

ACE600 Sputtering Protocol

Questions/Problems?
dsousa1@jhmi.edu, txt: 617-
633-0713

*This protocol includes the use
of delicate and sensitive
equipment. THE PROTOCOL
IS FOR TRAINED USERS ONLY.*



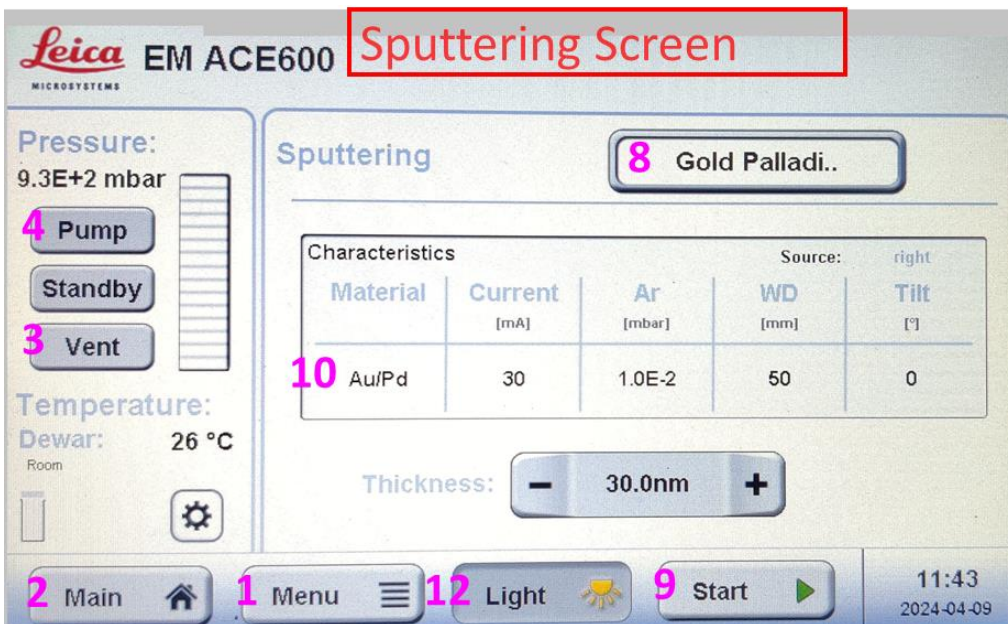
Startup Checklist

- Check tools and materials
- Check ACE600 log for problems
- Check ACE600 for problems
- Check the Argon and Nitrogen tanks for problems

Wrap-up Checklist

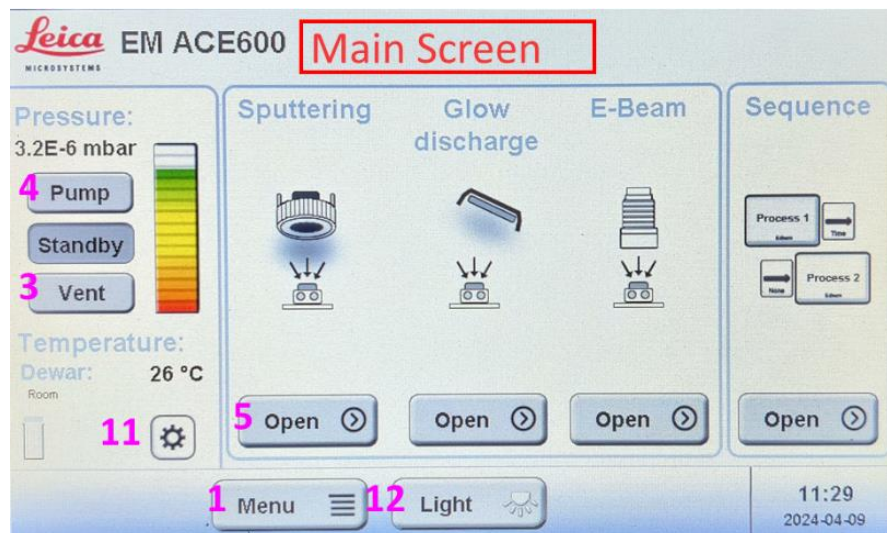
- Removed materials from the ACE600 chamber
- Leave ACE600 under vacuum
- Close the Argon and Nitrogen and tank main valves
- Put away all tools and materials
- Clean up area
- Fill out the logbook

1. Main page button
2. Menu page button
3. Vent button
4. Pump button
5. Sputtering page button
6. Quartz page button
7. Quartz test Start button
8. Sputtering recipe select button
9. Sputtering Start button
10. Modify sputtering parameters bar/button
11. Settings button
12. Light (chamber) button

