FastIR™

The FastIR* is a horizontal, single ATR accessory. It was originally designed for quick internal reflection (ATR) measurements of liquids and pastes. It is also extremely convenient for examining solids. Simply place the sample (liquid, paste or soft solid) on the prism, spread it over the horizontal sampling surface, record the spectrum, and wipe the prism clean.

APPLICATIONS

- Single reflection ATR spectroscopy.
- Convenient for routine analysis of liquids, pastes, and flexible solids.
- Excellent for both laboratory and quality control environments.

FEATURES

- Provides highly repeatable, qualitative and quantitative results.
- Convenient, horizontal sampling surface.
- Fixed 45° incident angle.
- Top loading.
- SuperCharged™ ZnSe optics for superior performance.
- Easy to align and use.
- High throughput (greater than 85%).
- Minimal sample preparation required.
- Readily exchangeable crystal.
- Optional polarizer for enhanced spectral contrast and orientation studies. Includes slide plate mount.
- PermaPurge™ for rapid purging of the system.

INCLUDES

- Mounted ZnSe prism.
- Built-in pressure plate and clamp for solid sampling.
- Glass cover slide for volatile samples.
- Mating hardware for the specified spectrometer.

Material	Catalog No.
ZnSe	FAS-ATR-M
ZnS	FAS-ATR-I
Ge	FAS-ATR-J

*Patented.

ORDERING INFORMATION

	CATALOG NO.
FastIR™	FAS-XXX*
OPTIONS	
Slip-Clutch, 56 in-oz	SLP-CHI
Slip-Clutch, 24 in-oz	SLP-CLO
FastIR™ Wire Grid Polarizer (KRS-5 substrate). Includes mount and polarizer	PWD-FAS-XXX*
Wire Grid Polarizer Mount for the GATR™ (use with PWD Polarizer)	PWC-FAS-XXX*
Torque Screwdriver	PTW-SXX
Flow-Through Liquid Cell	FAS-FLC
Temperature-Controlled Liquid Cell, 24V	FAS-TCC-3
Temperature Controller, 110V input, 24V output	ATC-024-3
Temperature Controller, 220/240V input, 24V output (CE marked)	ATC-024-4
REPLACEMENT PARTS	
Cover Slide	FAS-XCS

**XXX indicates spectrometer make and model*

Harrick Scientific Products, Inc.
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Ph: 800-248-3847 or 914-747-7202, FAX: 914-747-7209, web site: www.harricksci.com, e-mail: info@harricksci.com

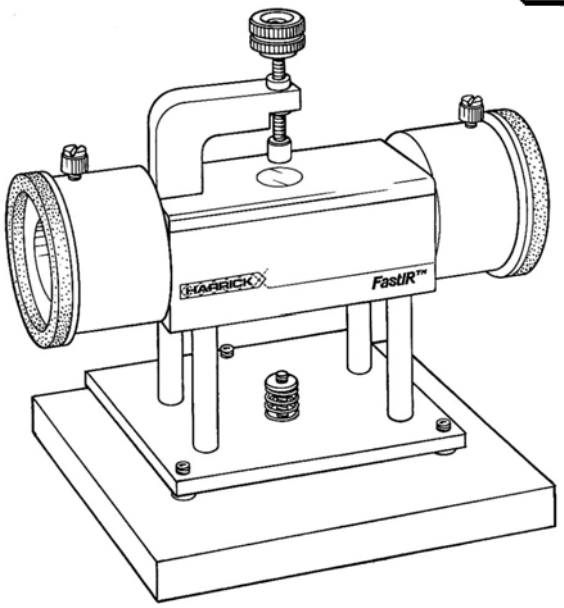


Figure 1. The FastIR. Shown with PermaPurge.

This single reflection, horizontal internal reflection (ATR) attachment is a powerful analytical tool for repeatable qualitative and quantitative studies of a wide range of samples. These include aqueous and organic liquids, pastes, and organic and inorganic powders

The simple efficient optical design of this attachment combines high optical throughput with the convenience of horizontal sampling. Installation and alignment are simple. Sample preparation is virtually eliminated. The high energy throughput allow excellent spectra to be obtained even with weakly absorbing samples. Conventional transmission cells can cause a degradation of spectral information obtained on highly absorbing samples due to severe energy losses, making accurate analytical work impossible. For such samples, the attenuation of this single reflection horizontal internal reflection attachment is essential.

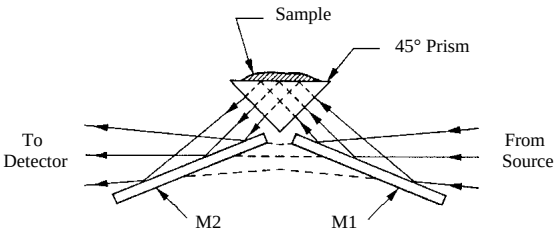


Figure 2. Optical Drawing of the FastIR™.

