

Flexus 2320

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Location: Fab by PECVD

Primary Trainer: Les Schowalter (587-879-1516, les.schowalter@ualberta.ca)

Secondary Trainer:

OVERVIEW

Full wafer measurement system for measuring stress of deposited thin film. This tool also has the capacity to heat substrates to 500C.

SAFETY PRECAUTIONS

If you are using the Flexus in heat mode be cautious of opening the door before the tool has cooled below 90C.

If you are bringing any new materials into the NanoFab for use in your process, it is necessary to fill out a chemical import form (available on our website, <http://www.nanofab.ualberta.ca>) and supply an MSDS data sheet to Stephanie Bozic.

OPERATING INSTRUCTIONS

Single Measurement

- 1 Press the power button on the computer and click **winflx**
- 2 Click your user name to open your file.
- 3 Turn on the power switch on the tool and then turn the laser keyswitch on.
- 4 Make sure the wafer locator ring is in the orientation that you want.
- 5 Use wafer tweezers to put your substrate on the stage and make sure it is sitting flat and close the door.
- 6 Ensure you are using the proper program, elastic modulus, and laser measurement setting.
- 7 Under measure click on "**First**", this will bring up a menu for the first measurement. Enter a filename, substrate ID, orientation and comments if any.
- 8 Enter substrate thickness, the default is 550 um.
- 9 Click "**Measure**".
- 10 After your film is deposited click "**Single**" under measure file menu.
- 11 Enter filename, substrate ID, orientation, and thickness in Angstroms.
- 12 Click "**Measure**".
- 13 To exit program click exit under the measure menu. Please turn the keyswitch off, power, and computer when finished.

Stress time measurement

- 1 Follow the instructions from single measurement 1 to 9
- 2 Click on Time under the measure file menu.
- 3 Enter filename, substrate ID, orientation, and thickness in Angstroms.
- 4 Enter the time interval and total time for the measurements.
- 5 Click "**Measure**".
- 6 To exit program click exit under the measure menu. Please turn the keyswitch off, power, and computer when finished.

3D Scanning

- 1 Turn the rotator ring to the 0 degree orientation.
- 2 Place the substrate in the ring.
- 3 Go to **First** measurement. Enter file name, ID, orientation of 0 degrees.
- 4 Press **measure**.
- 5 Rotate ring minimum of 15 degrees, input degrees and click measure.
- 6 Rotate ring and repeat above but **DON'T MEASURE 180 DEGREES OR HIGHER OR IT WON'T WORK!**
- 7 After your film has been deposited click **single**, enter file name, ID, orientation, and film thickness.
- 8 Put rotator ring to 0 degrees and press **measure**, repeat same rotation as first measurement.
- 9 Exit the window.
- 10 To view the results go to **analysis** click on **3D plotting**.
- 11 Click on **file** and **new**, click on the proper file in the list and click **OK**.

12 On top left of the screen under START REC double click on your first reading and an “F” will appear. Do the same for single and an “S” will appear.

13 Click OK and the map will be generated.

14 After you are finished make sure the rotator ring is in the 0 degrees orientation and shut down the tool.

TEMPERATURE MEASUREMENT

1 Take first measurement and then deposit film

2 Put substrate on hot plate and install hot plate cover. **NEVER USE THE HEATER WITHOUT HOT PLATE COVER, DAMAGE TO THE LASER AND ELECTRONICS WILL RESULT.**

3 Under **single** click on **temperature** and select file from the first measurement.

4 Enter the film thickness

5 On the right side of the screen on line 1 under temperature enter the maximum temperature you require up to the maximum of 500C.

6 Select **time** or **temperature** priority.

7 If you select temperature priority input ramp rate and number of readings (data points).

8 If you select time priority input ramp rate and reading interval.

9 On line two you can select ramp down rate. Even if you don't require this it is useful to help cool the chuck quicker. If you use this for cooling only select 25C for temperature and a rate of 20C/min as well as a few data points.

10 Click relay 1 to on for cooling, this will allow CDA to cool the chuck.

11 Click **measure**.

12 You can also open the N2 valve on the back of the tool to provide an inert atmosphere for your heating and cooling cycles. Please remember to turn the N2 off when the process is complete.

13 Don't turn off the fan or open the door to remove the hot plate cover until the tool has cooled below 70C.

14 Shut down the tool as normal.

TROUBLESHOOTING

Make sure your substrate fits properly in the slot otherwise you might have an error in measurement or no measurement at all. Make sure the program settings are for the substrate type and size you are using.

If you encounter an unexpected error or require assistance please contact the primary or secondary trainer listed above. Should they not be available, please contact any staff member for assistance.

APPROVAL

Qualified Trainer: Les Schowalter
Training Coordinator: Stephanie Bozic