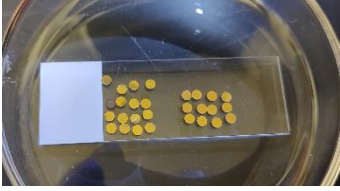


Main ACE600 Protocol

- 1) [Put grids on a glass slide](#)
- 2) [Turn ACE600 on](#)
- 3) [Main: Wait for the vacuum](#)
- 4) [Menu→Quartz: Test the quartz crystal](#)
- 5) [Main: Vent the system and load grids](#)
- 6) [Open the argon and nitrogen tanks](#)
- 7) [Main→Sputtering: Gold Palladium Grids sputter protocol](#)
- 8) [Main→Sputtering: Start the sputter coating process](#)
- 9) [Main: Vent the system after coating complete](#)
- 10) [Remove the grids](#)
- 11) [Logbook & Clean up \(close Ar & N₂ tanks, ACE600\)](#)



Protocol Details



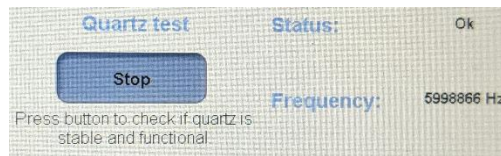
1) Arrange gold holey carbon grids on a glass slide. Be sure the glass slide is dust free (blow it off, wipe it off, etc.). Be careful not to touch the holey carbon film and only grab the edge of the gold grids.

2) If the system is off then turn it on. The switch is located on the back left bottom of the ACE600.

3) Hit "Menu" to view the "Menu" screen. Wait for the system to come up and the vacuum to come down to $1.0E-4$ mbar or better (should take $<10m$).

4) Open the Argon and Nitrogen gas tanks. Do **NOT** alter the **regulator pressure settings** or you could damage the ACE600 and Tergeo.

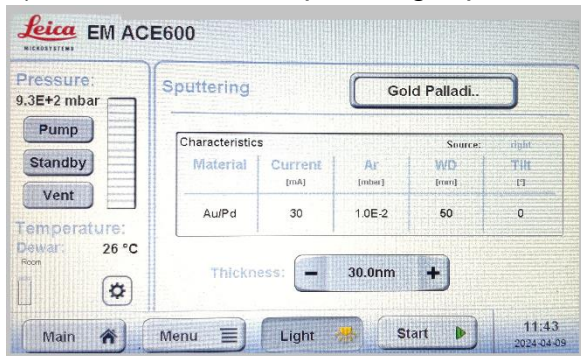
5) Select the Quartz tab and hit the start button. The quartz is still good unless the test shows it is unstable.



6) Vent the system by hitting the vent button. Wait until the door opens easily ($>7.5E2$ mbar). Turn off the venting by pressing "Vent" again. Open the door carefully and place your slide of grids inside (pic here). DO

NOT touch the inside, especially w/out gloves. Finger prints, etc. will make the vacuum worse. You can press the "Light" button for better lighting.

7) Select the "Sputtering" option then the "Gold Palladium Grids" protocol.

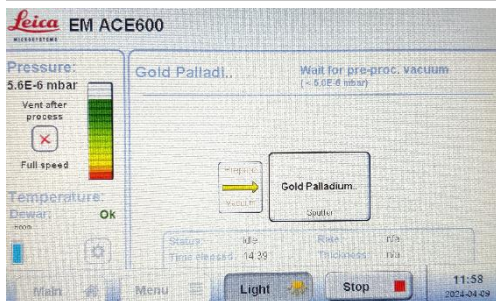
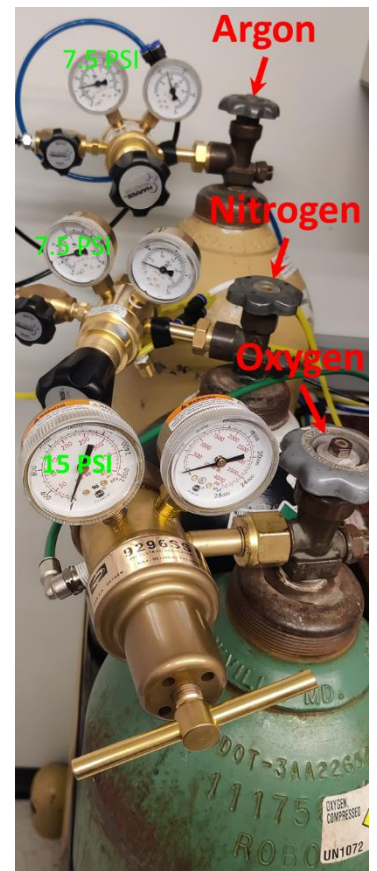


8) Hit the start button for the protocol. The system is automated for coating, but it will take tens of minutes to complete. If you would like to use a different target such as gold, contact staff to change the target. If you would like to create your own protocol w/ different parameters please verify the protocol w/ staff.

