

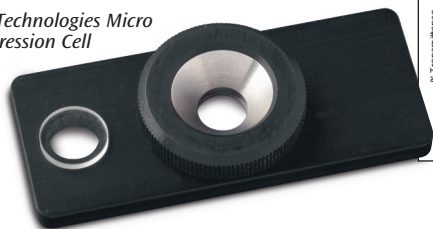
μMAX – Sample Compartment Microscope for FTIR



FEATURES OF THE μMAX

- Compact sample compartment design to save lab space
- Uses FTIR detectors – DTGS or MCT
- Available with transmission, reflection and ATR
- High throughput optical design
- Simultaneously view and collect spectrum
- Easy-to-use, robust design
- Available for most FTIR spectrometers
- Low-cost

PIKE Technologies Micro
Compression Cell

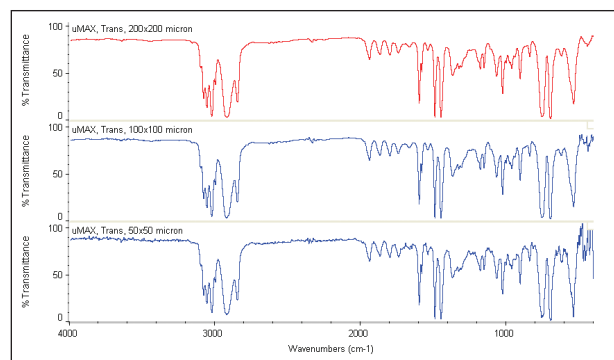


The μMAX™ is an all new optical design for IR microanalysis, providing high performance sampling at low-cost with exceptional ease of use. The μMAX is designed to fit into the sample compartment of most FTIR spectrometers. The compact, planar optical layout minimizes the pathlength of the IR beam and thereby maximizes IR throughput.

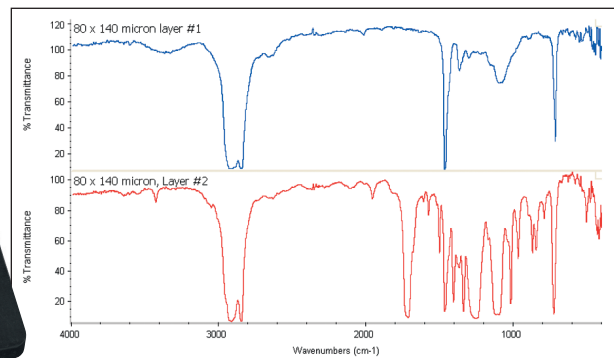
All operations with the μMAX are intuitive and made even easier with standard **Dichroic Optics** which provides full viewing of the sample while collecting IR spectra. With Dichroic Optics you can view the sample area and simultaneously search for appropriate IR spectral content – greatly speeding microanalysis. The fully variable **X, Y, θ See Thru aperture** for transmission provides optimized sample dimensioning – for getting the maximum IR signal from every sample.

The μMAX IR microscope uses 7.45X **Schwartzchild objective and condenser** to focus the IR beam onto the sample and provide excellent sample visualization – better than 1 micron visible image resolution. An optional CCD camera enables video image projection onto the PC. With the Dichroic Optics of the μMAX and spectral preview of the FTIR software one can view changing IR spectra and sample position in real-time on the PC.

The μMAX is the first sample compartment IR microscope accessory capable of all **microsampling modes – transmission, reflection and ATR**. The μMAX fits into the sample compartment, using the spectrometers detector for convenience and sampling flexibility. For relatively larger micro samples (100 microns and greater) the DTGS detector provides excellent performance with the μMAX and enables full mid-IR spectral range coverage to 450 cm⁻¹. For smaller micro samples to 20 microns in size an MCT detector is recommended.

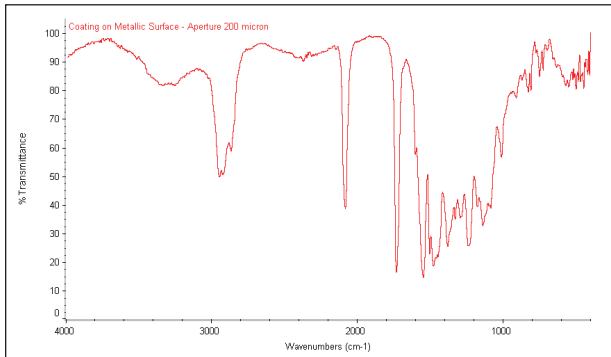


Transmission spectra of polystyrene film at aperture sizes of 200 x 200, 100 x 100, and 50 x 50 microns using the μMAX IR Microscope using the DTGS detector of the FTIR spectrometer. Spectra were collected using 4 cm⁻¹ spectral resolution and 2 minute collection time.



