

GENERAL PROCESS AND OPERATION SPECIFICATION

ASM P8200/P3000 Atomic Layer Deposition (ALD)

I. SCOPE

The purpose of this document is to describe requirements and basic operating instructions for the ASM P8200/P300 Atomic Layer Deposition tool. This tool is intended to be used to deposit various advanced high-k dielectric materials (hafnium oxide and hafnium silicate), high-k dielectric capping layers for metal gate work function tuning, high-speed aluminum oxide, conformal passivation layers, and high-k dielectric materials for micro-electrical mechanical systems (MEMS) applications.

II. SAFETY

- A. Do not use this tool without receiving training from the AggieFab staff.
- B. The tool has automated robotic systems to move samples between chambers. These arms can sometimes fail to grab a sample properly or behave incorrectly. If this happens do not try to retrieve your sample by yourself. Ask for staff assistance.

III. APPLICABLE DOCUMENTS, MATERIALS AND REQUIREMENTS

- A. Appendix A provides example photos which further describe the procedure described below.
- B. Please reference the AggieFab website for extra information and capability of the tool.

IV. OPERATION

1. Begin your session through iLab.
2. Prepare Samples
 - a) Fix your samples onto the 8" carrier wafer in Picture 1.
 - b) Use small pieces of Kapton tape in the corners of your samples to hold it onto the carrier wafer.
 1. Only two corners are necessary. Be sure to place the tape in an orientation where it will not interfere with gas flow as seen in Picture 2.
 2. IMPORTANT: Remember how you pulled the carrier wafer out because it should go back in the same way. This way you can keep track of the gas flow direction and place the tape properly.
3. Place the carrier wafer into the cassette and note which slot it is in.
4. Tilt the cassette into the load ready position.
 - a) You will need clear the error from the Fault screen on the monitor after tilting the cassette back into the ready position.
5. Click on Operate.
6. Select Carrier button.
7. Verify the loaded cassette is highlighted on the load lock screen as seen in Picture 4.
8. Click LOAD – Cassette of choice into load lock.
 - a) Filled wafer positions will be mapped and highlighted after robot loads cassette as seen in Picture 5.
9. Click on Lot button.
10. Select which load lock and cassette to use.
11. Select recipe for wafer(s) which are present as seen in Picture 6 and Picture 7.
 - a) Recipes can be selected from a pull-down list of recipes.

- b) IMPORTANT: If any wafers are shown but not present, click “no wafer” to delete that location.
- 12. Click Create once you have assigned the recipes to the wafers.
 - a) A start button will activate in the bottom left of the screen.
- 13. Click Start to begin processing.
- 14. Unload samples when finished.
 - a) After Lot is complete, the wafer will be moved back to the load lock.
 - b) Click Operate.
 - c) Select Carrier.
 - d) Choose Unload on the highlighted cassette.
 - 1. Cassette will be returned outside of the tool as it was in Picture 4.

NORMAL OPERATION

SIGNATURES AND REVISION HISTORY

- a. Author of this document: Mitchell Roselius
- b. Author Title or Role: Student Technician
- c. Date: 1/22/2020
- d. Revision: Original Issue
- e. Revision notes: Added:

Approvals:

Technical Manager Signature: _____

Date: _____

Revision History:

Revision	Author	Date
Original Issue	Mitchell Roselius	
Rev A		
Rev B		
Rev C		

Appendix A – Reference Photos



Figure 1: 8" Carrier Wafer

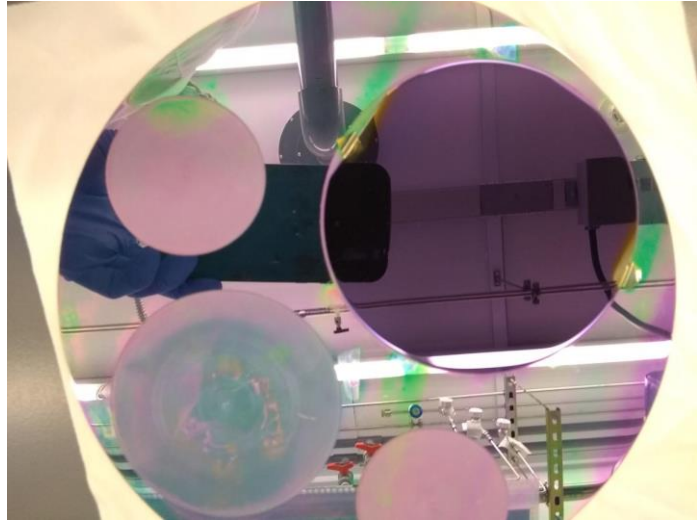


Figure 2: Carrier Wafer with sample wafer attached

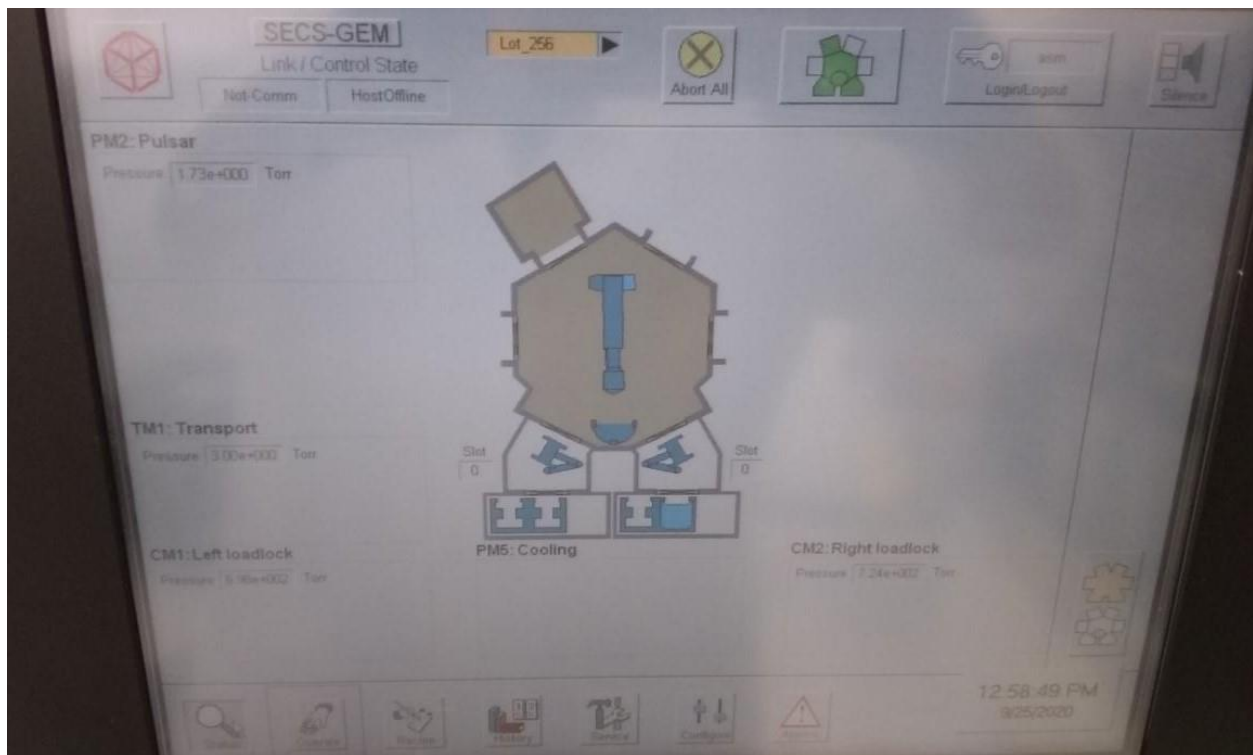


Figure 3: Gen ASM ALD tool Layout. PM2 is ALD process chamber at top left corner. Notice small diagram at top of monitor top above - "Dark Green" in each of the segments means ready.

