

Analysis of surface topography

METROLOGY

# P-6 Stylus Profiler

The P-6 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.

The P-6 offers complete high resolution 2D and 3D analysis of surface topography in a versatile platform with the best price-to-performance capabilities available from any manufacturer. The system's three different measurement head configurations offer flexibility for a wide range of vertical topographies, and the P-6's 'point-and-click' user interface makes it the easiest instrument to operate.

## APPLICATIONS

The P-6 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

## BENEFITS

Longest standard scan length, longest optional scan length, and flattest scan over the full length

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

Standard 2  $\mu\text{m}$  radius stylus, with options from sub-micron to 25  $\mu\text{m}$  radii available

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

Measure any part of the entire 6 inch diameter sample stage area without stitching or repositioning the sample on the stage platform

Standard sequence programmability and optional 1000 site productivity package with Batch Queue for increased automation and throughput

Advanced function Feature Find incorporating user defined models for locating small features and positioning the feature of interest for accurate measurement scans

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

# P-6 Stylus Profiler

## PRODUCT DESCRIPTION

The P-6 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 6 in. 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 6Å or 0.1% (1σ), a noise floor below 1nm RMS as measured on the scan stage, and a sub-Angstrom resolution capacitance sensor translates into the most repeatable, and sensitive ultra-thin film step measurements, roughness/waviness measurements, and accurate curvature reproduction.

- **Apex Software**

Processes over 40 key surface parameters to analyze depth, step height, roughness, waviness, slope, flatness, radius of curvature, stress, bearing ratio, distance, areas and volumes, peak count distribution, PSD, frequency spectrum (and other parameters). Apex provides a suite of filtering options to analyze surface characteristics with an easy to use report generating format and simultaneous template for post measurement analysis using the same presentation and methodology.

## POWERFUL OPTIONS

- **Long Scan**

Allows long scans up to 150 mm

- **Productivity Package**

The productivity package includes sophisticated stage mapping, sequencing up to 1000 measurement locations, combining multiple sequences into a queue, and advanced detection models and algorithms to improve overall throughput and end user productivity.

- **3D Imaging**

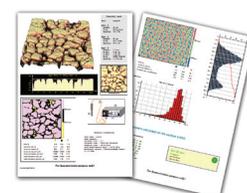
Enables three dimensional imaging and viewing of surface topography into photo-realistic, multi view 2D maps, 3D scalable and rotatable views. Allows the comprehensive analysis of scanned features by examining cross-sections along any direction of the data set.

- **2D Stress Analysis**

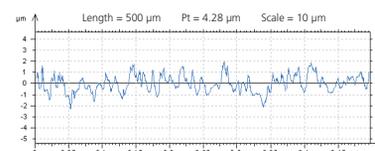
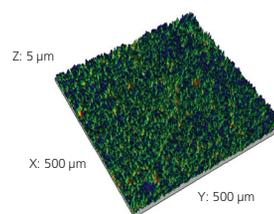
Calculates the stress on substrates by comparing substrate bow before and after processing. Use 5th order polynomial fit models for calculating the average, minimum, maximum stress in MPa.

- **Offline Analysis Software**

Allows data to be analyzed on a remote computer. Also, recipes and sequences can be created and edited then loaded onto the instrument computer.



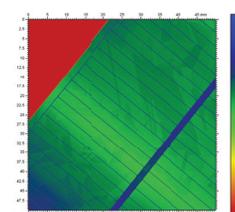
Defineable user specific custom reports & templates



**ISO 4287**

Amplitude parameters - Roughness profile		
<b>Ra</b>	0.509 μm	Gaussian filter, 0.08mm
<b>Rq</b>	0.625 μm	Gaussian filter, 0.08mm

Profile extraction from Si Solar substrate – Roughness calculation



Polycrystalline solar cell with metal lines

### 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 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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