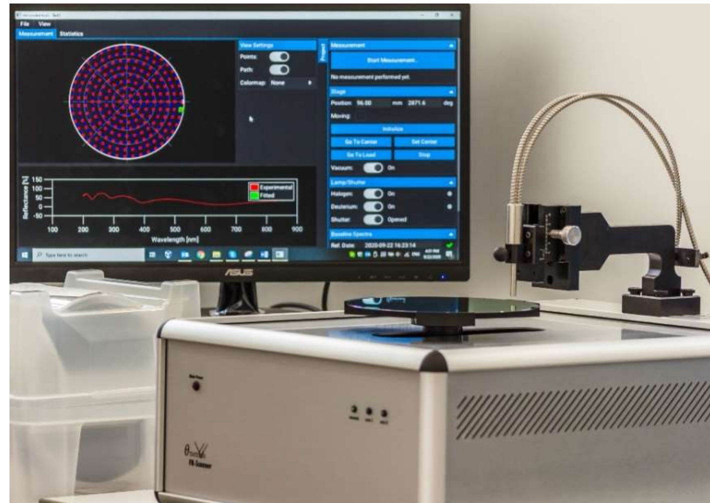
FR-Scanner AIO: Modular unit for automated, Ultra-fast & Accurate wafer mapping

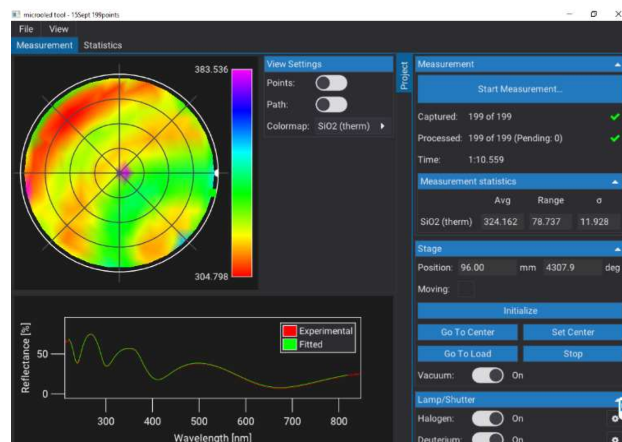
FR-Scanner AllInOne offers automatic characterization of films and coatings on wafers, masks or other substrates.
FR-Scanner is the ideal tool for the fast and accurate mapping of film properties: thickness, refractive index, uniformity, color etc.
Wafers of any diameter (300mm max) and shape can be accommodated on the vacuum chuck.

Applications

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

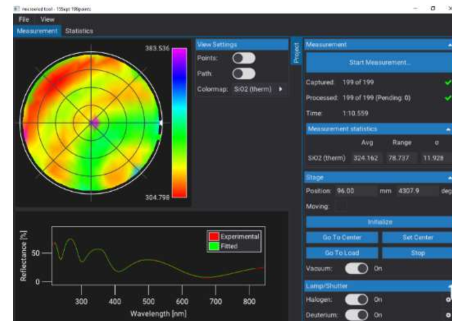


FR-Scanner scans the wafers by rotating the wafer and by moving it linearly (Polar Coordinates) with unparalleled speed and accuracy in both radius and angle. This way, accurate reflectance data with high repeatability are recorded, making FR-Scanner the ideal tool for at-line and on-line characterization of coatings on wafers or other substrates at processing facilities.
It is offered in a wide range of configurations for the characterization of films as thin as few nanometers and thick as several hundreds of microns and is accompanied with a dedicated S/W for daily routine use. FR-Scanner provides excellent performance in terms of accuracy, precision, reproducibility and long-term stability.



Features

- Single-click analysis (no need for initial guess)
- Dynamic measurements
- Measurement of n & k, color
- Save videos for presentations
- Multiple installations for off-line analysis
- Free of-charge Software update

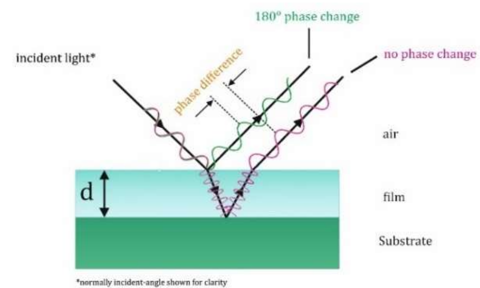


Specifications*

Model	UV/Vis	UV/NIR -EXT	UV/NIR-HR	D UV/NIR	VIS/NIR	D Vis/NIR	NIR	NIR-N1	NIR-N2	NIR-N3	NIR-N4
WL Range -nm	200 – 850	200 –1020	200-1100	200 – 1700	370 –1020	370 – 1700	900 – 1700	850-1050	900 - 1050	1280-1350	1520-1580
Pixels	3648	3648	3648	3648 & 512	3648	3648 & 512	512	3648	3648	512	512
Min Thick -SiO_2	3nm	3nm	3nm	3nm	15nm	15nm	50nm	1um	4um	12um	20um
Max Thick SiO_2	80um	90um	120um	250um	100um	250um	250um	500um	1.2mm	2mm	3mm
Max Thick -Si								300um	500um	1mm	1.3mm
n&k -MinThick	50nm	50nm	50nm	50nm	100nm	100nm	500nm		-	-	-
Thick. Accuracy **	1nm / 0.2%	1nm / 0.2%	1nm / 0.2%	1nm / 0.2%	1nm / 0.2%	2nm / 0.2%	3nm / 0.4%	50nm / 0.2%	50nm / 0.2%	50nm / 0.2%	50nm / 0.2%
Thick. Precision**	0.05nm	0.05nm	0.05nm	0.05nm	0.05nm	0.05nm	0.1nm		5nm	5nm	5nm
Thick. stability **	0.05nm	0.05nm	0.05nm	0.05nm	0.05nm	0.05nm	0.15nm		5nm	5nm	5nm
Light Source	Internal Balanced Deuterium & Halogen, 2000h				Halogen (internal), 3000h (MTBF)					SLED, 200000h (MTBF)	
Wafer size	Wafers: 2in-3in-4in-6in-8in-300mm***										
Scanning Speed	200meas/min (8'' wafer size)										
Spot size	Diameter of 350um (smaller spot size options are available upon request)										
Material Database	> 700 different materials										
R/Angle resolution	5 μ m/0.1°										
Dimensions -mm	600W x 750L x 500H & 450W x 320L x 250H										
Power	110V/230V, 50-60Hz, 300W										

Principle of Operation

White Light Reflectance Spectroscopy (WLRS) measures the amount of light reflected from a film or a multilayer stack over a spectral range, with the incident light normal (perpendicular) to the sample surface.
The measured reflectance spectrum, produced by interference from the individual 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] Specifications are subject to change without any notice. True X-Y scanning is also possible through custom-made configuration ** Measurements compared with a calibrated spectroscopic ellipsometer and XRD, Average of standard deviation of mean value over 15 days. Sample: 1micron SiO_2 on Si wafer, Standard deviation of 100 thickness measurements. Sample: 1micron SiO_2 on Si wafer, 2*Standard-Deviation of daily average over 15 days. Sample: 1micron SiO_2 on Si wafer. ***Stage for 450mm wafers is also available upon request.