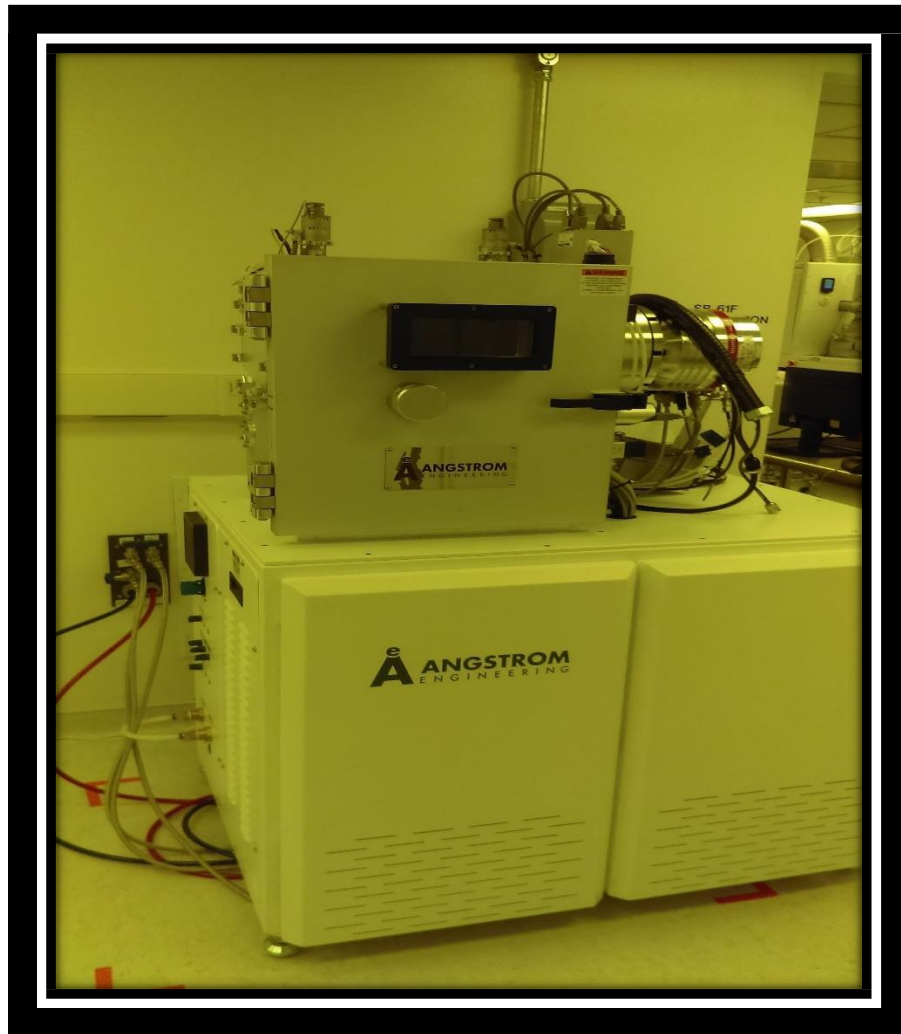




University of Pittsburgh

Nanoscale Fabrication & Characterization Facility

Angstrom Engineering Sputter System Users Guide



The Nexdep Series System with Aeres Advanced PC\PLC Automation. The system is equipped with 2 RF and 2 DC sputter guns. Both DC guns are capable of pulsed DC for reactive sputtering. One DC sputter gun has a Mag II source for magnetic targets. The system has an ultimate vacuum on the order of 1.1×10^{-7} torr.

Operation Procedure:

- 1) Log into both "Cr-Cleanroom" and "CR-Deposition System Sputter Angstrom" using FOM.
- 2) System software should be in "Operator" mode. If it is not, press the "Login" button located in the upper right side of the screen. The login and password are both "Operator".
- 3) Note the system pressure is generally below $1e-6$ Torr before venting.
- 4) Note the current target configuration on the "Main" tab and the "Load Materials" window. Make sure the material you need is installed. Current targets are also listed in FOM, and on the placard at the machine.
- 5) Note: Change of material requests must be made through Pitt e-mail at least 24 hours in advance.
- 6) Verify the system software is free of any alarms.
- 7) The sample holder is kept in the load lock.
- 8) On the "System", "Vacuum System", "Load Lock", page, press "Vent" and then "Start" to vent the load lock to atmospheric pressure.
- 9) Do not leave the load lock venting/vented. It must be pumping unless you are loading your samples. Leaving the system venting drains our N₂ supply!!
- 10) Once the load lock is vented you will be able to open the door.
- 11) Remove the sample holder and mount your samples. Securely mount your sample on the holder using the supplied screws and clips or kapton tape.
- 12) Re-install the sample holder by setting it onto the load arm make certain it is aligned to the notch.

- 13) Verify the O-ring is clean of particles, close the door.
- 14) If the red banner alarm for the load lock door being open does not clear, open and close the door again. The alarm should clear.
- 15) From the "System" page and the "Vacuum System" window, and "Load lock", press the "Pump Down" button and then the "Start" button to pump to evacuate the load lock.
- 16) The LL gate valve will open automatically once the acceptable pressure is achieved.
- 17) Align the rotation manual control knob so that the two arrows point at each other.
- 18) Press the "Down" button on the switch box while making certain the sample clamp lowers.
- 19) Extend the load arm by turning the load lock arm control knob counter clockwise while viewing the operation through the window. Chamber lights will turn on automatically.
- 20) Make certain the holder engages smoothly and accurately with lifter.
- 21) Once the load arm is fully extended, press the "Up" button on the switch box and the holder will lift off the arm.
- 22) Retract the load arm fully into the load lock by tuning the control knob clockwise. If it does not fully retract, there will be a yellow error banner displayed and the gate valve will not close.
- 23) Close the window protective manual shutter on the chamber door.
- 24) Running a recipe at this point will automatically close the Transfer Gate valve.

- 25) If you want to close the Transfer Gate valve manually before starting the process, that can be accomplished on the "Overrides", "Load Lock" page.
- 26) From the "Recipe" tab, open the desired recipe and make any desired changes.
- 27) Use the save button to save the changes and rename the file if this is a new recipe. Do not overwrite other user recipes.
- 28) From the "Main" page and the "Process" tab, select the "Load Recipe" button. Select the recipe that you want to run.
- 29) Press the green "Start" button and watch the recipe as it progresses on the screen.
- 30) When the process has completed, pump the load lock. This will verify the load lock vacuum level and open the gate valve.
- 31) Insert the load arm fully into the chamber.
- 32) Adjust the manual rotation knob so that the arrows align.
- 33) Press the "Down" button on the switch box and it will lower the holder onto the load arm.
- 34) Fully retract the load arm and vent the load lock.
- 35) Remove the holder and your sample.
- 36) Place the sample holder back in the load lock.
- 37) Pump down the load lock and close the Load lock gate valve on the "Overrides", "Load Lock" page.
- 38) Log out of FOM.

Target Material List

Titanium

MgO

WO₃

Tungsten

Iron

Al₂O₃

SiO₂

Silver

Aluminum

Molybdenum

Un-doped Silicon

Ge₂SbTe₅

Sb₂Te₃

GeTe