

PlasmaTherm 790
Reactive Ion Etcher (RIE)
University of Notre Dame



Precautions

1 - System loadlock was added after the machine was fabricated. All software commands that 'pump' or 'vent' will perform that specific task on the chamber. The system has no idea that the loadlock has been added. Please keep this in mind when using the system. The loadlock is to be controlled using the small controller under the loadlock.

2 – The Puck should ALWAYS be in the system whenever RF plasma is turned ON. Failure to install the puck causes micro-arcing inside the chamber and damages the chamber body.

3 – When Finished with the system – please return the Loadlock control to the IDLE Position. The loadlock pump is not intended to run for long periods of time.

4 – All recipes should be “ENGINEERING” type and contain NetID on description line of the 'initial' recipe step.

Contacts

For problems, clarification of procedures, or general information pertaining to this machine please contact one of the following personnel.

Dave Heemstra
Mark Richmond

631-6733
631-6478

dheemstr@nd.edu
mrichmon@nd.edu

In Case of Emergency, Please Contact Notre Dame Security at

911

If any step does not respond as it should, stop and put the machine into standby if you can and contact help. If unsure on how to get to standby mode safely, leave the machine as it is and contact above personnel.

Loadlock Controls:

OPEN GATE: Will open the gate ONLY if these two conditions are satisfied:

- Loadlock pressure <190 mT
- Obstruction Sensor must be clear and open

CLOSE GATE: This will close the gate and isolate the loadlock from the chamber.

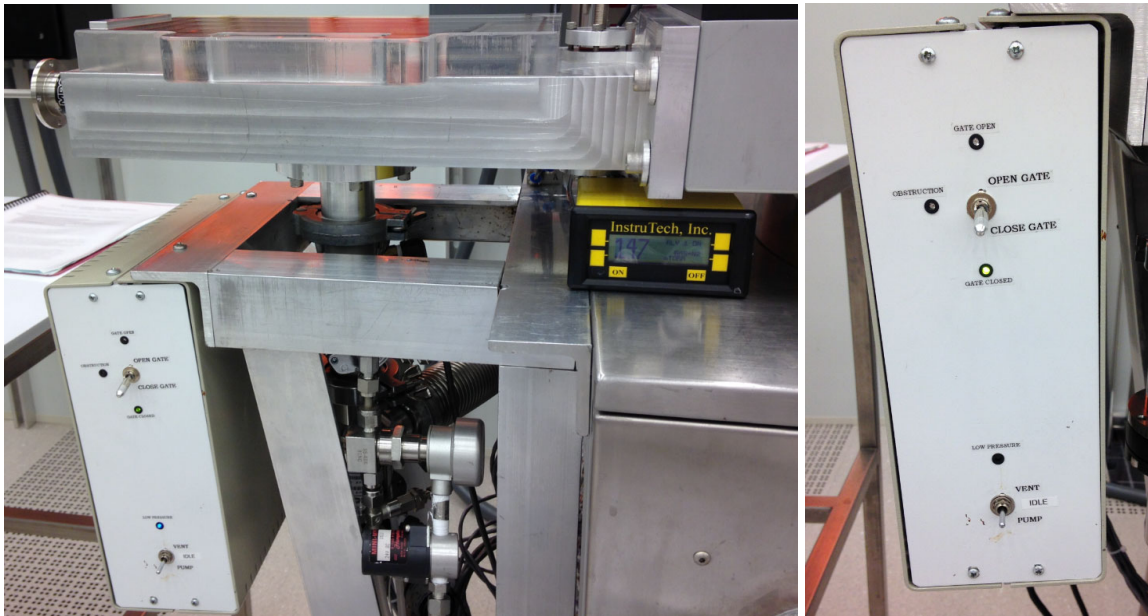
VENT: Will turn on the N₂ vent gas in the loadlock

IDLE: Neither the N₂ gas nor the pump are ON. When the system is not in use this is the default condition.

PUMP: Turns power to the pump ON – will allow the loadlock to pump down

OBSTRUCTION: Sensor that detects if an object is obstructing the gate valve entrance.