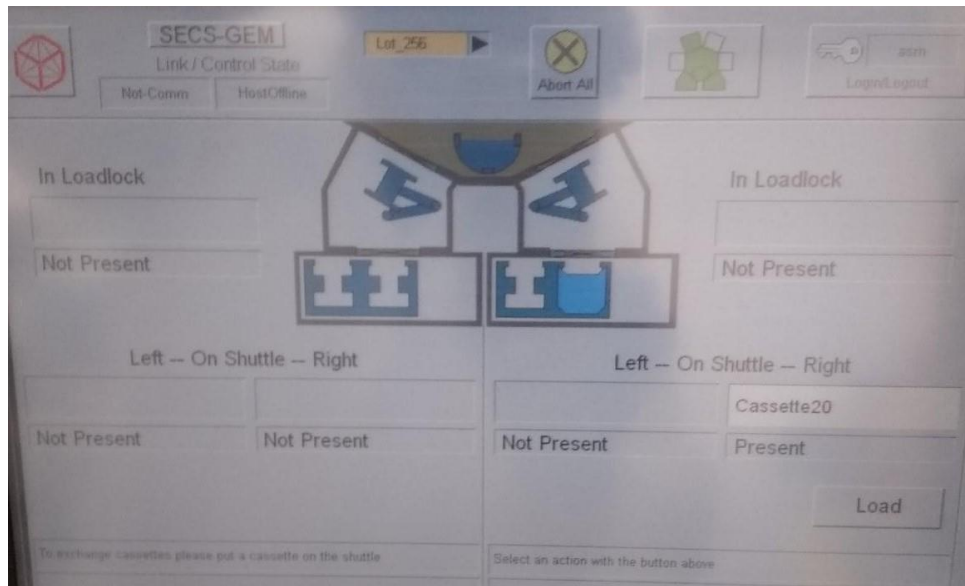


Figure 4: Load lock screen showing cassette present on right side.

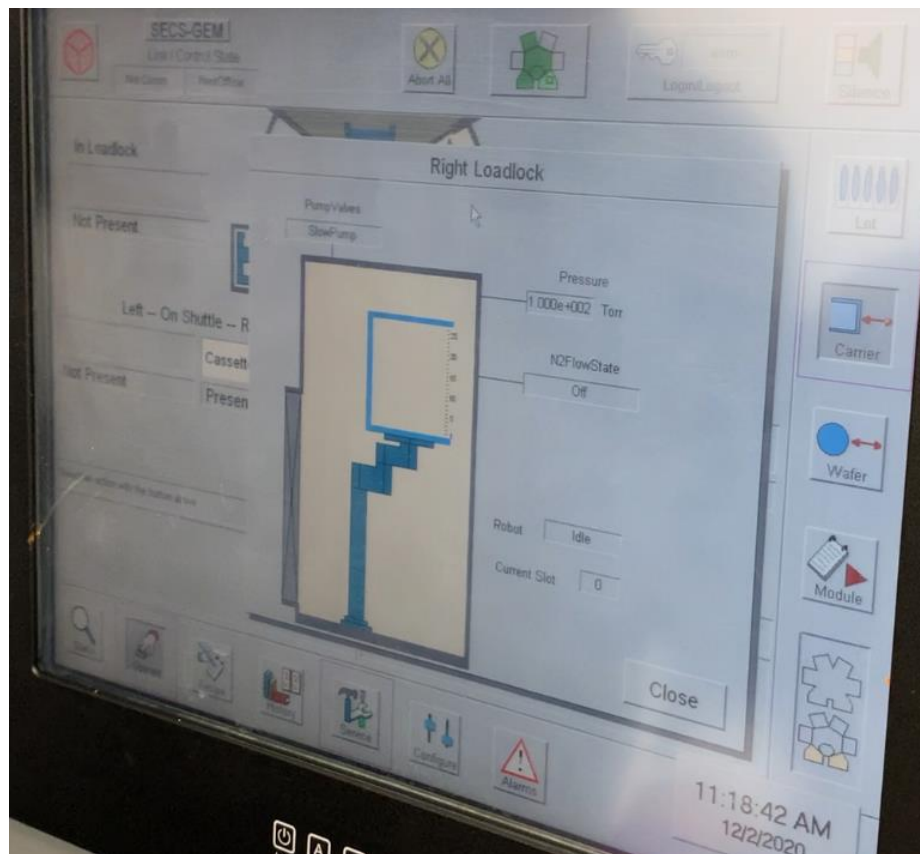


Figure 5: Load Lock screen showing wafer number locations -Here, before mapping, no wafers are present.

