Thin Film Metrology
Spectroscopic Reflectometry Systems

NanoCalc systems are versatile and configurable thin film measurement systems utilizing spectroscopic reflectometry to accurately determine optical and non-optical thin film thicknesses for applications in consumer, semiconductor, medical and industrial applications.

NanoCalc is part of the Mikropack line of thin film metrology systems. Options are available for measurements ranging from the deep UV to the shortwave NIR.

Preconfigured versions for VIS and XR are now available.

Sample NanoCalc Applications

- Transmission and reflection measurements of anti-reflective and hardness coatings
- Analysis of medical coatings and catheter balloon foils
- Testing of the hardness and wear of coatings
- Measurement of the thickness of thinned silicon wafers
- Determination of photoresist layers for masks
- Analysis of coatings applied for weather or dirt resistance (Lotus Effect)
- Measurement of coatings inside beverage containers
- Air gap measurements
- Analysis of optical disk coatings

NanoCalc Features

- Resolution to 0.1 nm
- Able to measure stacks of up to 10 layers
- Thickness and refractive index data
- Sophisticated algorithms for defect and roughness tolerance measurements
- Large database to ensure accuracy of a broad range of materials
- Adapters for complex geometries and accessories for thickness mapping

Specifications

Specification	NANOCALC-VIS-PRECON	NANOCALC-XR-PRECON	NANOCALC-DUV	NANOCALC-NIR
Wavelength range:	400-850 nm	250-1050 nm	~200-1100 nm	900-1700 nm
Thickness range:	50 nm-20 µm	10 nm-100 µm	1 nm-100 µm	100 nm-250 µm
Optical resolution:	0.1 nm	0.1 nm	0.1 nm	0.1 nm
Repeatability:	0.3 nm	0.3 nm	0.3 nm	1.0 nm
Angle of incidence:	90°	90°	90°	90°
Number of layers:	Up to 10	Up to 10	Up to 10	Up to 10
Refractive index:	Yes	Yes	Yes	Yes
Test materials:	Transparent or semi-transparent thin film materials	Transparent or semi-transparent thin film materials	Transparent or semi-transparent thin film materials	Transparent or semi-transparent thin film materials
Reference needed:	Yes (bare substrate)	Yes (bare substrate)	Yes (bare substrate)	Yes (bare substrate)
Measurement modes:	Reflection and Transmission	Reflection and Transmission	Reflection and Transmission	Reflection and Transmission
Rough materials capable:	Yes	Yes	Yes	Yes
Measurement speed:	100 ms to 1 s	100 ms to 1 s	100 ms to 1 s	100 ms to 1 s
On-line capable:	Yes	Yes	Yes	Yes
Height adjustment:	with COL-UV-6.35 (10-50 mm)	with COL-UV-6.35 (10-50 mm)	with COL-UV-6.35 (10-50 mm)	with COL-UV-6.35 (10-50 mm)
Spot size:	200 µm or 400 µm standard; 100 µm available upon request	200 µm or 400 µm standard; 100 µm available upon request	400 µm standard; 200 µm available upon request	400 µm standard; 200 µm available upon request
Microspot:	Yes (w/microscope)	Yes (w/microscope)	Yes (w/microscope)	Yes (w/microscope)
CCD color:	Yes (w/microscope)	Yes (w/microscope)	Yes (w/microscope)	Yes (w/microscope)
Mapping option:	150 mm (6") and 300 mm (12") xy-scanning stages	150 mm (6") and 300 mm (12") xy-scanning stages	150 mm (6") and 300 mm (12") xy-scanning stages	150 mm (6") and 300 mm (12") xy-scanning stages
Vacuum capable:	Yes	Yes	Yes	Yes