µMAX – *Sample Compartment Microscope for FTIR*

FEATURES OF THE µMAX

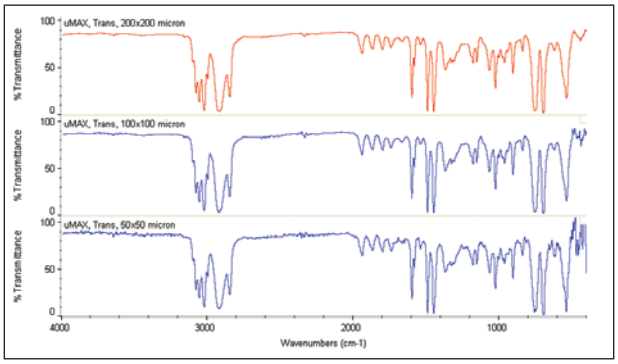
- *Sample compartment design*
- *Uses FTIR detectors – DLaTGS or MCT*
- *Available transmission, reflection and ATR*
- *High throughput optical design*
- *Simultaneous view and collect spectrum*

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 and this, coupled with its planar optical layout, minimizes the pathlength of the IR beam and thereby maximizes IR throughput. Gold-coated reflective optics in the µMAX further enhance IR signal strength and enable its use with the DLaTGS detector in the FTIR.

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 standard aperture slide provides easy fixed aperture dimensions. The optional, fully variable **X, Y, θ See Thru aperture** provides optimized sample dimensioning – recommended for getting the maximum IR energy from every sample.

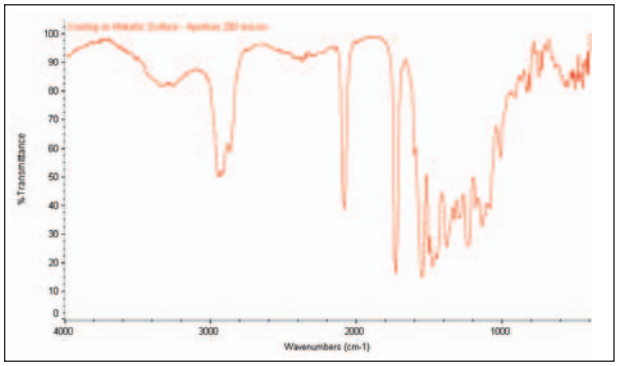
The µMAX IR microscope uses 7.45X **Schwartzchild objective and condenser** to focus the IR beam onto the sample and provide excellent sample visualization – better than 1 micron visible image resolution. An optional CCD camera enables video image projection onto the PC and with the Dichroic Optics of 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 DLaTGS detector provides excellent performance with the µMAX and enables full mid-IR spectral range coverage to 400 cm^{-1}. For smaller micro samples to 20 microns in size an MCT detector is required.



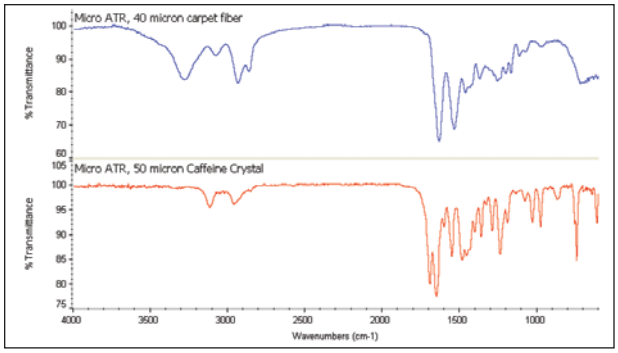
Transmission spectra of polystyrene film at aperture sizes from 200 x 200, 100 x 100, and 50 x 50 microns using the µMAX IR Microscope using the DLaTGS detector of the FTIR spectrometer. Spectra were collected using 4 cm^{-1} spectral resolution and 2 minute collection time.

Switching from transmission to reflection on the µMAX is easy with a thumb wheel selection. Reflection sampling area is defined by use of the aperture slide with pre-defined sizes from 10 to 1000 microns. Micro reflection analysis of small areas of interest on reflective surfaces is made easy with the PIKE Technologies µMAX. Just 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

ATR is an excellent sampling option for the µMAX IR microscope. The RotATR™ is a unique, rugged pivot designed 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)

Micro ATR works exceptionally well with the µMAX 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.

µMax Specifications

Sampling Modes: Reflection, optional Transmission 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, 26 x 75 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: Standard pinhole aperture slide for reflection sampling. Optional X, Y variable Glass Aperture for transmission sampling to view sample and surrounding sample area.

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

IR Microscope Optics: All reflecting optics are gold-coated for maximum IR throughput, optional aluminum coated

Station: In sample compartment, fits most FTIR spectrometers. Mounted on a baseplate for the FTIR spectrometer.

Detector: Uses standard detectors of the FTIR, typically DLaTGS and MCT.

Purge: Includes purge tubes and purge inlet for additional purge. Compatible with sealed and desiccated FTIR spectrometers.

Please contact PIKE Technologies for additional product detail.

Ordering Information

µMax Sample Compartment IR Microscope

Part Number	Description
034-10XX	µMAX Sample Compartment IR Microscope for Transmission, Reflection and ATR (optional) with gold optics
034-20XX	µMAX Sample Compartment IR Microscope for Transmission, Reflection and ATR (optional)
034-60XX	µMAX Sample Compartment IR Microscope for Reflection and ATR (optional), with gold optics
034-40XX	µMAX Sample Compartment IR Microscope for Reflection and ATR (optional)

Notes: The µMax Sample Compartment IR Microscope is available in versions for transmission and reflection sampling or refection only – both versions are also compatible with ATR sampling. RotATR µMax 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 also includes the X, Y Variable See Thru aperture. Please see the FTIR instrument code sheet.

Sample Viewing Options *(must select 1 or more)*

Part Number	Description
034-3020	Binocular Viewer for µMAX
034-3030	Trinocular Viewer for µMAX
034-3010	Video Camera for µMAX

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, µMAX ATR, Ge Crystal

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

µMAX IR Microscope Upgrades *(optional)*

Part Number	Description
034-0090	µMAX IR Microscope Transmission Upgrade

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

Micro Sampling Options

Part Number	Description
034-3050	X, Y Variable See Thru Aperture for µMAX Sample Compartment IR Microscope
034-0100	Standard Slide Aperture for µMAX IR Microscope
034-3060	Micro Compression Cell for 13 mm IR Transparent Windows
160-1135	13 mm x 2 mm KBr Window
300-0025	13 mm Gold Surfaced Disk for Reflection Analysis
034-3070	IR Microsampling Kit (sample slides, scalpel, tweezers, probes)
162-6401	3-position Sample Slide for 13 mm Windows
300-0002	Gold Surfaced Sample Slide
034-3080	Replacement Illumination Bulb for µMAX

Notes: The X, Y Variable See Thru Aperture is used to mask the sample in the transmission sampling mode. The standard slide aperture is used to mask the sample in the reflection sampling mode. For options not listed here, please contact PIKE Technologies.

PIKE TECHNOLOGIES

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