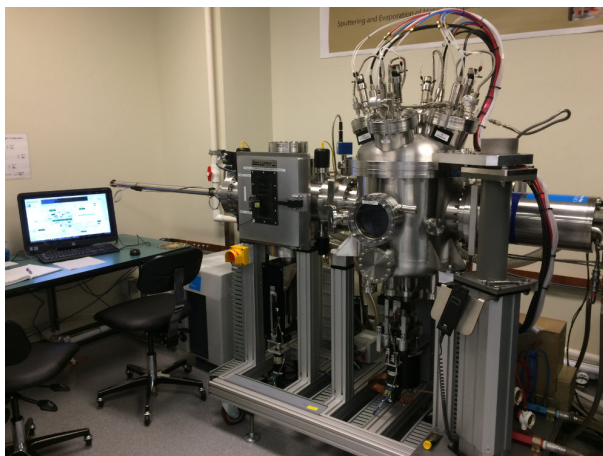


Sputtering System #3 (Floyd)

2016-11-11



Location: 10k Deposition Area

Primary Trainer: Les Schowalter
587.879.1516
les.schowalter@ualberta.ca

Secondary Trainer: Aaron Hryciw
780.940.7938
ahryciw@ualberta.ca

OVERVIEW

Sputtering System #3 (Floyd) is an automated planar DC magnetron sputtering system with four sputter guns. The system load lock contains six shelves, each of which can accommodate substrates from small pieces up to 150 mm diameter wafers, in a sputter-down configuration. The transfer of shelves to/from the process chamber, as well as the deposition itself, is computer controlled. The system is also equipped with a power supply for RF etchback, primarily used for resist descum prior to deposition for lift-off.

SAFETY PRECAUTIONS

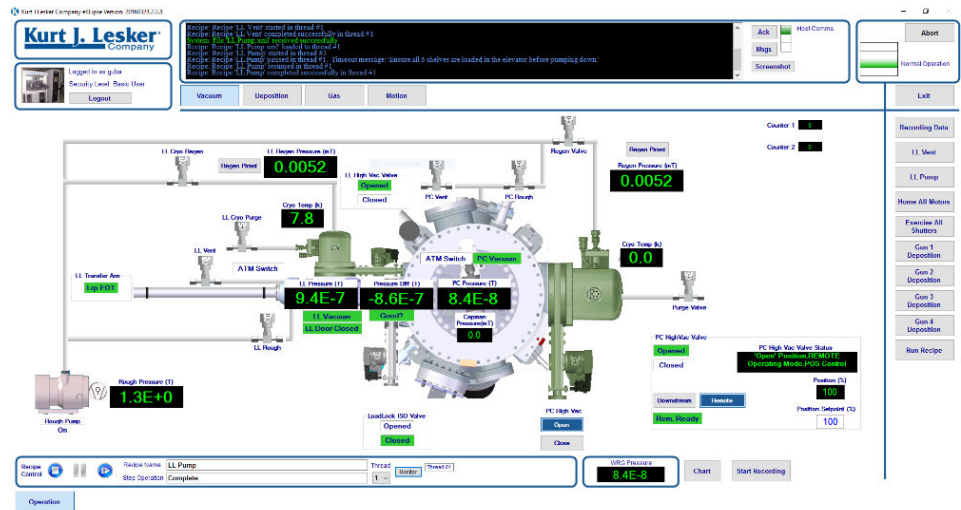
Do not put any pressure on the load lock door: this can put it out of alignment, compromising the load lock chamber vacuum.

Before bringing any new materials into the nanoFAB for processing, it is necessary to fill out a new chemical import request on LMACS.

OPERATING PROCEDURE

1. On LMACS, login to tool *Sputtering System #3 (Floyd)*; Location: *10k Deposition Area*.

2. The system control software, eKlipse, should be running. If not, start it by clicking the eKlipse icon on the desktop.



