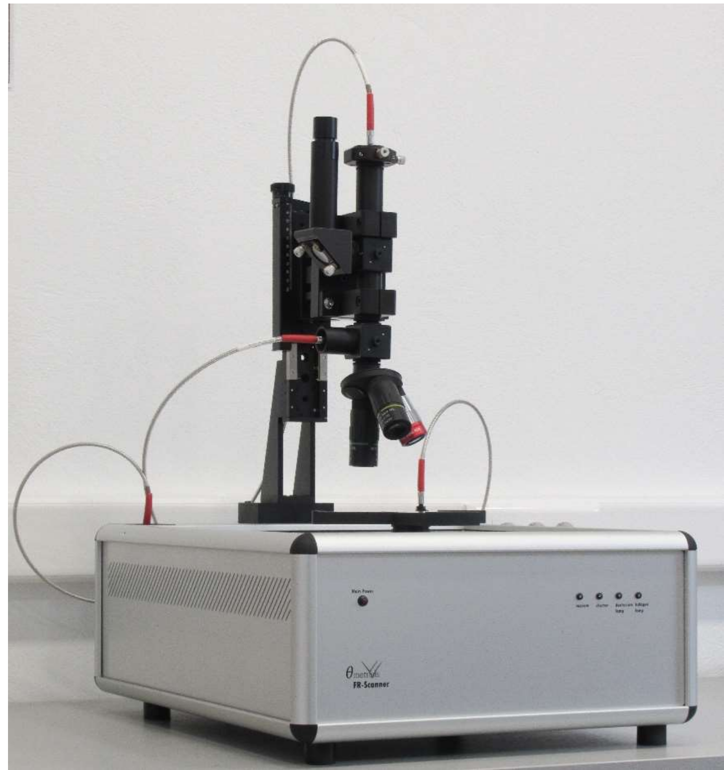
FR-Scanner AIO-Mic-RΘ150: Automated & Fast mapping of coatings in the micron lateral scale

FR-Scanner-AIO-Mic-RΘ150 is a holistic platform for the fully-automated in-depth characterization of patterned single and multilayer coatings on wafers. Wafers of any diameter (300mm max) and shape can be accommodated on the vacuum chuck.
The tool is offered in an endless range of optical configurations within the 200-1700nm spectral range.

Applications

- **Semiconductors** (Oxides, Nitrides, Si, Resists, etc.)
- **MEMS devices** (Photoresists, Si membranes, etc.)
- **LEDs, VCSELs**
- **Data Storage**
- **Polymer coatings,** adhesives, etc.
- And many more… (contact us with your requirements)



FR-Scanner-AIO-Mic-RΘ1500 is the modular platform that integrates in one unit state-of-the-art optical, electronic, and mechanical modules for the characterization of patterned thin and thick films.
The wafer is mounted on a vacuum chuck and the characterization is performed by a powerful optical module with a **spot size as small as a few micrometers.** The motorized and with ultra-high precision & repeatability RΘ stage provides coverage of every point on a wafer with diameter up to 300mm*.
FR-Scanner-AIO-Mic-RΘ150 provides:

- Real-time spectroscopic reflectance measurements
- Film thickness, optical properties, non-uniformity measurements, thickness mapping
- Imaging with integrated, and high-quality color camera
- Wide range of statistics for the parameters under characterization

** tools for mapping of coatings on wafers with larger diameter are also available (max 450mm)*

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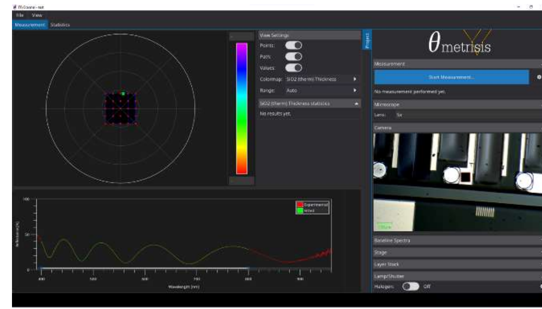
Features

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



Specifications

Model		UV/VIS	UV/NIR -EX	UV/NIR-HR	D UV/NIR	VIS/NIR	D VIS/NIR	NIR	NIR-N2
Spectral Range (nm)		200 – 850	200 –1020	200-1100	200 – 1700	370 –1020	370 – 1700	900 – 1700	900 - 1050
Spectrometer Pixels		3648	3648	3648	3648 & 512	3648	3648 & 512	512	3648
Thickness range (SiO_2)	5X- VIS/NIR	4nm – 60μm	4nm – 70μm	4nm – 100μm	4nm – 150μm	15nm – 90μm	15nm–150μm	100nm-150μm	4um – 1mm
	10X-VIS/NIR 10X-UV/NIR*	4nm – 50μm	4nm – 60μm	4nm – 80μm	4nm – 130μm	15nm – 80μm	15nm–130μm	100nm–130μm	–
	15X- UV/NIR *	4nm – 40μm	4nm – 50μm	4nm – 50μm	4nm – 120μm	–	–	100nm-100μm	–
	20X- VIS/NIR 20X- UV/NIR *	4nm – 25μm	4nm – 30μm	4nm – 30μm	4nm – 50μm	15nm – 30μm	15nm – 50μm	100nm – 50μm	–
	40X- UV/NIR *	4nm – 4μm	4nm – 4μm	4nm – 5μm	4nm – 6μm	–	–	–	–
	50X- VIS/NIR	–	–	–	–	15nm – 5μm	15nm – 5μm	100nm – 5μm	–
Min. Thickness for n & k		50nm	50nm	50nm	50nm	100nm	100nm	500nm	–
Thickness Accuracy **		0.1% or 1nm				0.2% or 2nm		3nm or 0.3%	
Thickness Precision **		0.02nm				0.02nm		<1nm	5nm
Thickness stability **		0.05nm				0.05nm		<1nm	5nm
Light Source		Deuterium & Halogen				Halogen (internal), 3000h (MTBF)			
R/Angle resolution		5μm/0.1°							
Material Database		> 700 different materials							
Wafer size		2in-3in-4in-6in-8in-300mm							
Scanning Speed		100meas/min (8'' wafer size)							
Tool footprint / Weight		650x500mm / 45Kg							
Power		110V/230V, 50-60Hz, 350W							

