EVG 301 cleaner User Manual

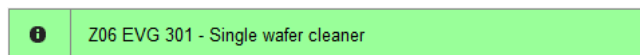*Version of 2024-11-19.*

1. Introduction

This manual explains how to operate the EVG 301 megasonic DI water cleaner 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 301 – Single wafer cleaner"

> ℹ️ Z06 EVG 301 - Single wafer cleaner

3. 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.

 EVG CIMFramework
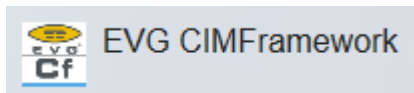
The tool operation will be very similar on all tools.

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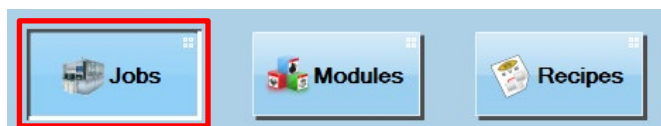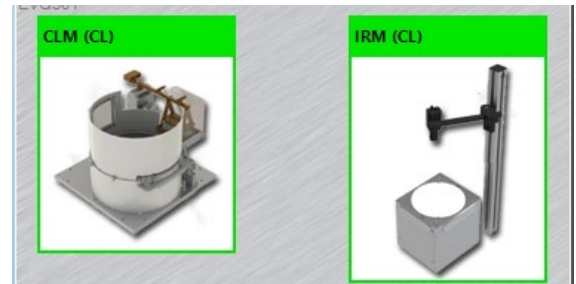

All the operations are started from the **"Jobs"** tab.

The EVG 301 consists of two modules:

1) the cleaning module **(CLM)**, used to clean wafers.

2) the pre-bond station and infrared lamp imaging module **(IRM)**, used to put the wafers in contact (prebond), and to image through the wafer stack with infrared illumination to look for the presence of bonding defects (voids).


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 Recipes" folder, and users can select from 4 recipes:

1) <u>EVG_Standard_Cleaning_ProcessFlow:</u> This recipe will only use the cleaning module, to perform cleaning on any number of wafers.

2) <u>EVG_Standard_Bonding_ProcessFlow:</u> This recipe will only use the bonding and infrared lamp station, to put two wafers in contact (prebond) and capture and IR image of the stack.

3) <u>EVG_Cleaning_and_Bonding_FullProcessFlow:</u> This recipe uses **both CLM and IRM modules** to clean both wafers one after the other, put them in contact (prebond) and take and infared image in the infrared imaging module.

4) <u>IR Imaging:</u> This recipe uses the IRM module to take an infrared image of a stack of bonded wafers (for instance wafers coming out of the EVG 510 bonder).

After selection of the recipe, users will proceed by clicking on "NEXT":
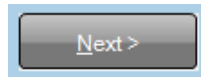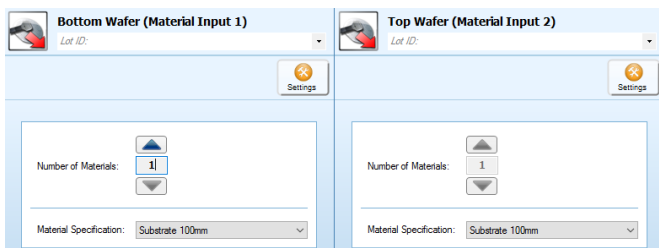

In the following window, users select the number of wafers to be processed, or more precisely the number of times the recipe will be used.
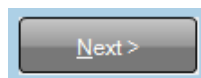
For a cleaning recipe, it looks like this:
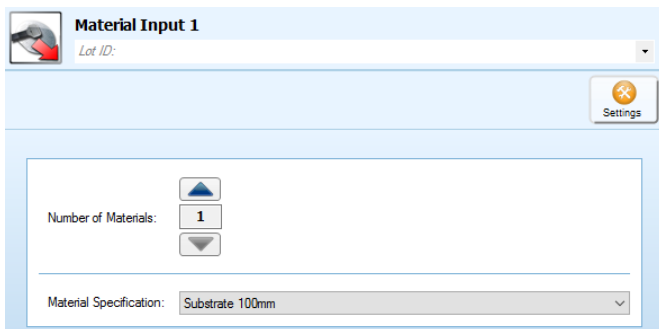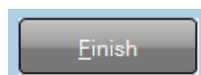

For a bonding recipe, it looks like this:

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.

