CORAL Name: Asher-Chuck-ESI

Location: Bay 6L
Purpose: Photoresist Stripper and Descum
Contact: Bob Bicchieri, Dennis Ward

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Introduction

The Asher-Chuck-ESI is an oxygen plasma asher (model no. e3511). It uses a microwave source (2.4GHz) and a heated chuck to quickly remove photoresist from wafers or pieces. A UV lamp can optionally be used to heat the surface of the resist as well. The system also has an Optical Endpoint System (OES) to detect when the organic material has been removed. This system can also be used for descum or removing residual layers of organic material. The Asher-Chuck-ESI can either strip resist from whole wafers (up to 8") or pieces using adapter trays. After processing the wafer rests on a cool plate before being returned to the cassette. Typically, the tool is configured to use either 4" or 6" cassettes. **A configuration file has to be changed to accommodate the cassette for 8" wafers.**



Safety

- This tool operates at 250C, wafers and piece trays are moved to a cool-plate before being returned to the cassette. When using the anodized, aluminum adapter trays for pieces, you **MUST** use a "**pieces recipe**" which keeps the tray on the cool plate for 6 minutes to allow for additional cooling time, otherwise you risk getting burned!
- The piece adapter trays are slightly thicker than actual wafers, so do **NOT** use them in adjacent slots! Currently, there are metal 4, 6 and 8" cassettes, the adapters are used with the 6" cassette.
- This tool has many moving parts and pinch points Do not reach into the tool! Report problems and stuck wafers in CORAL: Do **NOT** attempt to "rescue" your wafer. Keep your hands away from all moving parts.

- This tool uses Microwave radiation, high voltage, and compressed gases (Oxygen and Nitrogen) to create plasmas. Do not remove any machine panels or go behind the machine. Do not try to defeat any of the system interlocks.
- **Note:** Before using this machine, you should learn the location of the EMO button on the front panel of the tool. Press the EMO if the tool is behaving dangerously! **If you press the EMO button, alert the Staff. Do NOT attempt to re-energize the tool!**

User Qualifications and Responsibilities

If you encounter any problems while operating this machine, report them immediately in CORAL. The Staff in charge will address them in a timely fashion.

There are 3 types of recipes for this tool:

1. Ashing: either a timed or end-pointed recipe
2. Descum: lift-pins are raised so the sample is not in direct contact with the 250C platen
3. Pieces: for use with the adapter trays.

If there is not a recipe that meets your needs, then please contact the Staff. **Users should NEVER write or modify a recipe!**

NOTE: If you are running 8" wafers, you need special login access to reconfigure the tool for 8" wafers. It is imperative that you change the configuration file back to 6" when you are finished!! Please see the Staff before running 8" wafers.

Operating Procedures

1. Check reservations in CORAL to ensure you have reserved the correct machine for the correct time. Engage the tool in CORAL. This is necessary in order to operate the tool, as the "cassette in place" sensor is interlocked by CORAL
2. Log in as an **OPERATOR**, (password is **user**). This system has a touch screen monitor, either use your finger or the stylus to touch the screen. **See Figure A.**

