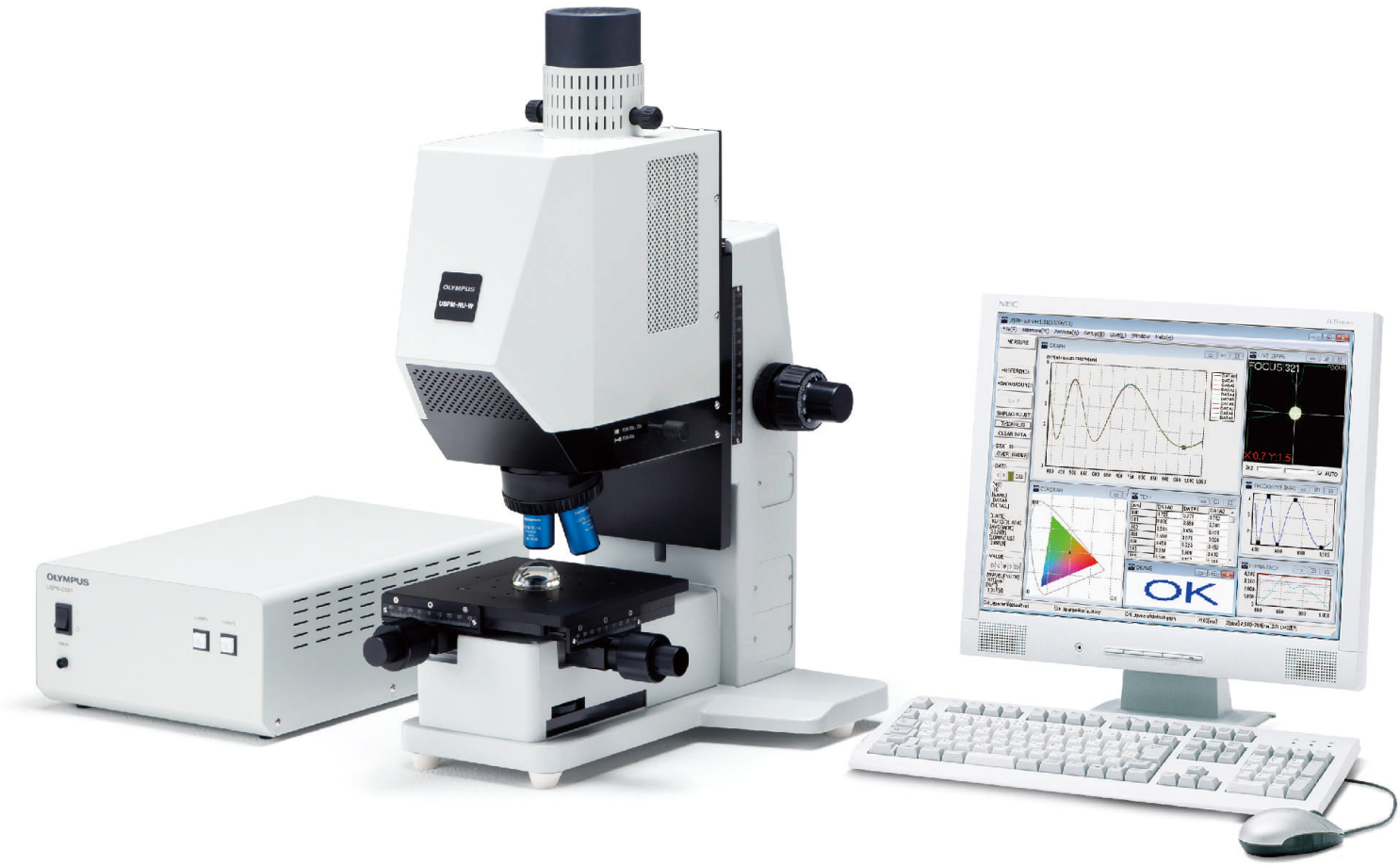
OLYMPUS®

Your Vision, Our Future

NIR Micro-Spectrophotometer

USPM-RU-W

Enables Spectrometry Across of a Wide Range of Wavelengths, from Visible Light to Near-infrared — 380 nm – 1050 nm



