

AJA E-beam Evaporator



1. Introduction

AJA E-beam evaporator is for metal deposition on silicon wafers or other compatible substrates. Some metals are provided for evaporation. Management approval is needed if user wants to provide own materials.

Only trained and approved (qualified) users may use this tool.

2. Features and Specifications

- Automatic operation: Auto pump, auto deposition and auto vent
- Single and multilayer deposition via Inficon SQC310 controller
- Accommodates substrates up to 6" in diameter
- Substrate heating up to 200° C.
- Substrate rotation
- Water cooled substrate holder
- Adjustable source-substrate distance (17"-20")
- Six pocket Temescal e-beam source (15 cc pockets)
- 6 kW FerroTech Power Supply
- Cryo pump and dry roughing pump
- Base vacuum 2×10^{-7} Torr or better

3. Safety

- a) High electrical power sources are present. Do not open any panels or defeat interlocks.
- b) The power sources don't turn on if the chamber is at atmosphere.
- c) If substrate heater is being used, there is a burn hazard. Do not touch the hot surfaces.
- d) Pay attention to safety symbols on the equipment.
- e) The chamber door is heavy, open and close slowly.
- f) Press EMO button if there is an immediate danger to personnel or the equipment and inform the staff.

4. Precautions

- a) Do not scratch or put any metallic objects on the vacuum seal surfaces.
- b) Before venting the chamber, ensure that substrate heater is off and substrate temperature is below 70° C. Ensure substrate holder is not too hot before touching it.

5. Operating Procedure

Activate this tool in FOM before you start. Deactivate it when finished.

5.1 Load sample

1. At the center of the controller cabinet, find the Pro-Face pump controller as marked in Figure 1.

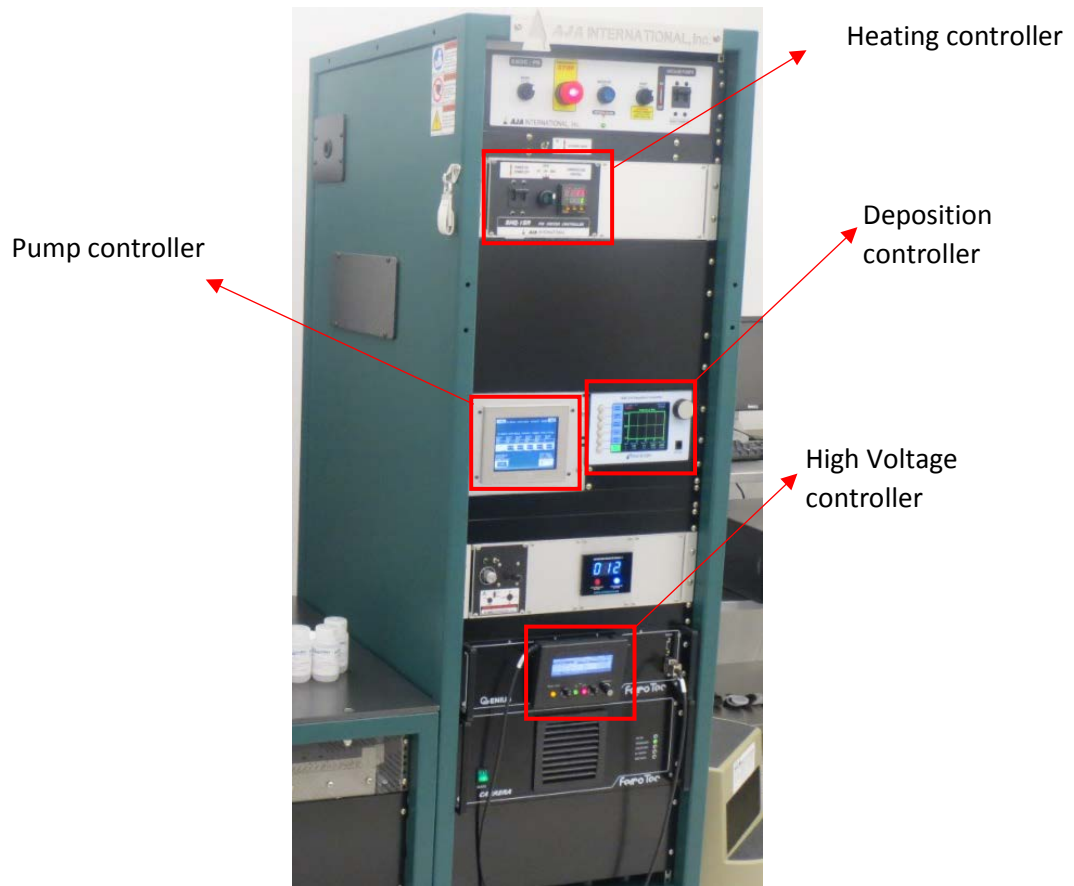


Figure 1

2. On the touch screen, press the PUMP DOWN softbutton on the right side of the screen, as marked in Figure 2. If a different screen is displayed, press the RTN softbutton on the right corner of that screen until you can see the screen with the pump down softbutton. After pressing PUMP DOWN, it will go to a screen as shown in Figure 3.

