

μMAX

AT A GLANCE

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



The μMAX™ is an IR microscope for microanalysis providing high-performance sampling at low-cost with exceptional ease-of-use.

OPTICAL DESIGN

The μMAX fits 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 this feature, you can view the sample area and simultaneously search for appropriate IR spectral content—greatly speeding microanalysis. The fully variable X, Y, θ see-through aperture for transmission provides optimized sample dimensioning for getting the maximum IR signal from every sample.

The μMAX IR microscope uses a 7.45X Schwarzschild 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 and spectral preview of the FTIR software one can view changing IR spectra and sample position in real-time.

MICROSAMPLING MODES

The μMAX is the first sample compartment IR microscope accessory capable of transmission, reflection and ATR analysis. The μMAX uses 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 TO MICRO REFLECTION ANALYSIS

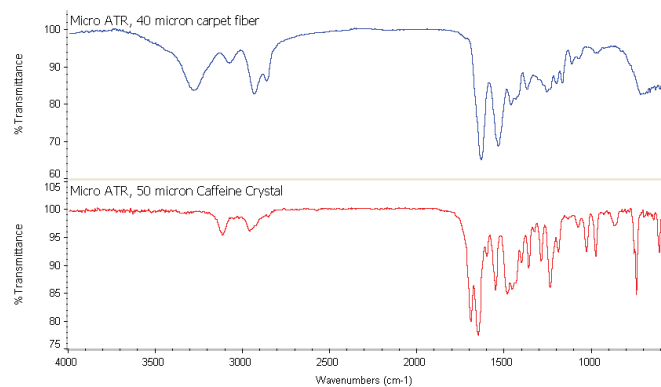
Switching from transmission to reflection on the μMAX is easy with a thumb wheel selection. Reflection sampling area is defined by use of the aperture slide with pre-defined sizes from 40 to 1000 microns. Micro reflection analysis of small areas of interest on reflective surfaces is easy. Simply focus 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 ATR

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

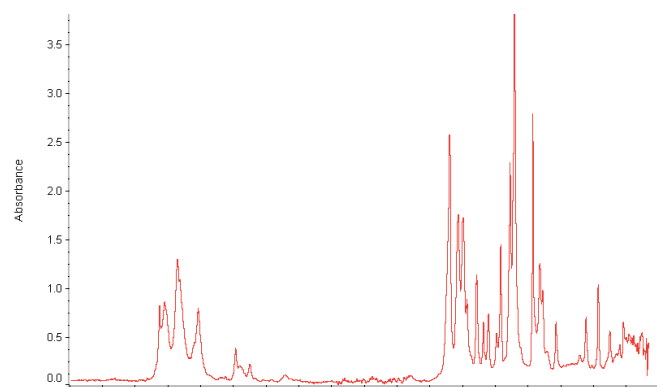
Micro ATR works exceptionally well with the μ MAX IR microscope. The 100-micron flat-tipped micro ATR crystal makes intimate contact with the sample easily achieved, providing high spectral quality as seen in the data below.



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

MICRO DIAMOND CELL

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. Typical samples include crystals, fibers, paint chips, rubbers and plastic materials including laminates.



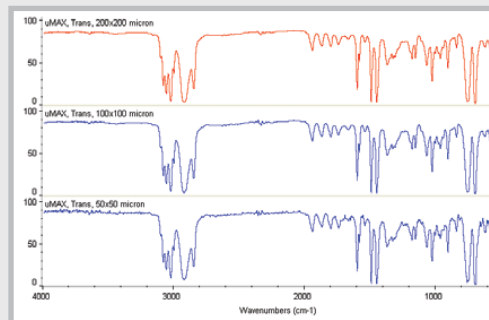
Single drug crystal identified as benzocaine flattened in the Micro Diamond Cell. Data collected using DTGS detector.



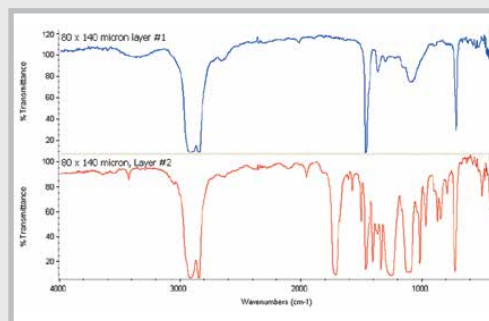
Micro Diamond Cell.