- Reflectivity, Film Thickness, Object Color, and Transmittance Measured in Seconds
- Wide Range of Wavelength from 380 to 1050 nm
- Measures Reflectivity on Curved Surface without Contact

USPM-RU-W

NIR Micro-Spectrophotometer

Olympus USPM-RU-W NIR Micro-Spectrophotometer performs fast, accurate spectrometry across a wide range of wavelengths of visible light to near-infrared. The ability to easily measure reflectivity of extremely small areas or curved surfaces that cannot be measured using ordinary spectrophotometers, makes the USPM-RU-W optimally suited for analyzing optical elements or minute electronics parts.

▶ Standard Set

1. Measure Reflectivity
2. Measure Film Thickness
3. Measure Object Color

▶ Transmittance Measurement Set

4. Measure Transmission Levels
3. Measure Object Color

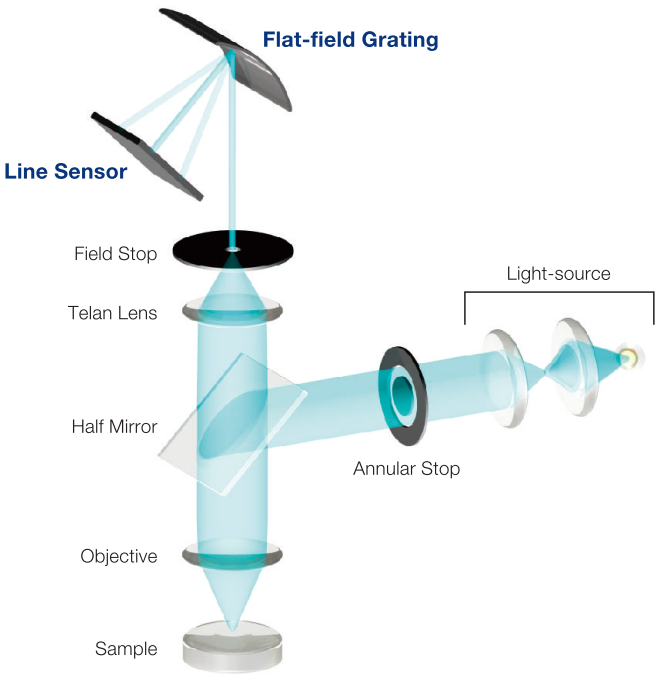
▶ Reflectivity Measurement Set for 45-Degrees

5. Measure Reflectivity at an Incidence Angle of 45 Degrees
3. Measure Object Color

Olympus USPM Enables Accurate and Fast Measurements of Curves Surfaces and Minute Areas

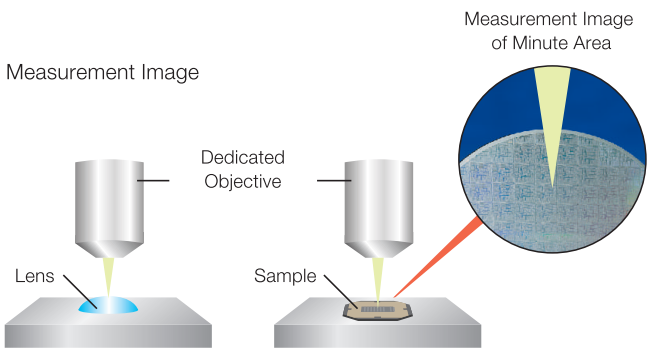
Provides High-speed Measurement

Quick, high repeatability measurements can be achieved in seconds using a flat field grating, line sensor and high-speed spectrophotometry.