9) After the sputter coating process completes, the system will display the results. You can record the details and then hit "close". Vent the system by hitting "Vent" on the main vacuum section.

10) Open the door carefully and slowly so the grids are not blown around. Slowly remove the grids and place in a glass petri plate and cover them to avoid dust settling on the grids.

11) Clean up everything. Close the Argon and Nitrogen tank main valves. Close the ACE600 and pump it down. Fill out the log book.



Tools and Materials

- ACE600
- Gloves
- Grids to coat
- Tweezers
- Glass slides
- Petri dish

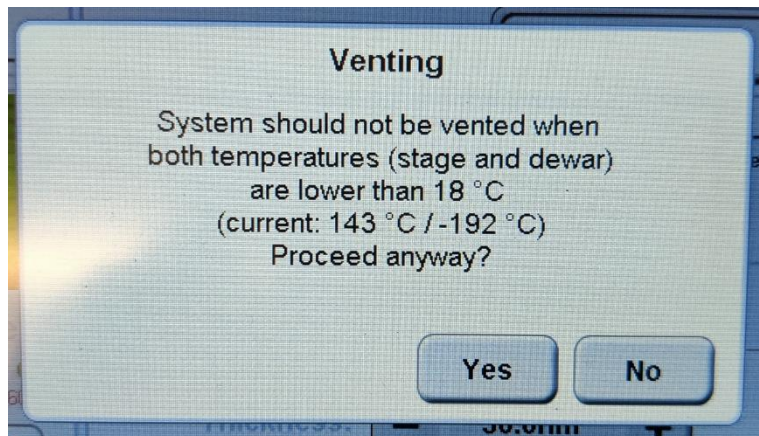
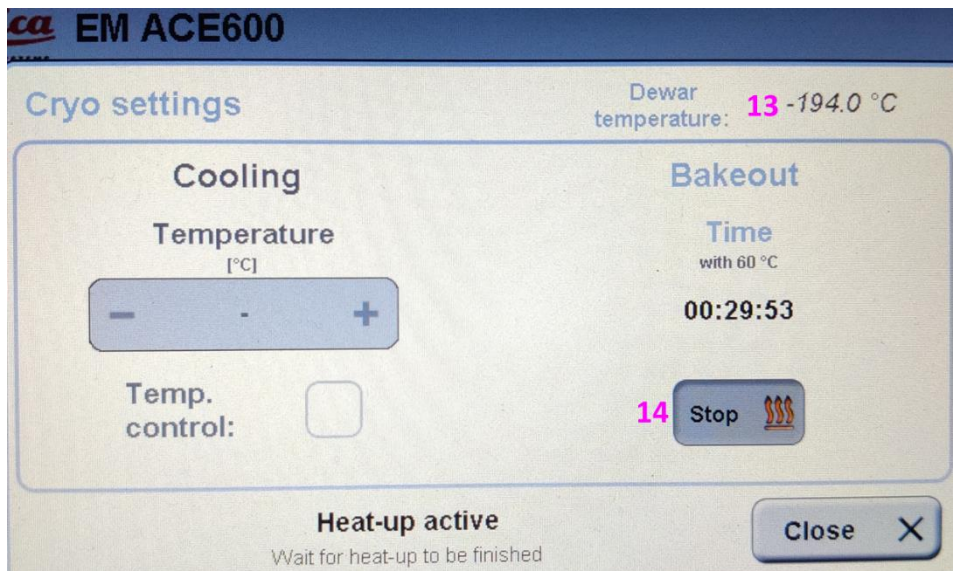
13. Dewar Temperature

14. Bakeout Stop button

Modify

Meissner Trap:

1. Add LN2 to the Meissner trap dewar. Wait for it to cool as you slowly add more LN2. Do not add too much or fill the trap completely otherwise it will take over 2 hours to warm up before you can vent the system. If you fill it enough to get completely cold, it will take <45m to warm up.
2. When you need to vent the system, you will need to “bake” the system. Hit the “system” tab on the “Menu” screen. Select the cryo settings. “Start” the “Bakeout.”
3. When the temperature has reached 25+ °C, you can hit “Stop” and vent the system. However, the Meissner trap is likely to cool itself again and require another “Bakeout” if it has just reached room temperature. There is no “stage” temperature (that is for a different system setup).



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- 11) Logbook & Clean up (close Ar & N2 tanks, ACE600)