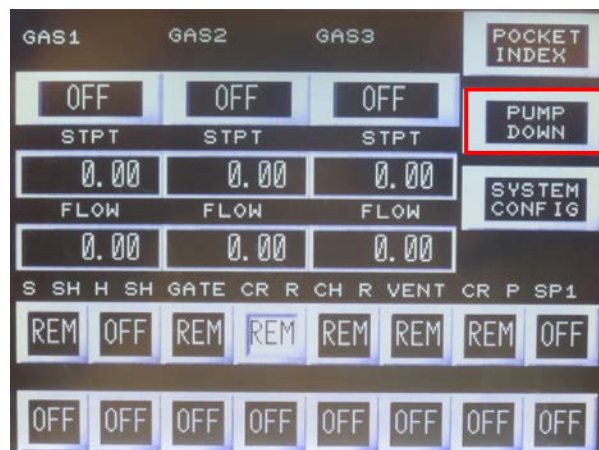


Figure 2

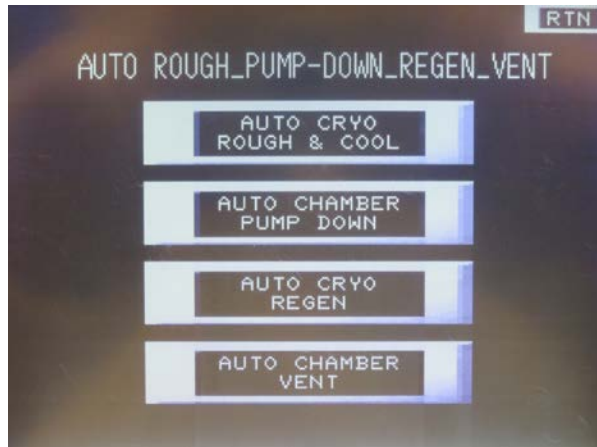


Figure 3

Press the AUTO CHAMBER VENT button to vent the chamber. It will then go to a screen as shown in Figure 4.



Figure 4

Press AUTO CHAMBER VENT button again. The button will display Auto chamber vent ON, and a message, "AUTO CHAMBER VENT IN PROGRESS", will flash.



Figure 5

3. The chamber door will open by itself in about 2 min. Press ABORT on the screen if nitrogen is still on after the door opens. The inside of the chamber is shown in Figure 6.

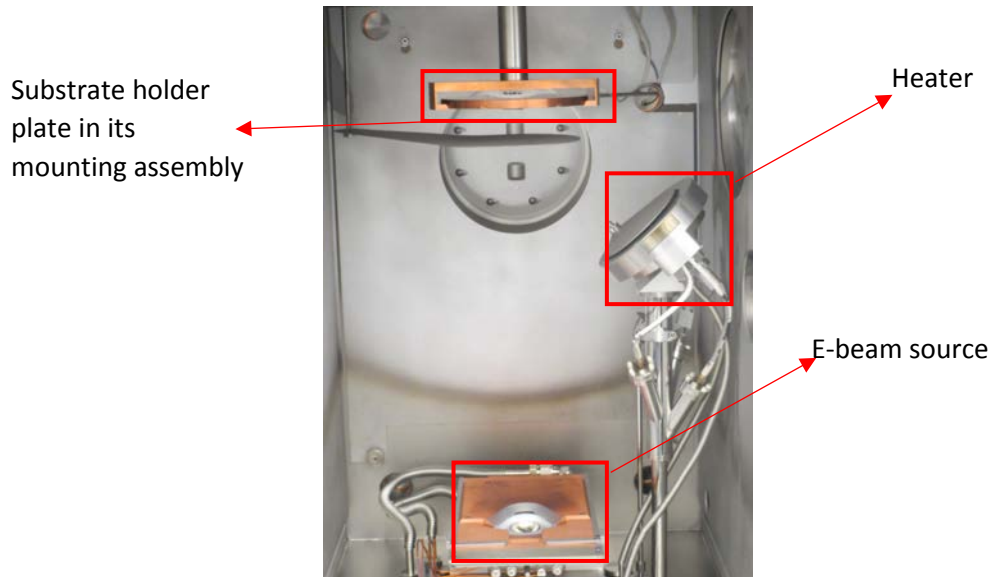


Figure 6

4. Slowly take the substrate holder out from its mounting assembly. Be aware that it is heavy. Do not drop! Flip it over and place it on the stage of the tool. Mount your sample or wafer using clamps as shown in Figure 7 and load the sample holder back onto its mounting assembly (Figure 8).

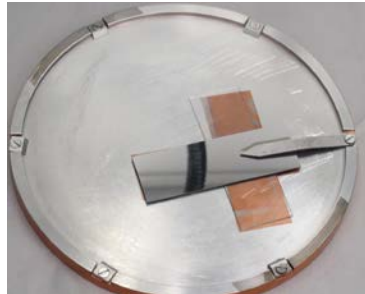


Figure 7



Figure 8

- Close and lock the chamber door. Go to the pump controller and the screen of Figure 3 by pressing RTN on the right corner once. Press the AUTO CHAMBER PUMPDOWN. On the next screen, press the auto chamber pumpdown button again. The button will display as “auto chamber pumpdown ON”. It will take about 15 min to pump down the chamber to 10^{-7} Torr range for deposition. Once the pumping process is done, a message, “autochamber pump down complete”, will display on the touch screen. Then you are ready to run recipes.

