

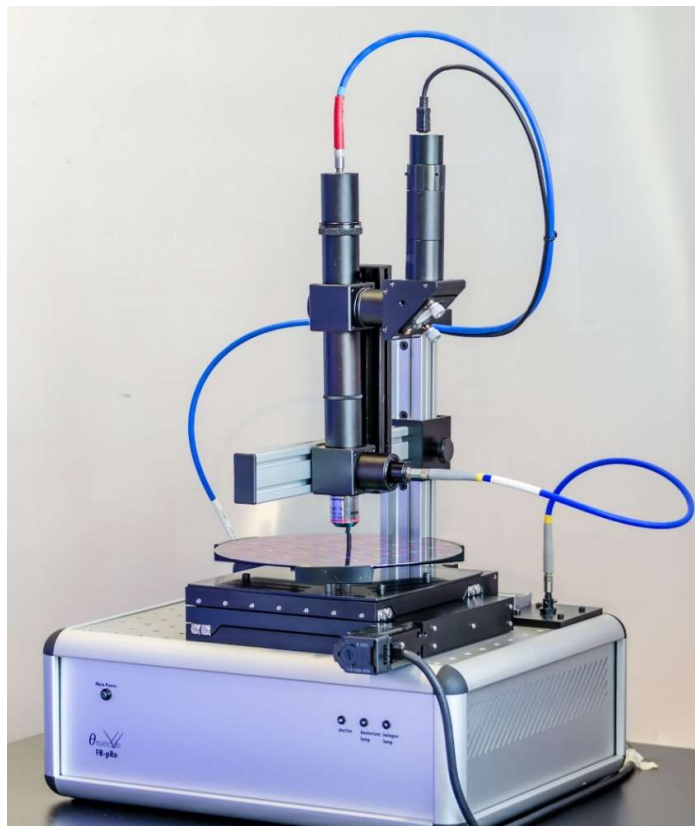
## FR-Mic: Local characterization of coatings in the micron lateral scale

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 either attached on FR-pRo or next to FR-pRo 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...  
(contact us with your requirements)



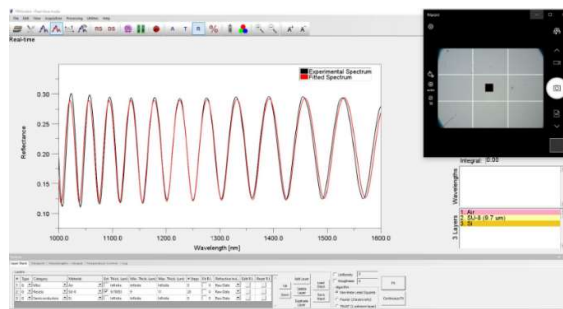
**FR-Mic** is the modular optical column for **fast & accurate** coating characterization applications that require **spot size as small as few micrometers**, Typical examples include (but not limited to): micro-patterned surfaces, rough surfaces and numerous others. It can be combined with a dedicated computer controlled XY stage, 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

## Features

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



## FR-Mic Specifications

Model	UV/VIS	UV/NIR -EXT	UV/NIR-HR	D UV/NIR	VIS/NIR	D VIS/NIR	NIR
<b>Spectral Range (nm)</b>	200 – 850	200 –1020	200-1100	200 – 1700	370 –1020	370 – 1700	900 – 1700
<b>Spectrometer Pixels</b>	3648	3648	3648	3648 & 512	3648	3648 & 512	512
<b>Thickness range</b>	5X- VIS/NIR	15nm – 60µm	15nm – 70µm	15nm – 90µm	15nm – 150µm	15nm – 90µm	15nm – 150µm
	10X-VIS/NIR 10X-UV/NIR*	4nm – 50µm	4nm – 60µm	4nm – 80µm	4nm – 130µm	15nm – 80µm	15nm – 130µm
	15X- UV/NIR *	4nm – 40µm	4nm – 50µm	4nm – 50µm	4nm – 120µm	—	—
	20X- VIS/NIR 20X- UV/NIR *	4nm – 25µm	4nm – 30µm	4nm – 30µm	4nm – 50µm	15nm – 30µm	15nm – 50µm
	40X- UV/NIR *	4nm – 4µm	4nm – 4µm	4nm – 5µm	4nm – 6µm	—	—
50X- VIS/NIR	—	—	—	—	15nm – 5µm	15nm – 5µm	100nm – 5µm
<b>Min. Thickness for n &amp; k</b>	50nm	50nm	50nm	50nm	100nm	100nm	500nm
<b>Thickness Accuracy</b>	0.1% or 1nm			0.2% or 2nm			
<b>Thickness Precision</b>	0.02nm			0.02nm			
<b>Thickness stability</b>	0.05nm			0.05nm			
<b>Light Source</b>	Balanced Deuterium & Halogen (internal)				Halogen (internal)		
<b>Material Database</b>	> 650 different materials						

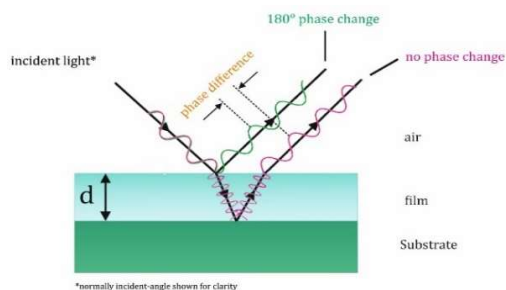
The measurement area (the area from which the reflectance or transmittance signal is collected) is relative to the objective lens and the FR-Mic's aperture size

Objective Lens	Spot Size (µm)		
	500 µm Aperture	250 µm Aperture	100 µm Aperture
5x	100 µm	50 µm	20 µm
10x	50 µm	25 µm	10 µm
20x	25 µm	17 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.



<sup>1</sup> Specifications are subject to change without any notice, <sup>2</sup> Measurements compared with a calibrated spectroscopic ellipsometer and XRD, <sup>3</sup> Average of standard deviation of mean value over 15 days. Sample: 1micron SiO<sub>2</sub> on Si wafer, <sup>4</sup> Standard deviation of 100 thickness measurements. Sample: 1micron SiO<sub>2</sub> on Si wafer, <sup>5</sup> 2\*Standard-Deviation of daily average over 15 days. Sample: 1micron SiO<sub>2</sub> on Si wafer.  
\* reflective objective lens