

## Dektak 6M Stylus Surface Profilometer Standard Operating Procedures



### Description

The Dektak 6M is semi-manual instrument which gives profile data of a sample detecting the vertical detection of a stylus in contact with the sample which is moved horizontally across the sample surface.

### Sample Requirements:

The machine was designed with silicon electronics in mind. Therefore, sample should be planar, approximately flat and level. With proper selection of stylus force both hard materials and soft materials may be measured. Examples of hard materials include silicon, silicon oxide, silicon nitride and metal films on rigid substrates. Examples of soft materials include photoresists other polymers.

### Practical Measurement Resolutions:

The useful maximum measurable step height is ~1mm and smallest resolvable is 200 angstroms. The machine has a point to point resolution of 1 angstrom. Standard deviation on successive 5000 angstrom step height measurements are typically a few percent. Horizontal resolution can be adjusted to well less than 0.1 micrometers depending on scan speed and scan length. Vertical step resolution is limited by the stylus tip radius of 12 micrometers.

Be aware that the machine has a low power sample positioning microscope. This means that the machine can profile features which are much smaller than can be viewed on the vide screen.

### User Adjustable Parameters:

Hardware: camera positions and focus, sample stage controls (XY, tilt, and rotate)

Software: automation program, scan routine, data view

### Data:

Data is saved in a binary format. Data may be exported to text files but must be copied to the 3.5 inch floppy disk drive since the computer is not on the network.

### Brief Procedure:

1. Power on Dektak hardware
2. Load software: "Dektak 6M Manual"
3. Rough position sample
4. Open automation program window.
  - Adjust Header, data file name, data folder, etc.
5. Open scan routine window.
  - Adjust scan parameters, automatic data analysis, etc.
6. Open sample position window.
  - Lower tower, adjust sample position, check stylus alignment, etc.
7. Run scan routine, adjust sample position or scan parameters if needed.
8. Run automation program from sample position or scan parameters if needed.
9. Data analysis window.
  - Level, smoothing, geometry, etc.
10. Save data, automation program
11. Close Software.
12. Power-off hardware.

