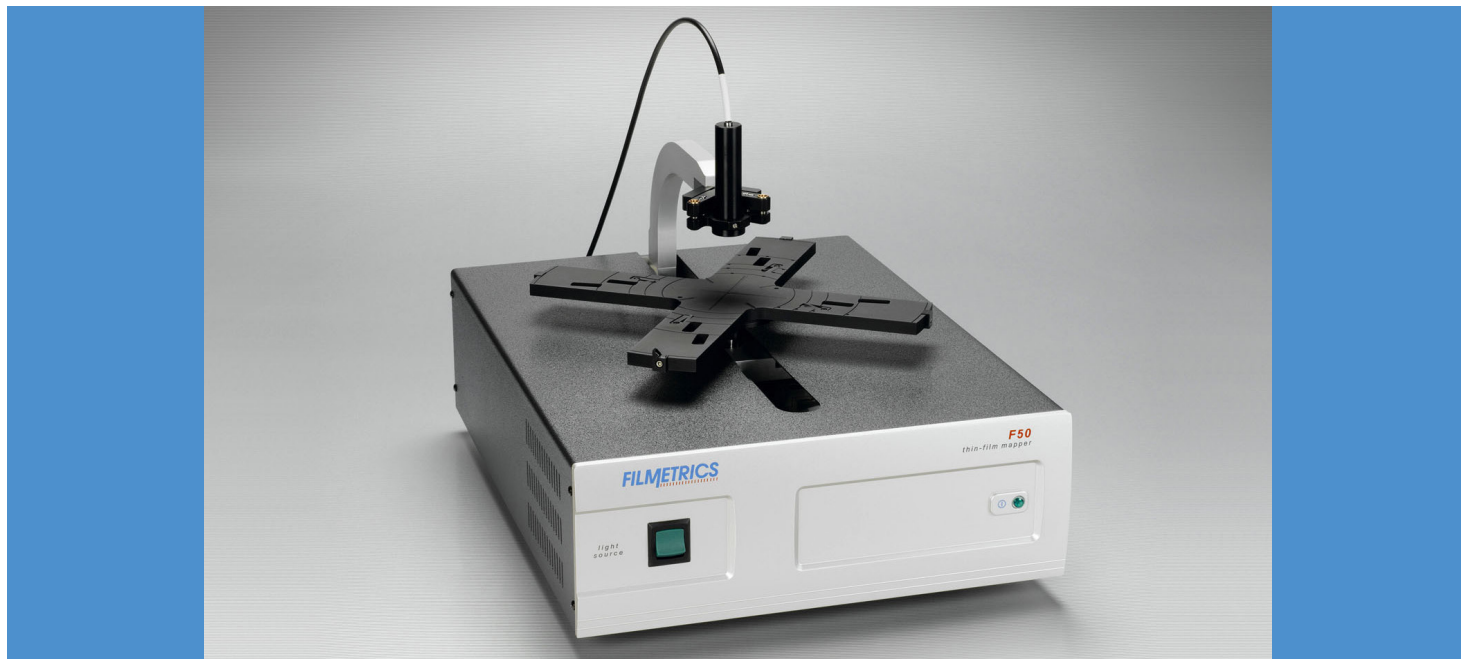


F50 Series

Thin-Film Mapping Analyzer



The Filmetrics Advantage

- World's leader in tabletop thin-film measurement
- 24-hour phone, e-mail, and online support
- Intuitive analysis software standard with every system

Additional Features

- Built-in online diagnostics
- Standalone software included
- Sophisticated history function for saving, reproducing, and plotting results

Automated Thin-Film Thickness Mapping System

Thin-film thickness of samples up to 450 mm in diameter are mapped quickly and easily with the F50 advanced spectral reflectance system. The motorized r-theta stage moves automatically to selected measurement points and provides thickness measurements as fast as two points per second. The F50 has the same precision high-lifetime stage that performs millions of measurements in our production systems.

Choose one of dozens of predefined polar, rectangular, or linear map patterns, or create your own with no limit on the number of measurement points. The entire desktop system is set up in minutes and can be used by anyone with basic computer skills.