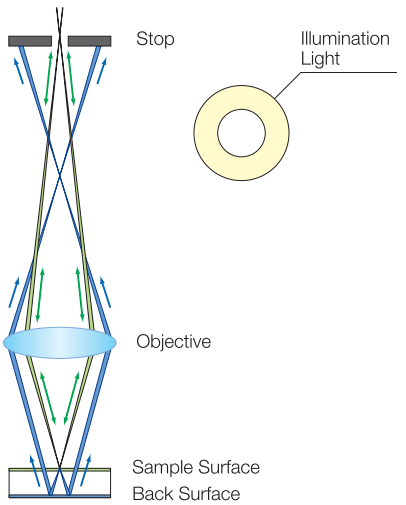
Optimally Suited for Reflectivity Measurement of Extremely Small Parts and Lenses

Olympus has designed a new dedicated objective that provides non-contact measurements across an area of 17 to 70 μm diameters. The new objective provides high repeatability on even curved surfaces or minute electronic parts.



Anti-reflection Processing is Not Required on the Back of the Sample

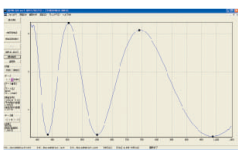
Accurate measurement of surface reflectivity can be performed without the costly steps needed to prevent rear surface reflection. Rear surface-reflected light is reduced by means of special optics that block all out-of-focus light reflection similar to a confocal system. Whether your optical component is spherical, aspherical or flat, the USPM-RU-W does not require sample preparation through anti-reflection treatments.



* Reflectivity is measured under our company's measurement conditions when using a 40x objective.

Available Film Thickness Measurement Methods

The single-layer or multi-layer film thickness can be analyzed according to the measured spectral reflectivity data.
You can select the optimum measurement method for the application.

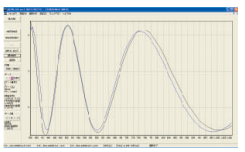


Peak-valley Method

This method is used to calculate film thickness based on the periods between the peaks and valleys of the measured spectral reflectivity value, and is effective for measuring single-layer film. No complicated settings are required, so measuring film thickness is easy.

Fourier Transform Method

This method is used to calculate film thickness based on the periods between measured spectral reflectivity values, and is effective for measuring single-layer and multilayer films. The Fourier transform method eliminates noise, thus making analysis possible when it is difficult to detect peak and valley values.



Curve Fit Method

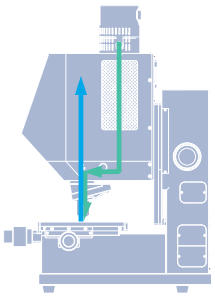
This method is used to calculate film thickness by estimating which structure has the smallest difference between the measured spectral reflectivity and the calculated reflectivity for that structure, and is effective for measuring single-layer and multilayer films. The curve fit method also makes it possible to analyze thin film in which peak and valley values are not apparent.

* The above images are composites. (They do not accurately represent the actual figures.)
* The function for measuring film thickness is effective during measurement of reflectivity.

Measurement Functions that Enable Wide Spectrometry with a Single near-infrared Micro-Spectrophotometer

1 Measure Reflectivity

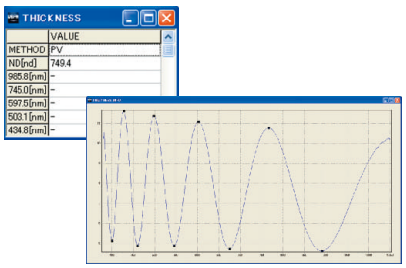
Measure the reflectivity of a minute area with a diameter of 17 to 70 μm.



Optical Path of Reflectivity Measurement

2 Measure Film Thickness

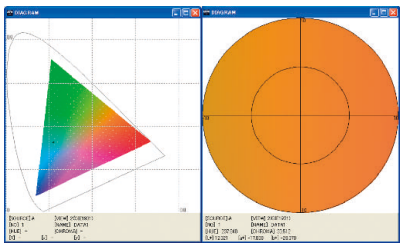
Use reflectivity data to measure the thickness of single-layer and multi-layer films of approximately 50 nm to 10 μm.



Film Thickness Measurement Screen-shot

3 Measure Object Color

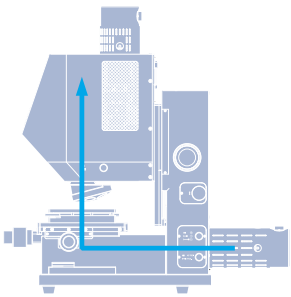
Display an XY chromaticity diagram, an L*a*b* chromaticity diagram, and their related numeric values based on reflectivity data.



