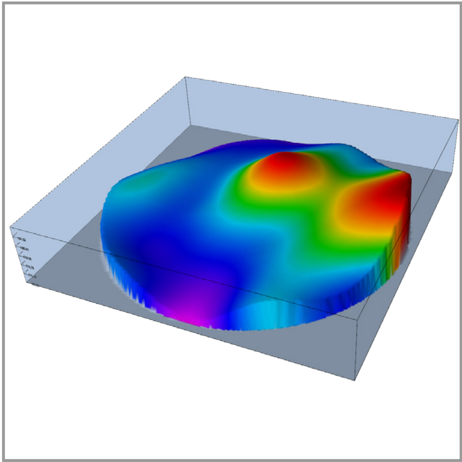


Tropel® UltraSort II Semi-Automated FlatMaster® Wafer Metrology System

Advanced Optical Measurement Module for Wafer Flatness, and Thickness Variation

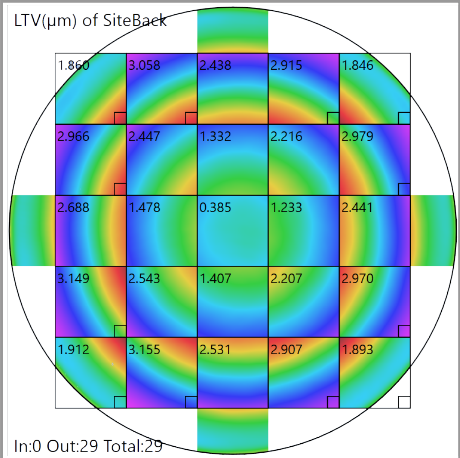
The Tropel® FlatMaster® Semi-Automated Wafer Metrology Module continues our 40 year tradition of providing metrology solutions to semiconductor wafer manufacturers. Designed for volume wafer production, this automated system offers superior performance in rapid, repeatable, accurate, non-contact qualification of silicon and alternative substrate wafers.

The FlatMaster® Semi-Automated Wafer flatness analysis system integrates a grazing-incidence interferometer with automated staging for improved wafer loading and measurement repeatability. The FlatMaster® Semi-Automated Wafer can be configured to measure wafer sizes from 2 inches to 8 inches in diameter, is field upgradable to full automation and sorting and is well suited for a variety of different materials including silicon carbide, gallium arsenide, sapphire, quartz, germanium, silicon, lithium niobite, glass, and many others.

The power of grazing incidence interferometry that makes the Tropel® FlatMaster® System an industry standard for precision flatness is offered on the Tropel® UltraSort™ Automated Wafer Analysis System.

Measurement Parameters

Global	Local (Site)
Thickness	SBIR (LTV)
GBIR (TTV)	SBID (LDOF)
GF3R (TIR)	SF3R (LTIR)
GFLR (NTV)	SF3D (LFPD)
GFLD (NTD)	SFLR (LTIR)
Bow, Warp, SORI	SFQR (LTIR)
	SFQD (LFPD)



Tropel® FlatMaster® Semi-Automated Wafer Metrology System Specifications

Measurement Method	Grazing Incidence Interferometry

Performance

Accuracy[1]	50 nanometers (2.0 µinches)
Repeatability[1]	15 nanometers (0.6 µinches) (1 sigma)
Resolution	5 nanometers (0.2 µinches)
Dynamic range[2]	> 100 micrometers
Part range	50 mm – 200 mm
Part range configuration	50 mm – 150 mm; 100 mm – 200 mm
Measured data points	≥ 230,000 per measurement
Measurement time	5 seconds typical
Measurement datum	Front referenced, back referenced, clamped and local site
Measurement parameters	Bow, Warp, SORI, TTV, LTV, LDOF, thickness, stress, and many others
Data analysis	3-D, contour, slice: x, y circumferential and radial, and wafer analysis plots

Materials and Surfaces

Materials	Gallium arsenide, gallium nitride, gallium phosphide, germanium, indium phosphide, lithium niobate, sapphire, silicon, silicon carbide, glass, and many others
Surfaces	Wire sawn, ground, lapped, polished, etched

Environmental and Facility

Temperature	15 °C to 30 °C (59 °F to 86 °F)
Rate of temperature change	< 2 °C, with no more than 0.5 °C per half hour period
Temperature Sensitivity	Approximately 0.5µm per °C
Vibration Isolation	Passive isolation included
Humidity	35% to 75% non-electrostatic and non-consdensing
Power	100-240 VAC, 50/60 Hz, 4 Amp
Air/Vacuum	See facilities document
System Dimensions (W x D x H)	160 cm x 103 cm x 150 cm (63 in x 40 in x 59 in)
System Weight	390 kg (860 lb)

Describes typical specifications at 2 µm/fringe sensitivity and subject to change based on specific customer requirements.
[1] Refers to instrument limited accuracy as measured on NIST traceable artifact. See Corning Tropel Acceptance Procedure for detailed specifications.
[2] Typical, limited by surface slope.
This product is covered by one or more U.S. patents.
All specifications are subject to change.

For more information about the FlatMaster Semi-Automated Wafer or any other of our Tropel® Metrology Instruments, please contact:

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TROPEL®
METROLOGY INSTRUMENTS

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