Example Layers

Virtually any smooth, non-metallic film may be measured. Examples include:

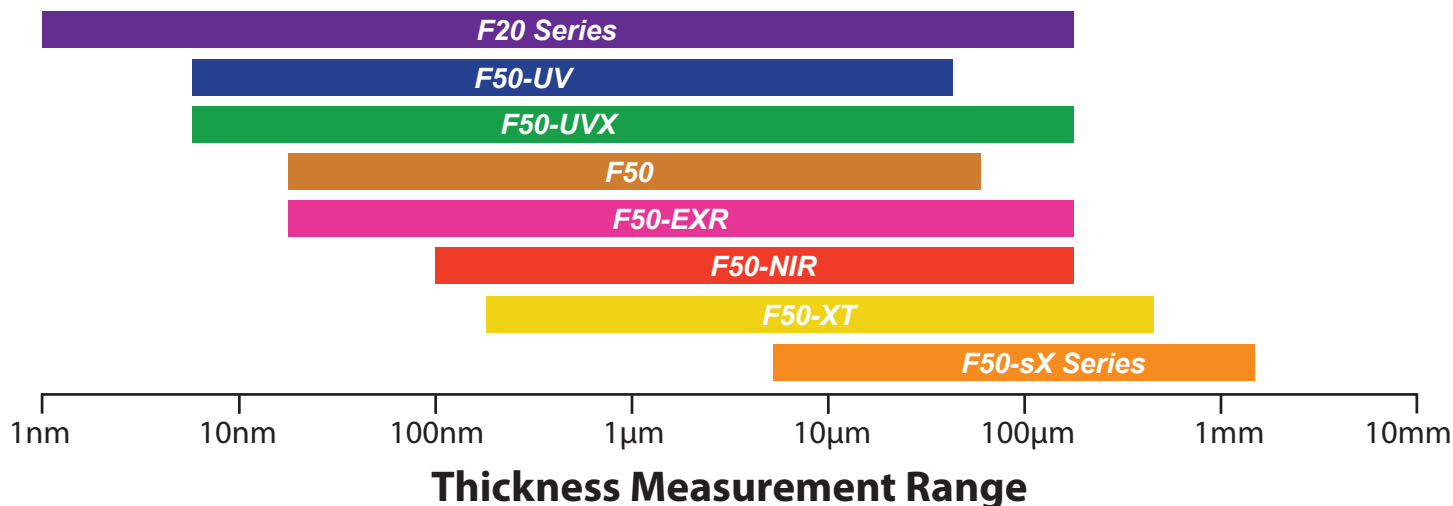
SiO ₂	SiN _x	DLC	Polysilicon
Photoresist	Polymer Layers	Polyimide	Amorphous Silicon

Example Applications

Semiconductor Fabrication	LCD
Photoresist	Cell Gaps
Oxides/Nitrides/SOI	Polyimide
Wafer Backgrinding	ITO
MEMS	Optical Coatings
Photoresist	Hardness Coatings
Silicon Membranes	Anti-Reflection Coating

F50 Series

Thin-Film Mapping Analyzer



Measurement Specifications	F50-UV	F50-UVX	F50	F50-EXR	F50-NIR	F50-XT	F50-s1310
Thickness Measurement Range*:	5 nm - 40 µm	5 nm - 250 µm	20 nm - 70 µm	20 nm - 250 µm	100 nm - 250 µm	0.2 µm - 450 µm	7 µm - 2 mm
Min. Thickness to Measure n and k*:	50 nm	50 nm	100 nm	100 nm	500 nm	2 µm	100 µm
Wavelength Range:	190 - 1100 nm	190 - 1700 nm	380 - 1050 nm	380 - 1700 nm	950 - 1700 nm	1440 - 1690 nm	1280 - 1340 nm
Accuracy*: The greater of	0.2% or 1 nm	0.2% or 1 nm	0.2% or 2 nm	0.2% or 2 nm	0.4% or 3 nm	0.4% or 4 nm	0.4% or 50 nm
Precision:	0.02 nm ¹				0.1 nm ¹	1 nm ¹	5 nm ²
Stability:	0.05 nm ³				0.12 nm ³	1 nm ³	5 nm ⁴
Spot Size:	Standard 1.5 mm, optional down to 150 µm					600 µm	10 µm
Light Source Lamp MTBF:	D2: 2000 Hours Halogen: 1200 Hours		Halogen: 1200 Hours				SLED: >10 years

General Specifications		200 mm Chuck	300 mm Chuck
Power Requirements:	100 - 240 VAC, 50 - 60 Hz, 100 Watts	Sample Size:	≤ 200 mm diameter
Dimensions:	14W x 19D x 11H (in) 35.5W x 48.3D x 28H (cm)	Speed (Typical with Vacuum Chuck):	≤ 300 mm diameter
Weight:	35 lbs. (16 kg)		5 points - 5 sec. 25 points - 14 sec. 56 points - 29 sec.
			5 points - 8 sec. 25 points - 21 sec. 56 points - 43 sec.