APPLICATION

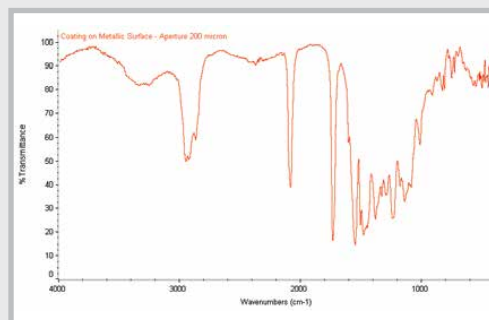
The μ MAX is an in-sample compartment IR microscope, which conveniently uses your spectrometer's detector. Data quality may be optimized by choosing the most appropriate sampling technique—ATR, transmission or reflection.



Transmission spectra of polystyrene film at aperture sizes of 200 x 200, 100 x 100, and 50 x 50 microns using the μ MAX IR Microscope and the DTGS detector of the FTIR spectrometer (collected at 4 cm^{-1} spectral resolution using a 2-minute collection time).



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



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



SPECIFICATIONS

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| Sampling Modes | Transmission, Reflection and ATR |
| Objective | 7.45X Schwartzschild, N.A. 0.64, fixed for sturdy, permanent alignment |
| Optional Condenser | 7.45X Schwartzschild, 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 | 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 Viewing | 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 compliant Please contact PIKE Technologies for additional product details. |

| PART NUMBER | DESCRIPTION |
|-------------|---|
| 034-21XX | Complete μMAX Sample Compartment IR Microscope with transmission, reflection, Ge ATR and video camera |
| 034-22XX | μMAX Sample Compartment IR Microscope with transmission, reflection and Ge ATR |
| 034-41XX | Complete μMAX Sample Compartment IR Microscope for reflection, Ge ATR and video camera |
| 034-42XX | μMAX Sample Compartment IR Microscope with reflection and Ge ATR |

Notes: Replace XX with your spectrometer's Instrument Code listed in the back of the catalog. All bundled μMAX packages include trinocular viewer, slide aperture for reflection, X, Y sample stage, microsampling kit, spectrometer base mount, purge tubes and storage case. Transmission versions include X, Y, θ variable see-through aperture.

Configurable μMAX Systems

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| 034-20XX | μMAX Sample Compartment IR Microscope for transmission and reflection (ATR optional) |
| 034-40XX | μMAX Sample Compartment IR Microscope for reflection (ATR optional) |

Notes: Replace XX with your spectrometer's Instrument Code listed in the back of the catalog. The μMAX 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 μMAX ATR must be purchased separately. Both versions include slide aperture for reflection, X, Y sample stage, microsampling kit, spectrometer base mount, purge tubes, and storage case. Transmission version includes X, Y, θ variable see-through aperture.

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

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| 034-3020 | Binocular Viewer |
| 034-3030 | Trinocular Viewer |
| 034-3010 | Video Camera |

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*)

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| 034-3040 | RotATR, μMAX ATR, Ge Crystal |
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Note: The RotATR micro ATR is compatible with the μMAX Sample Compartment IR Microscope.

| PART NUMBER | DESCRIPTION |
|-----------------------|---|
| Microsampling Options | |
| 034-3060 | Micro Compression Cell for 13-mm IR transparent windows |
| 160-1135 | Window, KBr, 13 x 2 mm |
| 162-0030 | Micro Plane, carbide blade |
| 162-0040 | Micro Plane, diamond blade |
| 162-0010 | Micro Diamond Cell, 1.6 mm |
| 162-0020 | Micro Diamond Cell, 2.0 mm |
| 162-0045 | Micro TouchPick Pen Set Includes pen with tip size 0.62 mm and 0.17 mm, scalpel/roller knife, cleaning compound and holder case |
| 162-0046 | Diamond Window, 2.5 mm |
| 162-0047 | Diamond Window, 3.5 mm |
| 162-0048 | Micro Vice-Mini |
| 034-0923 | Micro Roller Knife |

Note: For additional product information, see the microsampling tools section.

μMAX IR Microscope Upgrades

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| 034-0090 | μMAX IR Microscope Transmission Upgrade |
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Notes: Transmission Upgrade requires shipment of the accessory to PIKE Technologies. Upgrade includes μMAX condenser, X, Y, θ variable see-through aperture, and all additional optics required for transmission, reflection and optional ATR sampling.

μMAX IR Microscope Replacement Parts

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| 300-0025 | Gold-Surfaced Disk, 13 mm, for reflection analysis |
| 034-3070 | IR Microsampling Kit Includes 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, 1" x 3" |
| 034-3080 | Replacement Illumination Bulb for μMAX |

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