Radiant Zemax

Imaging Sphere for Scatter and Appearance Measurement

IS-SA™

Applications

- BRDF (bi-directional reflectance distribution function) measurement

- BTDF (bi-directional transmission distribution function) measurement

- Material characterization and classification based on scatter for metals, plastics, paper, textiles and more

- Surface treatment characterization and classification based on scatter for cleaners, polishes, paints, coatings, and more

- Quality control sampling

- Generation of accurate and complete appearance models for optical design and rendering applications

Benefits

- Complete BSDF and TIS measurement in seconds for many materials

- Cost effective solution for a broad range of related measurement applications

- Fastest, easiest way to build BSDF libraries for arbitrary materials

Fast, flexible system for comprehensive BRDF, BTDF, and TIS measurement

The IS-SA™ provides rapid, comprehensive measurement of scatter distribution functions for almost any material, including films, metals, plastics, papers, textiles, and surface treatments such as cleaners, polishes, coatings, and paints. It is designed for use in both R&D and production quality control applications for material characterization and quality assessment, and for generating libraries of BSDF measurements for computer modeling and rendering.

The IS-SA™ takes advantage of a novel optical configuration to measure 2ϖ steradians (a full hemisphere) of scattered light at once, dramatically reducing the time required to obtain a BSDF measurement. The IS-SA™ comes with Radiant Zemax' sophisticated IS-SA™ control and analysis software providing flexible measurement set-up and intuitive operation. Extensive data analysis and display functions, including isometric plots, cross-sectional graphs, radar plots, bit maps and color graphs, are also available.

With an optional tunable light source, the IS-SA™ can be used to measure BSDF as a function of wavelength. Other options include a Transmission Arm attachment for BTDF (transmission) measurement, and a goniometric positioning system to automatically move and rotate the material sample. Software options allow the IS-SA™ user to perform view angle performance measurement for displays or luminous intensity distribution measurement for small light sources; additional software allows the IS-SA™ ProMetric® Imaging Colorimeter to be used in stand-alone mode for other applications.

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IS-SA™

Key Features

- Photopic and colorimetric measurement capabilities

- Full, automated control over illumination angle of the light source

- Extensive configuration options for light source and sample control

- Easy to use control and analysis software interface

- Data can be exported for use in optical design and rendering tools

Specifications*

Optical Specifications

CCD Type	Full-frame, cooled and temperature stabilized CCD
CCD Bit Depth	16-bit (65,536:1) dynamic range
Resolution	Either 512x512 or 1024x1024 pixel CCD options
Field of View	Approximately 2ϖ steradians
Color Measurement	CIE 1931 matched XYZ filters (photopic only and spectral options also)
Neutral Density Filters	ND0, 1, and 2 standard
Standard Illumination Angle	Continuous to 80°
Illumination Source	Metal Halide or Halogen
Sensitivity	Less then 5% reflectivity
System Accuracy	BRDF: ±5%
	TIR: ±5%
Minimum Measurement time	Photopic: 1 sec
	Color: 5 sec

Mechanical Specifications

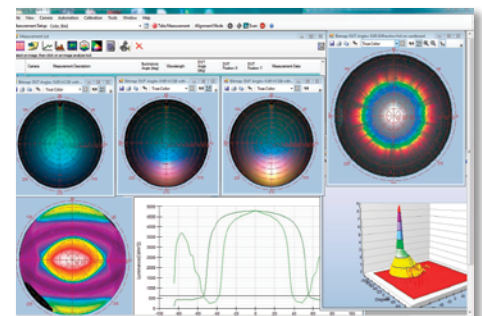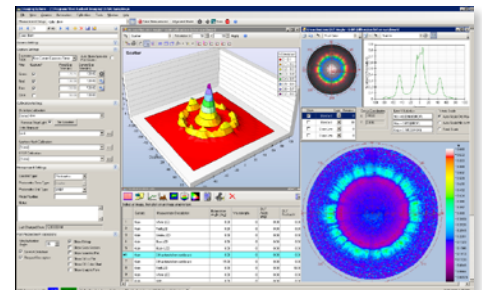|	
Overall Size (WxHxD)	88cm x 66cm x 110cm
Orientation	Rotatable to vertical, face-down or face-up positions
Angular Resolution	0.5°
Weight	120 kg
Construction	Integrated imaging dome and imaging colorimeter
Maximum Sample Size	Unlimited x Unlimited (for reflectance measurement)
Illumination Area	10 mm or 20 mm

Control and Analysis Software Specifications

Measurement Capability:	BRDF, CCBRDF, BTDF, CCBTDF
	TIR (Total Integrated Reflectance)
	TIS (Total Integrated Scatter), Gain
	Relative Color: CCT; CIE x,y; u',v'; E
IS 1.x Software	Measurement set-up and image capture control
	Gray-scale and false color display
	Cross-Sections of scatter & relative color
	3D surface plot of scatter & relative color
	Isometric plot of scatter & relative color
	Graph and image comparison for multiple captures
	Export BSDF data to optical design & rendering tools
	Reports of TIS, TIR, and color
	Process measurements (rotate, add, subtract, threshold, etc.)

Optional Equipment

Transmission Arm for BTDF measurement
XYPhi Stage for automated sample positioning and rotating
Automated specular light removal
Calibration Samples
Aperture Mask Calibration Device
Monochromator for automated spectrally tunable illumination

* Specifications subject to change without notice

System Requirements

- 2.0 GHz or faster processor

- 1GB or greater RAM

- Windows® 7, Vista or XP

- USB 2.0 interface

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