DIAMAXATR
-HIGH THROUGHPUT DIAMOND ATR-

The DiaMaxATR is the *highest* performance single reflection diamond ATR available at an unbeatable price. This accessory is designed not only for straightforward infrared spectroscopy of common laboratory samples like liquids, powders, pastes and solids but also for analysis of challenging samples such as extremely hard solids, abrasive powders and highly corrosive liquids. The sampling plate features a high performance diamond crystal sealed into a chemically resistant stainless steel holder. It can be readily removed from the base and snaps firmly into place. This accessory is enclosed for purge. Liquid are measured by simply placing a drop on the crystal. Solids can be compressed against the ATR crystal using the built-in pressure applicator with its force-limited slip-clutch. Optional heated and flow cells are available, along with a force sensor with digital read-out for more precise compression.

APPLICATIONS

- Excellent for studying optically thick, hard samples; slightly curved samples; fibers; paint chips; micro-liters of liquids and pastes; and powders.
- Invaluable for QC applications.

FEATURES

- High throughput *Diamond* ATR for the mid-IR
- Small, slightly raised sampling area: 1.5mm in diameter.
- Convenient horizontal sampling.
- High sample throughput.
- Little or no sample preparation required.
- Excellent retention of sample integrity.
- Readily interchangeable sampling plates.
- Built-in pressure applicator with slip-clutch for reproducible compression of solids.
- Optimized contact between the ATR crystal and solids.
- Pre-aligned and ready to use with adjustments to optimize performance as needed.
- Harrick's PermaPurge™ for rapid sample exchange without interrupting the purge.
- Optional monolithic diamond sampling plate for use in the FIR.
- Optional Liquid Cells for static and flow through applications, featuring:
  - Heatable for operation up to 200° C with the included 24V heaters and FKM o-rings.
  - Cooling conduit for operation at below and near ambient temperatures.
  - Luer or Swagelok fittings.
- Optional solid sampling adapter with 24V heaters and cooling conduit, for operation up to 200° C.
- Force sensor with digital read-out for precise force measurements available.

INCLUDES

- Epoxy-free high throughput diamond ATR sampling plate.
- Built-in pressure applicator with slip-clutch.
- Mating hardware for the specified spectrometer.

Mounted ATR Crystals	
FIR diamond	MVD-ATR-W
Si	MVD-ATR-E
Ge*	MVD-ATR-J
ZnSe*	MVD-ATR-M
High throughput diamond	MVD-ATR-WC

ORDERING INFORMATION

	CATALOG NO.
High Throughput Diamond ATR	MVD-XXX

XXX denotes the spectrometer code

OPTIONS

	CATALOG NO
Liquid cell with Luer fittings	MVD-FSL-3
Liquid cell with Swagelok fittings	MVD-FSS-3
Volatiles Cover	FAS-XCS
Temperature controllable solid sampling adapter	MVD-SSP-3
Temperature Controller (110V)	ATK-024-3
Temperature Controller (220/240V)	ATK-024-4
Force Sensor (110V)	MVD-1-FSD
Force Sensor (220/240V)	MVD-2-FSD
*Low Torque Slip-Clutch, 24 in-oz (170mN-m) for Ge ATR crystals	SLP-CLL

Harrick Scientific Products, Inc.
141 Tompkins Ave, 2nd Floor, Pleasantville NY 10570
Ph: 800-248-3847 or 914-747-7202, FAX: 914-747-7209, web site: www.harricksci.com, e-mail: info@harricksci.com

This high throughput diamond ATR is ideal for analyzing routine samples and samples are difficult to analyze by conventional spectroscopic methods. Liquids and pastes are easily placed by droplet or smear on the ATR crystal for measurement. Compressible solids, like foam or gasket materials, harder solids like tablets, shaped plastics and coated metals are readily pressed against the ATR crystal for analysis.

To make optimal contact with solid and powder samples, the DiaMaxATR is equipped with a built-in pressure applicator with slip-clutch. For more precise force measurements, a pressure applicator with built-in force sensor and display is available on special order.

The accessory utilizes all front-surface mirrors to focus the beam to and from the ATR crystal. The basic model comes with a monolithic diamond ATR with a 1.5 mm diameter sampling area. The high performance AR coated diamond is suitable for use for spectroscopy measurements in the mid-infrared and FIR diamond is offered for use from 45,000 cm^{-1} to the FIR; both with limited signal-to-noise in the 2300 cm^{-1} to 1850 cm^{-1} region.

The ATR crystal is sealed mounted in a removable sampling plate for easy cleaning and replacement. The sampling plate assembly is made from chemically resilient materials for a broad range of applications and snaps firmly in place when reinstalled.

