

TASC™ Scatterometer

Hemispherical scatter measurements with an option for polarization control



TASC™ provides unsurpassed versatility in hemispherical scatter measurement systems. The polarization transformation option allows measurement and analysis of Stokes vectors and Mueller matrices. The retro-scatter assembly option provides sensitive measurement of energy scattered directly back along the incident beam.

System Description

The TSW TASC® Scatterometer uses light energy from lasers or broadband source monochromators, as a non-contact probe to measure scattered light from a wide variety of materials including liquids and powders. Powerful measurement techniques including polarization transformations and retro-scatter options provide the tools you need for complete material characterization.

The sample is mounted horizontally on stages capable of moving in X and Y and/or rotation. The incident angle can be set to any angle up to 85° from surface normal. TASC can be programmed to scan in the hemisphere above (for reflectance) or below (for transmission) with resolutions down to 0.001° per step.

Powerful software simplifies sample and scan set-up and stores the information in retrievable scan configuration files. BRDF data can be used to calculate TIS, Total Hemispherical Reflectance, PSD, and RMS roughness. Polarization transformation measurements calibrate automatically and can be analyzed as Stokes vectors or Mueller matrices. ASTM Standard data files are in a format easily read by other programs for expanded analysis capabilities.

Applications Include

Semiconductors Materials
Magnetic Storage Media

Polarization Studies
Cosmetic Appearance

Precision Machined Surfaces
Diffuse and Specular Baffles

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TASC[®] Technical Information

Features Full hemispherical measurements

- Measures: Bi-directional Scatter Distribution Function (both transmissive and reflective)
 - Automated control of set-up, scanning, filter, and aperture changes
 - Area Raster scans for sample X & Y and sample rotation
 - Accommodates liquid and powder samples
 - Real time data display
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Specifications

Measurement:	BRDF, BTDF, transmittance, reflectance, Scatter
Wavelength:	.25 –14 microns using monochromators, or lasers
Total System Accuracy:	3%
Total System Linearity	1%
Repeatability:	2%
Noise Equivalent BRDF:	Less than 10^{-3} (broadband); less than 10^{-7} (laser) typical
Automated Axes:	
Resolution	.001° .01 mm linear
Accuracy	.05° angular .01 mm linear
Theta_i Range	0- 80° (broadband), 0-85°
Phi_i Range	0, 180°
Phi_s Range	0 - 180°
Theta_s Range	0 - 180°
Sample X Motion	± 3"
Sample Y Motion	± 3"
Source Polarization:	H, V, +45 – 45, R circular & circular (Mueller option only)
Receiver Polarization:	H, V, +45 – 45, R circular & circular (Mueller option only)
Sample Size:	12"L x 12w x 3"H
Raster Area:	6"L x 6" W
Sample Weight:	Up to 10 lbs.
Source/Detector	
Occulted Area:	± 3° from specular (broadband), ± 1.5° from specular (laser)
Controller:	IBM compatible Pentium computer
Software:	Menu driven control and display functions
Data Format:	ASTM Standard data format

Options

- Full polarization control for measurement of Stokes vectors and Mueller matrices
- Measures retro-scatter
- Other source wavelengths and receivers are available

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