

## Ansys Optical Measurement Device Solutions

For easy, virtual management of materials samples, with multiple options for measuring color, trim and materials — either individually or in combination — in real time.

Ansys Optical Measurement Device (OMD) solutions enhance your color and trim processes and provide your clients with a realistic, detailed view of the final product.

### / Optical Measurement Device – Pro

#### Overview

The Portable Optical Measurement Device quickly determines optical surface properties of a sample on-site.

#### Use cases:

Perceived quality studies on vehicle interiors, consumer goods, etc.

#### Pro package includes:

- Portable Optical Measurement Device
- Calibration sample
- User and installation guide (electronic version)
- Anisotropic sample holder
- Software for operating the device and analyzing the results
- Half day of training
  - The training course will be held on customer premises after installing the system for a maximum of three persons. Basic knowledge of Ansys optical simulation solutions is a prerequisite for at least one of the trainees.
  - The training is available in English or French.

Shipping cost excludes customs fee for importation (paid by the customer).

#### Description and limitations:

Visible range, full-spectral bidirectional reflectance distribution function (BRDF) measurement

- BRDF surface response is averaged over a 1 mm area.
- Optical angular resolution:
  - $\pm 0.5^\circ$  FWHM
  - HDR measurement with high dynamic range:  $10^6$
- Iridescent effect are captured except for anisotropic samples.

#### Deliverables and software compatibility:

- Ansys optical BRDF surface file (\*.brdf) for full-spectral isotropic characterization
- Ansys optical surface file (\*.anisotropicbsdf) for anisotropic semi-spectral characterization



Compatibility	Ansys VRXPERIENCE	Ansys SPEOS
.brdf	Compatible – spectral and angular down sampling	Fully compatible
.anisotropicbsdf	Compatible – anisotropy is neglected; spectral and angular down sampling	Fully compatible

**Sample prerequisites:**

- Diffusive (polished mirror can't be measured with OMD Pro)
- Minimum size is 5 mm x 5 mm
- Plane and flat (concave/convex curvature smaller than 100 mm radius, structure smaller than 200 µm)
- Homogeneous (i.e., appearance is uniform)
- No fluorescent, phosphorescent or any other inelastic form of light scattering
- No thick (>200 µm) coating in front of diffused surface
- No light penetrating inside part volume

**Warranty:**

Hardware system is warrantied for one year from reception. Alignment and calibration can only be executed by Ansys – any modification by the customer voids the warranty.

**MAINTENANCE**

The yearly preventive maintenance contract extends the instrument lifetime and performance.

**Maintenance includes:**

- Access to software updates (during the maintenance period)
- Post-sale services
  - Hotline support from the technical support team during company operating hours
  - Remote diagnostics of encountered issue, in cases of device part failure or breakdown
- Hardware preventive calibration and alignment
- Performance report

**Exclusions:**

- Transport costs and cost of spare parts in need of replacement are excluded.
- Maintenance contract does not extend, in any way, the initial contractual guarantee provided by Ansys.
- The cost of replacement parts is not covered by the maintenance contract. Ansys, if possible, will provide a price quote for repair or change.

**Prerequisites:**

- Instrument TECS period must have ended in the last 24 months.
- Instrument must be working.

If prerequisites are not met, please contact the Product Manager to discuss the possibilities.

# / Optical Measurement Device – Premium

## Overview

Laboratory Optical Measurement Device is designed to measure HD BSDF, where HD is characterized by a high peak-to-noise ratio and a high angular resolution of the BSDF function

## Use cases:

For photometric analysis with Ansys SPEOS simulations, like this [highly resolved analysis performed with Laboratory OMD](#)

## Package includes:

- Laboratory Optical Measurement Device
- Calibration sample
- Laser eye protection glasses
- Software
  - Performs hardware and perform measures
  - Measures post-treatment with Ansys solutions for optical simulation software
- Basic computer to operate the Laboratory OMD
- Shipping cost (**customs fees excluded**)
  - Shipped in a protective wooden container
  - Customs fees for importation will be paid by the customer
- Two days mandatory on-site assembly and calibration
- Two days mandatory training
  - The training course will be held on customer premises after system installation, for a maximum of three persons. Basic knowledge of Ansys optical simulation solutions is a prerequisite for at least one of the trainees.
  - The training is available in English or French.



