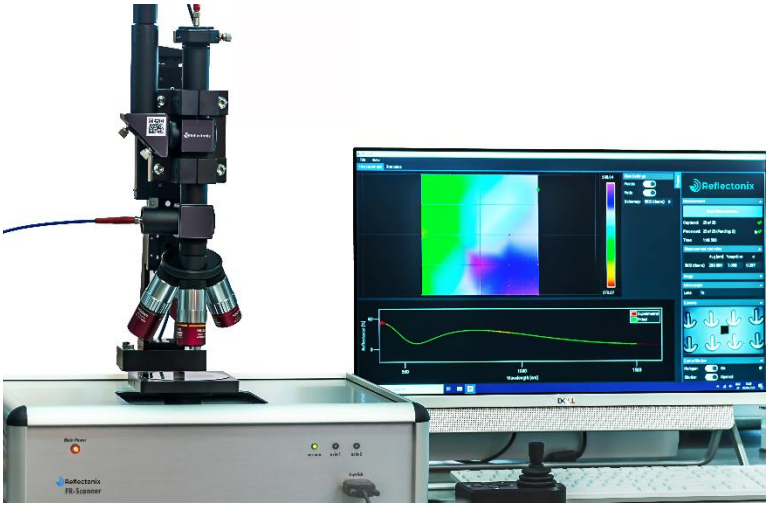
With FR-Mic, local measurement of film thickness, optical constants, reflectance, transmission, and absorbance across any spectral regime within UV / VIS / NIR spectral range, is just a matter of a click.
FR-Mic can be mounted either on FR-pRo units or over external manual or motorized stages when large surfaces need to be characterized.

APPLICATIONS

- **Univ. & Research labs**
- **Semiconductors** (Oxides, Nitrides, Si, Resists, etc.)
- **MEMS devices** (Photoresists, Si membranes, etc.)
- **LEDs, VCSELs**
- **Data Storage**
- **Anodization**
- **Hard/Soft coatings on curved substrates**
- **Polymer coatings,** adhesives, etc.
- **Biomedical** (parylene, balloon wall thickness, etc.)
- And many more…



FR-Mic is the modular optical column for **fast & accurate** coating characterization applications that require **spot size as small as few micrometers.** Typical examples include (but not limited to): micro-patterned surfaces, rough surfaces and numerous others. It can be combined with a wide range of computer controlled XY and RΘ stages, allowing the automated thickness & optical properties mapping of samples fast, easily and accurately.

FR-Mic provides:

- Real-time spectroscopic measurements
- Film thickness, optical properties, non-uniformity measurements, thickness mapping
- Imaging with an integrated, USB connected and high-quality color camera

Numerous user-friendly functions e.g. Click2Move, Measurement scale.

Specifications

Model		UV/VIS	UV/NIR-HR	D UV/NIR	VIS/NIR	VIS/NIR-UR	D VIS/NIR	NIR	NIR-N2
Spectral Range (nm)		200 – 850	200-1100	200 – 1700	380 –1020	380-1100	380 – 1700	900 – 1700	900 - 1050
Spectrometer Pixels		3648	2048	3648 & 512	3648	2048	3648 & 512	512	3648
Thickness range	5X- VIS/NIR	4nm – 60µm	4nm – 90µm	15nm – 90 µm	15nm – 90µm	15nm – 80µm	15nm–150µm	100nm-150µm	4µm–1mm SiO_2
	10X-VIS/NIR 10X-UV/NIR*	4nm – 50µm	4nm – 80µm	15nm – 80µm	15nm – 80µm	15nm – 70µm	15nm–130µm	100nm–130µm	–
	15X- UV/NIR*	4nm – 40µm	4nm – 50µm	–		15nm – 60 µm	–	100nm-100µm	–
	20X- VIS/NIR 20X- UV/NIR	4nm – 25µm	4nm – 30µm	15nm – 50µm	15nm – 50µm	15nm – 50 µm	15nm – 60µm	100nm – 60µm	–
	40X- UV/NIR*	4nm – 4µm	4nm – 5µm	–			–	–	–
	50X- VIS/NIR	–	–	15nm – 7µm	15nm – 7µm	15nm – 7µm	15nm – 8µm	100nm – 8µm	–
Min. Thickness for n & k		50nm	50nm	50nm	100nm	100nm	100nm	500nm	–
FR-API		YES	NO	YES	YES	YES	YES	NO	YES
Thickness Accuracy **		0.2% 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 (Not Included)		Balanced Deuterium & Halogen, 2000h (MTBF)			Halogen, 3000h (MTBF)				
Material Database		> 850 different materials							
Dimensions & Weight									
SW Characteristics		FR-Monitor v4.0 (free of charge updates) Full details are listed at the related catalog's page							

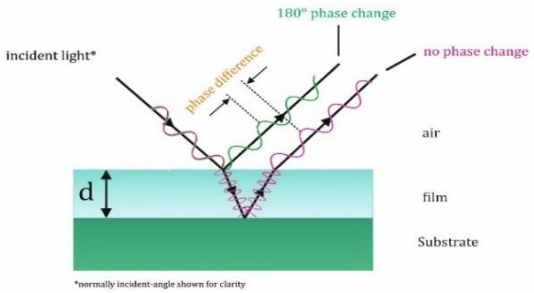
The measurement area (the area from which the reflectance or transmittance signal is collected) is relative to the objective lens and the FR-Mic's aperture size. Standard apertures sizes are: 500µm, 250µm, 100µm. Apertures with size 150µm and 50µm are also available upon request.

Objective Lens	Spot Size (µm)			
	500 µm Aperture	250 µm Aperture	100 µm Aperture	50 µm Aperture
5x	100 µm	50 µm	20 µm	10 µm
10x	50 µm	25 µm	10 µm	5 µm
15x	33 µm	17 µm	7 µm	3.5 µm
20x	25 µm	13 µm	5 µm	2.5 µm
50x	10 µm	5 µm	2 µm	1 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.



* 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.