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VARIABLE ANGLE REFLECTION ACCESSORY

Harrick's Variable Angle Accessory is ideal for specular reflection studies of films on metallic substrates, coatings, contaminants on reflective surfaces, and measurements of film thickness. The sample stage is readily adapted for absolute reflectance measurements or convenient horizontal sampling at a 12° incident angle.



APPLICATIONS

- ► Specular reflection studies of coatings on reflective substrates.
- ► Films on metallic substrates.
- ► Determining film thickness.
- ► The industry standard for variable angle specular reflectance.

FEATURES

- ► Incident angle variable from 30° to 85°.
- ► Accommodates samples at least 12mm x 12mm and up to 12mm thick.
- ► Maintains alignment for all incident angles.
- ► Adaptable for variable angle, fixed angle, and absolute reflection studies.
- ► Models available for a wide range of FT-IR and UV-Vis spectrometers.

INCLUDES

- ► Optical base unit with variable angle reflectance sample stage.
- ► Mating hardware for the specified spectrometer.
- ► Optional sample stages for absolute reflectance and horizontal sampling.

OPTIONAL SAMPLE STAGES

12° ABSOLUTE REFLECTANCE SAMPLING STAGE



- Ideal for highly reflective substrates.
- Utilizes the VW double reflection technique.
- Alignment, pathlength and polarization are maintained for both the sample and reference measurements

45° ABSOLUTE REFLECTANCE SAMPLING STAGE

- Useful for examining highly reflective substrates.
- Measures the square of the reflectance using the VW double reflection technique.
- Alignment, pathlength and polarization are maintained for both sample and reference measurements.

HORIZONTAL REFLECTION STAGE



- Fixed 12° incident angle.
- Convenient horizontal sampling.

ORDERING INFORMATION

	CATALOG NO.
Variable Angle Reflection Accessory	VRX-XXX

'X' denotes model (C, T, L or R); 'XXX' denotes the spectrometer code

OPTIONAL SAMPLE STAGES

12° Absolute Reflectance Sampling Stage	VR1-VWA-12	Horizontal Reflection Stage	VR1-HRS
45° Absolute Reflectance Sampling Stage	VRX-VWA-45		

OPTIONS

Wire Grid Polarizer, KRS-5 Substrate	PWG-U1R	Polarizer Mount (VRC models only)	VRC-PLL
Glan-Taylor Polarizer	PGT-S1V	Purge Cover/Light Shield (VRC models only)	VRC-OPC
Large Sample Support	VR1-RMA-LSS	KBr window for encl. (VRC models only)	WPD-U38-P

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The Variable Angle Reflection Accessory is ideal for specular reflection studies of films on metallic substrates, coatings, contaminants on reflective surfaces, and measurements of film thickness. This accessory is the industry standard for variable angle specular reflectance studies. Three different models are available to suit the various optical designs of commercial FT-IR and UV-Vis spectrometers.

The incident angle can be continuously varied from approximately 30° to 80°. Samples with a minimum size of ½" x ½" and up to 0.5" thick can be readily examined. This accessory works best with samples up to 0.5" thick.

The incoming radiation is directed by mirrors to the sampling stage, where it reflects from the sample stage mirror and the sample. This mirror and the sample are coupled to rotate together. This configuration ensures that, once the Variable Angle Reflection Accessory is aligned, it remains aligned for all incident angles. A typical application is shown in Figure 1.

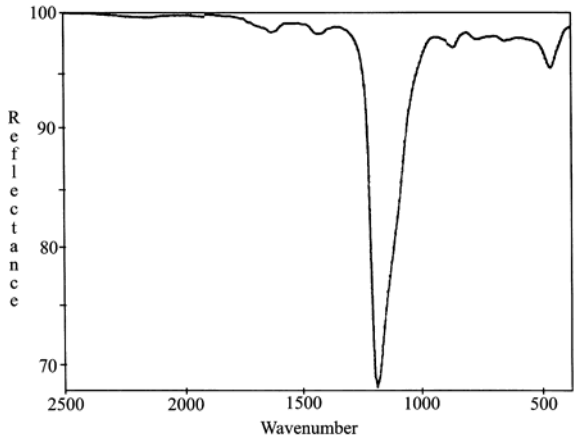


Figure 1. External Reflectance of an SiO2 Coated Mirror at an Incident Angle of 75°.

For polarization measurements, Harrick Scientific's Brewster's Angle or Wire Grid Polarizers can be easily mounted onto the sample stage. For sampling versatility, there are four different reflectance sampling stages available: a continuously variable angle rotational stage, included with the accessory; 12º absolute reflectance stage; 45º absolute reflectance stage and a 12º horizontal stage.

Absolute Reflectance Sample Stages

The two fixed angle absolute reflectance sample stages are available, featuring incident angles of 12º and 45º. Both utilize the 'V-W' double reflection technique illustrated in Figure 2. Using this technique, the reference spectrum is obtained in the 'V' mode. The beam is directed by mirrors to the sample stage mirror and back to the detector. To collect the sample spectrum, the stage is rotated (12º model) or inverted (45º model) to the 'W' mode. In this mode, the beam is directed from the sample to the stage mirror. The sample stage mirror reflects the beam back to the sample. The beam is then directed via mirrors to the detector of the spectrometer.

This configuration maintains the alignment, optical pathlength and polarization for both the sample and the reference spectra. Note that the quantity measured is the ratio of the spectrum with the sample to the spectrum without the sample, is R^2. Other incident angles are available on special order.

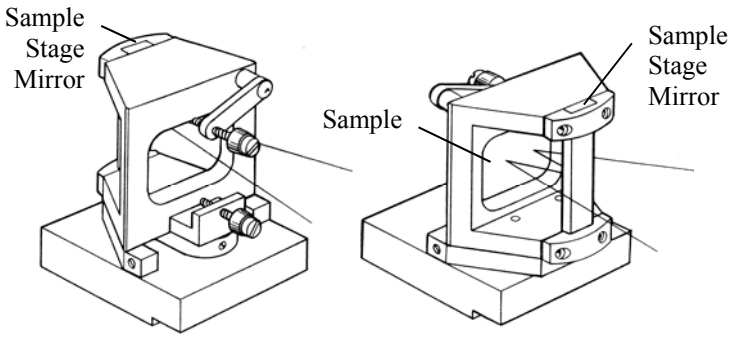


Figure 2. The 12° Absolute Reflectance Accessory.

Horizontal Reflection Stage

The Horizontal Reflection Stage (see Figure 3) is used in combination with the Variable Angle Reflection Accessory for reflectance measurements at a 12° angle of incidence (near normal). The sample rests sample side down on a horizontal stage, making surface scanning and sample exchange straightforward.

This sample stage incorporates a single mirror that reflects the radiation from the sample stage mirror to the horizontal sample and then directs the light reflected from the sample back to the sample stage mirror.

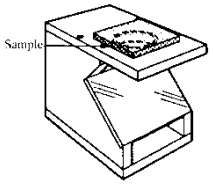


Figure 3. Horizontal Reflection Stage.

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