

EVG 810 Plasma Activation User Manual

Version of 2024-11-19.


1. Introduction

This manual explains how to operate the EVG 810 low temperature plasma activation system to prepare the surface of wafers before bonding experiments.

2. Login on CAE

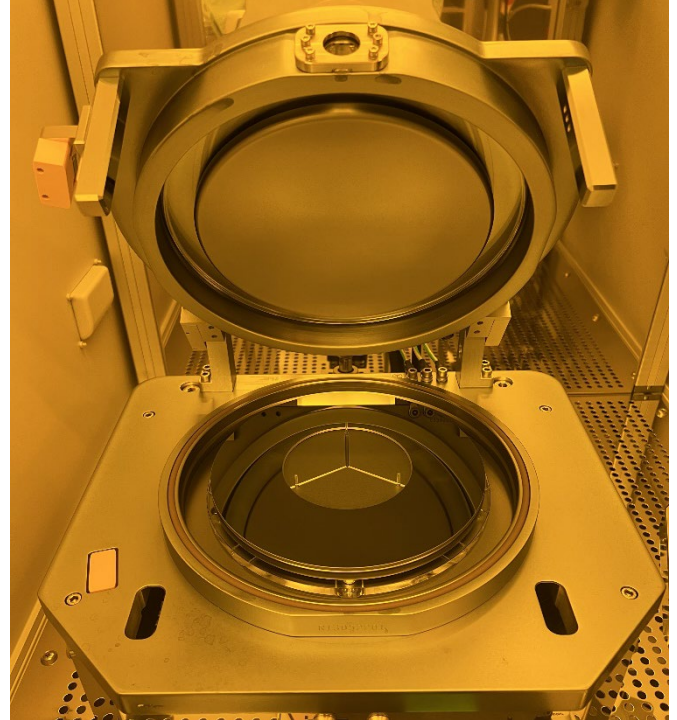
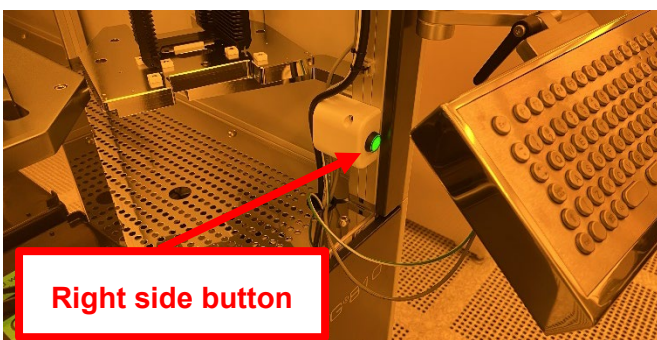
Login with your "CMi" username and password on the Zone 06 CAE accounting computer.

Select the "EVG 810LT - LowTemp plasma activation".

 Z06 EVG 810LT - LowTemp plasma activation

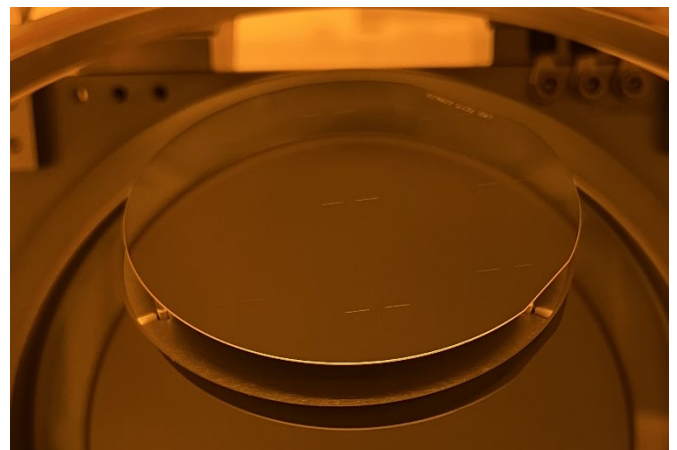
3. Loading the wafer into the chamber

To open/close the plasma chamber, the user will require to push and maintain (at the same time) both "Cover Open Close" buttons located on each side of the system until the cover is fully moved up or down.



EVG810LT with fully opened cover

Load the wafer on top of the three lift pins. Rotate the wafer in a way the wafer flat sits in between the location of the pins.



You do not need to center the wafer perfectly. It will be guided into the opening on the chuck by the metal ring insert placed around the chuck.

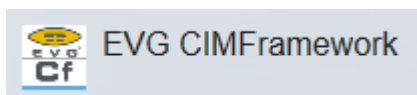
Warning: The pins are made of glass and are extremely fragile! Avoid any contact/shock during manipulation.

Note: Processing of 6inch wafers into the EVG 810LT will require to exchange the metal ring insert. Please ask the CMI Staff to be trained to perform the change.

After loading the wafer, the chamber is closed by pushing the two “Cover Open Close” side buttons simultaneously.

4. Starting a job with EVG CIMFramework

Note: All the EVG bonding tools (bonder, bond-aligner, plasma activation equipment and cleaner) are using a unified GUI program platform called EVG CIMFramework.



The tool operation will be very similar on all tools.

At the bottom of the user interface, different tabs are available, but only “Jobs”, “Modules” and “Recipes” will be useful to operators.



All the operations are started from the “Jobs” tab, where the EVG810LT module will be shown, together with a series of action buttons on the left side of the screen.