Computer Requirements	
Interface:	USB 2.0
Operating System	
PC ⁵ :	Windows XP (SP2) - Latest Windows (64-bit)
Mac:	OS X Lion/Mountain Lion running Parallels

* Material dependent

¹ 1σ of 100 measurements of 500 nm SiO₂-on-Si. Average of 1σ over 20 successive days.

² 1σ of 100 measurements of 100 µm SiO₂-on-Si. Average of 1σ over 20 successive days.

³ 2σ of daily average of 100 measurements of 500 nm SiO₂-on-Si over 20 successive days.

⁴ 2σ of daily average of 100 measurements of 100 µm SiO₂-on-Si over 20 successive days.

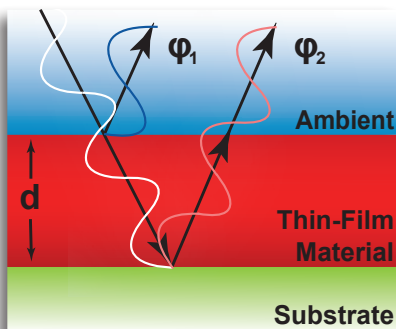
⁵ Windows Vista – Latest Windows(64-bit) and a DirectX 10 graphics card required to render 3D wafer maps

F50 Series

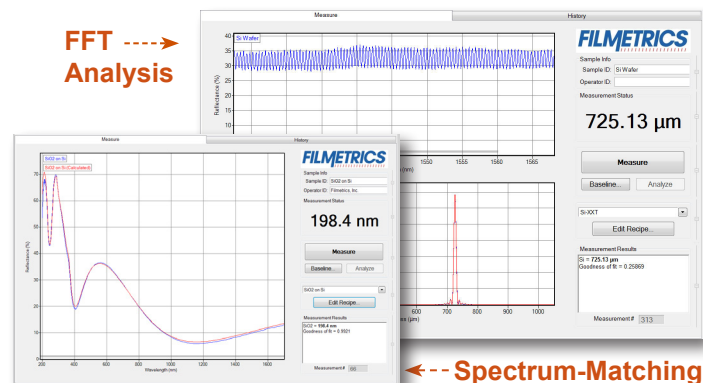
Thin-Film Mapping Analyzer

How Does It Work?

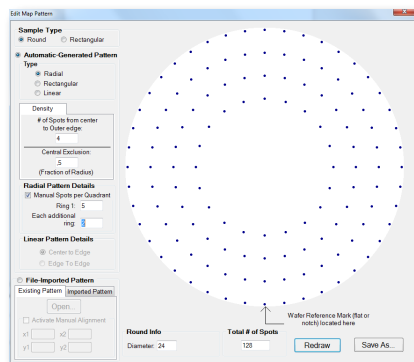
When light encounters an interface between two materials, it is partially reflected. The wave-like nature of light causes reflections from multiple interfaces (ϕ_1 , ϕ_2) to interfere with each other, resulting in oscillations in the wavelength spectrum of the reflected light (see image above). From the frequency of these oscillations, we determine the distance between the different interfaces and thus, the thickness d of the materials (with more oscillations meaning greater thickness). Other material characteristics are also measured, such as refractive index and roughness.



For the analysis of the spectra, our FILMeasure/ FILMapper software uses two analysis modes: Spectrum-Matching and FFT. In Spectrum-Matching mode, you can analyze thickness, as well as refractive index, whereas FFT mode is only for thickness but is often more robust for thicker films.