Proceed with:

The process will start!

The EVG 310 feature a safety door with an interlocked blocking function. The door interlock will "most of the time" be released automatically, but locking will be activated

manually by the user by clicking the door icon (bottom left of the UI)

WARNING: please follow the indication on the screen regarding unlocking and locking the door. If the sequence of actions is not followed strictly, the recipe can fail completion.
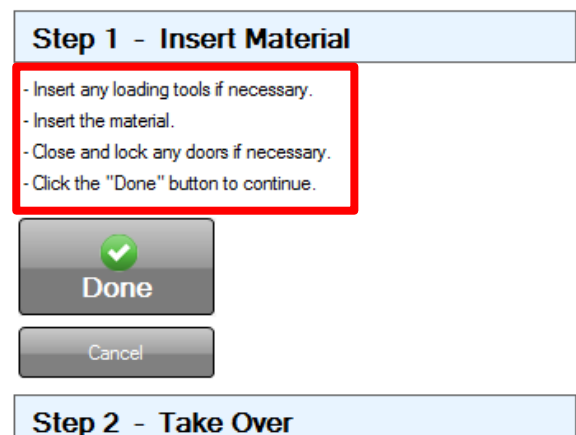
A. Cleaning sequence

The door will be unlocked automatically once the recipe starts. In addition, the centering tool of the cleaner will move into position.
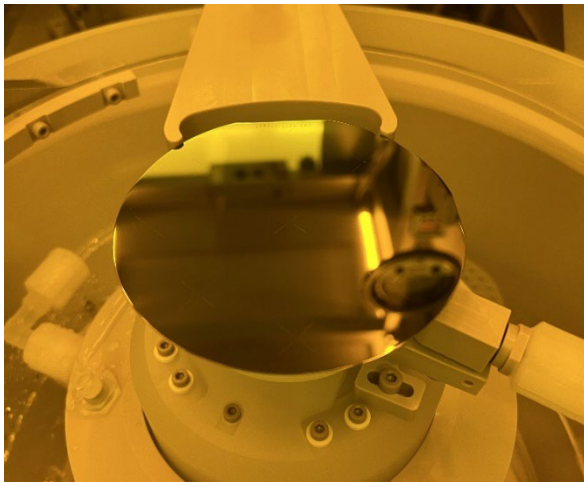
The "Load Material" window will pop up:
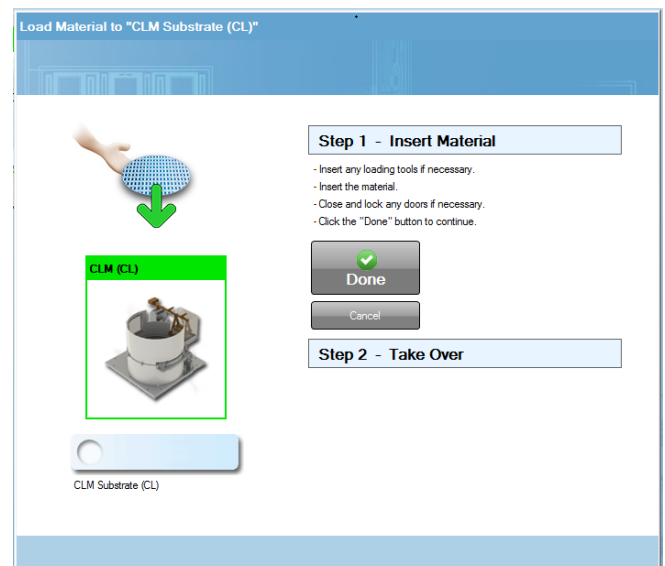
Strictly follow all the instructions in "Step 1" and "Step 2" in order to start the process. Do not forget to lock the door with the "Lock Doors" button.