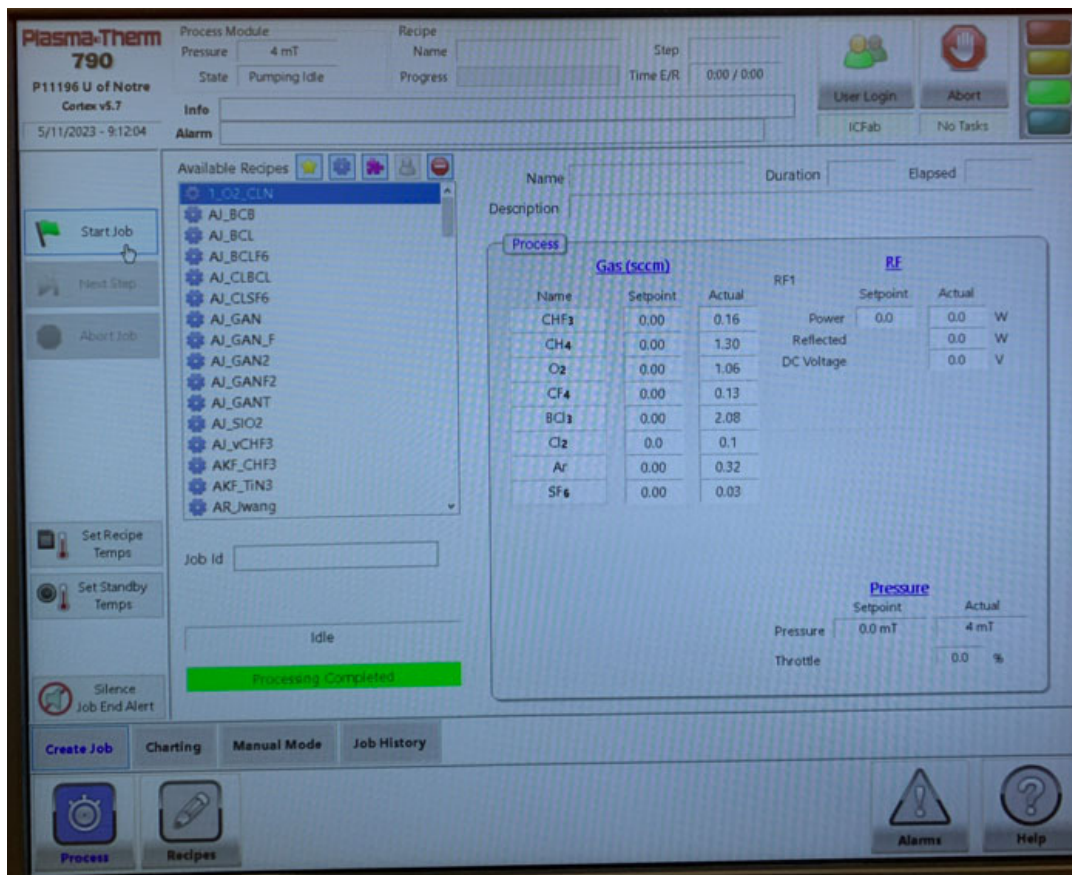
LOW PRESSURE: Relay will enable only when loadlock is < 190 mT as sensed by loadlock pressure gauge.



Operation Instructions:

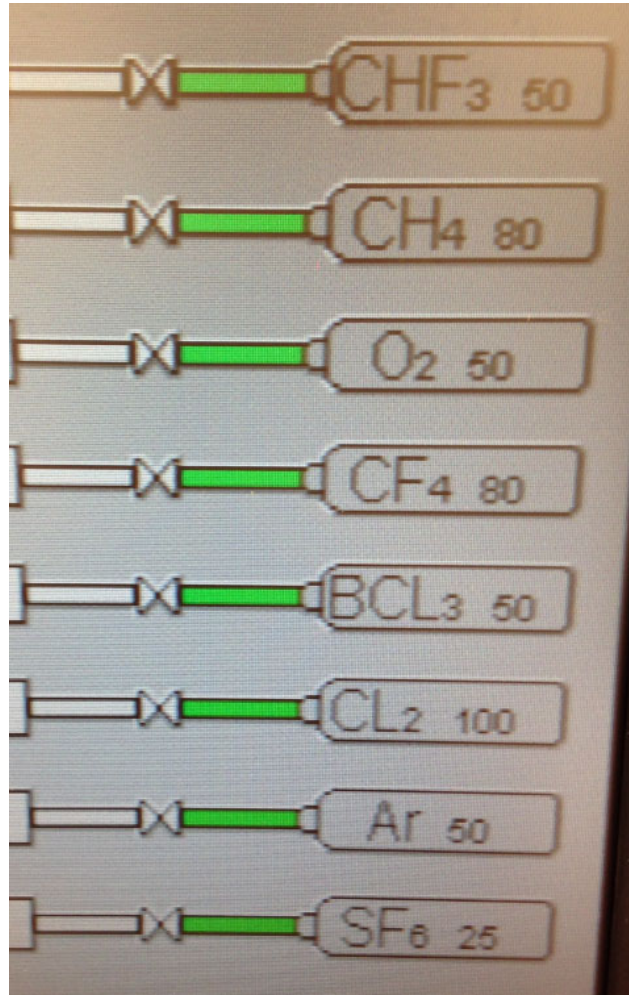
1. iLabs
 - a. Login and enable machine
2. Pump down Loadlock
 - a. Turn pump ON
 - b. Allow pressure to < 190 mT
3. Puck Installation
 - a. Open Gate Valve
 - b. Slide Puck into chamber
 - c. Unthread puck by turning counterclockwise
 - d. Remove rod from chamber
 - e. Close Gate Valve
4. O2 Clean – 5 min
 - a. “Process” Tab → “Create Job” Tab → Select Recipe → “Start Job”
 - b. Allow O2 clean to finish
5. Chamber Seasoning – 30 sec
 - a. Load Recipe to be processed – run 30 sec
6. Remove Puck
 - a. Verify Loadlock pressure is < 190 mT
 - b. Open Gate Valve
 - c. Insert Rod and Thread into puck by rotating clockwise
 - d. Remove puck from chamber
 - e. Close Gate Valve
7. Loadlock VENT
 - a. Allow system to vent to ATM
 - b. Turn OFF Vent valve
 - c. Open lid and gently set back
 - d. Verify loadlock oring is in place
8. Insert Sample onto Chuck
 - a. Max loading is Qty 2 – 4” wafers
9. Close Loadlock lid
10. Pump down loadlock
 - a. Switch loadlock controller to PUMP
 - b. Allow pressure to < 190 mT
11. Sample Insertion
 - a. Open Gate Valve
 - b. Slide puck into chamber
 - c. Unthread rod by turning counterclockwise
 - d. Remove rod from chamber
 - e. Close Gate Valve
12. Run Process on sample
 - a. Select Recipe → “Start Job”
 - b. Allow process to complete
13. Sample Removal
 - a. Verify Loadlock pressure is < 190 mT

- b. Open Gate Valve
 - c. Insert Rod and Thread into puck by rotating clockwise
 - d. Remove puck from chamber
 - e. Close Gate Valve
14. Loadlock VENT
- a. Allow system to vent to ATM
 - b. Turn OFF Vent valve
 - c. Open lid and gently set back
 - d. Verify loadlock oring is in place
15. Remove sample from Puck
16. Close Loadlock lid
17. Pump down loadlock
- a. Allow loadlock to get to <190 mT
18. Turn OFF PUMP
- a. Return pump to IDLE Position
19. Place system back into STANDBY
20. Disable iLab



Gas Box Configuration:

Gas 1 – Normally CHF_3 is also connected to Hydrogen (H_2). If users would like to use hydrogen during processing, please contact the lab staff to reconfigure the system and purge gas lines.



Access Levels and Logins:

ICFAB Access:

login: ICFab

Password: ICFab