

## VN Near Normal Absolute Specular Reflectance Accessory

For Evolution™ 300 UV-Visible spectrophotometers

The Thermo Scientific VN 10° Absolute Specular Reflectance Accessory enables absolute reflectance measurements on samples as small as 10 mm. The single bounce design and an intense xenon light source combine to provide a unique combination of accuracy and convenience that is especially suited to small and low reflectance samples.



The Thermo Scientific VN Absolute Specular Reflectance Accessory (VN ASRA) gives you direct access to reflectivity measurements on even your most challenging samples. Accommodating reflective surfaces as small as 10 mm or as large as 80 mm x 80 mm, the VN ASRA lets you measure any flat surface reflector in your laboratory. Samples mount on a convenient vertical mount equipped with an easily gripped clamp (Figure 1).

In contrast to relative specular reflectance measurements where the baseline is recorded using a standard mirror or witness piece, in absolute specular reflectance measurements the only difference between the baseline and sample measurements is the inclusion of the sample mirror. Figure 2 shows how the V and N light paths are implemented in the VN ASRA.

The VN ASRA delivers excellent performance even at higher scan speeds, or choose up to twenty precise wavelengths important to you and measure in fixed mode with an extended integration time for maximum measurement precision.

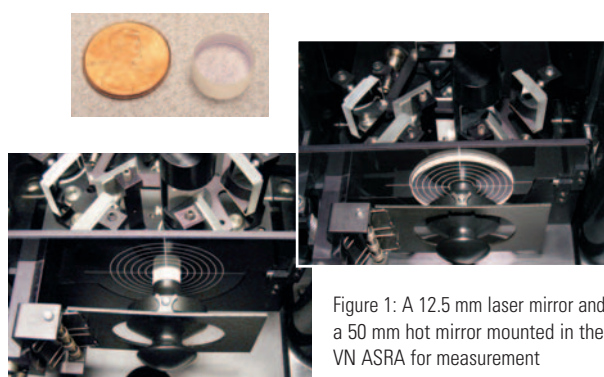


Figure 1: A 12.5 mm laser mirror and a 50 mm hot mirror mounted in the VN ASRA for measurement

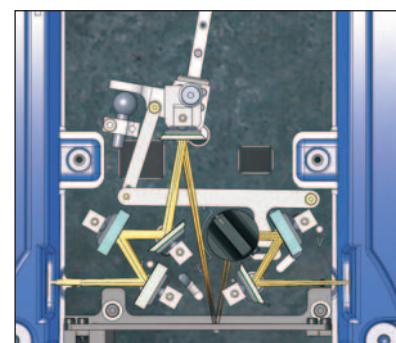


Figure 2: Ray trace diagrams showing the baseline "V" configuration (top) and sample-included "N" configuration (bottom).

Diagrams courtesy of Labsphere, Inc.

## Performance You Can Measure

Data from a wavelength scan of a calibrated mirror<sup>1</sup> using a one second integration time over the range 250 nm to 1100 nm show that the VN ASRA yields values that are within the stated uncertainties in the calibration data across the entire wavelength range<sup>2</sup> (Table 1). Measure the performance of your coatings across the spectrum or at a chosen wavelength. Figures 3, 4 and 5 show example results for dielectric filters.

## Value You Can Depend Upon. Convenience You Can Trust.

Thermo Fisher Scientific offers absolute specular reflectance measurements in an affordable package with a moderate footprint. There are no electrical connections to make, so you can boot with or without the accessory in place. Just snap the VN ASRA into the kinematic mount of the Thermo Scientific Evolution 300 spectrophotometer and you are ready to acquire data. The long life xenon flash lamp in the Evolution 300 comes with a three year warranty, keeping your consumables cost low and minimizing downtime.

Wavelength (nm)	Certificate Reflectance Value (%)	Measured Reflectance Value (%)	Δ
250	0.896	0.905	0.009
300	0.882	0.883	0.001
350	0.866	0.863	0.003
400	0.855	0.852	0.003
450	0.856	0.851	0.005
500	0.859	0.854	0.005
550	0.861	0.857	0.004
600	0.863	0.858	0.005
650	0.860	0.856	0.004
700	0.854	0.850	0.004
750	0.842	0.839	0.003
800	0.823	0.819	0.004
850	0.823	0.819	0.004
900	0.860	0.861	0.001
950	0.901	0.901	0.000
1000	0.925	0.922	0.003
1050	0.937	0.932	0.005
1100	0.946	0.944	0.002

Table 1: Certificate and measured reflectance values for a calibrated near normal specular reflectance standard. Stated uncertainties in the certificate are < 0.02 up to 300 nm and < 0.005 between 300 and 1100 nm.

