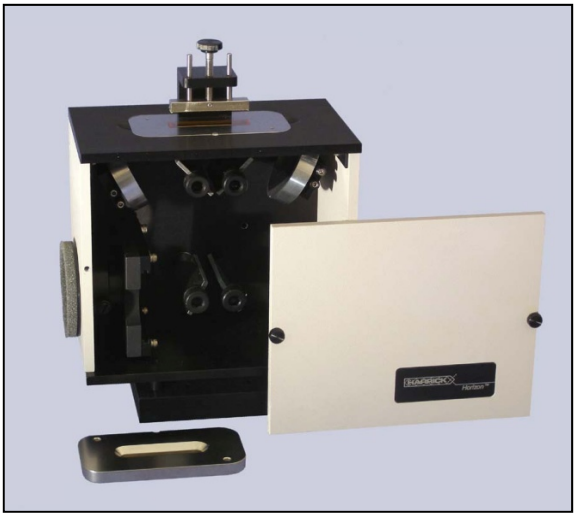
HORIZON™

The Horizon™ multiple internal reflection attachment is well suited for rapid analysis of liquids, pastes, powders, and thick films. Its unique design takes advantage of the astigmatism inherent in spherical mirrors to shape the beam to match the aperture of the ATR crystal and to keep the radiation away from the edges of the crystal. This eliminates spectral interference from the adhesive used to mount the crystal and results in higher throughput. The Horizon™ also features a horizontal sampling surface for easy sample positioning and PermaPurge for rapid sample and crystal exchange without interrupting the purge of the system.

APPLICATIONS

- Multiple reflection ATR spectroscopy.
- Useful for examining liquids, pastes, powders and other soft solids.
- Perfect for quality control and other applications requiring rapid sample exchange.



FEATURES

- Top loading.
- Unobstructed, horizontal sampling surface.
- Thirteen reflections from the sample.
- Readily exchangeable sampling plates
  - Solid sampling plate includes pressure plate for analyzing powders and solids.
  - Gasket-sealed trough for measurements of liquids and pastes. User replaceable ATR crystal.
- Rapid sample and crystal exchange without interrupting the purge.
- Utilizes astigmatism to match the beam shape to that of the ATR crystal, creating insensitive edges within the crystal, minimizing spectral inference from the adhesive or gasket used to mount the crystal.
- High spectral contrast.
- High throughput (25-40%)
- Wire grid polarizer available separately.
- Optional adapters for injection, flow-through, and temperature controlled applications (see table).

INCLUDES

- One mounted 50x10x2mm SPT 45° ZnSe crystal.
- Solid or trough sampling plate.

MOUNTED ATR CRYSTALS

Material	Solid Plate	Trough
Ge	HOR-SSP-J	HOR-LSP-J
ZnSe	HOR-SSP-M	HOR-LSP-M

ADAPTERS

	Fitting	Approx. Volume	Pressure Range (ktorr)	Temp. Range (ºC)*	Catalog Number
Solid Plate	Luer	0.14 ml	Ambient to 1.8	Ambient	HON-FSL
Solid Plate	Luer	0.14 ml	Ambient to 1.8	-10 to 190	HON-FSL-TC3
Solid Plate	Swagelok	0.14 ml	10^{-4} to 4.1	Ambient	HON-FSS
Solid Plate	Swagelok	0.14 ml	10^{-4} to 4.1	-10 to 190	HON-FSS-TC3
Trough	Luer	2.89 ml	Ambient to 1.8	Ambient	HON-FLL
Trough	Luer	2.89 ml	Ambient to 1.8	-10 to 190	HON-FLL-TC3
Trough	Swagelok	2.89 ml	Ambient to 4.1	Ambient	HON-FLS
Trough	Swagelok	2.89 ml	Ambient to 4.1	-10 to 190	HON-FLS-TC3

* May be limited by the ATR crystal, connectors or tubing. The maximum useable temperature for Ge is 100ºC.

ORDERING INFORMATION

	CATALOG NO
Horizon™ Liquid Sampler	HON-L-XXX
Horizon™ Solid Sampler	HON-S-XXX

OPTIONS

Wire Grid Polarizer, KRS-5 substrate, Continuously Adjustable	PWG-UIR
Torque Screwdriver	PWT-SXX
Temperature Controller, 110V input, 24V output	ATC-024-3
Temperature Controller, 220/240V input, 24V output (CE marked)	ATC-024-4
Temperature Controller,USB to RS-485 Adapter	ATC-USB-485

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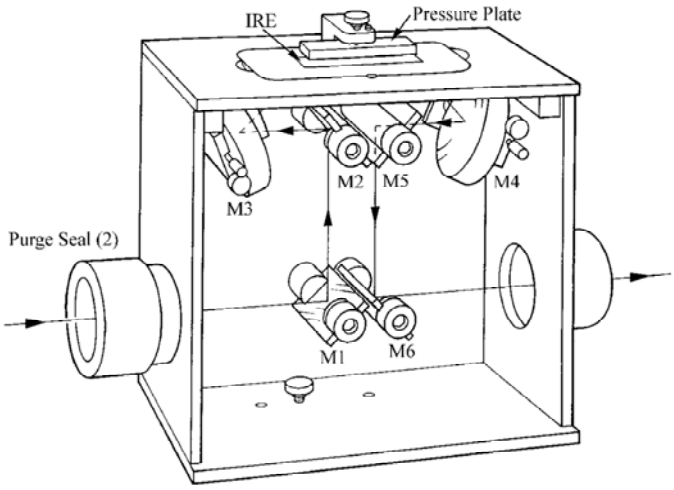

Figure 1. The Horizon™ Solid Sampler.

