapodized.
- Wavenumber reproducibility:
Mid IR models: 0.1 cm^{-1} at 1918 cm^{-1}
Near IR models: 0.04 cm^{-1} at 7300 cm^{-1} .
- Wavenumber repeatability $\pm 0.002 \text{ cm}^{-1}$ ($\pm 2\sigma$).
- Calibration transferability test: All NIR models will reproduce the absorbance spectrum of toluene (4100-6000 cm^{-1}) in a 0.5 mm cell at 28 C ± 1 C to within 0.002 A when compared with any other NIR unit.
- Mid IR Signal-to-RMS-noise ratio at peak response is typically 30,000: 1 for the FTLA2000-100 for 1 min scan time, 4 cm^{-1} resolution, open beam.
- Near IR RMS-noise absorbance at peak response is typically 4 micro-A for 1 min scan time, 16 cm^{-1} resolution, open beam.
- 100% line reproducibility is within 0.1% in the 4000 to 550 cm^{-1} range for MIR models and the 8000 to 4500 cm^{-1} range for NIR models, for 2 consecutive measurements.
- 100% line long-term stability is affected only by temperature change. Temperature coefficient of change in 100% line is 1% / 1 C at 8000 cm^{-1} for Near IR models and at 4000 cm^{-1} for Mid IR models.
- Apodized resolution selectable from 1 cm^{-1} to 128 cm^{-1} in steps of 2 x
- Arid-Zone sample compartment with countercurrent purge flow in telescopic purge tubes provides continuous purge up to sample. Arid-Zone sample compartment with "Open-architecture" provides free space for accessories.
- IR beam at sample focus is f/4.5.
- IR beam at sample focus has nominally 5 mm size.
- Beam diameter at beam stop is 2.5 cm.

- Maximum beam divergence: 90 milliradians.
- Sample focus is 8.9 cm (3.5 in.) above base.
- Free accessory space is 10 cm (4 in.) on each side of sample focus.
- Overall dimensions: 51 cm x 56 cm x 30 cm (20 in. w x 22-1/4 in. d x 12 in. h)
- Weight: 44 kg (97 lbs.).

Interferometer

- Four-port optical design. Eliminates retro-modulation induced artifacts.
- Patented Michelson-type interferometer with 2 cube corner retroreflectors mounted on a "wishbone" swing arm.
- Factory prealigned interferometer and input/output optics; requires no adjustments by user.
- Scanning is by rotating the swing arm on a flex pivot bearing, driven by an induction motor. This provides smooth, constant-velocity, perturbation-free scanning.
- The scanning mechanism has a lifetime warranty against breakage and wear-out.
- Self-compensating, single-plate beamsplitter/compensator.
- Maximum scan length is 1 cm optical path difference both before and after centerburst.
- Scan mode: double-sided interferograms acquired in both forward and reverse directions.
- He-Ne reference laser for: digital sampling, mirror velocity control, quadrature detection of scan direction, and fringe counting for path-difference determination.
- Automatic white-light zero path difference location on power-up.
- Diagonal mirror with flipper mechanism to switch to side-port beam.

Interferometer Enclosure

- The interferometer module, control electronics, power supply, source, and source power supply are housed in a cast-aluminum housing with the lower and upper halves bolted together and sealed with an O-ring.
- Optional output or emission port available on left side of instrument.
- Enclosed volume is desiccated by easy-change cartridge with status indicator.
- Source access panel permits source replacement by user.
- Purge inlet with disperser.
- Electrical power, switch, fuses, data cable, and status lights are interfaced at a side panel on the back right side of the instrument.

Embedded Control

- Modular surface-mount electronics for reliable data acquisition and transfer.
- Automatic shock protection helps to insure that all acquired spectras are perfect.
- 10/100 Mbps Ethernet interface to PC computer.
- Advanced instrument management via web interface.

Computer

- Computer requirements depend on the application software used with the instrument. Information is available in the applicable software data sheets.

Software

- Windows-based program allows acquisition, display, and processing of spectral data.
- Optional Advanced spectroscopic software.
- Optional Spectral Search function.
- Optional PLS and PCR quant software packages.
- Optional quality-control software package (AIRS).
- Optional industrial turn-key automated analysis program (FTSW100).
- Software compatibility with spreadsheet and word-processing programs.

Operating Environment

- Orientation: all specifications are guaranteed only when the instrument is in a horizontal, top-plate up position.
- AC input: 120 or 240 V manually selectable.
- Power consumption: 150 W.
- Ambient temperature: -15 C to 50 C nonoperating, 10 C to 30 C operating. Specifications measured at 25 C.
- Relative humidity (operating): 0% to 95% non-condensing for FTLA2000-104, FTLA2000-154 and FTLA2000-160 models; 0% to 40% non-condensing for FTLA2000-100.

Model	Internal Source	Optics	Detector	Spectral range cm ⁻¹
FTLA2000-100	SiC	KBr	DTGS	6,500-350
FTLA2000-104	SiC	ZnSe	DTGS, ZnSe window	6,500-500
FTLA2000-154	dual SiC / NIR	ZnSe	MIR-NIR DTGS, ZnSe window	12,000-500
FTLA2000-160	NIR	BK7	NIR DTGS	14,000-3,800

Specifications subject to change without notice.



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