Standard Operating Procedure (SOP)

Rapid Thermal Annealer - 01

(RTA-01)

In case of emergency, please call 911

For any other major safety concern, contact EHRS at 215-898-4453 or via email: ehrs@ehrs.upenn.edu

> **If there is an error on the system/tool please report it on NEMO, we will take care of it**
>
> **Please *DO NOT* run diagnosis without a staff member's approval**

General safety tips and common mistakes

- DO NOT use Kapton tape to secure your samples.
- Before running your process, run the recipe with a dummy sample at least once. This will condition the chamber and ensure the process runs as expected.
- The system allows door opening if the sample temperature is lower than 95° C. This is still very hot. Use caution and handle samples with appropriate tweezers.
- The RTAs must not be left unattended.
- The processes' time limits associated with each temperature range are:
    - up to 500° C - 15 min.
    - 500 °C to 800° C - 5 min.
    - 800 °C to 1000° C - 1 min.
    - 1000 °C to 1200° C - 30 sec.
- Compound semiconductors and non-MOS compatible metals are not allowed on RTA-01.
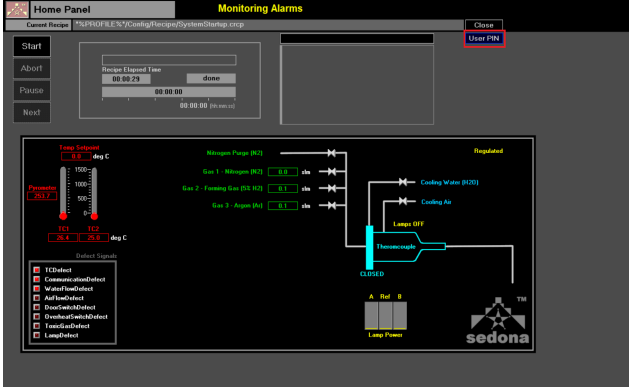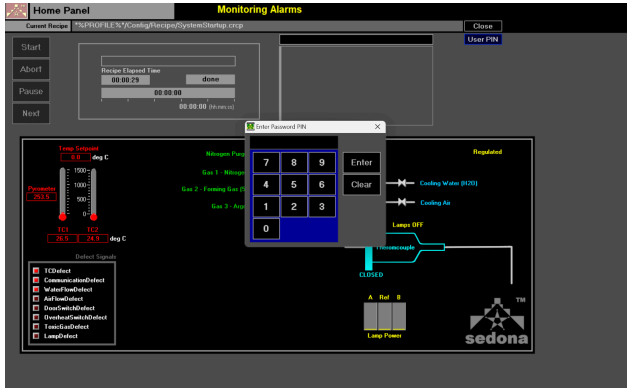
AET Thermal RX

Procedure Overview

- Check if the tool is in an idle state.
- Load your sample(s).
- Select, modify, and run your recipe.
- Unload your sample(s).
- Put the system into an idle state.

Tool Overview:

The Rapid Thermal Annealer-01 anneals the sample up to 1200° C. The processes can be run under atmospheric pressure in Oxygen, Nitrogen, Forming Gas, and Argon environments. The tool can hold 4'' wafers or smaller chips. Only MOS-compatible materials are allowed. Compound semiconductors and metals are not allowed.

Full procedure:

Enable Tool	
0. Log into the tool via NEMO.	
1. Click on the "User PIN" icon. 1.1 Type 054321 and press enter.	