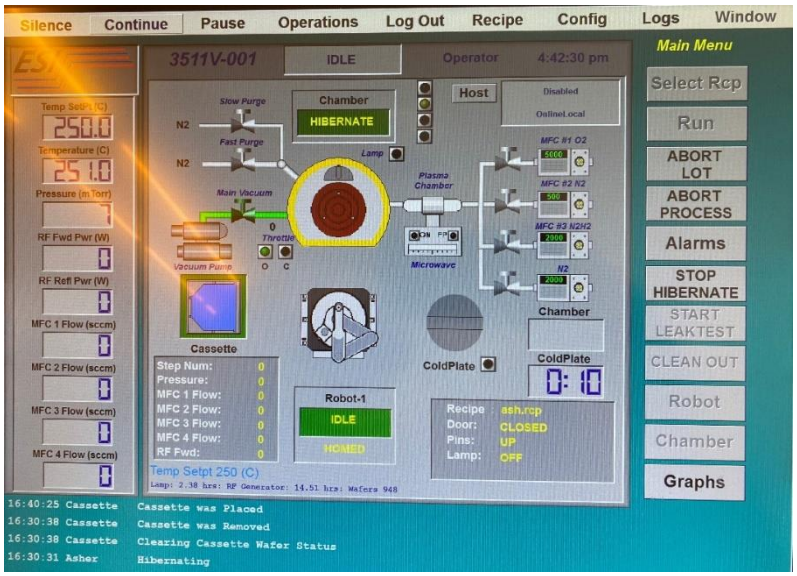


Figure A

3. **Stop HIBERNATE.** Under the Main Menu, press the Stop Hibernate button in order to vent the chamber. When vented the chamber door will open.
4. **Load the Cassette.** Remove the cassette from the elevator, and load your wafers in the cassette being careful not to cross-slot any. Take note of which slots you use as you'll need this info in step 7.
5. **Place the cassette back on the elevator.** The cassette should turn blue as in Figure A (above)
6. **Press the Select Rcp Button.** Under the Main Menu. A new window opens. Choose either the Ash or Descum recipe.
7. **Press the Run Button** You can name the lot if you wish, otherwise the tool will generate one. Press Pad to get to the keypad. When finished press OK. A new window opens….
8. **Select the slots to be processed.** In this example Slot 1 is selected for processing. Then Press OK. **See Figure B**

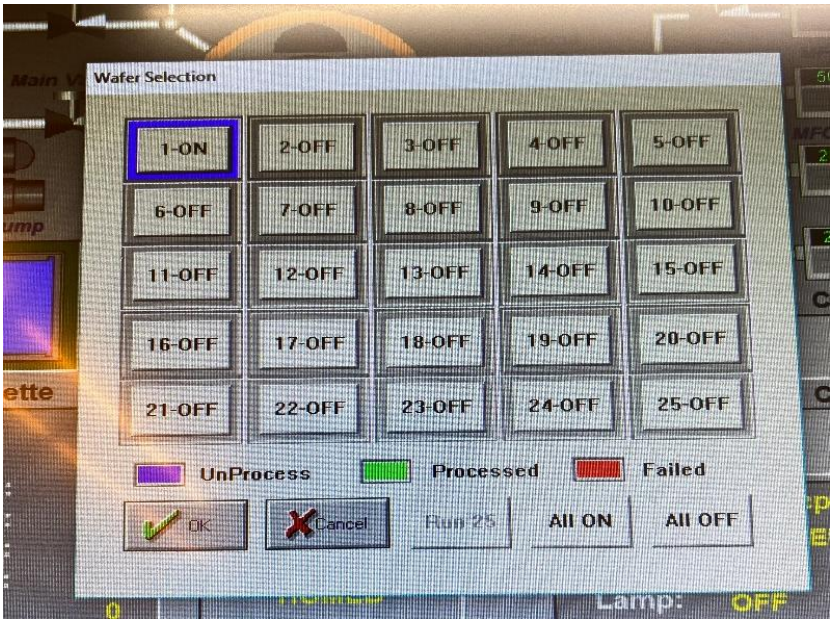


Figure B

9. **Start This Run?** A new window opens. **See Figure C.** Press OK to Start Run.

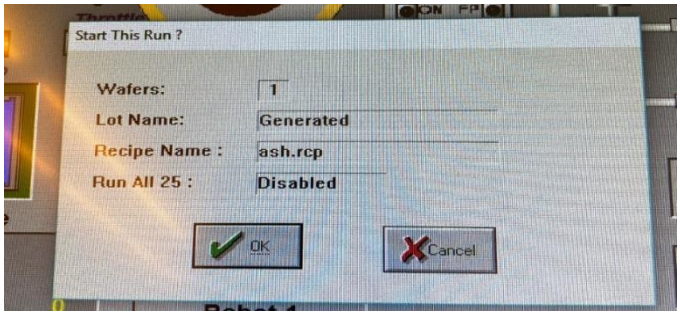


Figure C

10. **The Process Begins.** The Robot will take the wafer from the cassette and place it in the Chamber. The door will close and the Chamber will pump down and begin the process. When finished, the Chamber will vent and the Robot will remove the wafer and place it on the Cool Chuck. After a brief cooling, the Robot will return the wafer to its original slot in the cassette.