Object Color Measurement Screen-shot

4 Measure Transmission Levels

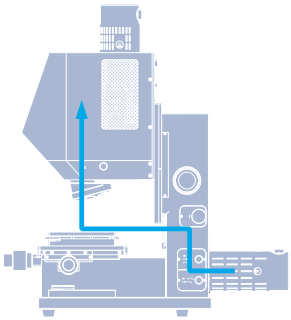
Measure the transmittance of a plane sample by transmitting 2 mm parallel beams of lights through the sample to the spectrophotometry acceptance elements. (Optional)



Optical Path of Transmissivity Measurement

5 Measure Reflectivity at an Incidence Angle of 45 Degrees

Measure the reflectivity at an incidence angle of 45 degrees by reflecting 2 mm parallel beams of lights to the spectrophotometry acceptance elements. (Optional)



Optical Path of 45-degree Reflectivity Measurement

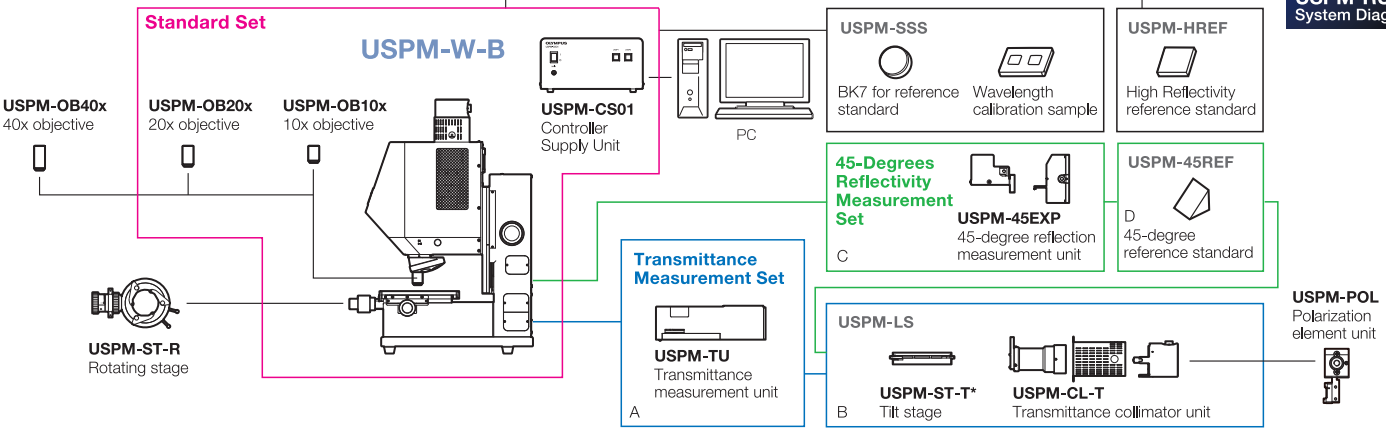
Polarization Element Unit

This unit is used for measuring P and S polarization in order to measure transmissivity and reflectivity at an angle of incidence of 45 degrees. (Optional)

Rotating Stage

This stage facilitates the measurement of reflectivity on curved surfaces. (Optional)

USPM-RU-W System Diagram



Transmittance Measurement Set : A+B, 45-Degree Reflectivity Measurement Set : B+C+D *Available as a stand-alone unit.

• The above images are composites. (They do not accurately represent the actual figures.)