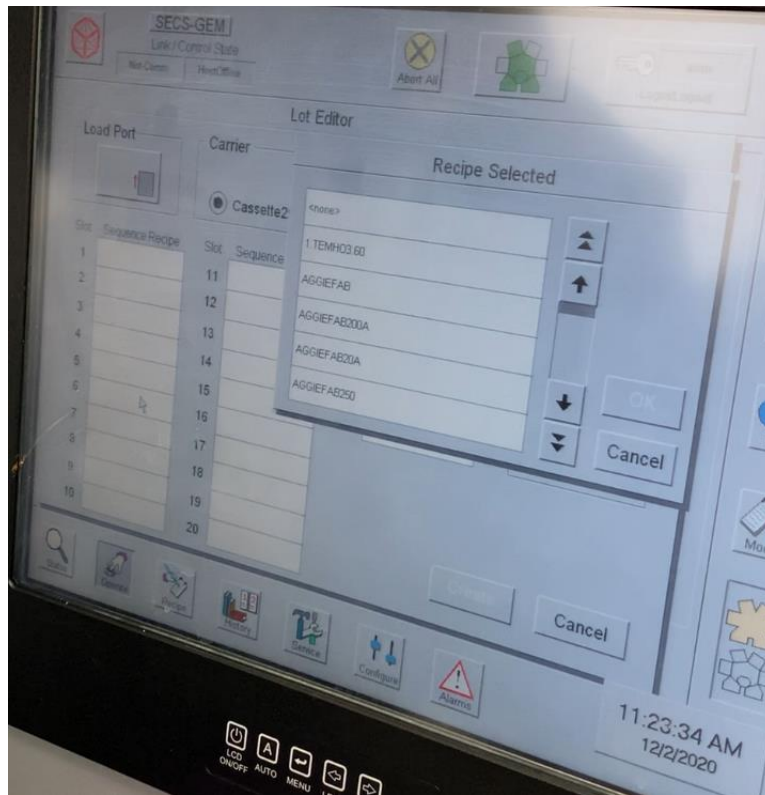


Figure 6: Selecting Recipe in Lot Screen.

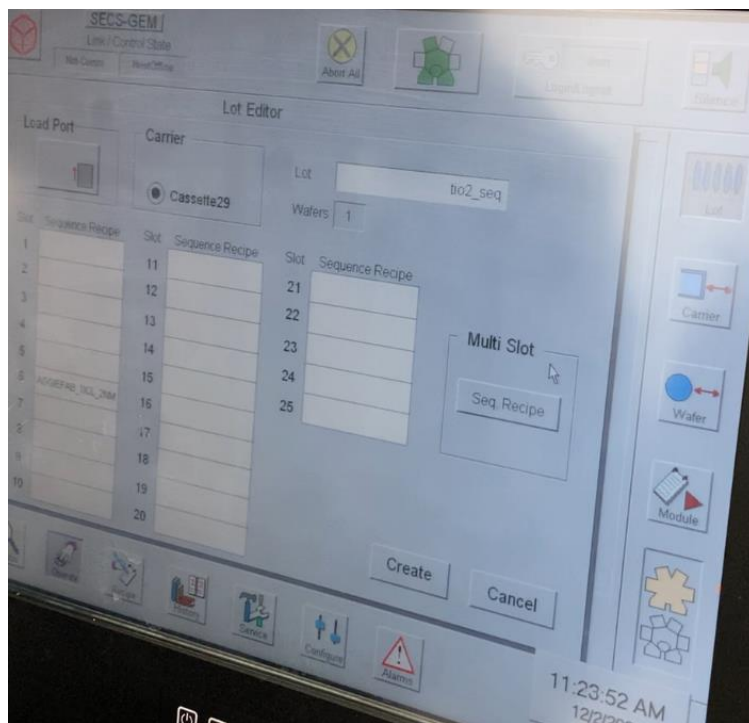


Figure 7: Lot Screen Showing Selected Recipe in Slot 6.