

F54-XY-200

Thin-Film Mapping Analyzer Automated Thin-Film Thickness Mapping System

Thin-film thickness on samples up to 200mm by 200mm is easily mapped with the F54-XY-200 advanced spectral reflectance system. The motorized X-Y stage moves automatically to specified measurement locations, facilitating thickness measurements as quickly as two points per second.

Choose from dozens of predefined polar, rectangular, or linear map patterns, or create your own with no limit on the number of measurement points. This desktop system sets 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:

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



The Filmetrics Advantage

- #1 brand for tabletop thin-film measurement
- 24-hour phone, email, 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

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Specifications

Measurement Specifications	F54-XY-200-UV	F54-XY-200-UVX	F54-XY-200	F54-XY-200-EXR	F54-XY-200-NIR
Thickness Range with 5X Objective*:	-	-	20nm-40µm	20nm-120µm	100nm-120µm
Thickness Range with 10X Objective* ¹ :	4nm-35µm	4nm-115µm	20nm-45µm	20nm-115µm	100nm-115µm
Thickness Range with 15X Objective* ¹ :	4nm-30µm	4nm-100µm	20nm-40µm	20nm-100µm	100nm-100µm
Thickness Range with 50X Objective*:	-	-	20nm-2µm	20nm-4µm	100nm-4µm
Min. Thickness to Measure n and k* ² :	50nm	50nm	100nm	100nm	500nm
Accuracy*: The Greater of	1nm or 0.2%	1nm or 0.2%	2nm or 0.2%	2nm or 0.2%	3nm or 0.4%
Precision ³ :	0.02nm	0.02nm	0.02nm	0.02nm	0.1nm
Stability ⁴ :	0.05nm	0.05nm	0.05nm	0.05nm	0.12nm

General Specifications					
Spectrometer Wavelength Range:	190-1100nm	190-1700nm	380-1050nm	380-1700nm	950-1700nm
Light Source:	External D2 + Halogen		Internal Halogen		
Dimensions:	472mm x 561mm x 391mm				
Weight:	26.3kg				
Power Requirements:	100-240VAC, 50 - 60Hz, 1.3A				

Computer Requirements	
Processor Clock Speed:	1.4GHz min
Interface:	USB 2.0

Operating System	
PC:	Windows 10 (64-bit)
Mac:	OS X Lion - Latest Mac OS running Parallels

* Material dependent

¹ Reflective objective

² Using 5X objective

³ 1σ of 100 measurements of 1µm

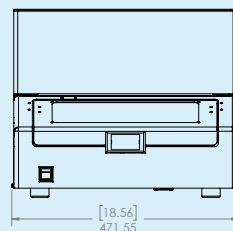
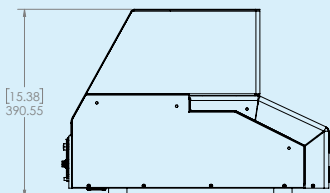
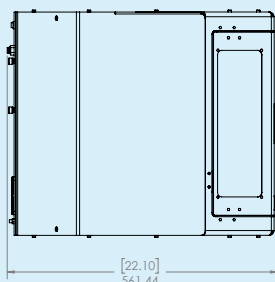
SiO₂-on-Si. Value is average of 1σ over 20 days.

⁴ 2σ of daily average of 100 measurements of 1µm

SiO₂-on-Si, measured over 20 days.

Spot Size	500µm Aperture	250µm Aperture	100µm Aperture
5X Objective:	100µm	50µm	20µm
10X Objective:	50µm	25µm	10µm
15X Objective:	33µm	17µm	7µm
50X Objective:	10µm	5µm	2µm

200mm Chuck	
Sample Size:	≤ 200mm diameter
Speed (Typical with Vacuum Chuck):	5points - 5sec. 25points - 14sec. 56points - 29sec.