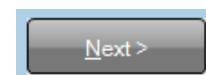
Jobs are started by pressing the “Add Job” button on the left side of the UI.



An explorer-like window will pop up. Standard recipes are stored in the “EPFL” folder, and users can select from 3 standard plasma treatment:

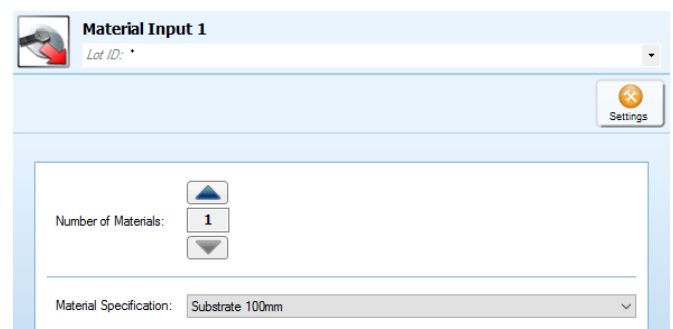
- 1) EVG_Standard_PlasmaActivation_N2_ProcessFlow_TurboPump: Activation of the surface with a low power, short-duration oxygen (**O2**) plasma.
- 2) EVG_Standard_PlasmaActivation_O2_ProcessFlow_TurboPump: Activation of the surface with a low power, short-duration nitrogen (**N2**) plasma.
- 3) EVG_Standard_PlasmaActivation_Ar_ProcessFlow_TurboPump: Activation of the surface with a low power, short-duration argon (**Ar**) plasma.

Select the best plasma activation program, based on the materials to be bonded. After selection of the recipe, users will proceed by clicking on “NEXT”:

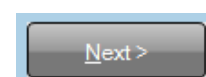


In the following window, users select the number of wafers to be processed, or more precisely the number of times the recipe will be used.

The window will look like this:



After selection of the number of materials, users will proceed by clicking on “NEXT” one more time:

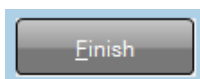


A summary of the process will be presented, together with a validation check.

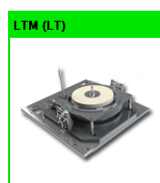
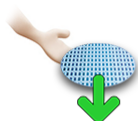


Recipe OK. Click Finish to start process job.

Proceed with:



The system will ask to load the wafer (already done). Users should click on "Done" and then "Take Over".



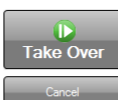
LTM Substrate (LT)

Step 1 - Insert Material

✓ Done

Step 2 - Take Over

- Close and lock any doors if necessary.
- Click the "Take Over" button to instruct the module to take over the material.



The process can be monitored by selecting the "Modules" icon at the bottom of the UI.

Process Information		
Recipe:	EPFL>EVG_Standard_PlasmaActivation_O2_ProcessFlow_TurboPum	
Elapsed Time:	00:00:17	Remaining Time: 00:01:25
Recipe Step:	2	Wait Pressure
Wait Pressure < 0.09 mbar		Skip
#	Step	Description
1	Evacuate	Mode: Evacuate low;
2	Wait Pressure	Mode: equal or lower than; Pressure: 9.00 E-02 mbar;
3	Purge	Mode: Purge; Type: Base Purge Line; Gas: Oxygen
4	Wait Pressure	Mode: equal or higher than; Pressure: 500.0 mbar;
5	Evacuate	Mode: Evacuate low;
6	Wait Pressure	Mode: equal or lower than; Pressure: 9.00 E-02 mbar;
7	Purge	Mode: Purge; Type: Base Purge Line; Gas: Oxygen
8	Wait Pressure	Mode: equal or higher than; Pressure: 500.0 mbar;
9	Evacuate	Mode: Evacuate controlled; Setpoint: 3.00 E-01 mbar;
10	Wait Pressure	Mode: equal or lower than; Pressure: 3.30 E-01 mbar;
11	Evacuate	Mode: Evacuate off;
12	Proximity Pins	Mode: Down;
13	Timer	Timer: 0:00:02.0 hh:mm:ss.s
14	Activate Surface	RF Power Mode: On; Low Frequency Generator Power Setpoint:...
15	Timer	Timer: 0:00:15.0 hh:mm:ss.s
16	Activate Surface	RF Power Mode: Off;
17	Proximity Pins	Mode: Up;
18	Purge	Mode: Purge; Type: Base Purge Line; Gas: Nitrogen
19	Wait Pressure	Mode: equal or higher than; Pressure: 850.0 mbar;
20	Purge	Mode: Off

The plasma is active during step 14. Users can verify the stability of the plasma from the small front window.

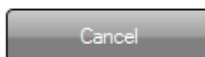
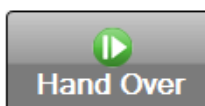


5. Removing the wafer and log-out

At the end of the process, the "Unload Material" window will pop-up.

Step 1 - Hand Over

- Insert any unloading tools if necessary.
- Close and lock any doors if necessary.
- Click the "Hand Over" button to instruct the module to hand over the material.



Step 2 - Remove Material

Click on "Hand Over", then open the chamber with the side buttons, and finally unload the wafer.

It is now possible to load a second wafer to start a new activation process.

When all is done, make sure to close the cover.

You can then perform logout if you want.