

## FR-pOrtable: USB-powered film characterization tool at the Point-of-Need

**FR-pOrtable** is a unique miniaturized solution for accurate & precise non-destructive characterization of transparent and semi-transparent single films or stack of films.

With **FR-pOrtable** the user can perform reflectance and transmittance measurements in the 380-1020nm spectral range.

### Applications

- **Universities & Research labs**
- **Semiconductors** (Oxides, Nitrides, Si, Resists, etc.)
- **MEMS devices** (Photoresists, Si membranes, etc.)
- **LED**
- **Data Storage**
- **Hard/Soft coatings on curved substrates**
- **Polymer coatings, adhesives, etc.**
- **Biomedical** (parylene, balloon wall thickness, etc.)
- And more...  
(contact us with your requirements)



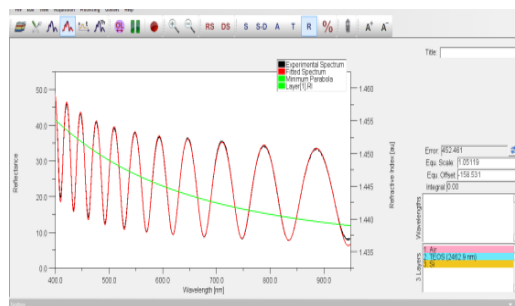
The compact size of **FR-pOrtable** and the custom designed reflection probe, guarantee highly accurate and repeatable measurements.

FR-pOrtable, can be either mounted on the supplied stage or can be easily transformed to a handheld thickness measurement tool to be placed over the sample under characterization.

**FR-pOrtable is the only optical characterization tool for in-field applications.**

## Features

- Thickness measurement range: 12nm to 90  $\mu$ m
- Refractive Index (n & k) calculation
- Broad Spectral Range: 380nm – 1020nm
- USB powered
- Portable
- Reflectance, Transmittance, Absorption and Color parameters



## Specifications

Thickness range*	12nm – 90 $\mu$ m
Refractive Index calculation	✓
Thickness Accuracy <sup>1</sup>	0.2% or 1nm
Thickness Precision <sup>2,3</sup>	0.07nm or 1‰ (0.01nm <sup>3</sup> )
Thickness stability <sup>4</sup>	0.06nm
Sample size	1mm to 180mm and up
Spectral Range	380nm – 1020nm
Working distance	3mm-20mm
Spot size	360 $\mu$ m (diameter)
Light Source Lifetime	20000h
Wavelength resolution	0.8nm
Number of Layers Measured	Max. 5 layers
Measurement time	10ms
A/D converter	16 bit
Power	USB - supplied
Dimensions	300mm x 110mm x 40mm <sup>5</sup>

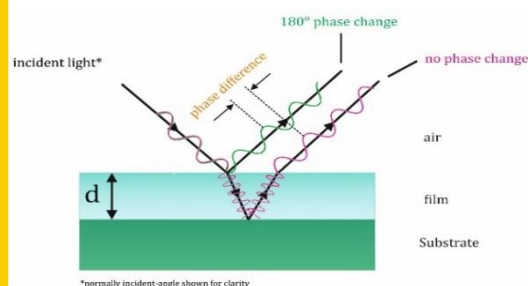
## Accessories

- At-the-Field adaptor:** For measurements at the Point-of-Need.
- Transmittance module:** For the measurement of transmittance & absorbance spectra of coatings, coating thickness etc.
- Manual X-Y stage:** For the characterization of coatings at multiple positions (manual movement)

## Principle of Operation

**White Light Reflectance Spectroscopy (WLRs)** measures the amount of light reflected from a film or a multilayer stack over a range of wavelengths, with the incident light normal (perpendicular) to the sample surface.

The measured reflectance spectrum, produced by interference from the 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.



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