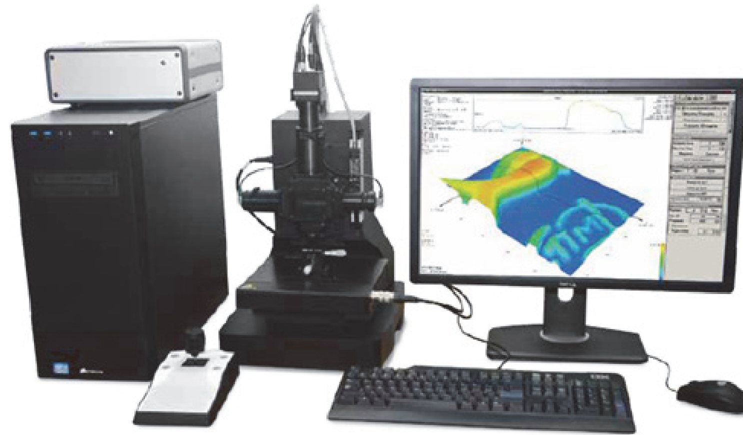
ostec corporate group

future's in the making

IMOS Interference Microscope-Nanoprofilometer



IMOS Interference Microscope-Nanoprofilometer enables accurate, quantitative, ISO-compliant non-contact surface measurements and characterization of micro- and nanoscale surface characteristics, capturing up to two million data points in seconds. Choosing the right optical profilometer depends on your application requirements, including speed, accuracy, vertical range, automation and flexibility.

IMOS optical surface profilometer provides powerful versatility in non-contact optical surface measurements. The system makes it easy and fast to investigate a wide range of surface types, including smooth, rough, flat, sloped and stepped surfaces. All measurements are non-destructive, fast and require no special sample preparation.

The system is based on partially coherent light interference technology, which provides sub-nanometer accuracy on a wider range of surfaces with higher resolution than other commercially available technologies, thus optimizing your return on investment.

Performance, value and versatility

IMOS profilometer offers exceptional benefits in a variety of applications such as flatness, roughness and waviness, stepped heights and more.

IMOS profilometer can be equipped with a specially developed state-of-the-art discrete zoom optical head. The sample stage can be configured from manual to fully automated with coded travel.

This versality system offers high accuracy, ease of use and high measurement rate at an affordable price in the Research Class segment of 3D optical profilometers.

Main advantages

- Z resolution up to 30 pm
- Compact
- Fast response
- Resistant to external vibrations
- Highly automated measuring process
- Special user-friendly interface
- High-quality graphic interface for working with multi-planar 3D representations of measurement results
- Wide range of microscope configurations for different morphological parameters of the measured surfaces
- Two modes of operation: micro-relief and nano-relief
- Positioning of the measurement object in three coordinates
- Possibility to measure large areas by cross-referencing individual measurements
- Unique system of storage and systematization of measurement results

Application fields

- Industry
  - Control of surface defect depth
  - Measurement of surface roughness after mechanical, ionic treatment
- Metrology
  - Caliber measurement (in microrange and nanorange)
  - Measurement of surface nanohoughness
  - Measurement of structures with a height of one interatomic spacing of a silicon crystal lattice
- Scientific study
  - Investigation of thin film deposition process – thin film thickness measurement on the witness sample
  - Investigation of the surface treatment process in the nanoscale range – measurement of surface nano roughness before and after processing
- Forensics

