

Operation Procedure for RIE1

Trion Phantom II Oxide/Nitride/Polymer Reactive Ion Etcher

Start Up

1. Verify the system is in Standby Mode
2. Fill out all appropriate information in the logbook
3. Press “**Cancel**” to exit Standby Mode
4. Press “**Vent Reactor**” to vent the chamber and open the lid (the lid should open on its own at the end of the vent cycle, if it does not the handle on the front of the chamber can be used to assist the lid opening).
5. Load samples on to the main chamber chuck
6. Press “**Close Lid**” to close the chamber (be sure to watch for anything being trapped in the closing lid).

Setting Up A Process

7. Press “**Load/Edit Recipe**” to go to the recipe edit screen
8. To load and/or edit a currently saved recipe press “**Recipe From Disk**”
9. Choose the desired recipe, then press “**Exit**”
10. Verify/Edit the recipe parameters
 - a. The first recipe step will be displayed. Typically this is a 60 second pump out step with no gas or RF and with the pressure setpoint being set to 0. This step insures residual room moisture and air are removed from the chamber before processing.
 - b. Press “**Step#**” and type a desired recipe step number followed by “**Enter**” to see another step in the recipe
 - c. Alter any recipe parameters as needed by pressing the parameter value under that parameter and typing in the new value on the touch screen then pressing “**Enter**”.
 - d. *Note: Pressure is in mTorr, Power for the ICP and RIE generators is in Watts, Time is in seconds and the gas flows are in standard cubic centimeters per minute (sccm).*
 - e. All edits only apply to the active loaded recipe location and not the main recipe on the hard drive
 - f. When complete press “**Exit**”
 - g. To permanently save a recipe (*please only do this if parameters are very different from other loaded recipes or the process is specialized and will be used many times in the future*) press “**Load/Edit Recipe**” then press “**Save Recipe to Disk**” and type a new name using the keyboard and press “**Enter**”. Contact SMIF staff if you need to permanently delete a recipe.
 - h. Pressing “**Create New Recipe**” will start a new blank recipe that must be named first, then edited, then saved.

Running in Automatic Mode

11. IMPORTANT: Once the recipe has been loaded and edited as needed press “**Download Recipe**” and insure the recipe name appears below the “Download

Recipe” button. This will download the edited recipe to the active location so the process can be run.

12. Press “**Automatic Single Process**”. This will pump down the chamber and run the recipe.
13. Verify that the RF tunes properly (having less than 5% reflected power) during the process. If it does not then the RF switches on the front of the tool may need to be manipulated. See SMIF staff for further explanation on this.
14. If a recipe needs to be stopped early, press “**Abort**”.
15. When the process completes the system will return to the main menu
16. Press “**Vent Reactor**”
17. Unload samples and repeat as needed.

Manual Process Control

18. Press “**Manual Process Control**”
19. Select the desired recipe step to run using the arrow buttons at the bottom of the screen
20. Set desired recipe parameters, noting that the process time is not used in manual mode
21. Press the “**Vacuum Closed**” button to toggle it to “**Vacuum Open**” (turns green)
22. Press the “**Press Iso Closed**” button to toggle it to “**Press Iso Open**” (turns green)
23. Once pumped down and ready to process, the “**Gases Off**” button will appear. Press it to toggle it to “**Gases On**” (turns green)
24. Allow the gasses and the pressure to stabilize at their setpoints.
25. Press the “**RF Off**” button to toggle it to “**RF On**” (turns green). This will start the process
26. The timer will count upwards to give you the process time, but it ignores the setpoint and will continue to run the process until manually stopped.
27. All parameters are editable while running in manual mode
28. Verify that the RF tunes properly (having less than 5% reflected power) during the process. If it does not then the RF switches on the front of the tool may need to be manipulated. See SMIF staff for further explanation on this.
29. When done press the “**RF On**” and “**Gases On**” buttons to toggle them off.
30. Press “**Exit**”
31. Press “**Vent Reactor**”
32. Unload samples and repeat as needed.

Shut Down

33. If processes have been run for a long period of time and the chamber is dirty (rainbows in the black regions or visible dirt in the chamber) then run the “**Clean**” recipe in automatic single process mode (10 minute clean) with no samples in the chamber
34. When everything is complete and the chamber lid is closed press “**Stand By Mode**” on the main menu to put the system back into idle pumped down Standby Mode
35. Fill out any remaining information or comments in the logbook.