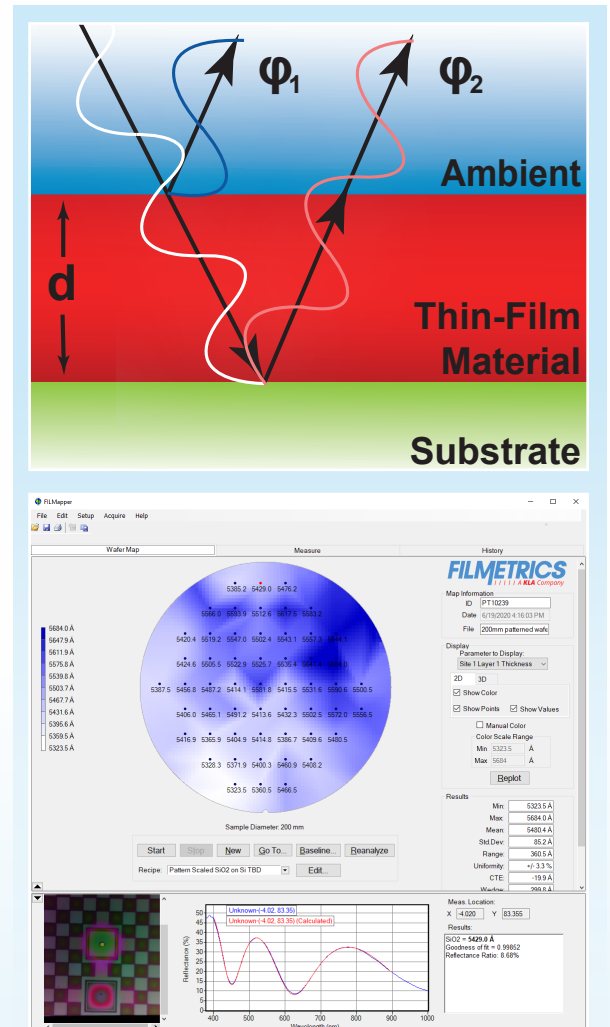
How Does It Work?

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 thin film (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 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.

MICROSPOT MEASUREMENT FOR PATTERNED SURFACES

The F54-XY-200 has an integrated microscope and live video camera which allows exact monitoring of the film thickness measurement spot. The small measurement spot size allows for measurement on patterned samples, as well as improved performance on rougher materials.



FILMAPPER SOFTWARE – MEASUREMENT AUTOMATION THE MAP PATTERN GENERATOR

The built-in map pattern generator lets you easily define the measurement location map 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:

- Sample shape; round or square
- Radial, rectangular, or linear patterns
- Center and edge exclusion
- Measurement location density

MEASUREMENT RESULTS VISUALIZATION IN 2D AND 3D

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

Accessories & Options

Staying Focused

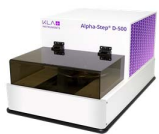
You'll benefit from our autofocus if you're measuring absolute reflectance with high accuracy or if your samples have a significant height variance.

Variable Spot Size

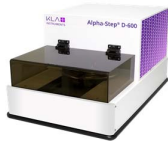
The F54-XY-200 features a field-swappable aperture plate to vary measurement spot size at a fraction of the cost of purchasing additional objectives. Apertures are available in 100, 250, and 500µm sizes.

Looking to do more? Extend your capabilities even further with these related products:

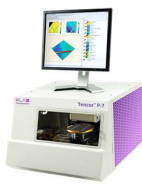
KLA INSTRUMENTS: OPTICAL AND STYLUS PROFILERS



Alpha-Step® D-500



Alpha-Step® D-600



Tencor™ P-7



Tencor™ P-17



Tencor™ P-170



HRP®-260

Manual, Features-to-Value

Throughput, Automation



Profil3D®



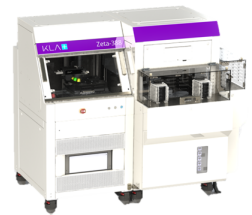
Profil3D®-200



Zeta-20



Zeta-300



Zeta-388

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