JASCO®

Model M-200

SPECTROSCOPIC ELLIPSOMETERS

The M-200 Spectroscopic Ellipsometers from JASCO are research grade instruments designed for top performance and ease of use. Featuring our patented PEM system with optical servo and reference systems, they deliver results in real time. Spectroscopic ellipsometry is the ultimate non-contact, non-destructive characterization technique for optical and electronics materials. JASCO optics, permit extremely accurate measurements of substrates and films for displays, recording media and electronics materials. These are only some of the features you'll find on our Ellipsometers:

- **Stable and reliable** Our patented Optical Servo and Optical Reference give unprecedented stability and instant start-up.
- **Fast** The PEM method used in our optics allows millisecond acquisition rates
- **Maximum sensitivity** The optical system employs our proprietary polarization configuration for maximum sensitivity when measuring extremely thin dielectric and semiconductor films.
- **Multiple light sources** include a xenon light source with double monochromator and a He-Ne laser as standard. Switch easily between the two sources. Optional light sources such as a semiconductor laser can be added as required. Options from UV to IR are available.
- **User replaceable stage blocks** meet your demands for all kinds of samples. The large sample chamber gives easy access to the optical bench so that the widest range of samples and measurements can be accommodated.

At JASCO, we build ellipsometers with the quality only a world leader in spectroscopic optical systems can achieve. JASCO PEM Ellipsometers are equipped with our unique, patented Optical Servo and Reference systems. This ensures both an optimized PEM drive program and immediate stability after start up. Measurement reproducibility is second-to-none.

SPECIFICATIONS OF M-200

1. Standard System Configurations

Operation principle :	50 kHz Quartz PEM (Photo Elastic Modulator) with optical servo and optical reference
Wavelength range :	260 ~ 860 nm in 1nm steps (options are available from UV to NIR)
Incidence angle :	40 ~ 90° in 0.01° steps (continuous automatic adjustment)
Measurement reproducibility :	Δ, Ψ better than ± 0.01° (integration times 0.5 s or longer)
Integration time :	1 ms ~ 16 s
Spectral bandwidth :	0.5, 1, 2 nm
Beam diameter :	6mm at 1 nm bandwidth (Xe source) 1 mm with He-Ne laser source
Film thickness measurement :	1 Å ~ 10^5 Å
Light source :	Xe lamp, 632.8 nm 1 mW He-Ne laser (other options are available)
Detector :	Photomultiplier
Sample stage options :	Manual x-y stage, automatic x-θ stage, vacuum chuck stage, transparent sample stage (double-refraction measurements), anisotropy measurement stage, photoelasticity measurement stage, etc.

2. Software

Operating System :	Microsoft Windows® 95/98
Data acquisition and system control :	JASCO Spectra Manager

Data processing :

(Standard)	(Optional)
System control	Mapping
Film thickness measurement	Multi-layer analysis
Simulation package,	Multiple incidence angles
Δ, Ψ wavelength dispersion	Sensitivity analysis
Retardation	Anisotropy
Substrate optical parameter	Photoelastic constant
Dielectric constant calculation	
Reflectivity calculation	

3. Applications

M-200 series Spectroscopic Ellipsometers incorporate fast and stable quartz Photo Elastic Modulator (PEM) optics with JASCO's patented Optical Servo and Optical Reference control. The PEM program and fast instrument start-up are ensured. Instrumental time resolution and reproducibility are second-to-none. The M-200 sample chamber is specifically designed for rapid sample exchange and stage block replacement, with samples oriented in the vertical plane. This geometry allows for transmission studies as well as reflection, making the M-200 perfect for studying optical materials, liquid-crystal displays, transparent films and membranes as well as any other ellipsometry work. M-200 applications include:

- Liquid-crystal display time-resolved measurements
- Semiconductor materials characterization
- Opto-magnetic and optical storage media like $Ge_2Sb_2Te_5$ for DVD
- Poly-silicon, amorphous silicon for solar cells
- Silicon-on-insulator (SOI) buried-layer measurements
- Metals and ceramic thin-layers like TiN, AlO_x, WSi_x
- Photo-resist coatings and polymer layers
- Coatings for optical components including laser mirrors
- Materials science studies such as Langmuir-Blodgett films, DLC, dielectrics
- Biological science applications including molecular monolayers and membranes

ISO 9001 Certified

Products described herein are designed and manufactured by ISO-9001-certified JASCO Corporation.

● Specifications are subject to change without notice.

JASCO

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C7219-9907 Printed in Japan