11. **When all the wafers are processed.** A new window opens...Press OK **See Figure D**

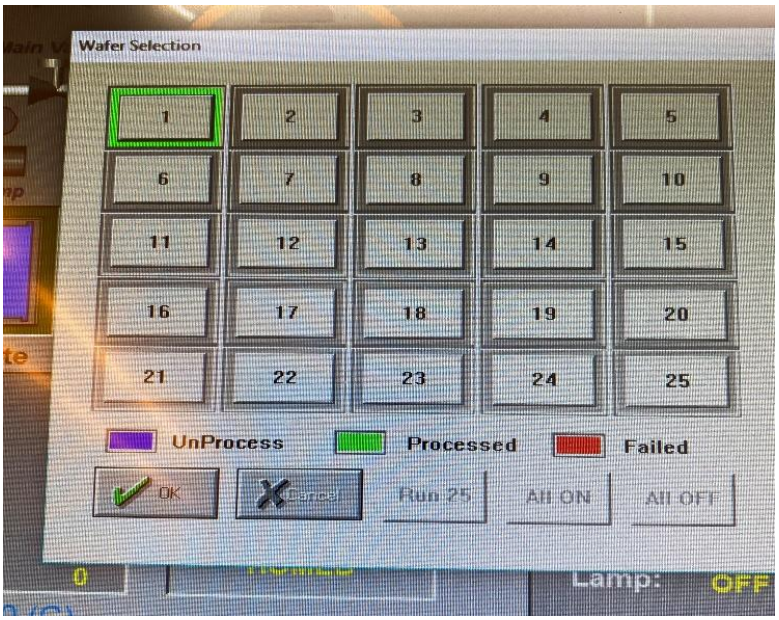


Figure D

12. **Remove the Cassette.** Unload your wafers from the cassette and place the empty cassette back on the elevator.
13. **Press the START HIBERNATE Button.** The chamber door will close. The system will be placed under vacuum. The tool will be as you found it. **See Figure A.**
14. **Disengage the tool in CORAL** Enter the correct data in the report fields.

Appendices

The ESI Asher strips a micron of positive photoresist in 28 seconds!

Recipes for whole wafers:
Ash.thin.rcp is an end pointed recipe for resist under 3 microns, and includes a 50% overetch.
Ash.thick.rcp is an end pointed recipe for resist under 15 microns, and includes a 50% overetch.

Recipes for pieces:
Pieces45s.rcp is a timed etch for 1.2um resist to be used with the Aluminum adapter tray
Pieces135s.rcp is a timed etch for thick resist to be used with the Aluminum adapter tray
Pieces300s.rcp is a timed etch for thick resist to be used with the Aluminum adapter tray

Descum Recipes:
There are several Descum recipes of varying lengths. Ideally, these should be at lower temperatures, but it would take hours to cool the chamber. The OEM recommends running the descum processes at the standard temp, but with the lift pins up, so the sample is not in direct contact with the platen. Typically, the MW power on these recipes is at 700W instead of 900W!

Changing the Configuration File to 8":

1. Click Logout at the top of the screen, and Click Yes
2. Click Login and use the pad to enter your name and password to login (see Staff to get your login credentials)
3. Click Config at the top of the screen, and then, Configuration
4. Click on Robot, Then Edit
5. Robot-1 is highlighted, Click Select
6. Cassette Size is highlighted
7. Click Pad and change the 6" to 8", Click OK and Click OK
8. Click Save, then Yes to reconfigure device
9. Click Exit. System will say Current cassette size is 8". Click OK
10. Select desired recipe and Run. When finished, you **MUST** reconfigure the tool for 6"!!

Changing the Configuration File back to 6":

1. Click Config at the top of the screen, and then, Configuration
2. Click on Robot, Then Edit
3. Robot-1 is highlighted, Click Select
4. Cassette Size is highlighted
5. Click Pad and change the 8" to 6", Click OK and Click OK
6. Click Save, then Yes to reconfigure device
7. Click Exit. System will say Current cassette size is 6". Click OK
8. Click Logout at the top of the screen
9. Click Login, enter Operator and use the pad to enter the password user