

UC Merced SCIF

Bruker DektakXT Profilometer SOP

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- Turn on Computer
- Log in to your lab's Windows login
- Turn on DektakXT instrument pressing the white button
- Open Vision64 program
- To measure surface profile:
- Scan Type: set to standard
- Range: This determined the height range. Select the value greater than the max height range of your sample. Eg. If you have 10um height range, select 65.5um range
- Profile: Select what you want to measure. Hills and valleys is the best selection to start with
- Stylus type: We only have 2um stylus
- Stylus force: Leave at 3mg. This is good for soft samples. Force can be increased to 10mg for hard samples you are not worried about scratching
- Length: input. The range is 50um to 55mm
- Duration: input. The shorter the duration the lower the resolution. Rule of thumb: set duration to 10 seconds per 1000um.
- Resolution: function of length and duration
- Press "Unload Sample" to bring stage out
- Place sample on the stage
- Press "load sample" to return stage
- Press "tower down" to bring stylus down. It will automatically stop on sample, then slightly rise back up.
- Use black knobs to finely position object in X,Y plane where you want the stylus to start. Stylus will move back (away from you) to take measurement.
- Press "tower down" again to get it to touch surface. It will back off after it touches
- Close the instrument lid
- Press "single acquisition" to get the profile
- If sample is tilted as seen in your trace, then adjust the tilt knob and try measurement again. Tilt does not need to be perfect. This can be adjusted when analyzing data.
- Once measurement is complete save the data file by clicking File->Save->dataset
- Data Analysis:
- Our instrument can calculate step heights and roughness

#### **To Calculate Step Height:**

- Open a dataset or take a new measurement to analyze
- In the "Data Analyzer" window, under "scan" right click and delete any unwanted filter. Then under the "Analysis Toolbox" window, double click "Terms Removal (F Operator)"

- In the “Data Analysis” window right click on the graph and select “R cursor” and “M cursor”. R is the Reference cursor and M is the Measurement cursor. Drag the R and M cursors to widen them, which will average any data in that range.
- Place the cursors on areas that should be in the same plane
- Right click on the F-operator. Press “edit setting”. Click 2-point linear fit and then calculate. Then close.
- Data will be flattened.
- To get measurement of a step height, place the R cursor on the flat portion and the M cursor on the step. In a table it will display the height in um.

**To Calculate Roughness:**

- Take a measurement as before or open a dataset.
- Remove tilt as above.
- Go to “Analysis Toolbox” and single click on “Profile Stats”
- In the “Analytical Results” window right click the table and click “Append”. In the “Heights” area click “Pa”
- Click “Calculate” and close. The Pa or roughness will be listed for the area under the M cursor.
- Click File->Save->Analyzer Recipe to save the analysis
- Exit the program. This will lift the stylus and turn off the camera/light.
- Remove your sample and turn off the instrument and computer.