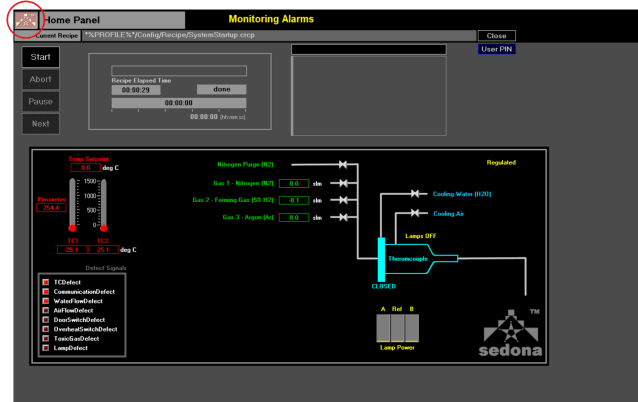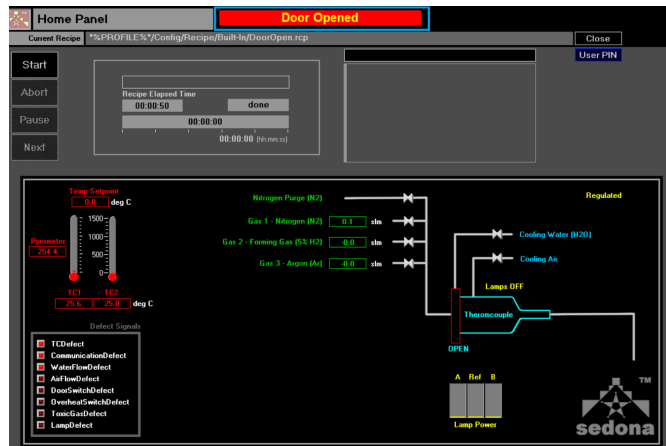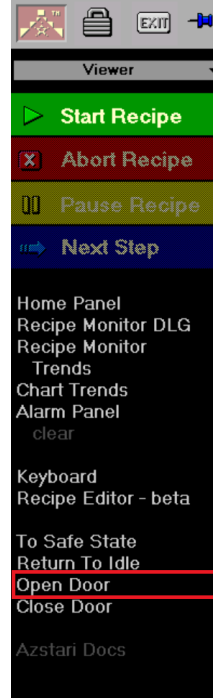|	
Load Sample	
2. Make sure that the tool is in an idle state. 2.1 - Click on the top left icon 2.2 - Run the "Return To Idle" recipe in the viewer menu. **Return To Idle**	
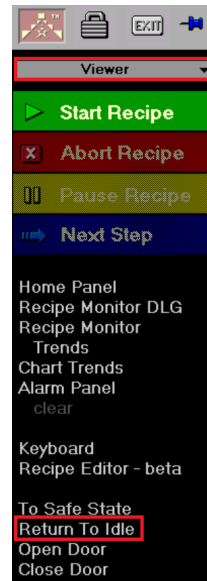
3. Open the door.

3.1 – Run the "Open Door" recipe in the viewer menu.

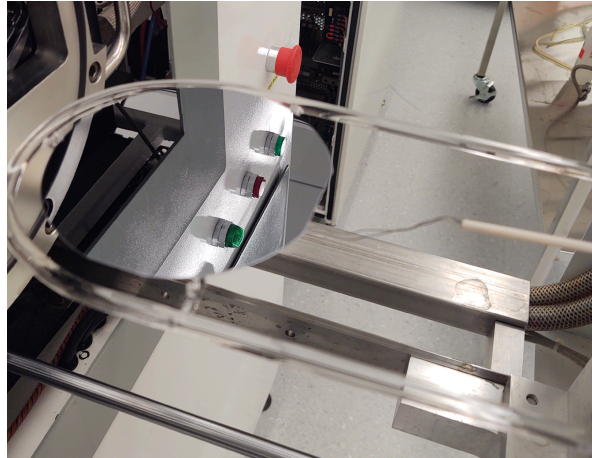**3.2** – The door will open, and the software will display a "Door Opened" message.

Door Opened

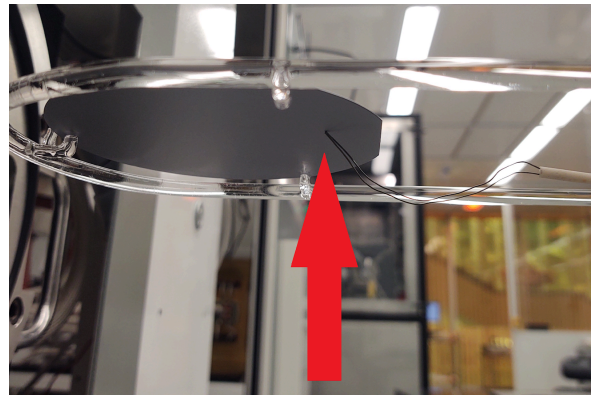The door will open automatically; do not pull it.
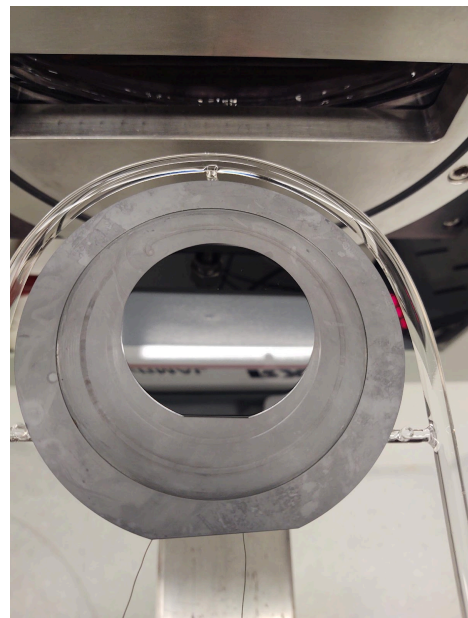
4. Load your sample/wafer.