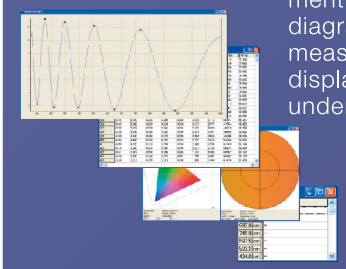
Spectral Analysis Software with an Easy-to-use User Interface

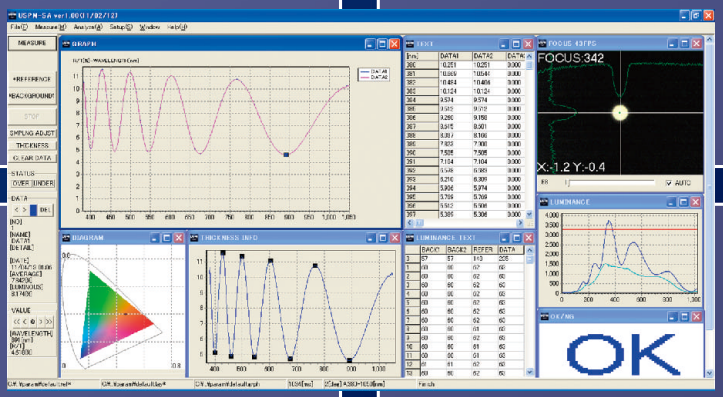
Easy-to-understand Display

Change the layout and position, size, and visibility of each window according to the measurement purpose and user needs.

Diverse Measurement Results

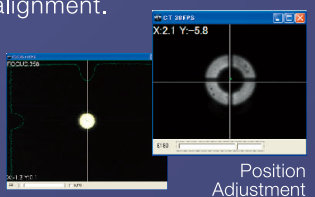
Spectral reflectivity/transmissivity graphs and text, color measurement (XY and L*a*b* chromaticity diagrams), and film thickness measurement values can be displayed on one screen for easy understanding.





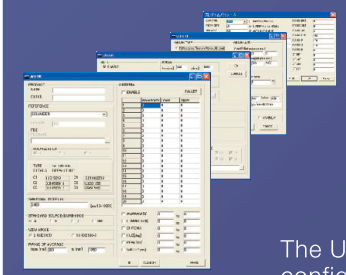
Easy Position Adjustment and Focus Adjustment

Positioning the measuring point is easy by using a focusing window for Z axis alignment and centering (CT) window for X and Y axis alignment.



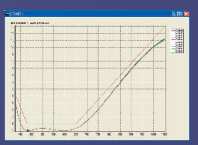
Focus

Position Adjustment



Flexibility for Any Application

The USPM-RU-W software can be configured to achieve optimum performance for your specific sample.



Tolerance setting function of automatic pass / fail determination.

System can be configured to provide good / no good designations automatically.

Satisfies Diverse Measurement Needs at High Speed and With High Precision

Evaluation of Lens Coating for reflectivity, color and film thickness.

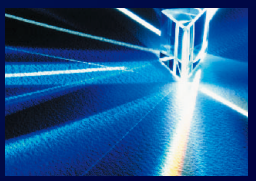
Mobile Phone Camera Lenses | Digital Camera Lenses | Projector Lenses | Spectacle Lenses

Reflectivity, Film Thickness and Transmittance measurment of Planar Optical Elements.

LCD color filters | Optical films

Examining the Reflectivity and Film Thickness of Minute Electronic Parts.

LED Packages | Printed Circuit Boards



Optical Elements Reflectivity at an Incident Angle of 45 Degrees.