The Horizon™ multiple internal reflection attachment is a powerful tool for examining liquids, pastes, powders, and soft surface solids.

The unobstructed, horizontal sampling surface makes analysis easy. Samples of various sizes may be simply placed on top of the ATR element. For high quality spectra without atmospheric interference, this accessory features PermaPurge™ for rapid sample and crystal exchange while maintaining the purge. This is ideal for quality control and other applications.

The Horizon™ is shown in Figure 1. Mirrors M1 and M2 direct the incident beam to a spherical mirror, M3, which focuses the beam into the crystal. The beam is internally reflected along the length of the crystal, where it interacts with the sample. After interacting with the sample, the beam is reflected from spherical mirror M4 to M5. Mirror M5 reflects the beam to mirror M6 and onto the detector of the spectrometer. The crystal is positioned relative the focal points of the two spherical mirrors so that the beam shape is elongated to match the aperture of the crystal at both its entrance and exit (see Figure 2). Upon entering the crystal, the light continues converging in the direction parallel to the width of the crystal. When it reaches the center of the crystal, it starts diverging. This keeps the radiation away from the edges of the crystal, minimizing spectral interference from the adhesive used to seal the crystal onto the mounting plate. This optical design results in a highly efficient multiple reflection accessory.

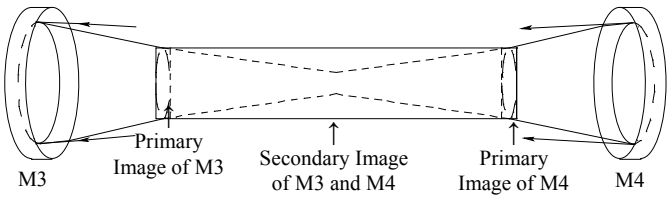

Figure 2. Schematic of the Beam Profile as the Beam Passes through the ATR Crystal.

Representative spectra obtained using the Horizon™ are shown in Figures 3 through 6.

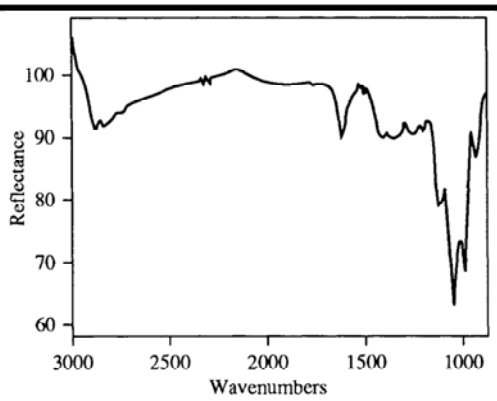

Figure 3. ATR Spectrum of Sweetened Coffee (without Milk) Relative to Water.

Figure 4. ATR Spectrum of an Adhesive on Paper.

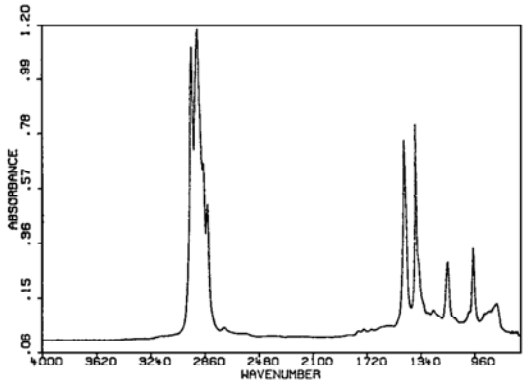

Figure 5. ATR Spectrum of Anhydrous Maleic Acid in Molten Polypropylene Recorded at 185°C.

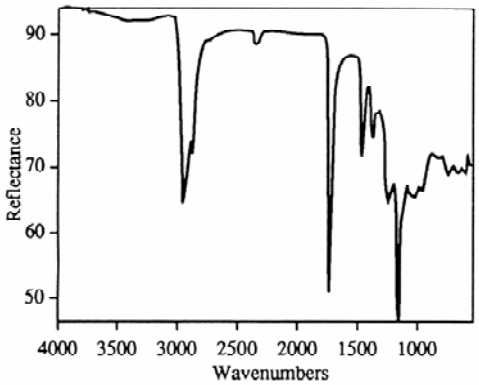

Figure 6. ATR Spectrum of Black Foam.