4.1 - 4'' wafers must be placed directly on the sample stage.

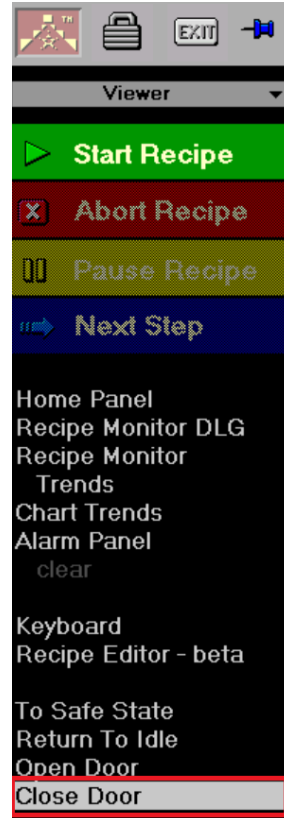4.2 – Ensure the thermocouple is in contact with the back of the wafer.

4.3 – Use the carrier wafer for smaller samples.

5. Close the door 4.1 Run the "Close Door" recipe in the viewer menu. The door will close automatically; do not push it.	

Run Process

6. Select and run your recipe.

6.1 Click on the top left icon.

6.2 Click on Start Recipe.

6.3 Select your recipe and click on "Execute".

6.4 On the "**Select Batch Details**" window, click "**OK**."

6.5 The software will display a window with the following question:

Would you like to run the previous user process recipe?

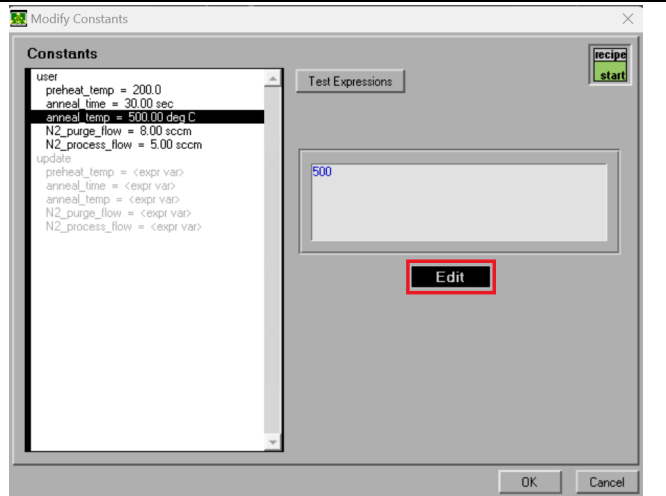If you want to edit the process parameters, click "**No**."

It is strongly recommended that you select "**No**."