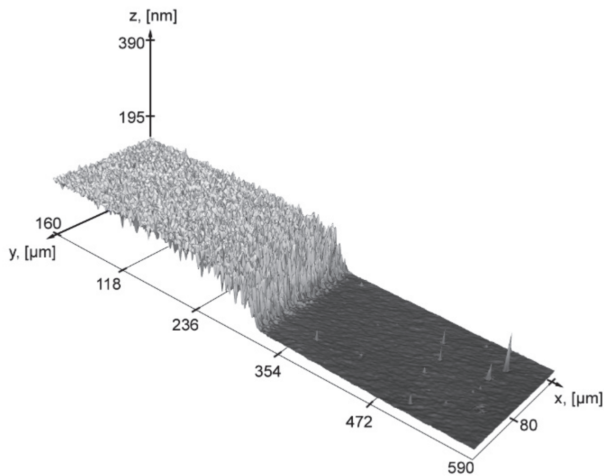
Specification

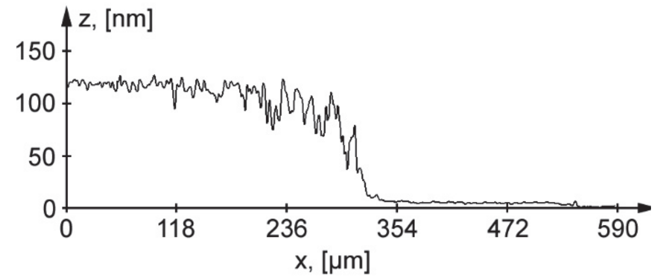
	Nano-relief mode	Micro-relief mode
Z resolution	1 nm (30 pm optionally, with atomically flat mirror)	0.3 µm
XY resolution	1 µm	
Measurement range	up to 10 µm *	up to 2.5 mm *
Measurement area	0.4 x 0.3 mm *	
Pixel size in measurement area	0.3 µm *	
Measurement rate	0.1 µm/s *	4 µm/s *
Photodetector**	CCD-matrix 1392x1040	
Light source**	LED (λ_{eff} = 630 nm)	
Microobjectives**	20x (or 10x, 5x), 2 items without changing magnification	
Scanner	Piezoelectric ceramic element	
Sample stages	1D (Z) range 50 mm, 2D (XY) range 75x50 mm	
Controllers	CCD-camera frame grabber, stages controller, device control unit	
PC & Control software	Included	

