



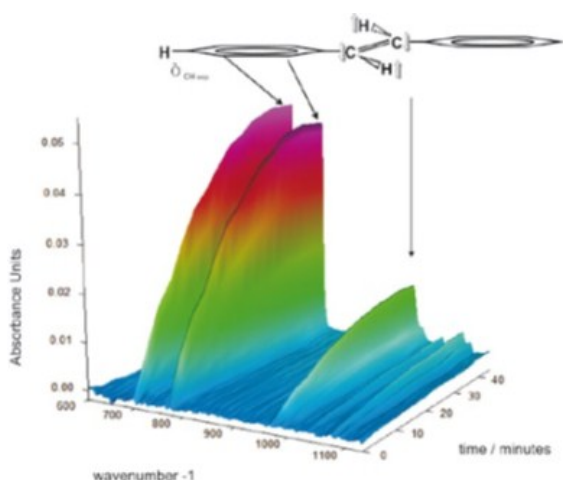
better chemistry – faster



HEL PAT-IR FT-IR Spectrometers

HEL's **PAT-IR** is the mid-infrared (FT-IR) rugged and a compact spectrometer that can be fiber optically coupled to measure chemical reactions in laboratory and/or process environments.

- **Non-destructive analysis in seconds**
- **Ideal for in-line process measurements**
- **Built-in 6-port multiplexer**
- **Multiple components per measurement**



The **PAT-IR** is a process ready FT-IR spectrometer that is ideal for real-time monitoring and analysis of chemical and biological reactions. The **PAT-IR** design protects the optics in a dedicated sealed compartment. The permanently aligned Bruker RockSolid™ interferometer and Digitec detector electronics ensure high quality spectra, even in the harshest environments.

Although the instrument is designed for a process environment, its small footprint can also make it an ideal instrument for laboratory-based applications.

Fiber Optic Probes

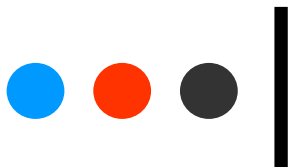
The combination of the ATR (attenuated total reflection) sampling technique and the light guiding fiber optics enhances the use of infrared spectroscopy. Fiber optic probes enable in-situ measurements, which helps fully utilize the benefits of the information rich mid-IR spectroscopy.

A wide range of probe adaptations, including the patented diamond ATR probe, can be attached to the unit for in-situ analysis. The patented design combines a two reflection diamond ATR probe head with the excellent performance of MIR-silver halide fibers.

Main probe specification: 6mm diameter, 300mm length, Hastelloy construction, diamond window, rated from -100 to 180°C and 300bar.

Quick Connect

The **PAT-IR** offers proprietary quick connector design ensuring easy and reproducible fiber optic probe exchange, providing reproducible results. Utilizing the automated built-in multiplexer up to 6 reactions can be monitored by a single instrument.



better chemistry – faster

Specifications

Compact, rugged mid-IR spectrometer based on Bruker optics, designed for quality assurance/process control and process optimization using mid-IR fiber optic probes. One fiber probe connection with BQC is standard, a 6-port multiplexer is optionally available. The system contains a narrow band MCT detector, liquid N2 cooled with a typical hold time of 12h.

Performance:

- Spectral Range: 7500 - 720 cm^{-1} with standard KBr beam splitter and MCT detector
- Measuring Speed: Up to 5 scans/sec at 8 cm^{-1} resolution
- Resolution: Better than 1.0 cm^{-1} (apodized)
- Wavenumber Reproducibility: Better than 0.04 cm^{-1}
- Wavenumber Accuracy: Better than 0.1 cm^{-1}
- Photometric Accuracy: Better 0.1% T

Design:

- Housing: Rugged, compact, sealed and desiccated optics housing (optional: purge accessory)
- Interferometer: Bruker RockSolid, permanently aligned, high stability with gold-coated cube corner mirrors and non-wearing, non-contact bearing for long life
- IR Source: Air cooled MIR source (12V, 20W)
- Beam splitter: KBr substrate with proprietary coating
- Scanner: Mechanical, frictionless bearing (no compressed air required), 4 selectable mirror velocities
- Detector: liquid nitrogen-cooled MCT detector, optional: closed cycle MCT detector

Probe:

- ATR element: Silicon or diamond prism, with 2 reflections
- Probe head length: 290 mm \pm 20 mm
- (customized configurations on request)
- Probe head diameter: 6 mm
- Probe head material: Hastelloy
- Sealing technique: Teflon (Si) or inert soldering (diamond)
- Optical fiber: silver halide fibers in robust cable protective tube
- Spectral range: Silicon 3500 - 660 cm^{-1} (3 - 16 μm),
Diamond 3500 - 560 cm^{-1} (3 - 18 μm),
(depending on detector selection)
- Temperature range: Silicon: -100 $^{\circ}\text{C}$ < T < 130 $^{\circ}\text{C}$
Diamond :-100 $^{\circ}\text{C}$ < T < 180 $^{\circ}\text{C}$
- Pressure stability: Silicon: up to 30 bar
Diamond: up to 300bar



For further information visit <http://www.helgroup.com>

or contact e: marketing@helgroup.com, t: +44 (0)20 8736 0640

HEL Ltd, 9-10 Capital Business Park, Manor Way, Borehamwood, Herts WD6 1GW, United Kingdom