



Production Series

METROLOGY

# P-7 Stylus Profiler

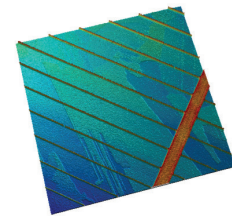
The P-7 stylus profiler builds on the success of KLA-Tencor's market-leading stylus profilers for the semiconductor, data storage, MEMS, solar, opto-electronics and general purpose markets. This mid-range platform brings together all the superior scanning features associated with the KLA-Tencor brand — programmable scan stage, low noise, and high quality, high resolution long scans — with the best price-to-performance capabilities available from any manufacturer.

The P-7 offers industry leading measurement repeatability for reliable measurement performance. The system has 150 mm scan length standard — the only stylus profiler on the market to offer long scan capability without the need for stitching. The UltraLite® sensor includes dynamic force control, excellent linearity, and the highest vertical resolution making it the best sensor available on a stylus profiler. Finally, the system includes point-and-click operation and the productivity package to offer the easiest to use tool on the market with the features required by university, R&D, and production environments.

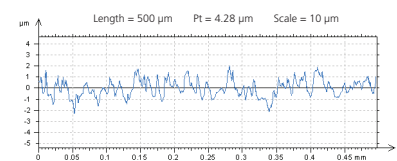
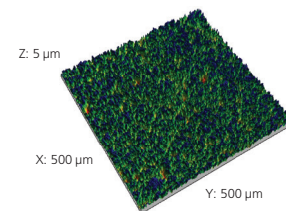
## APPLICATIONS

The P-7 Stylus profiler is capable of addressing a wide range of measurements and applications:

- Thin film step heights
- Thick film step heights
- Photo resist / soft films
- Etched trench depth
- Materials characterization for surface roughness and waviness
- Surface curvature and form
- 2D stress of thin films
- Dimensional analysis and surface texture
- 3D imaging of various surfaces
- Flatness or curvature
- Defect review and defect analysis
- And many more

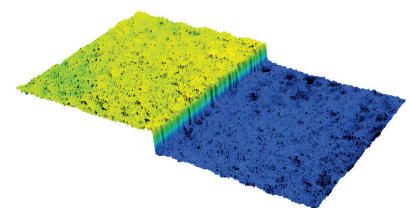


High Resolution 3D Scanning Capability



Amplitude parameters - Roughness profile		
0.509	µm	Gaussian filter, 0.08mm
0.625	µm	Gaussian filter, 0.08mm

Profile Extraction from Si Solar Substrate – Roughness Calculation



Thin Film Step Height Measurement Capability

# P-7 Stylus Profiler

## PRODUCT FEATURES AND OPTIONS

The P-7 surface profiler features an unprecedented range of features and capabilities in a mid-range general purpose instrument. A variety of options are available to enhance the capabilities of the standard system.

- **Stylus Profiling**

The precision scan stage design enables high quality scans over the entire 150 mm sample stage area with up to 150 mm scan length and 1 mm Z range. This design ensures the highest quality 2D and 3D scans resulting in a higher level of metrology quality.

- **Step Height Repeatability**

A step height repeatability of 4 Å, one-sigma or better on samples up to 1 µm tall offers the best measurement precision in the industry. This performance is ensured with ultra-low-noise electronics, and a low mass, low inertia capacitive sensor with sub-Angstrom resolution, and superior scan flatness.

- **Apex Software**

Apex software contains advanced filtering, leveling, and analysis functions to support R&D and production environments. This includes over 40 key surface parameters to analyze depth, step height, roughness, waviness, slope, flatness, radius of curvature, stress, bearing ratio, distance, volume and peak count distribution, to name a few of the parameters available. Apex is fully integrated into profiler software, enabling production use of Apex capability. Apex has a simple and intuitive format that allows for an easy creation of customized reports, automatic processing of data, including multiple language support.

- **Productivity Package**

The Productivity Package includes pattern recognition, 1000 sequence sites, and the sequence queue function for improved throughput and enduser/fab productivity. The productivity package when combined with Feature Detection, Feature Find, and integrated Apex software enables fully automated data collection and reporting.

- **3D Imaging**

3D imaging enables 3-dimensional imaging and viewing of surface topography in photo-realistic, color-coded, and rotatable 3D or top-down contour maps. This allows comprehensive analysis of scanned features as they appear in 3D and in 2D by examining cross-sections.

- **2D Stress Analysis**

Stress is measured in 2D using Stoney's equation to calculate the stress of a processing step, such as thin film deposition, by measuring the change in curvature of the substrate.

- **Offline Analysis Software**

Offline software enables creation of scan and sequence recipes as well as analysis of data in profiler or Apex software.

## BENEFITS

**Unmatched repeatability and reproducibility for reliable measurements**

**P-7 comes standard with a 150 mm scan stage offering the longest continuous scan without the need to do scan stitching, all at superior scan flatness**

**Best noise floor, linearity, and measurement sensitivity over the full Z measurement range**

**Standard 2 µm radius stylus, with options from sub-micron to 25 µm radii available**

**Extensive list of standard measurement parameters, Apex report generating software and advanced 3D imaging**

**Measure any part of the entire 150 mm diameter sample stage area without stitching or repositioning the sample on the stage platform**

**Standard sequence programmability and optional 1000 site productivity package with pattern recognition and sequence queue for fully automated operation and enhanced throughput**

**Calibrated video image and stage position enabling a point-and-click or point and drag to select the profile length and location**

### KLA-TENCOR SERVICE/SUPPORT

Customer service is an integral part of KLA-Tencor's portfolio that enables our customers to accelerate yield. Our vast customer service organization collaborates with worldwide customers to achieve the required productivity and performance at the lowest overall cost. K-T Services includes comprehensive contracts, time and materials, spares, asset management, customer training, and yield consulting.

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