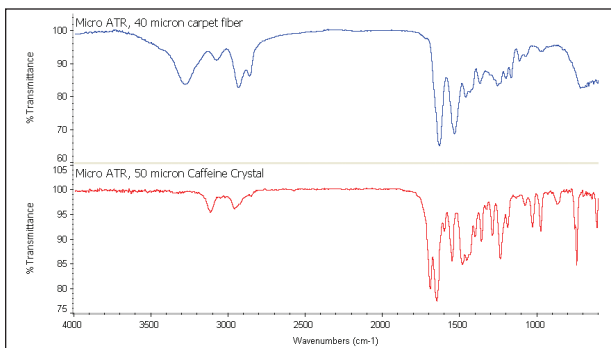
Transmission spectra of polymer laminate sample using DTGS detector. Samples held in PIKE Micro Compression Cell.

Switching from transmission to reflection on the μ MAX is easy with a thumb wheel selection. Reflection sampling area is defined by use of the aperture slide with pre-defined sizes from 40 to 1000 microns. Micro reflection analysis of small areas of interest on reflective surfaces is made easy with the PIKE Technologies μ MAX. Simply focus and position the sampling stage, select the sample area with the aperture slide and collect the spectrum. The background spectrum is collected using the same dimension aperture using the gold surfaced reference slide.



Micro reflection spectrum of a coating on a reflective base metal, 200 x 200 micron sampling area using DTGS detector

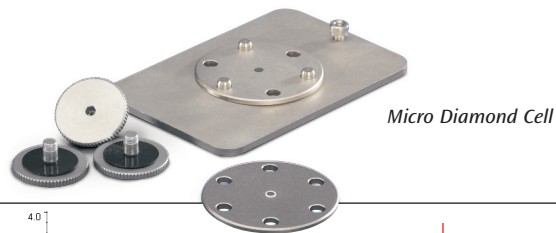
ATR is an excellent sampling option for the μ MAX IR microscope. The RotATR™ is a unique, rugged pivot designed germanium ATR providing easy and precise operation and excellent micro ATR spectra. Focus and select the sample area, rotate the ATR crystal into sample position, make sample contact and collect the IR spectrum.



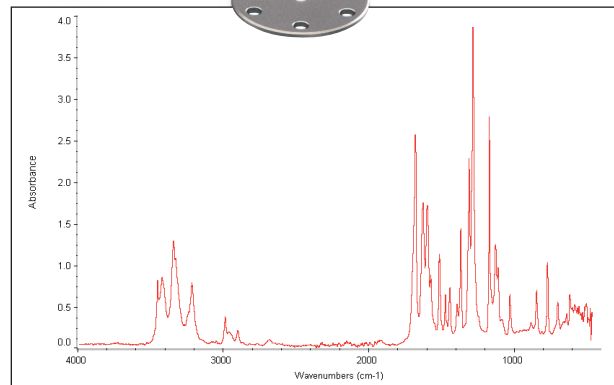
Micro ATR spectra of a 40 micron carpet fiber (upper – blue) and a 50 micron caffeine crystal (lower – red) using DTGS detector

Micro ATR works exceptionally well with the μ MAX IR microscope. The 100 micron flat-tipped micro ATR crystal makes intimate contact with the sample easily achieved, providing high spectral quality as seen in the data above.

The Micro Diamond Cell is an excellent option for use with the μ MAX IR Microscope. Tiny chips or fiber segments can be flattened to obtain excellent transmission spectra.



Micro Diamond Cell



Single drug crystal identified as benzocaine flattened in Micro Diamond Cell. Data collected using DTGS detector

