Enabling Nanoscale Advances

Accurion SIMON

Surface Inspection Metrology by Accurion

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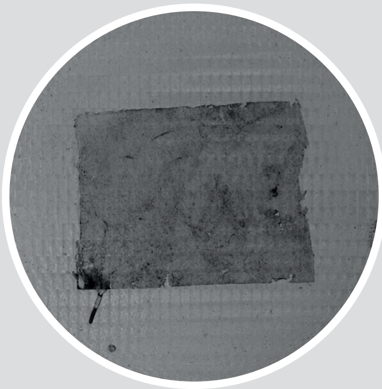
- Entry level system into Imaging Ellipsometry
- Well suited for routine measurements
- Visual surface metrology demonstrates structures or defects even on tiny features
- Experience Imaging Ellipsometry as simple as possible
- Perfect addition for every non-imaging ellipsometer

Key Features

- Imaging Ellipsometry with a lateral ellipsometric resolution down to 1 µm
- Thickness and refractive index measurements of microstructures
- Fast visualization of layer thickness distribution and hidden defects on large areas

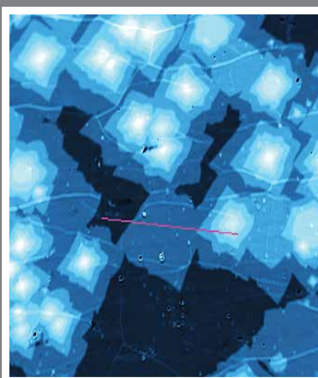
Typical Applications



Full 4" wafer partially covered with Graphene (0.35 nm) recorded in less than 47 minutes

Large Area Inspection and Automatic Flakesearch

SIMON is designed to automatically stitch large areas with smooth transitions. A complete 4" wafer can be inspected within 47 minutes, whilst observing defects, particles and inhomogoneities as small as 10 µm. SIMON also allows searching for flakes or materials with desired thicknesses. Through the imaging aspect of SIMON, histogram analysis on a single measurement becomes possible and provides a detailed insight into the distribution of thicknesses or inhomogeneities.



Thickness Mapping

The combination of ellipsometry and microscopy allows to measure thickness maps of your sample. These maps are comparable to AFM measurements, but can also be measured for non top layers.
Additionally, imaging ellipsometry will measure the thickness map of approx. 500 µm (X) x 550 µm (Y) in less than 1 minute.
The thickness resolution is below 0.01 nm within a range of 0.01 nm < d < 5 µm*. The ellipsometric mode also determines the refractive index. This allows users to determine refractive index variation, that e.g. occure in holographic gratings scribed by a laser.
Small changes in refractive index, as for example seen in waveguides, can thus be visualized and observed.

*Depending on sample/substrate combination

Technical Specifications

Ellipsometer Type	Imaing Ellipsometer (IE) or Spectroscopic Imaging Ellipsometer (SIE)
Lateral Ellipsometric Resolution	2µm*
Ellipsometric Performance Range (Precision)	Thickness (d) 0.01 nm - 5µm** [± 0.01 nm]*** Refractive Index (n): [0.001]*** Δ / Ψ: [0.004° / 0.002°] ***
Detector	Monochrome CCD Camera (1392 x 1040 pixels, 12 bits, max. 40 frames per second)
Fixed Angle of Incidence (AOI) Setup	AOI has to be pre-selected: 45°, 53° or 60°
Computer and Software	Windows™ computer with preinstalled Accurion software packages
Measurement Principle	Non-contact microscopic surface metrology, using polarized light
Measurement Method	Nulling/rotating compensator

*Depending on objective
**Depending on sample/substrate combination
*** Measured on PSI standard 300nm Silicon-dioxide/Silicon wafer

Configuration Possibilities

	Options	Technical Details
Objectives	2x, 5x, 10x (*), 20x and 50x magnifcation	Adjust the field of view (FOV) and lateral ellipsometric resolution to sample demands
Light Sources	LEDs: 1 (*) to 6 different wavelengths, selectable with in 380 nm to 1000 nm Laser 658 nm or 488 nm Filterwheel: 45 wavelengths from 360 nm to 1000 nm	If the filterwheel or a LED box with multiple LEDs is selected, spectra can be measured to determine the refractive index in dependency of the wavelength.
XY-Stages	Manual: 100 mm travel range (*) Motorized: 100/200/310 mm travel range	For large area stitching, e.g. full wafer scans, motorized tables are required.
Alignment	Adjustable tilting range: ±4° manual (*) or motorized	In the field of ellipsometry, aligning the sample tilting to the measurement system is crucial for accurate measurements.
Z-Lift	Travel range: 50 mm Manual (*) or motorized	The motorized version is strongly recommended if multiple samples with different heights ought to be measured automatically.

*Standard configuration

Park Systems GmbH - Accurion

Park Systems GmbH previously known as Accurion GmbH is a leading provider of high-end, state of the art imaging ellipsometry and active vibration isolation products. Accurion was merged into Park Systems Corporation in 2022 to boost its R&D resources and expand its sales network to better serve its customers.
Park Systems is a world leading manufacturer of nano metrology-microscopy solutions including the atomic force microscopy (AFM), white light interferometry and infrared spectroscopy systems.
It provides complete range of nano metrology and microscopy products for researchers and engineers in the chemistry, materials, physics, life sciences, semiconductor, and data storage industries.

Prior to merger with Park Systems, Accurion was previously known as Nanofilm Technology GmbH, a spin-off from the Max Planck Institute for biophysical chemistry in Goettingen. In 1991, the company began designing the Brewster angle microscope for the characterization of ultrathin films. In 1996, the company's division of active vibration isolation was established. In 2009, Halcyonics GmbH, a specialist in active vibration isolation solutions, merged with Nanofilm Technology GmbH to form Accurion GmbH.

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