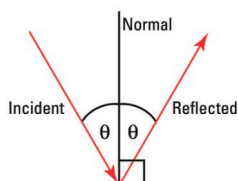


# UV-Vis VeeMAX Variable Angle Specular Reflectance Accessory

## For the Evolution Pro Spectrophotometer

The UV-Vis VeeMAX™ accessory for the Thermo Scientific™ Evolution™ Pro UV-Visible Spectrophotometer

measures specular reflectance at user-selectable angles from 30° to 80°. Specular reflectance is “mirror like” reflectance off a surface, i.e., the angle of reflectance is the same as the angle of the incident beam.



### Introduction

The specular reflectance properties of coatings on transparent and opaque surfaces help define accuracy of the coating procedure and the performance of coated materials.

Examples of coated products:

- Anti-reflective coating on eyeglasses or binocular lenses
- UV mirror on a cockpit window
- Solar reflective window for skyscrapers
- Metal first surface mirror for research laser tables
- Gloss paint
- Rear reflector for a spot-lamp
- Anti-reflective coating for stacks of stepper lenses for photolithography
- Military pilot helmet visor
- Research, military or production reflectors

Reflectivity at critical angles and wavelengths helps define performance and commercial success. The UV-Vis VeeMAX accessory offers the versatility and accuracy needed to make these measurements.

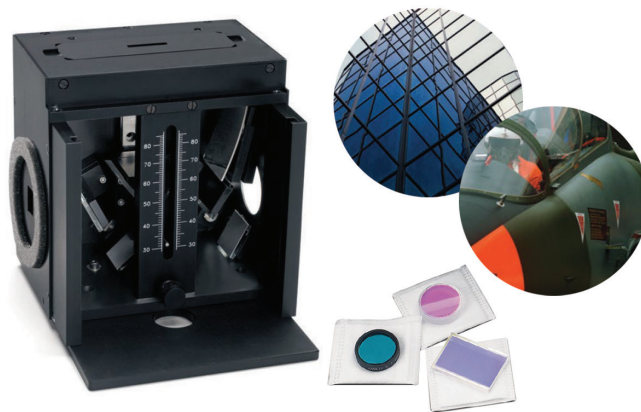
### Sophisticated design for measuring advanced coatings

Measure advanced coating performance at the angles that matter to you. Plate and automotive glass may be treated with coatings to enhance reflection of UV or IR wavelengths for interior safety and climate control. Optical elements are often anti-reflective (AR) coated to enhance performance. Laser table mirrors must be highly reflective at the laser wavelength to prevent beam energy loss and substrate heating.

### Measure at Brewster's Angle for any substrate, coating, or wavelength

$$\theta_B = \arctan\left(\frac{\eta_2}{\eta_1}\right)$$

Scottish physicist Sir David Brewster (1781–1868) discovered that *p*-polarized light does not reflect off a surface at an angle given by  $\theta_B$  where  $\eta_1$  is the refractive index of air ( $\approx 1$ ) and  $\eta_2$  is the refractive index of the surface. For glass,  $\eta_2 \approx 1.5$  making Brewster's angle approx 56°. Refractive index changes with wavelength, therefore, Brewster's angle does as well. Only the UV-Vis VeeMAX accessory gives you the ability to tune your measurement angle to achieve Brewster's condition for any material or wavelength.



UV-Vis VeeMAX accessory for the Evolution Pro UV-Visible Spectrophotometer

### Kinematic mount for reproducible installation

The UV-Vis VeeMAX accessory installs directly into the kinematic mount of the sample compartment for a secure and reproducible fit. Align the accessory once and performance is optimized at every subsequent installation.

### Sealed optics permit large samples

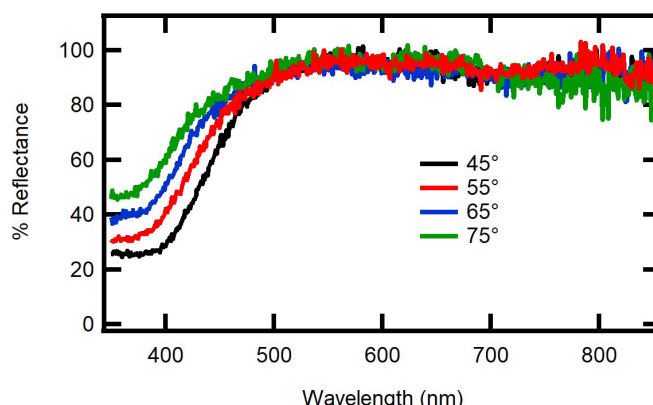
Measure oversized or very thick samples with the UV-Vis VeeMAX accessory. A light sealing tube fits into the reference beam, sealing the optical path to allow operation with the sample compartment open. Simply choose and insert a mask with an appropriate aperture, place your sample on top of the UV-Vis VeeMAX accessory, and record the spectrum.

### Flexibility to choose specific angles for special applications

- Mirrors operating at 45° on laser tables are required to direct the beam through experiments in research applications.
- Hot mirrors, cold mirrors and bandpass mirrors have different cut-on and cut-off wavelengths depending on the angle of incidence.
- For chemists and surface scientists, grazing angle (80°) measurements give the longest possible path through adsorbed or chemically fixed thin films on a surface.
- Calculate refractive indices of surface films by measuring at two angles using the same accessory.
- Film thickness measurements can be performed at any known angle.

### Feature-packed software for control and calculation

Thermo Scientific™ INSIGHT™ Pro Software included with the PC-control instrument gives the user complete control of the instrument for alignment and method development.



The percent reflectance spectra shown in the figure above demonstrate the incident beam angle dependence of the cut-off wavelength for a gold coated silver mirror.

### Specifications

Mask apertures	7 mm, 13 mm, and 25 mm x 4 mm
Optics	MgF <sub>2</sub> -coated aluminum flat mirrors and aluminum-coated nickel concave mirrors

### Wavelength measurement range

Evolution Pro	190 – 1100 nm
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### Product information

Description	Part number
Thermo Scientific Evolution Pro PC-controlled Spectrophotometer	840-340200
UV-Vis VeeMAX variable angle specular reflectance accessory	222-239600

Learn more at [thermofisher.com/specular-reflectance](https://thermofisher.com/specular-reflectance)