If you click "**Yes**," the tool will run the process with the same parameters set when the selected recipe was last used. The recipe will start immediately.
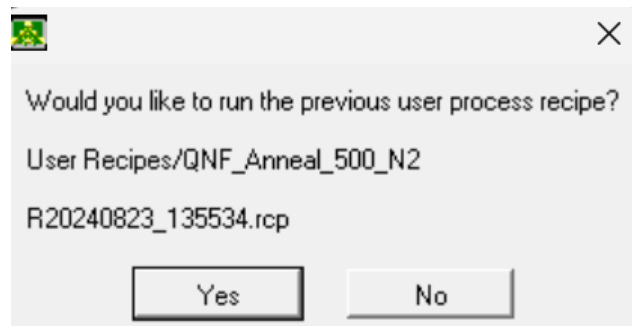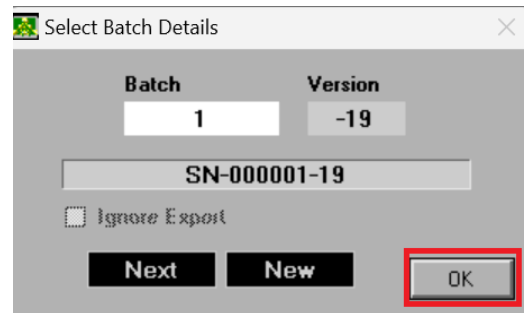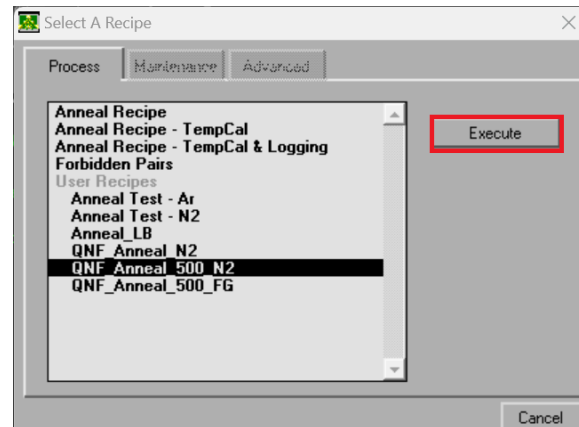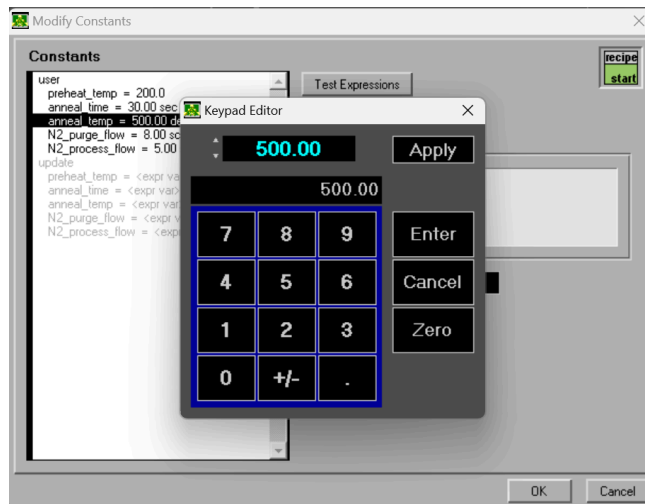
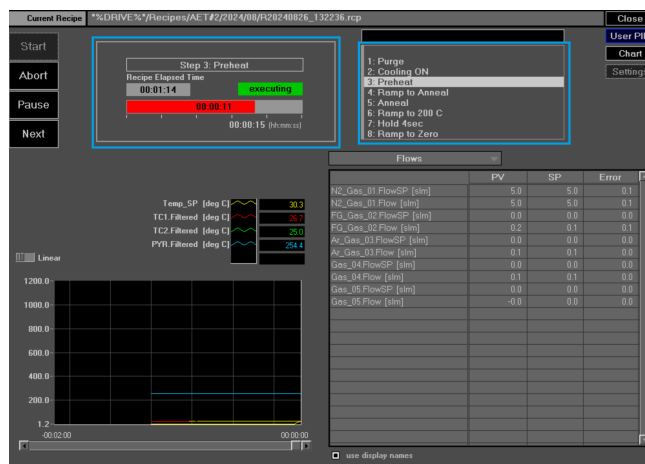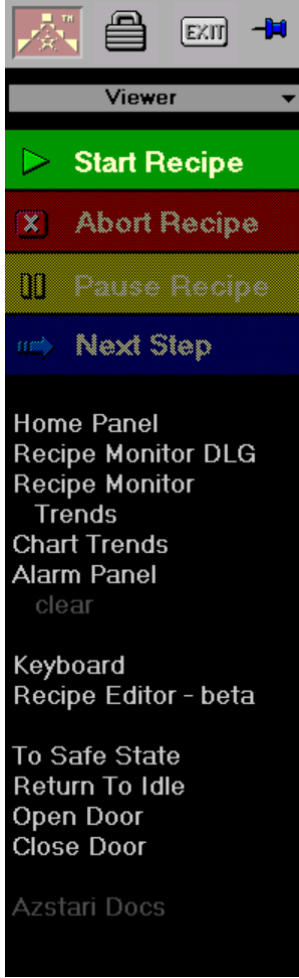6.6 On the "**Modify Constants**" window, select the parameter you want to modify and click on "**Edit."**

6.7 The software will display a Keypad Editor window. Type the parameter value, click "**Enter**," and then "**Apply**."

6.8 After finishing editing the parameters, click on "**OK**." The recipe will start.

6.9 Follow the progress of your process. The tool must not be unattended while the process is running.

Unload Sample	
7. Remove your sample(s). 7.1 Run the "Open Door" recipe in the viewer menu. **Open Door** 7.2 Remove your sample. 7.3 Run the "Close Door" recipe in the viewer menu. **Close Door** 7.3 Run the "Close Door" recipe in the viewer menu. 7.4 When the system door is closed, run the "Return to Idle recipe." **Return To Idle**	
Log out of the tool via NEMO.	

Feel free to contact the staff members with any questions about your process and the tool.

Last modified: 08/29/2024 by Lucas Barreto