

DXT Profilometer

Last Updated: 8/6/2021

You must be a “Qualified Self-User” to operate this instrument independently.

You must be on the labs “Instrument Reservation Schedule” before touching the instrument for any reason.

Any problems, STOP, Post a note on the instrument and send an email to mtim@mit.edu immediately.

Do not perform any maintenance.

Do not install any software

Do not adjust any optics.

Instrument Hazards:

Electrical: 110-120V, 60Hz

Required Apparel:

Safety Glasses

CORAL:

Engage the instrument using CORAL when you enter the lab.

Disengage CORAL when you are leaving the lab.

Report all problems immediately to mtim@mit.edu.

Important: Potential Instrument Damaging Actions

Do NOT touch the stylus or drive your substrate into the stylus.

Checkout the instrument out when you arrive

Tower Assembly - Raised

Computer: On

Software: Open

Dust Cover: Closed

Neat and Clean

Measure the Calibrated Standard

Measure the 4500Angstrom step height calibration standard (+,-50A).

Each measurement range is calibrated separately.

You should check the standard with the parameters you will use for your sample.



Abbreviated Operation Procedure

Place Standard on stage being careful not to touch the stylus mechanism.

Position the Styli above sample.

Lower the Tower. (Use X or the escape key to stop movement).

Move to your feature of interest.

Edit the measurement setup screen for your measurement.

Run a single scan.

Scan Parameters

Standard Scan

Range: 6.5um

Styli size: 2um or 12.5um

Stylus Force: 2mg

Scan Length: 300um

Scan Time: 10seconds

Shutdown

Tower Home

Computer: On

Software: Open and showing.

Dust Cover: Closed

Walk away with a copy of your data, No data storage here.

Leave the instrument in perfect condition and ready for the next user.

Disengage CORAL

Specifics

Model: Bruker DXT-A

Bruker DXT-A Stylus Profilometer

Step Height Range: 20A-1mm

180mm Scan Length, (55mm without stitching).

Styli available: 2um, 12.5um

Color Video Camera

2D & 3D Scanning

2D Stress Analysis

Stylus force control: Typical 2mg, N-lite option allows force control to 0mg

Eight inch Sample Stage

Motorized X, Y movement

Motorized: Theta Rotation

Manual leveling

Web Description/Theory

The DektakXT system takes measurements electromechanically by moving a diamond-tipped stylus over the sample surface according to a user-programmed scan length, speed, and stylus force. The stylus is linked to a Linear Variable Differential Transformer (LDVT), which produces and processes electrical signals that correspond to surface variations of the sample. After being converted to digital

format, these surface variations are stored for display and analysis.

The Vision64 application calculates and displays the results of user-selected analytical functions for measuring surface texture and other parameters to characterize the profile data. For example, the Ra (average roughness) analytical function—the most commonly used international parameter of roughness—calculates the arithmetic average deviation from the mean line within the assessment length. If there is an active database, selected analytical functions are logged to it during each measurement.

Data Formats

Binary-Proprietary format - .OPD, (Good Lab practice - if your data is important enough to take with you then this what you should take with you at the end of your session).

Also, Export as .csv or image file if needed.

Right click in the window you would like to obtain comma separated values (CSV) for. Choose Export.

Computing

Printing to the room printer.

Internet Access: Yes

USB: Yes, CD: Yes, DVD: Yes

Computer Restarting

Name: (blank)

Password: (blank)

Restarting the Vision64 software

You will be prompted to initialize the stage movement and then the Theta movement when starting the vision64 software.

****If an error message is encountered.***

It is ok to try and correct the problem by restarting computer and instrument software.

The system will go through a self-test routine upon restart.

Try measuring the provided Step Height Standard.

If the error persists:

Stop using the instrument (prevents possible damage).

Report the problem to mtim@mit.edu immediately.

Utilities:

Electricity (wall).

Emergency Shutdown:

Shutdown the computer.

Turn off the Profilometer power.

Power switch is on the computer bench, big red button.

Restart after an emergency:

Restart the computer.

Turn on the Profilometer power.

Power switch is on the computer bench, big red button.