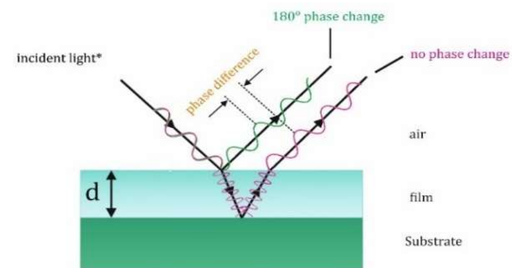
The measurement area (the area from which the reflectance signal is collected) is relative to the objective lens and the aperture size

Objective Lens Magnification	Spot Size: 500 μm Apertrture	250 μm Aperture	100 μm Aperture
5x	100 μm	50 μm	20 μm
10x	50 μm	25 μm	10 μm
20x	25 μm	15 μm	5 μm
50x	10 μm	5 μm	2 μm

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, * Reflective objective lens ** 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.

FR-Scanner-AIO-Mic-XY200: Automated & Fast mapping of coatings in the micron lateral scale

FR-Scanner-AIO-Mic-XY200 is a holistic platform for the fully-automated in-depth characterization of patterned single and multilayer coatings on wafers. It provides 200mm of travel along X and Y axes and is suitable for accurate measurements while the sample is secured on the stage through vacuum.

The tool is offered in an endless range of optical configurations within the 200-1700nm spectral range.

Applications

- **Univ. & Research labs**
- **Semiconductors** (Oxides, Nitrides, Si, Resists, etc.)
- **MEMS devices** (Photoresists, Si membranes, etc.)
- **LEDs, VCSELs**
- **Data Storage**
- **Polymer coatings,** adhesives, etc.
- And many more... (contact us with your requirements)

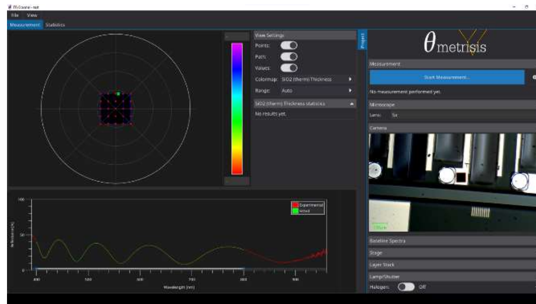
FR-Scanner-AllInOne-Mic-XY200 is the modular platform that integrates under the same roof state-of-the-art optical, electronic, and mechanical modules for the characterization of patterned thin and thick films. Typical examples include (but are not limited to): micro-patterned surfaces, rough surfaces, and numerous others.
The wafer is mounted on a vacuum chuck that supports any wafer size up to 200mm diameter. The characterization is performed by a powerful optical module with a **spot size as small as a few micrometers.** The motorized XY stage provides travel of 200mm on both axes with unprecedented specifications in speed, accuracy & repeatability.

FR-Scanner-AIO-Mic-XY200 provides:

- Real-time spectroscopic reflectance measurements
- Film thickness, optical properties, non-uniformity measurements, thickness mapping
- Imaging with an integrated, USB-connected, and high-quality color camera
- Wide range of statistics for the parameters under characterization

Features

- Single-click analysis (no need for initial guess)
- Dynamic measurements
- Optical parameters (n & k, color)
- Click2Move & Pattern alignment functions
- Multiple installations for off-line analysis
- Free of-charge Software update



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	20X- VIS/NIR 20X- UV/NIR *	4nm – 25µm	4nm – 30µm	4nm – 30µm	4nm – 50µm	15nm – 30µm	15nm – 50µm	100nm – 50µm	–
	40X- UV/NIR *	4nm – 4µm	4nm – 4µm	4nm – 5µm	4nm – 6µm	–	–	–	–
	50X- VIS/NIR	–	–	–	–	15nm – 5µm	15nm – 5µm	100nm – 5µm	–
Min. Thickness for n & k		50nm	50nm	50nm	50nm	100nm	100nm	500nm	–
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Thickness Precision **		0.02nm				0.02nm		<1nm	5nm
Thickness stability **		0.05nm				0.05nm		<1nm	5nm
Light Source		Deuterium & Halogen				Halogen (internal), 3000h (MTBF)			
Min. incremental motion		0.6µm							
Stage repeatability		±2µm							
Absolute accuracy		±3µm							
Material Database		> 700 different materials							
Wafer size		2in-3in-4in-6in-8in							
Scanning Speed		100meas/min (8'' wafer size)							
Tool dimensions / Weight		700x700x200mm / 45Kg							

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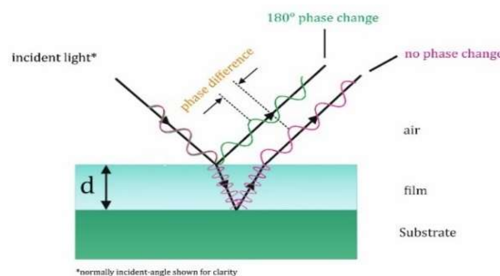

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