μ MAX SPECIFICATIONS

Sampling Modes	Transmission, Reflection and ATR
Objective	7.45X Schwartzchild, N.A. 0.64, fixed for sturdy, permanent alignment
Optional Condenser	7.45X Schwartzchild, N.A. 0.64, Z-adjust to optimize sample focus
Micro ATR	RotATR with 100 micron tip, pivot pinned-in-place and easily removable for maximum sample area access. Universal Ge crystal for analysis of all micro samples.
Sample Stage	Z focus including X, Y slide sample holder, with 20 x 50 mm travel
IR Collection/Sample Viewing	Dichroic Optics reflect IR energy and transmit visible, providing continuous view of the sample during data collection. Dichroic Optics eliminate the need to switch optics from view sample to collect spectrum.
Sample Masking	X, Y, θ variable Glass Aperture for transmission sampling to view sample and surrounding sample area. Standard pinhole aperture slide for reflection sampling.
Illumination	Köhler, variable intensity, 50 watt
Sample Viewing	Binocular or Trinocular Viewer with 10X eyepieces. Standard eyepiece reticule for sample dimensioning, optional Video Camera with USB interface.
Visible Field of View	1600 microns
Visible Image Contrast	Better than 1 micron
Station	In sample compartment, fits most FTIR spectrometers. Mounted on a baseplate for the FTIR spectrometer.
Detector	Uses standard detectors of the FTIR, typically DTGS and MCT
Purge	Includes purge tubes and purge inlet for additional purge. Compatible with sealed and desiccated FTIR spectrometers.
Regulatory	RoHS and CE Mark compliant

Please contact PIKE Technologies for additional product detail.

ORDERING INFORMATION

Bundled μ MAX Packages

PART NUMBER	DESCRIPTION
034-21XX	Complete μ MAX Sample Compartment IR Microscope with Transmission, Reflection, ATR and video camera
034-22XX	μ MAX Sample Compartment IR Microscope with Transmission, Reflection and ATR
034-41XX	Complete μ MAX Sample Compartment IR Microscope for Reflection, ATR and video camera
034-42XX	μ MAX Sample Compartment IR Microscope with Reflection and ATR

Notes: All bundled μ MAX Packages include a trinocular viewer, slide aperture for reflection, X, Y sample stage, micro sampling kit, spectrometer base mount, purge tubes and storage case. The transmission versions include the X, Y Variable See Thru aperture. Please see the FTIR instrument code sheet.

Configurable μ MAX Systems

μ MAX Base Optics

PART NUMBER	DESCRIPTION
034-20XX	μ MAX Sample Compartment IR Microscope for Transmission and Reflection (ATR optional)
034-40XX	μ MAX Sample Compartment IR Microscope for Reflection (ATR optional)

Notes: The μ MAX Sample Compartment IR Microscope is available in versions for transmission and reflection sampling or reflection only – both versions are also compatible with ATR sampling. RotATR μ MAX ATR must be purchased separately. Both versions include the slide aperture for reflection, X, Y sample stage, micro sampling kit, spectrometer base mount, purge tubes, and storage case. The transmission version includes the X, Y Variable See Thru aperture. Please see the FTIR instrument code sheet.

Sample Viewing Options (must select one or more)

PART NUMBER	DESCRIPTION
034-3020	Binocular Viewer for μ MAX
034-3030	Trinocular Viewer for μ MAX
034-3010	Video Camera for μ MAX

Notes: Trinocular Viewer is required for selection of the Video Camera option. Binocular and Trinocular Viewers include adjustable reticule to assist with sample dimensioning.

Micro ATR (optional)

PART NUMBER	DESCRIPTION
034-3040	RotATR, μ MAX ATR, Ge Crystal

Notes: The RotATR micro ATR is compatible with the μ MAX Sample Compartment IR Microscope.

Sampling Options, Upgrades and Replacement Parts

Micro Sampling Options

PART NUMBER	DESCRIPTION
034-3060	Micro Compression Cell for 13 mm IR Transparent Windows
160-1135	13 mm x 2 mm KBr Window
162-0030	Micro Plane with Carbide Blade
162-0040	Micro Plane with Diamond Blade
162-0010	Micro Diamond Cell 1.6 mm
162-0020	Micro Diamond Cell 2.0 mm

μ MAX IR Microscope Upgrades

PART NUMBER	DESCRIPTION
034-0090	μ MAX IR Microscope Transmission Upgrade

Notes: The Transmission Upgrade requires shipment of the accessory to PIKE Technologies. The upgrade includes the μ MAX condenser, the X, Y Variable See Thru Aperture, and all additional optics required for transmission, reflection and optional ATR sampling.

μ MAX IR Microscope Replacement Parts

PART NUMBER	DESCRIPTION
300-0025	13 mm Gold Surfaced Disk for Reflection Analysis
034-3070	IR Microsampling Kit (3-position sample slide with gold mirror, 2 KBr windows, scissors, tweezers, probes and roller knife with replacement blades)
162-6401	3-position Sample Slide for 13 mm Windows
300-0002	Gold Surfaced Sample Slide
034-3080	Replacement Illumination Bulb for μ MAX

Notes: For options not listed here, please contact PIKE Technologies.