## The system includes:

- Light emission using three laser diodes
  - 4 mW – class 3a: red (635 nm), green (520 nm) and blue (450 nm)
- Optical angular resolution:  $\pm 0.1^\circ$  FWHM
- HDR measurement with high dynamic range:  $10^8$
- Spectral sensing using spectrometer
  - Integration sphere: 4 inches
  - Spectrometer range: 380 nm – 1000 nm
  - Spectrometer resolution: 5 nm

## System bench performance:

- BSDF accuracy:  $\pm 5\%$
- Repeatability accuracy:  $\pm 5\%$

## Sample requirements:

- Sample Size – from 3 cm x 3 cm to 15 cm x 20 cm (thickness up to 30 mm)
- Max. sample weight: 500 g

## Output measurement description:

- BxDF files compatible with Ansys optical simulation solutions
  - Anisotropy compatible through multiple measures
  - Semi-spectral BxDF – the spectral component of the BxDF is measured using spectrometer
    - Full spectral description (for iridescent samples) requires Optical Measurement Device – Enterprise
  - Measurement time: 4 to 12 hours depending on BxDF type and angular sampling

- Simple scan (1D cross-section of BSDF):
  - Data txt format
  - Measurement time: ~ one minute
- Surface roughness (unpolished):
  - Measures the sample surface normal distribution
  - Requires a metallization of the sample (NOT INCLUDED IN THE PACKAGE)
  - Measurement time: approx. four hours
- Volume scattering and absorption Ansys optical simulation solutions (\*.material) file
  - The volume scattering measurement option allows the characterization of “mass” diffusive and absorbing materials, using a semi automated Excel™-based application with VBA macros and Ansys SPEOS simulations to derive volume optical properties.

#### Measurement enhancement:

- Adaptive sampling reduces measurement time by 10X and the file size by 100, which is important for highly polished surfaces.
- The Ansys interpolation enhancement achieves highly accurate simulation results, even when measuring low diffusion levels with low incidence angle resolution, and helps to reduce the measurement time by 10X or more.
- The BSDF editor allows exporting standard values, such as gloss and lab colorimetric values, for quality control and colorimetric analysis.
- The BSDF viewer allows exporting BSDF data to conoscopic intensity maps and sections with access to the measured values.

#### Dimensions:

- Height = 2.10 meters, length = 2.10 meters, width = 1.6 meters
- Weight = 130 Kg

#### Operating conditions:

- Must be installed in a dark room (walls painted in black matte color with less than 5% reflection).
- The power supply of the bench must provide stable current and voltage 110V-220V, 50-60 Hz, with maximum power consumption of 400.
- The bench is designed for laboratory environments that have low humidity and are dust-free.
- Operators and room occupants should wear class 3a laser eye protection glasses and comply with all additional regulations.

#### Warranty

System is warrantied for one year from reception. Alignment and calibration can only be executed by Ansys – any modification by the customer voids the warranty.

## MAINTENANCE

The yearly preventive maintenance contract extends the instrument lifetime and performance.

#### Maintenance includes:

- Access to software updates for your OMD Premium during the maintenance period
- Post-sale services:
  - Hotline support from the technical support team during company operating hours
  - Remote diagnostics of encountered issue, in cases of device part failure or breakdown
- Two days on-site hardware preventive maintenance with calibration and alignment
- Performance report

#### Exclusions:

- Transport costs and cost of spare parts in need of replacement are excluded.
- Maintenance contract does not extend, in any way, the initial contractual guarantee provided by Ansys.
- The cost of replacement parts is not covered by the maintenance contract. Ansys, if possible, will provide a price quote for repair or change.

#### Delivery conditions:

- Telephone analysis before intervention of engineer
- Excludes transport costs and cost for spare parts in need of replacement

#### Prerequisites:

- Instrument TECS period must have ended in the last 24 months.
- Instrument must be working.

If prerequisites are not met, please contact the Product Manager to discuss the possibilities.

# / Optical Measurement Device – Enterprise

## Overview

The laboratory optical measurement device enterprise edition extends the OMD Premium package with additional white source hardware for full-spectral measures

## Use cases:

For photometric analysis Ansys SPEOS simulations to capture iridescent effects and the subtle spectral effects of diffraction gratings (example: [highly resolved analysis performed with Laboratory OMD](#))

## Package includes:

- OMD Premium configuration
- Spectral lamp from Hamamatsu coupled with 18-spectrum filter wheels (357 nm to 725 nm)
  - The filters maximize the visual gamut coverage and ensure high colorimetry fidelity.

## Specifics:

- Measurement time significantly increases for full-spectral measurement.
- Detector angular resolution becomes  $\pm 0.5$  degrees.
- System is not currently compatible with full-spectral and anisotropic BxDF measures.



## MAINTENANCE

The yearly preventive maintenance contract extends the instrument lifetime and performance.

## Maintenance includes:

- Access to software updates for your OMD Enterprise during the maintenance period
- Post-sales services:
  - Hotline support from the technical support team during company operating hours
  - Remote diagnostics of encountered issue, in cases of device part failure or breakdown
- Two days on-site hardware preventive maintenance with calibration and alignment
- Performance report

## Exclusions:

- Transport costs and cost of spare parts in need of replacement are excluded.
- Maintenance contract does not extend, in any way, the initial contractual guarantee provided by Ansys.
- The cost of replacement parts is not covered by the maintenance contract. Ansys, if possible, will provide a price quote for repair or change.

## Delivery conditions:

- Phone support analysis before intervention of engineer
- Excludes transport costs and cost for replacement parts

## Prerequisites:

- Instrument TECS period must have ended in the last 24 months.
- Instrument must be working.

If prerequisites are not met, please contact the Product Manager to discuss the possibilities.

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