5.2 Run recipes

- Go to the SQC-310 deposition controller which is located at the right side of the pump controller. Press the Next Menu softkey for several times until the softkey set is displayed as shown in Figure 9.

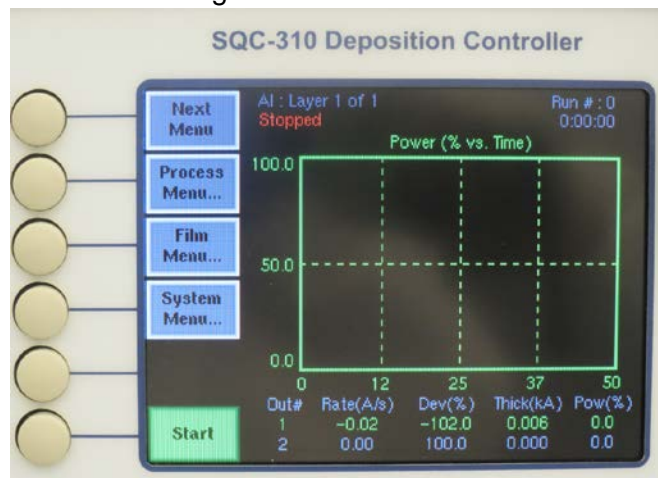


Figure 9

- Press the Process Menu softkey to select your film coating process. A screen shown in Figure 10 will show.

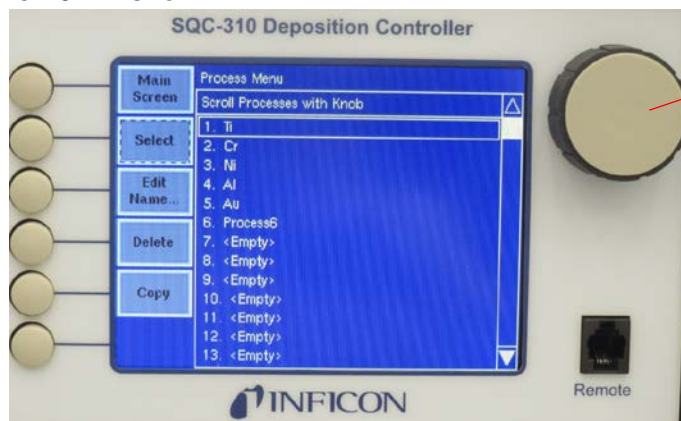


Figure 10

- Use the big knob (Figure 10) to scroll up and down to highlight the process you need. Then press the Select softkey. When it goes to another screen, press the Edit softkey. A screen shown in Figure 11 will show.



Figure 11

- Use the big knob to scroll up and down to highlight Final Thickness parameter, Press the Edit softkey. It will then highlight the value of Final Thickness. Use the big knob to increase or decrease the value to your need. After that, press the Enter softkey. NOTE: ONLY change Final Thickness here. Do NOT change the rate or any other parameters. If you by mistake made some changes to some other parameters, please press the Cancel softkey to avoid the changes being saved.
- After setting the thickness, press the To Main softkey. Check if the pump controller is displaying AUTOCHAMBER PUMPDOWN COMPLETE message. If so then you are ready to start. If not, then wait few more minutes until you see that message.
- On the pump controller, go back to the pocket index, press the 'Local' at the right bottom corner and change it to 'Remote'. This allows the deposition controller to move the pockets to the desired one, and allows you to monitor the pocket location during deposition.



Figure 12

- Go to the high-voltage controller, press MENU/QUIT, use left scroller to select Auto/Manual; use the right scroller to select Manual operation. A bold 'Manu' should show up at top middle. Use left scroller to select Set pocket, use the right scroller to select the material to be deposited. Figure 12 shows AL being selected. Note that the pocket number here doesn't influence the pocket number on the pump controller. Then put the control back to automatic operation by selecting

Auto/Manual on left and Automatic operation on right. A bold 'Auto' should show up at top middle, as shown in Figure 12.

8. Press the HV ON button (Figure 3.11) on the handheld controller to turn on the high voltage. The 8.5 KV high voltage should be displayed on the screen of the handheld controller.



Figure 13

9. Go to the deposition controller, press the Start softkey (Figure 14) to start the coating process. The power will start ramping up. And the process will automatically stop when the pre-set thickness is reached.



Figure 14

10. When the process is finished, go to the highvoltage controller, find and press the HV OFF button (Figure 3.11) to turn OFF the high voltage. Then you are ready to unload your sample.

5.3 Unload sample

1. Follow the Load Sample procedure (Section 5.1, procedure 1 to 5) to unload your sample. Note: Do NOT forget to pump down the chamber after unloading you sample.
2. Log out tool in FOM.