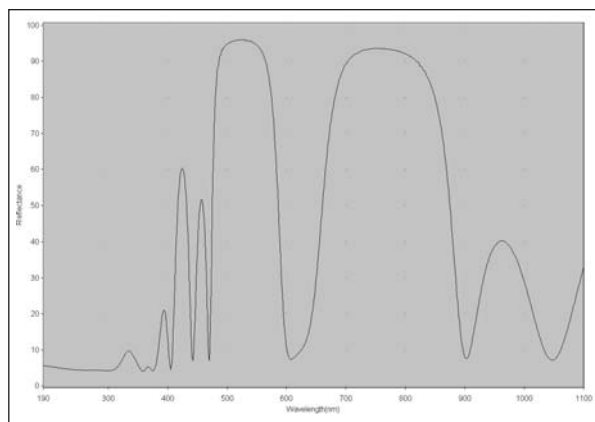


Figure 3: VN ASRA spectrum of a 586-660 nm bandpass filter

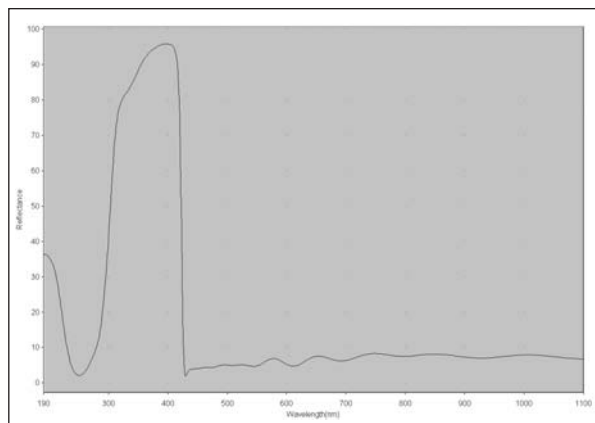


Figure 4: VN ASRA spectrum of a 420 nm sharp cut filter

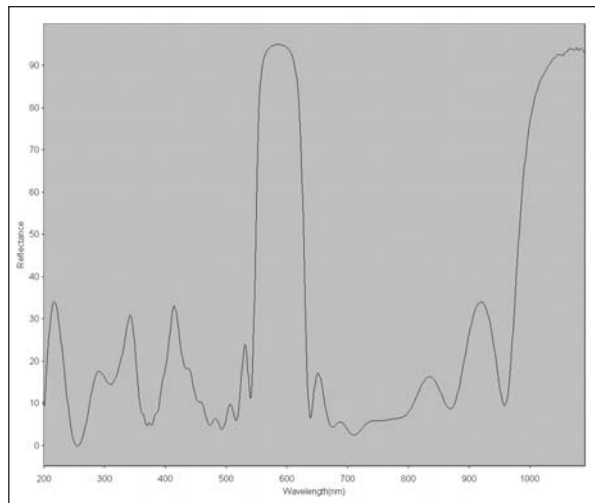


Figure 5: VN ASRA spectrum of a narrow band optical coating

## Specifications

Mask Aperture	9 mm x 5 mm
Optics	MgF <sub>2</sub> Coated UV Enhanced Aluminum Mirrors

## Ordering Information

Recommended system for use with the VN ASRA

Description	Part Number
VN Absolute Specular Reflectance Accessory	222-216500
Evolution 300 PC Controlled Spectrophotometer with Thermo Scientific VISION <sup>pro</sup> Software	10300201
Specular Reflectance Standard	222-219900

Software Packages	Part Number
Thermo Scientific VISION <sup>lite</sup> MaterialsCalc Software	869-124500
Reporter-SPX Software	869-127400

## References

1. Supplied by Labsphere Inc., Sample ID SPRS-010, SN MIR01-3658.
2. The reference mirror is not calibrated below 250 nm.