** – for 20x objective*

*** – Other configurations are possible on demand*

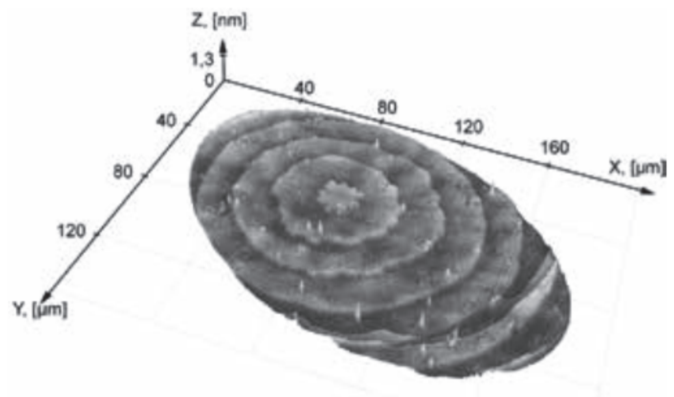
Nano-relief mode applications

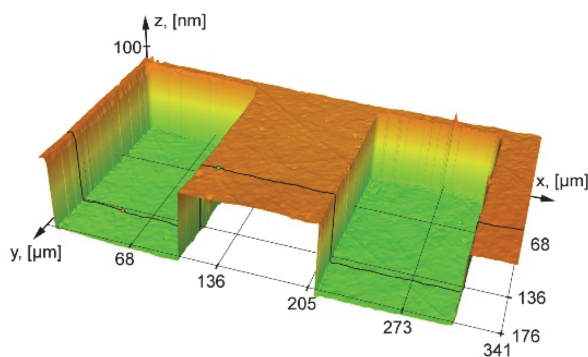


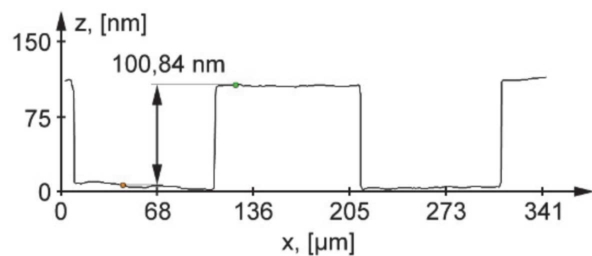


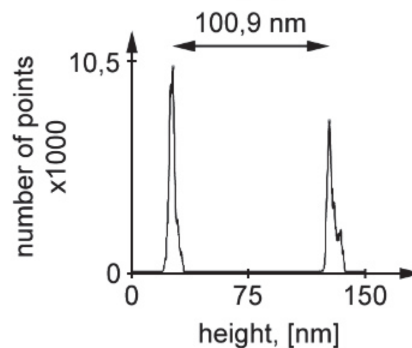
Palladium film on the silicon substrate, average thickness ~ 120 nm

Terraces on the surface of Si crystal,
height 0.314 nm



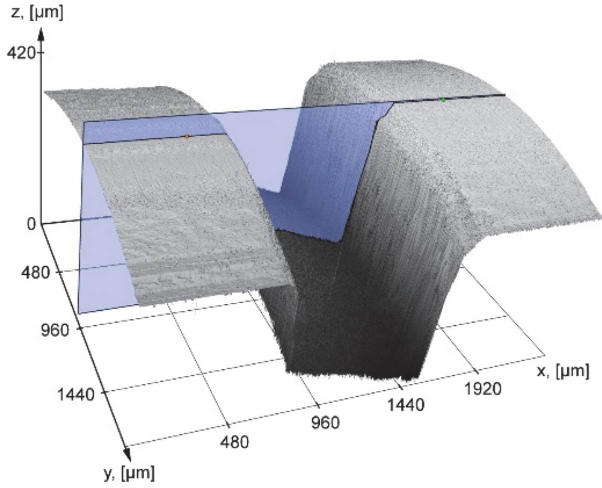


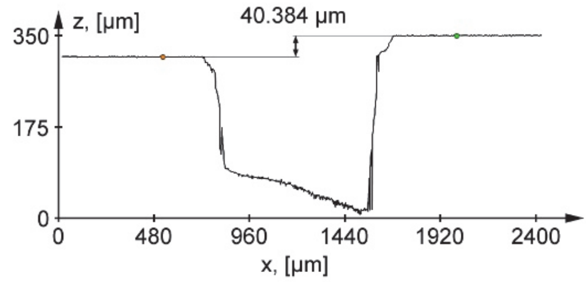




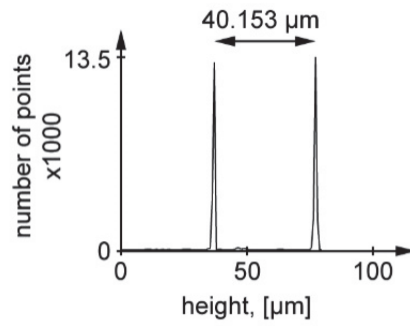
Caliber, the metric of roughness Rz,
industrial standard 1st category,
nominal value 101 nm ± 3%

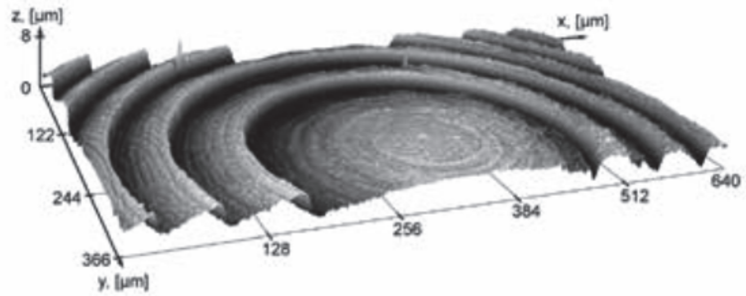
Micro-relief mode applications





Certified height caliber 40 ± 1.2 µm





Diffraction element, height 3,7 µm

All configurations and specifications
are subject to change without notice