Prisms | Mirrors

SPECIFICATIONS

	Reflectivity measurement			Transmissivity measurement*1	Reflectivity Measurement for 45-Degrees*1
Name	NIR Micro-Spectrophotometer			Transmittance measurement set for NIR Micro-Spectrophotometer	45-degree reflectance measurement set for NIR Micro-Spectrophotometer
Model	USPM-RU-W				
Measured wavelength	380 to 1050 nm				
Measurement method	Compared with a reference sample for measurement			Transmissivity is measured with 100% as standard	Compared with a reference sample for measurement
Measurement range	See the specifications of the objective below			Approx. 2.0 mm in diameter	
Measurement repeatability (3σ)*2	Reflectivity measurement	During use of 10x and 20x objectives	±0.02% or less (430 to 1010 nm) ±0.2% or less (Except as described above)	±0.3% or less (430 to 1010 nm) ±1.0% or less (Except as described above)	
		During use of a 40x objective	±0.05% or less (430 to 950 nm) ±0.5% or less (Except as described above)		
	Film thickness measurement		±1%	—	
Wavelength display resolution	1 nm				
Lighting accessory	Dedicated halogen light source, JC12V 55W (Average life: 700 hours)				
Shift stage	Loading surface size: 200 (W) x 200 (D) mm With stand load: 3 kg Operating range: (XY) ±40 mm, (Z) 125 mm				
Tilt stage	—			Loading surface size: 140 (W) x 140 (D) mm Withstand load: 1 kg Operating range: (XT) ±1°, (YT) ±1°	
Weight	Main body: Approx. 26 kg (not including PC)			Main body: Approx. 31 kg (not including PC)*3	
	Control power box: Approx. 6.7 kg				
Dimensions	Main body: 360 (W) x 446 (D) x 606 (H) mm			Main body: 360 (W) x 631 (D) x 606 (H) mm	
	Control power box: 250 (W) x 270 (D) x 125 (H) mm (Protruding parts are not included)				
Power specifications	Input specifications: AC 100-240V (110V) 50/60Hz				
Operating environment	Horizontal place not subject to vibration Temperature: 15 ºC to 30 ºC Humidity: 15% to 60% RH (Free from dew condensation)				

*1 Optional unit *2 Measured under the measurement conditions of our company. *3 The total weight of both the transmissivity measurement set and 45-degrees reflectivity measurement set installed is approx. 33 kg.

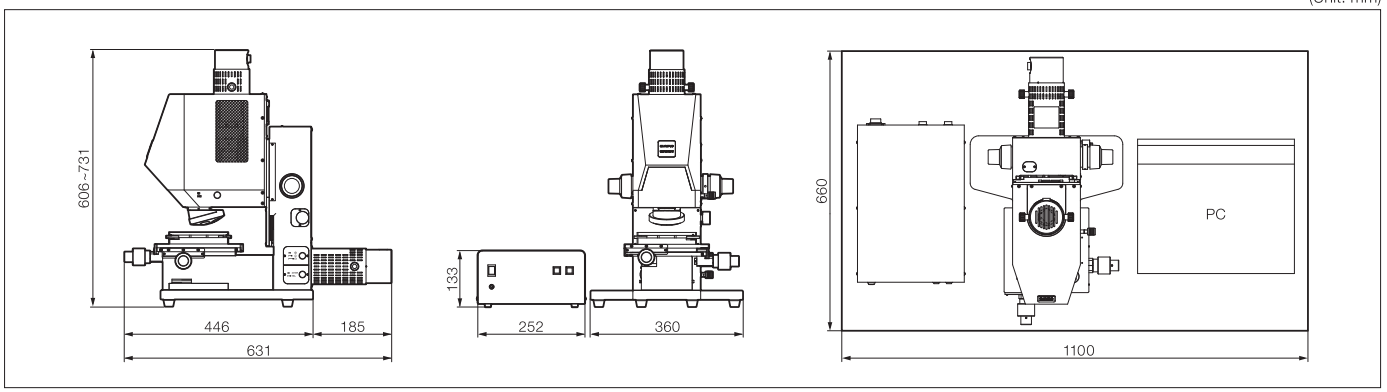
OBJECTIVE

Model	USPM-OB10x	USPM-OB20x	USPM-OB40x
Magnification	10x	20x	40x
Measurement NA*4	0.12	0.24	0.24
Measurement range*5	70 μm	35 μm	17.5 μm
Operating distance	14.3 mm	4.2 mm	2.2 mm
Radius of sample curvature	±5 mm or more	±1 mm or more	±1 mm or more

*4 It differs from objective's NA. *5 Spot diameter

DIMENSIONS

(Unit: mm)



- **OLYMPUS CORPORATION is ISO9001/ISO14001 certified.**
- **Illumination devices for microscope have suggested lifetimes. Periodic inspections are required. Please visit our web site for details.**
- This product is designed for use in industrial environments for the EMC performance. Using it in a residential environment may affect other equipment in the environment.
- All company and product names are registered trademarks and/or trademarks of their respective owners.
- Images on the PC monitors are simulated.
- Specifications and appearances are subject to change without any notice or obligation on the part of the manufacturer.

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