University of Pittsburgh

Nano-scale Fabrication & Characterization Facility

Ultratech Fiji Atomic Layer Deposition System Users Guide

The Ultratech Fiji G2 is a modular, high-vacuum system accommodating multiple deposition modes using flexible system architecture and multiple configurations of precursors and plasma gases. The standard configuration of the Fiji G2 enables deposition of a wide range of materials including oxides, nitrides, and metals.

Operation Procedure:

1) Log into FOM. If you do not log into FOM the Load Lock will not pump down and the pump purge is disabled.

2) Safety:

    a. If any audible alarms are sounding, leave the clean room and contact NFCF staff. The "Rooster" alarm on the side of the ALD enclosure will alarm if the exhaust is at an unsafe level for operation. The precursors are disabled if the alarm is present.

    b. Main chamber is heated. Avoid any contact with the heated surfaces.

    c. Review the Safety Data Sheets in the three ring binder to understand the hazards of the gasses on the ALD system.

    d. Note the location of the Emergency Off buttons. Use them in the event of a serious situation.

3) Open the computer drawer and the lap top.

4) Verify that there are no system alarms on the computer screen. If any alarms have occurred notify NFCF staff.

5) Select the "Security" tab, select change user and log into the software using the Login: "user" and password "user".

6) Right click in the body of the recipe window.

7) Select the load recipe option and load your desired recipe.

8) Enter the desired precursor ports and the number of cycles into the recipe. The top bar of the screen shows an error until the data has been entered. Once you have entered the required data the top bar will read "Recipe Validated".

9) Refer to the process information in the binder for recipe parameters and rates.

10) The process recipe folder is for factory recommended processes and the user recipe folder is for your own area to store custom recipes.

11) Remember when creating custom recipes to save them in your own dedicated folder.

12) **Do not overwrite the default recipes provided by Ultratech!**

13) Press the "Pump Down Load Lock" tab aand wait for the process to complete.

14) Press the Load/Unload" tab on the main screen to transfer the sample holder from the process chamber to the load lock. The sample holder is stored in the main chamber to keep it as clean as possible.

15) Vent the load-lock by pressing the "Vent Load Lock" tab on the main screen. The venting process will take approximately 2 minutes.

16) Once the vent cycle is complete, open the load lock cover and place your sample at the center of the platen. The sample will move around during the pump down cycle.

17) Close the load lock cover and press the "Pump Load Lock" tab to evacuate the load lock.

18) Once the load lock pump down sequence completes press the "Load/Unload" tab to allow the system to place the platen and sample into the process chamber.

19) Press the "Start Recipe" to run the recipe.

20) Press "Stop Recipe" if a problem occurs.

21) Monitor the system during the run to verify the operation. Remember if the facility exhaust shuts off, the precursors will not flow and your sample will not be as expected.

22) Once the run is complete, press the "Pump Down Load Lock" tab and wait for the process to complete.

23) Press the "Load/Unload" button to transfer your sample to the load lock.

24) Once the unload cycle is complete, press the "Vent Load Lock" button to vent the load lock.

25) After 2 minutes, open the load lock and remove your sample. Be aware that the sample and the platen will be hot!

26) Close the load lock lid and press the "Load Lock Pump" button.

27) Once the load lock is pumped down, press the "Load/Unload" button to place the platen in the main chamber for storage until the next user.

28) After loading, select and load the "Idle Temp" recipe and hit start to run it. This sets the temperature for the system for the idle state and optimizes the system for the next user.

29) Once the recipe is complete, go to the "security tab" and log out of the software.

30) Close the lap top and the drawer.

31) Log out of FOM