We recommend to place wafer so that the flat lies in-between the two centering points. This will greatly help during the transfer to the prebonding/IR station.

Users can follow the sequence in the "Modules" tab.

The sequence will end with the "Unload Material" window. Follow the instructions.

Do not forget to lock the safety door. You can then perform logout if you want.

B. Cleaning & Bonding full sequence
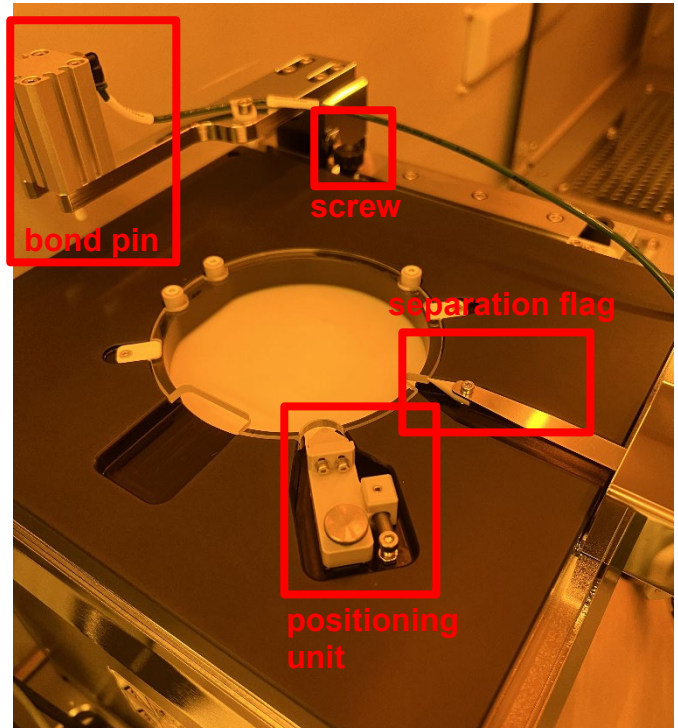
The complete cleaning and bonding process will consist of the following steps:

1) Cleaning of wafer N°1
2) Transfer of wafer N°1 to the pre-bond station
3) Insertion of the separation flag (automatic)
4) Cleaning of wafer N°2
5) Transfer of wafer N°2 to the pre-bond station
6) Manual alignment of wafer N°1 and N°2
7) Wafer N°1 and N°2 going in contact by retraction of the separation flag (automatic)
8) Application of a small pressure on the stack using the centre bond pin.
9) IR image
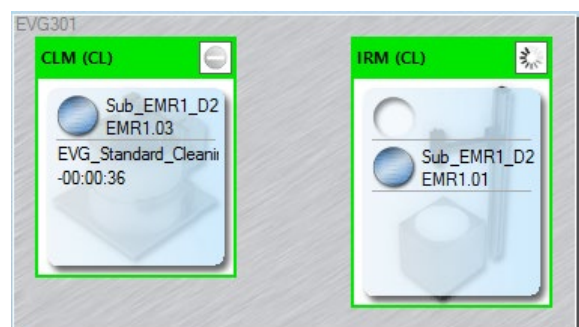
Both modules will be active at the same time in the user interface.

WARNING: please follow the indication on the screen regarding unlocking and locking the door. If the sequence of actions is not followed strictly, the recipe can fail completion. In particular, the transition between the use of each module will always need closing the door to open it again shortly after which might seem redundant.

