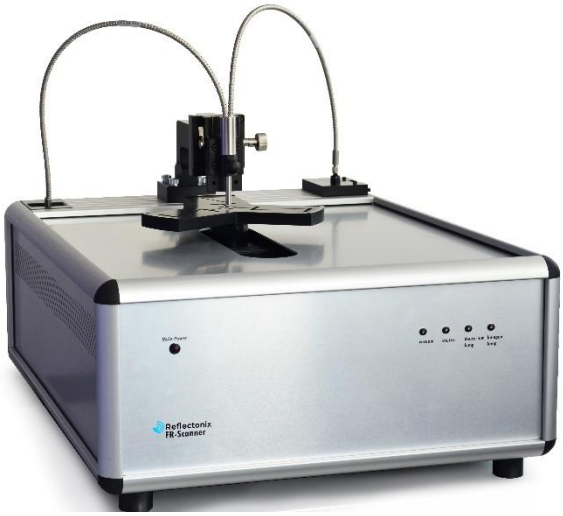
FR-Scanner AllInOne: the tool for automatic characterization of films and coatings on wafers, masks or other substrates.
FR-Scanner is the ideal tool for the fast, accurate and non-destructive mapping of film properties: thickness, refractive index, uniformity, color etc. Wafers of any diameter (300mm 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-AIO-RΘ150 operates in Polar Coordinates with unparalleled speed and accuracy in both radius & angle. Accurate reflectance data with high repeatability are recorded, making FR-Scanner the ideal tool for at-line and on-line characterization of films on wafers / 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.

The FR-Scanner-AIO-RΘ150 platform is offered in a very wide range of implementations covering a wide spectral range (200-1700nm) and thickness range.

Specifications

Model	UV/VIS	UV/NIR-HR	D UV/NIR	VIS/NIR	D Vis/NIR	NIR	RED/NIR	NIR-N1	NIR-N2	NIR-N3	NIR-N4
WL Range -nm	200 – 850	190-1100	200 – 1700	380 – 1020	380 – 1700	900 – 1700	600-850	850-1050	900 - 1050	1280-1350	1520-1580
Pixels	3648	2048	3648 & 512	3648	3648 & 512	512	3648	3648	3648	512	512
Min Thick -SiO_2	3nm	3nm	3nm	15nm	15nm	80nm	600nm	1µm	4µm	12µm	20µm
Max Thick SiO_2	80µm	100µm	250µm	100µm	250µm	230µm	300µm	500µm	1mm	2mm	3mm
Max Thick -Si***								300µm***	400µm***	1mm***	1.3mm***
n&k -Min Thick	50nm			100nm	100nm	500nm			-	-	-
Thick. Accuracy **	1nm / 0.2%	1nm / 0.2%	1nm / 0.2%	1nm / 0.2%	2nm / 0.2%	3nm / 0.4%	25nm / 0.2%	50nm / 0.2%	50nm / 0.2%	50nm / 0.2%	50nm / 0.2%
Thick. Precision**	0.05nm			0.05nm	0.05nm	0.1nm	5nm		5nm	5nm	5nm
Thick. stability **	0.05nm			0.05nm	0.05nm	0.1nm	5nm		5nm	5nm	5nm
Light Source	Internal Deuterium & Halogen, 2000h (MTBF)			Halogen (internal), 3000h (MTBF)							
Wafer size	Wafers: 2in-3in-4in-6in-8in-300mm***										
Scanning Speed	100meas/min (8'' wafer size)										
Spot size	Diameter of 350µm (smaller spot size options are available upon request)										
R/Angle resolution	3µm/0.1°										
Dimensions - mm	600L x 460W x 350H										
Power	110V/230V, 50-60Hz, 300W										
Material Database	> 850 different materials										
SW Characteristics	FR-Monitor v4.0 (free of charge updates) Full details at the related catalog's page										

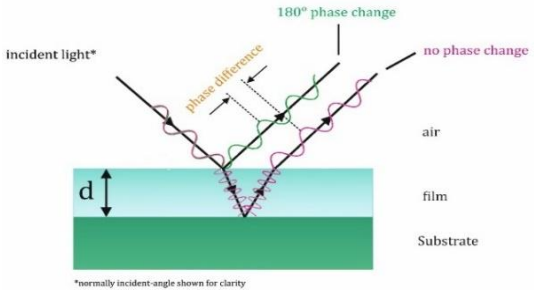
Options

R-axis:	200mm long linear axis for mapping of wafers with diameter up to 400mm.
Chucks:	Standard chucks (4in, 6in, 8in, 12in) and multi wafer chucks (any size up to 200mm, or any size up to 300mm), custom-designed chucks upon request
FR-Mic:	For characterization of patterned wafers with small spot-size

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.



* Specifications are subject to change without any notice; ** Thickness range depends on the spectral range and refers to a single layer with refractive index ~1.5 on Si substrate ** Measurements compared with a calibrated spectroscopic ellipsometer and XRD, Average of standard deviation of mean value over 15 days. Sample: 1µm SiO_2 on Si, Standard deviation of 100 thickness measurements. Sample: 1µm SiO_2 on Si, 2*Standard-Deviation of daily average over 15 days. Sample: 1µmicron SiO_2 on Si.