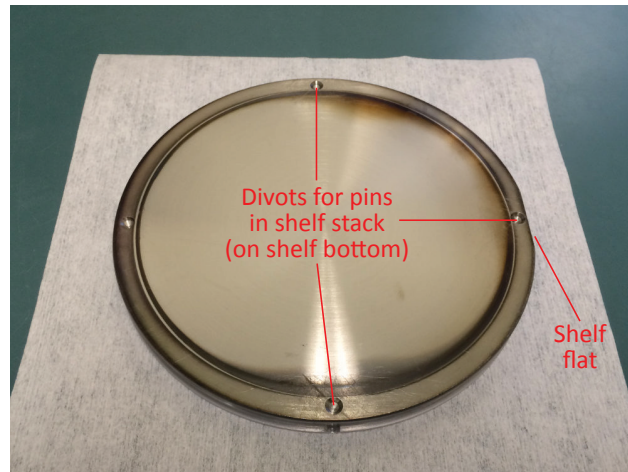
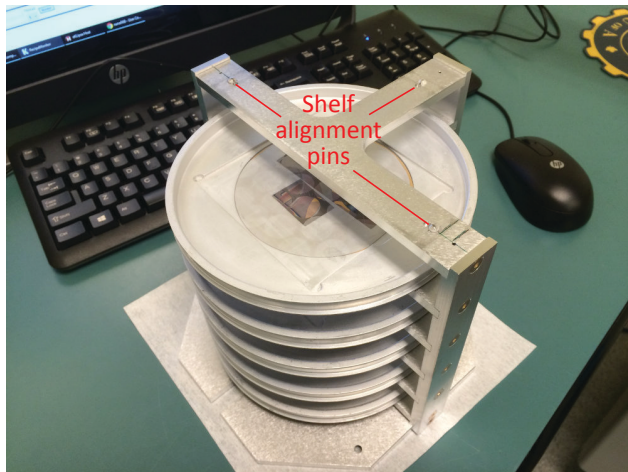
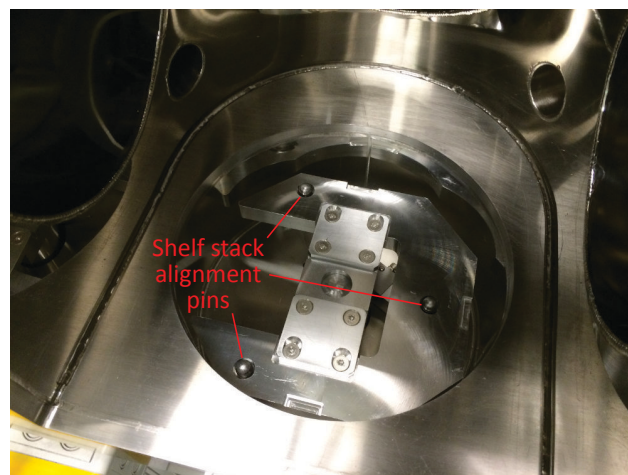
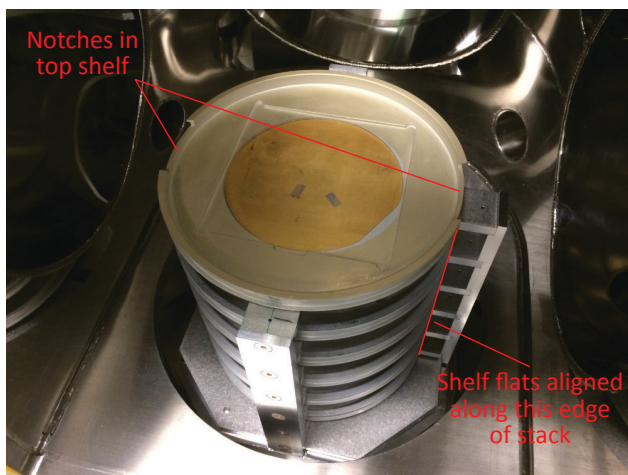
3. Login to eKlipse: click the **Login** button in the upper-left corner and enter your username and password. All users receive their own unique login information once signed off on Floyd.

