

EVG 810 Plasma Activation System Operation

Overview

This is a capacitively coupled Oxygen plasma activation system used exclusively for the surface activation of clean surfaces prior to wafer bonding. This technique allows bonding temperatures to be lowered.

Restrictions & Precautions

- **THIS SYSTEM IS NOT A DESCUM, DO NOT PUT RESIST COATED SAMPLES INSIDE!**
- **NO METAL-TIPPED TWEEZERS AS IT CAN DAMAGE THE SYSTEM!**
This machine is intended for plasma activation prior to direct-wafer bonding. The chamber and electrodes are coated in silicon and are very sensitive to scratching. Only remove the carrier wafer with the vacuum wand. If you dropped a sample, use only carbon tipped tweezers if you must.
- **DO NOT EXCEED 200W!**
- **ALWAYS LOWER THE LOADING PINS BEFORE CLOSING THE CHAMBER LID!**
- Recipes are characterized for substrate thicknesses between 250um and 750um. Thicknesses outside of this range need to have parameters optimized to minimize reflective power.

Operational Notes

- At times you will encounter a 'MACH Missing Machine facilities (Pressure, Vacuum or N2): Input PRESSURE missing!' error in red across the top of the screen. Click on this error to clear it and proceed.
- If you encounter any errors during your run, attempt to clear them first. If that does not work, select 'Abort' and then 'Clean up'. After that try to run the recipe again.

Operation

1. Select 'Login Here' (lower left corner of the screen) and use the pop-up window to login to the system.
2. Select 'Jobs'.
3. Select 'Start' and a select recipe window will pop-up. The wafer size is always 6" and should not need to be changed, use the drop down menu to select a recipe and then select 'OK'.

The standard recipes are:

- a. **ExSitu_0.8mbar** – 0.8mbar, N₂, 100/75W
- b. **ExSitu_0.8mbar_Line2** – 0.8mbar, O₂ 100/75W
- c. **ExSitu_0.4mbar** – 0.4mbar, N₂, 100/75W
- d. **ExSitu_0.4mbar_Line2** – 0.4mbar, O₂, 100/75W
- e. **Dis 0.2mbar_Line2** – 0.2mbar, O₂, 125/75W

NOTE: These are qualified recipes provided by EVG and will not require adjustment of the RF Match (in lower cabinet).

4. The chamber will vent. Once the message at the top of the screen reads 'Please press both safety buttons now!', press and hold both of the green buttons until the chamber lid is open and the lid actuation noise stops.

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- Inspect the inside of the chamber. Do you see any marks or any particles? If so, gently brush them aside with a foam swab and isopropanol. Note this in the logbook.
- A pop-up window stating 'Please put wafer on bonder. Press OK when finished!' will have appeared once the chamber is opened. Before loading your samples, Select 'OK' to lower the carrier wafer. After it has lowered, make sure the carrier wafer is centered before proceeding.
NOTE: A 6" carrier wafer is kept in the system at all times. If you need to run a 6" wafer of your own, then you will need to remove this carrier wafer. Do this before lowering the wafer. Use the vacuum wand at the system to unload the carrier wafer and place it in the cassette at the system. Now load your wafer using the vacuum wand. The vacuum wand is always on, pressing the lever on the wand shuts off the vacuum.
- Place your samples onto the 6" carrier wafer in the chamber.
- Press and hold both green buttons until the chamber lid is closed and the lid actuation noise stops.
- The system will run the selected recipe and vent the chamber when it is finished. Once the message at the top of the screen reads 'Please press both safety buttons now!', press and hold both of the green buttons until the chamber lid is open.
- Unload your samples from the carrier wafer.
NOTE: If you ran your own 6" wafer, unload it using the vacuum wand and then reload the carrier wafer that was in the system.
- Inspect the chamber as per Step 5. Note any cleaning in the logbook.
- A 'Substrate finished' pop-up window with the options of 'Load next' or 'End' will have appeared once the chamber is open. If you are finished with the system proceed to Step 13. If you need to make more runs, select 'Load Next'. A pop-up window will appear asking 'Repeat same sequence?':
 - If you are running the same recipe, select 'Yes' and go back to Step 6.
 - If you are running a different recipe, select 'No' and go back to Step 3 (the select recipe pop window will have appeared).
- Select 'End', you will be asked to close the chamber cover. Select 'No', a pop-up window stating 'Process is Finished!' will appear, select 'OK' to continue.
NOTE: IT IS EXTREMELY IMPORTANT THAT YOU DO NOT LOWER THE CHAMBER COVER!
- Click on the center of the chamber graphic, a pop-up menu will appear. Select 'LoadingPins Down' and the wafer will lower.



- Click on the center of the chamber graphic again and select 'Start Idle process' from the menu.
- Press and hold both green buttons until the chamber lid is closed and the lid actuation noise stops.
- Log out by selecting your user ID in the lower left corner of the screen.
- Enter your run(s) in the logbook.