θ metrisis **Film Metrology & More...**

FR-Scanner: Automated, Ultra-fast & Accurate wafer mapping

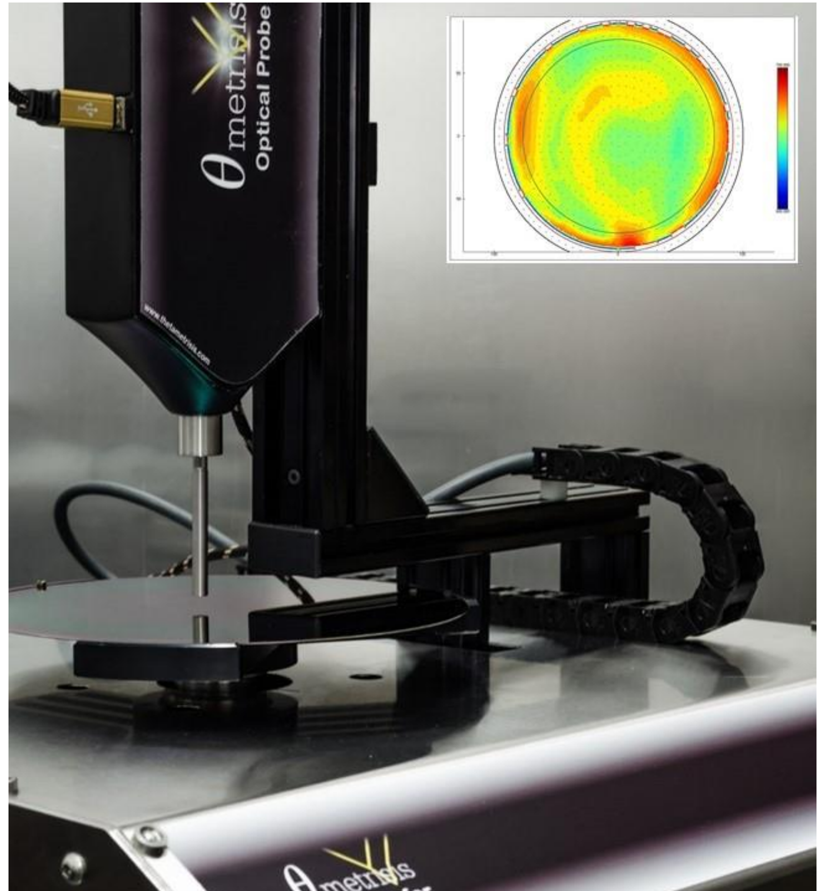
FR-Scanner is a compact bench-top tool suitable for the automatic characterization of films and coatings on wafers.

FR-Scanner is the ideal tool for the fast and accurate mapping of film properties: thickness, refractive index, uniformity, color etc.

Wafers of any diameter / shape can be accommodated on the vacuum chuck.

Applications

- **Semiconductor Manufacturing** (photoresists, dielectrics, poly- Si, a-Si, DLC, photonic multilayer structures)
- **PV Industry**
- **Liquid Crystal Display**
- **Optical Coatings**
- **Polymers**
- **MEMS and MOEMS**
- **Substrates: transparent** (glass, quartz, etc) **and semi-transparent**



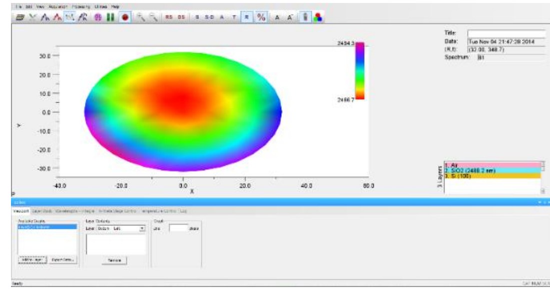
The unique optical head accommodates all optical parts: the spectrometer, the hybrid light source (lifetime, 20000h), the rigid reflection probe. Therefore, excellent performance in terms of accuracy, reproducibility and long-term stability is guaranteed.

FR-Scanner scans the wafers at very high speed by rotating the wafer and by moving linearly the optical head on top (polar scanning). This way, accurate reflectance data with high repeatability are recorded in a very short time, making FR-Scanner the ideal tool for the at-line and on-line characterization of wafers or other substrates at processing facilities.

Typical film thickness mapping on an 8” Si wafer at 625 points take < 60 sec.

Software

- Single-click (no need for initial guess)
- Dynamic measurements
- Save videos for presentations
- 350+ non-identical materials
- 3-years free of-charge Software updates
- Running on Windows 7/8/10

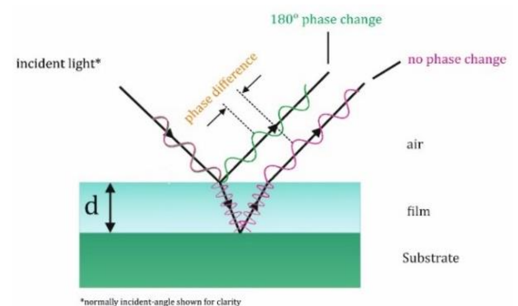


Specifications

Sample Size	Wafers: 2in-3in-4in-6in-8in-300mm[1]
Resolution in R/Angle	5μm/0.1°
Spot Size	350μm
Spectral Range	370-1020nm
Spectrometer specs	3648pixels/16bit
Light Source MTBF	10000h
Thickness Range[2]	12nm-90μm
Meas. Precision[3]	0.06nm
Meas. Stability[4]	0.06nm
Meas. Accuracy[5]	1nm
Min. Thickness for measurement of refractive index[6]	100nm
Scanning Speed[7]	625meas/min
Computer Interface	USB 2.0 / USB 3.0.
Dimensions (mm)	485W x 457L x 500H
Power Requirements	110V/230V, 50-60Hz, 300W
Housing	electrostatically painted Steel and 304 Stainless Steel panels
Weight	40Kg

Principle of Operation

White Light Reflectance Spectroscopy (WLRS) measures the amount of light reflected from a film or a multilayer stack over a range of wavelengths, with the incident light normal (perpendicular) to the sample surface.
The measured reflectance spectrum, produced by interference from the interfaces is being used to determine the thickness, optical constants (n & k), etc. of free-standing and supported (on transparent or partially/fully reflective substrates) stack of films.



[1]The chuck can accommodate samples of arbitrary shape. Stage 450mm wafers is also available on request. True X-Y scanning is also possible through custom-made configuration.
[2]The thickness values based on single layer SiO_2 film over Si substrate. For other films/substrates these values may be slightly different.
[3]Average of standard deviation of mean value over 15 days. Sample: 1micron SiO_2 on Si wafer
[4]2*Standard-Deviation of daily average over 15 days. Sample: 1micron SiO_2 on Si wafer
[5]Measurements compared with a calibrated spectroscopic ellipsometer
[6]Material dependent
[7]The measurements based on 8'' wafer. Higher scanning speed over 1000measurements/min is possible on special request

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