4. Click **LL Vent** on the right side of the screen. Wait for venting to finish: the Recipe Name field of the *RecipeMonitor* window should read **LL Vent Recipe Complete**, and the load lock atmosphere indicator should be green: **ATM Switch**.

5. Open the load lock door and load your specimens.

- If you only require one shelf, place specimen(s) on the top shelf (Shelf 6); in this case, it is not necessary to remove the shelf or shelf stack from the load lock.
- If you require more than one shelf, remove the six-shelf stack and place it on a cleanroom wipe on the table. Load each individual shelf with your samples. It is important that the top shelf has notches cut out of the left and right sides, and that all shelves have their flat edges aligned to the right side of the stack (see following image). Ensure each shelf is securely seated on its three pins: failure to do this will cause a loading failure and possible damage to the loading arm. Return the six-shelf stack to the load lock, fitting it securely to the three pins in the load lock.

N.B. Ensure that the shelf stack is full (i.e., has six shelves loaded) and that the top shelf has the appropriate notches before continuing.



6. Click **LL Pump**. Do not load any shelves into the process chamber until the load lock pressure drops below $5\text{e-}6$ Torr; this may be a few minutes after the recipe completes.
7. While waiting for the load lock to pump down, exercise the gun shutters: click **Exercise All Shutters**. It is recommended to do this twice to ensure all shutters open and close smoothly.
8. Load the desired shelf into the process chamber: click **Run Recipe** to open the *RecipeSelector* window, and select the appropriate “S[N] to PC” recipe, where [N] is the number of the shelf you wish to load. Remember that the shelves are numbered from 6 to 1, top to bottom. Click the **Run Recipe** button in the *RecipeSelector* window to start the shelf transfer.
9. After the shelf load recipe is finished, you may run a deposition or RF etchback process. To deposit a film, click the appropriate **Gun [N] Deposition**, where [N] is the gun containing the material you wish to deposit (e.g., **Gun 4 Deposition** to deposit Al); the current gun configuration is posted on the wall above the computer monitor. In the resulting *Parameter Passing Recipe* window, adjust the parameters in the *Value* column as required. The default parameters usually do not need to be changed, except for deposition time and possibly burn-in time. The default burn-in time of 30 s is generally sufficient unless a lot of material (different from the material you wish to sputter) has

been deposited immediately before (consult the logbook to verify); in this case, a burn-in time of 60 s is recommended. Next, enter your required deposition time in seconds; a table of deposition rates for different materials and powers is posted on the power supply rack. Click **Continue Load**.

N.B. It is also possible to run process recipes by clicking the **Run Recipe** button and choosing from the list in the *RecipeSelector* window. The four **Gun [N] Deposition** recipes can be run this way, as well as **Cr/Au Deposition** (a shortcut to deposit two common films back to back) and **RF Etchback**.

10. After the recipe is complete, repeat Step 9 to perform further deposition/etchback processes on the loaded shelf, if required.
11. Unload the shelf from the process chamber: click **Run Recipe** to open the *RecipeSelector* window, and select the appropriate “PC to S[N]” recipe. Click the **Run Recipe** button in the *RecipeSelector* window to start the shelf transfer back to the load lock.
12. After the shelf unload recipe is complete, repeat Steps 8–11 to process additional shelves, if required.
13. Vent the load lock by clicking the **LL Vent** button.
14. When the recipe is complete you can safely open the door and remove the shelf stack and/or remove your specimens from the shelves. Return all shelves to the shelf stack (ensuring that each one is properly seated on its three pins in the shelf stack), and return the shelf stack to the load lock (properly seated on the three load lock pins).
15. Click **LL Pump**.
16. Logout from eKlipse: click the **Logout** button in the upper-left corner.
17. Logout from tool *Sputtering System #3 (Floyd)*; on LMACS.

TROUBLESHOOTING

If there are any problems or questions regarding use of the tool, do not hesitate to contact the primary or secondary trainers.

APPROVAL

Qualified Trainer: Les Schowalter

Fabrication Group Manager: Aaron Hryciw