

# Non-contact Metal Film Thickness Measurement System MESEC Series

As film thickness and distribution control of metal thin film deposited on wafer play important roles in the characteristics of the device and yields in the semiconductor wiring process, it is an important element of quality control.

While the commonly used conventional measuring methods were contact systems and only indirect evaluation by monitor wafer could be carried out, MESEC is equipped with an automatic transfer system compatible with up to 300mm wafer and it can measure directly on wafers from practical production and, therefore, more reliable data can be obtained. Furthermore, it will contribute to a reduction in the quantity of monitor wafers.

Stand-alone type MESEC-SAT and built-in type MESEC-BIT are available.



MESEC-SAT



MESEC-BIT

### Features

- Non-contact and non-destructive measurement of the thickness of metal thin film on silicon wafer can be carried out and the process can be evaluated directly with product wafers.
- As the eddy current sensor is small-sized and the measurement speed is high, it is possible to mount to and measure on tools for PVD, CVD, ECD, CMP, etc.
- An automatic calibration method has been developed, the influences of drift of the measurement system can be removed, and the repeatability of thickness measurement is excellent.
- Thickness of all kinds of metals or alloys can be measured through simple establishment of a database for the calculation of film thickness by the user (Stand-alone type).

### Specifications

Model	MESEC-SAT	MESEC-BIT
Item		
Film thickness measurement range	0.03 - 5 $\mu$ m	0.05 - 3 $\mu$ m
Measurement accuracy (compared to calibration value)	$\pm 1\%$	
Measurement repeatability	$\pm 0.5\%$ (1 $\sigma$ , 10-time continuous measurements on the same point)	
Measurable film	Metal films of Cu, Al, AlCu, etc.	Cu films
Measurement spatial resolution	3mm	
Measurement speed	1 second/point or less (excluding time for stage movement and wafer transfer)	
Sample stage system	X - Y type linear stage	R - $\theta$ type rotary stage
Sample stage precision	X-axis: $\pm 0.05$ mm	R-axis: $\pm 0.1$ mm
	Y-axis: $\pm 0.05$ mm	$\theta$ -axis: $\pm 0.05^\circ$
Sample size	200 mm and 300 mm wafer	200 mm or 300 mm wafer
Measurement results	Film thickness, sheet resistance	
Equipment dimensions		
W x D x H (mm)	1400 x 1200 x 1300	Depends on the conditions of deposition tools
Weight (kg)	450	
Utility	Power supply: 100 V, 15 A Vacuum: 400 mmHg or less Compressed air: 0.4 MPa or more	
OS	Microsoft® Windows NT4.0	

### Applications

- **MESEC-SAT**  
Quality control for metal film thickness and sheet resistance in semiconductor manufacturing lines  
Feedback to R & D
- **MESEC-BIT**  
Condition monitor of deposition tool  
Quality control in deposition processes

### Standard Equipment Configuration

- Main unit of the film thickness measurement system
- Computer set (Monitor and Keyboard and/or Mouse)
- Software operational environment (OS): Microsoft® Windows NT
- Power cable
- Operation manual

### Option

- Color printer for MESEC-SAT (Microsoft® Windows NT compatible)