The DiaMaxATR comes pre-aligned and features adjustments to optimize performance with virtually any infrared spectrometer. These adjustments are equipped with tamper-resistant lock-outs for ease of use in multi-user facilities. Some of these also serve as part of the purge enclosure, for rapid sample exchange without interrupting the purge of the system.

The optional solid sampling adapter and liquid cells incorporate 24V heaters, a K-type thermocouple and a cooling conduit for operation up to 200° C. The liquid cells seal using a FKM o-ring and are available with Luer or Swagelok fittings The interior volume of the cells are 0.3 mL and 0.4 mL respectively.

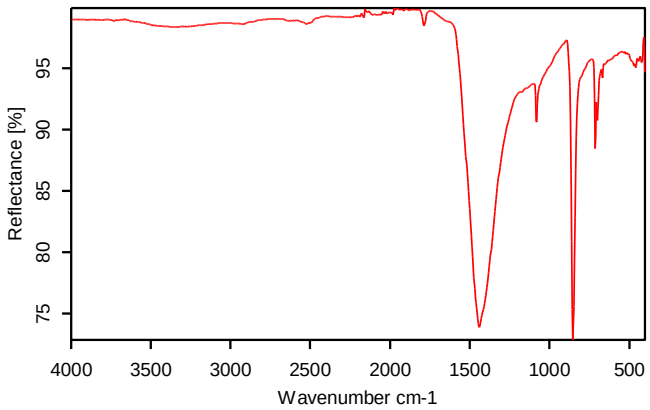

Figure 1. ATR Spectrum of Sand.

Representative spectra recorded with this accessory are shown in Figures 1 through 3. Figure 1 shows the spectrum of sand from a child's sandbox. As expected, the spectrum shows the broad absorption with a maximum at around 1082 cm^{-1} which is attributed to the Si-O stretching vibrations and the bands around 863 cm^{-1} and 667 cm^{-1} are due to the Si-O-Si bending vibrations.

Figure 2 shows spectra of brown paper and printing on that paper. The pad is impregnated with soap, as shown by the black spectrum. The spectra show that the concentration of soap in the pad is lower after the pad has been used.

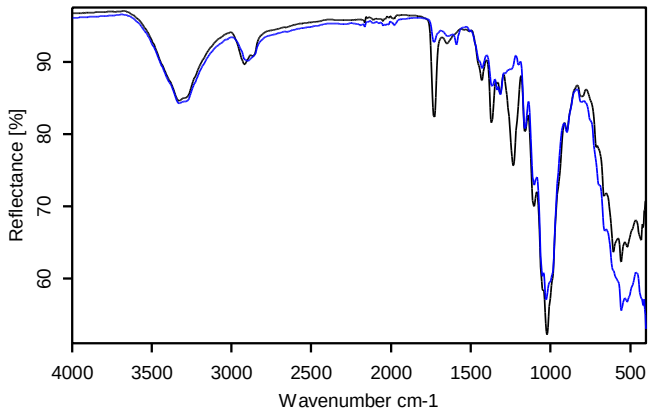

Figure 2. ATR Spectra of brown paper (black) and blue print on brown paper (blue)

Figure 3 shows the ATR spectra of powdered dishwasher detergent. The detergent was a white powder with a low (<1%) concentration of green particles. A few grains of the green grains were separated from the bulk for analysis. The spectra show that the green material differs in composition from the bulk.

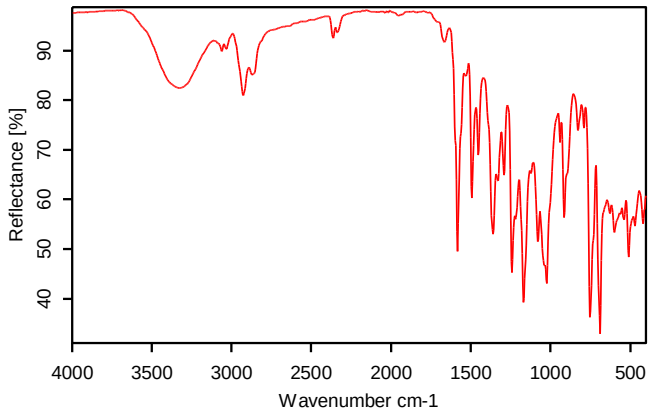

Figure 3. ATR Spectrum of blue ink from a PaperMate Profile® blue pen.

The DiaMaxATR high throughput diamond ATR is excellent for examining a wide range of samples - liquids, pastes and solids. It is ideal for analyzing samples that would damage other crystals – highly acidic or basic liquids and extremely hard solids.