After the completion of the cleaning recipe on wafer N°1, the interface will ask you to unload the wafer and the user will transfer it to the pre-bond station. To ease the transfer, unload it from the chuck of the cleaner as shown below:
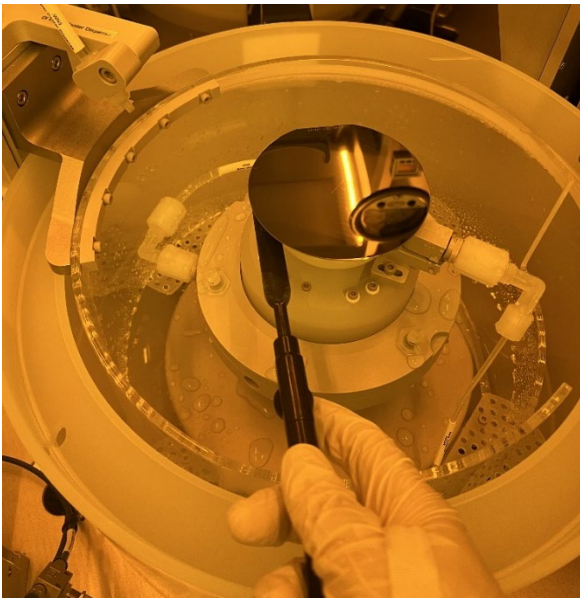

Place the wafer in contact with the positioning pins Pay attention to the position of the flat. The wafer N°1 is loaded **with the surface to bond facing up**, as shown below:
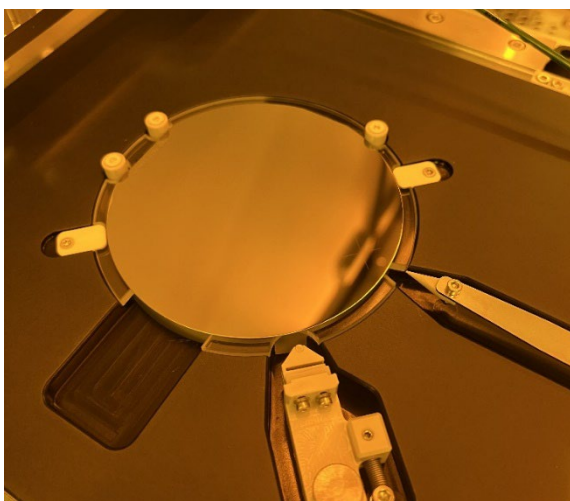
The IR module will then take over, asking for loading the material, which should be already done. Then, a safety message will pop up in the UI and ask you to check the height of the flag.


Make sure flags are in correct z height, can cause collision.

Click "OK" and the flag will move above wafer N°1:
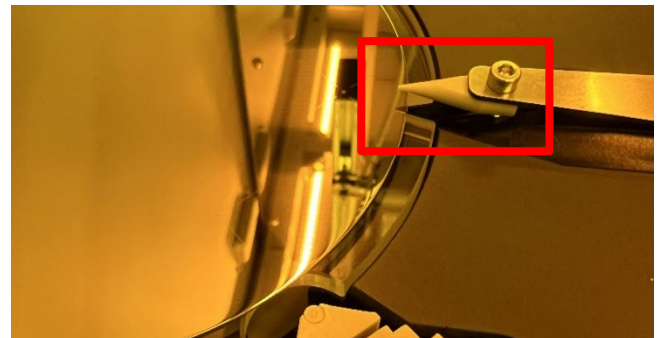
At that point, the UI will request to load wafer N°2 in the cleaning station. Repeat the cleaning procedure with the second wafer until it is asked to unload it from the cleaner.