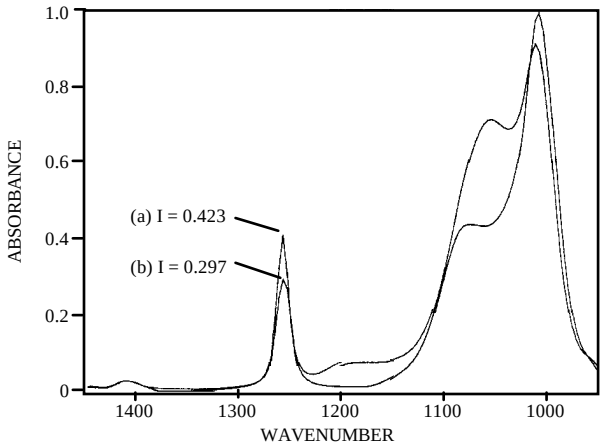
An optical drawing of the FastIR™ is shown in Figure 2. Light from the spectrometer source strikes mirror M1. The reflected light then strikes the 45° single reflection crystal at normal incidence and passes through the element until it is internally reflected at the sampling surface. The light interacts with the sample and exits the other 45° face at normal incidence. The radiation then reflects from mirror M2 to the detector of the spectrometer. This design provides a high degree of insensitivity to precise alignment. It also allows the mirror configuration of the attachment to be used not only for internal reflection (ATR) but also for external or specular reflection at a fixed 45° angle of incidence.

The standard internal reflection element is made from ZnSe. This has a wide useful spectral range (20,000 cm^{-1} to 500 cm^{-1}) and durable mechanical properties. Alternative materials are also available. The crystal is held into its mounting block using a Kalrez gasket. This gasket does not interact with the sampling radiation. Thus spectra are free from any spurious peaks or energy degradation due to the interaction of the light with the adhesive.

Liquids and pastes may be analyzed by simply placing the sample on top of the crystal. For volatile samples, a glass cover slide is provided. The o-ring of the sealed liquid cell does not come in contact with the sampling light, so spectra are free from any interference or degradation associated with the o-ring. Additional accessories for the FastIR™ include flow-through liquid reservoirs and trough-style liquid cells. Heatable solid and liquid cells are available on special order.

Solid materials, such as fine powders, flexible polymers, and soft films, may also be analyzed using this attachment. In order to assure uniform and repeatable compression of the sample, a pressure plate and clamp are provided.

As one example of the versatility of this attachment, quantitative analyses of silicone oil were performed. The ability to analyze these samples directly eliminated the need for a tedious chromatographic separation. The samples exhibit high absorbance in the infrared and high viscosity. Use of



Figures 3a and 3b. Silicone Oil.
Components (a) 1 and (b) 2.

short pathlength transmission liquid cells would prove difficult due to the viscosity of the samples. The short effective pathlength and ease of sample introduction for this attachment, however, make analyses of samples of this nature extremely straightforward. Figures 3a-c show the almost identical absorbance spectra of the silicone oil samples: pure component 1, pure component 2, and a mixture of the two. Using the absorbance at 1257 cm^{-1}, the concentration of components 1 and 2 in the mixture were quickly and accurately determined.

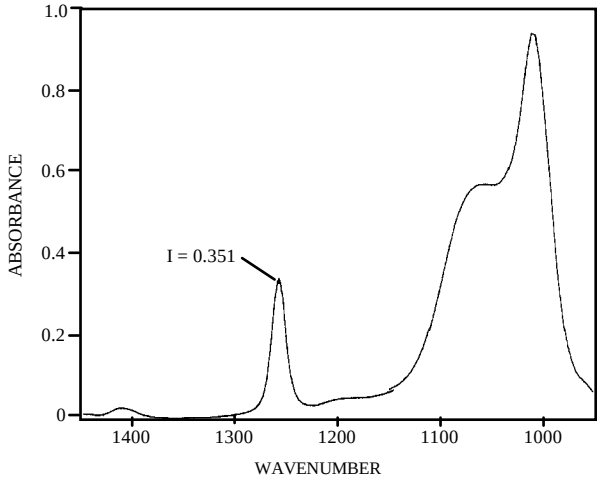


Figure 3c. Silicone Oil Mixture.

A second example is given in Figure 4. Here, the spectrum of talcum powder is shown. This spectrum was taken using the attachment with the pressure plate and clamp.

These two examples demonstrate the utility and flexibility of this single reflection FastIR™ accessory.

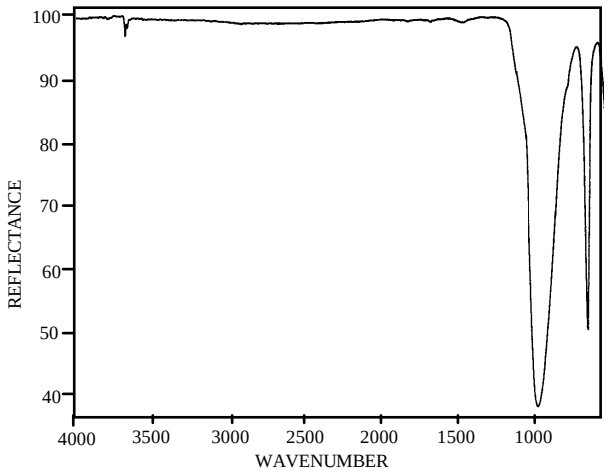


Figure 4. Internal Reflectance of Talcum Powder.