FILMapper Software – Measurement Automation



The Map Pattern Generator

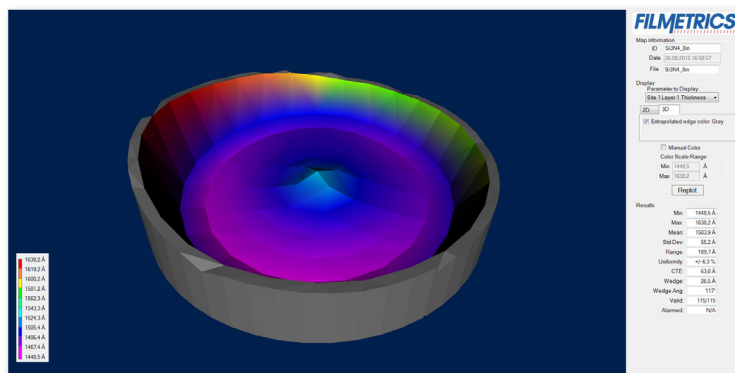
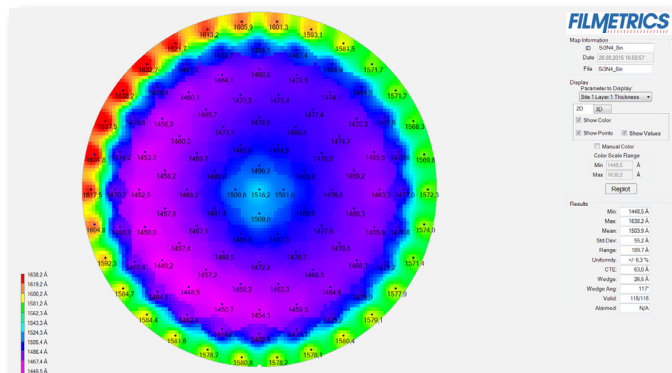
The built-in map pattern generator lets you easily generate the spot patterns needed to measure the relevant area of your samples, thus saving time during data acquisition.

Here are only some of the parameters you can adjust to customize your map's properties:

- Round or square maps
- Radial or rectangular patterns
- Center or edge exclusion
- Spot density

Measurement Results Visualization in 2D and 3D

Whether you are measuring reflectance, film thickness, or refractive index, FILMapper lets you display the resulting measurement maps in either 2D or 3D. Switch easily between the maps for the individual measurement parameters and freely rotate 3D profiles to get an optimal view of the results.



F50 Series

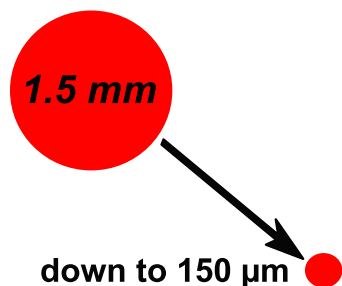
Thin-Film Mapping Analyzer

Optional Accessories

Overcoming High Surface Roughness

For samples with a high roughness, spot sizes of 300 μm or 150 μm are available. If an even smaller spot size is needed (e.g. to measure on lateral structures), take a closer look at the Filmetrics F54.

Measurement spot size

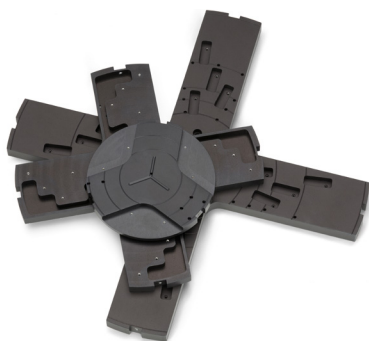


Staying Focused



You'll benefit from our optional autofocus if you're measuring absolute reflectance with high accuracy or if your samples have a significant height variance. It is also important to maintain the small spot size of the sX versions.

Available Chuck Sizes



Select one of our standard chuck sizes of 100 mm, 200 mm, 300 mm, or 450 mm in diameter or ask for a custom-made chuck.

Bigger Samples and Transmittance

With the F50-XY, measure samples as big as 590 mm x 550 mm and up. It also allows for measurement of sample transmittance.

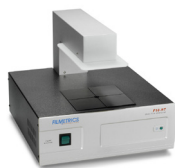


Looking to Do More?

Extend your capabilities even further with these related products:



F3 Series for layers as thin as 1 nm thick



F10-RT for simultaneous reflectance and transmittance



F54 Series for micro-spot measurements