The second wafer should be loaded **on top of the separation flag with the surface to bond facing down,** as shown below (with a glass wafer):
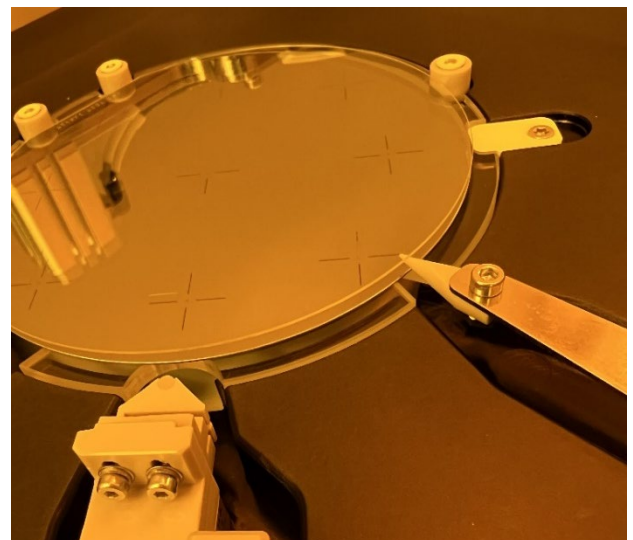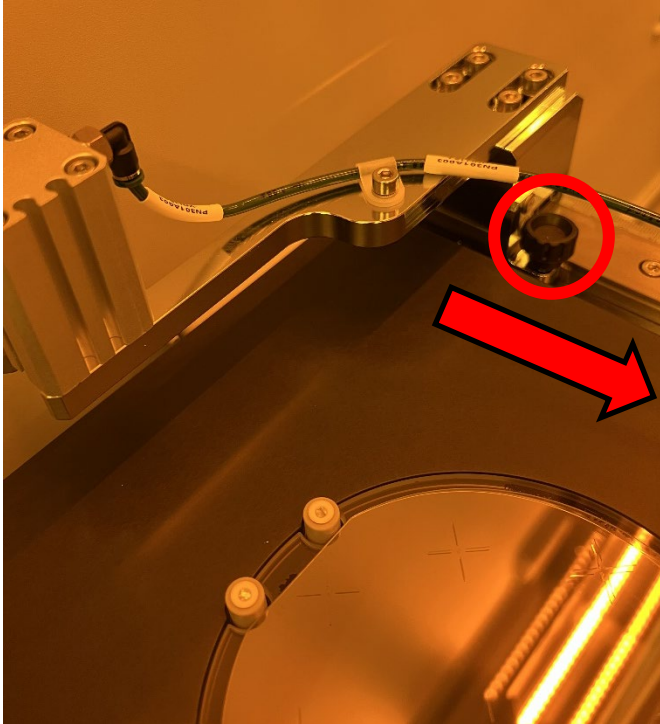

After loading the wafer N°2, the door should be closed and locked before continuing to the next step.
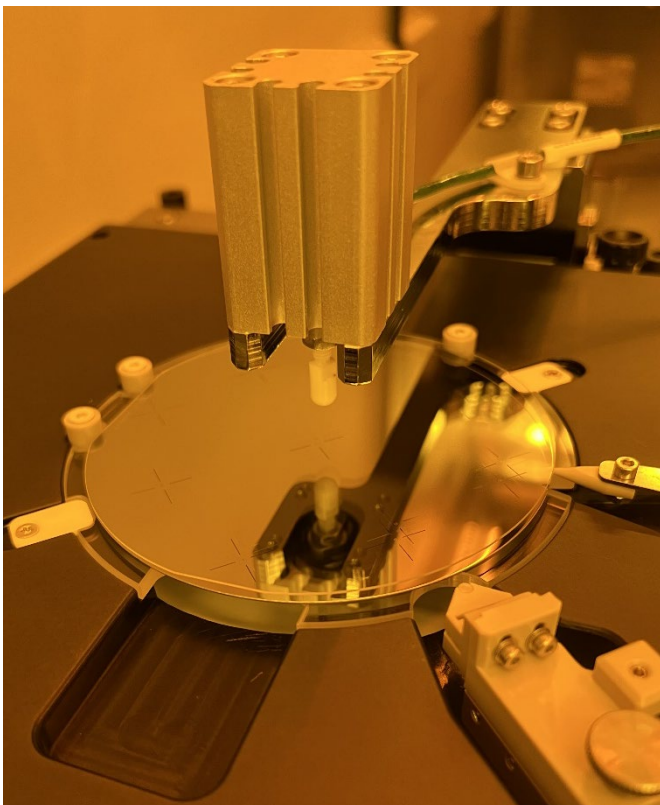
The infrared module will then take over and ask you to load the material (already done).

After that the pre-bonded stack of 2 wafers will be ready for unloading. Users will proceed through the "Hand Over" and "Remove Material" actions.
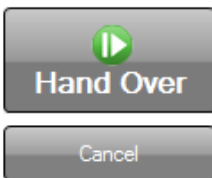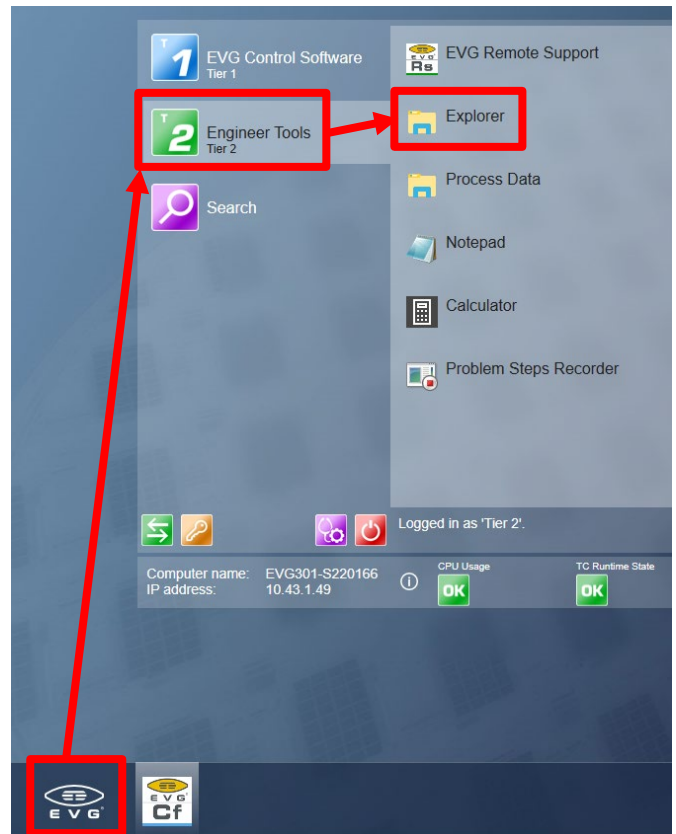

Remove the wafers. Close and lock the safety door. You can then perform logout if you want.

C. Accessing IR images

To retrieve the saved IR images, you will need to access the windows explorer. Move the mouse to the EVG logo at the bottom left of the screen to access the EVG "Engineer Tools" section and then the "Explorer".
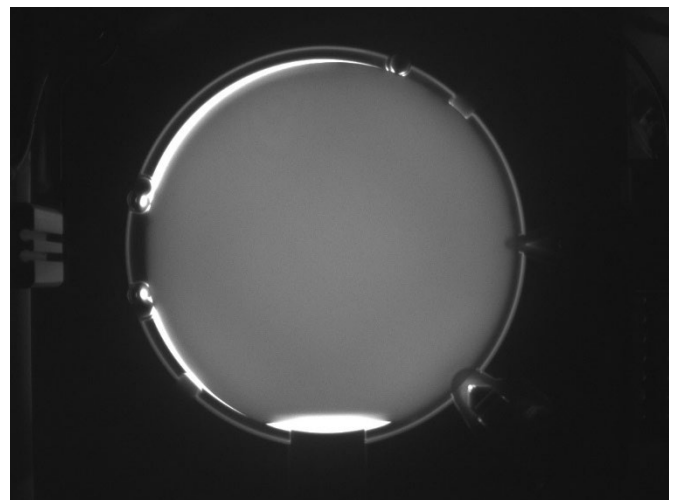

Note: "Tier 2" login access is needed to be able to access the engineering tools. Please contact the CMi staff if tier 2 is missing.

The IR images are stored in the "Data" drive in the following folder:

D:\ ProcessData\Pictures\

Please navigate to the correct year and month to retrieve your images.

You can then copy and paste into cmi-transfert using the explorer.