

Tool Identifier	Thin Dry Oxide
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Documented by	Anjum Ahmed



People List

Role	Name	Email ID	Mobile no.
System Owner	Anjum	anjum@ee.iitb.ac.in	9920470606
Authorised User	Suresh	sureshch@iitb.ac.in	9930834073
Authorised User	Pradeep	pradeeprn@ee.iitb.ac.in	9920190630
Authorised User	Sandeep	sandeepm@ee.iitb.ac.in	9867634828
People authorised to handle gas cylinders	Pradeep Sandeep	pradeeprn@ee.iitb.ac.in sandeepm@ee.iitb.ac.in	

Training Procedure and Authorization:

1. Contact the system owner after getting permission from the respective Professor/lab supervisor.
2. Get through with the training notes to understand the system and participate in 3-4 process runs with the system owner or existing authorized user.
3. To get authorization s/he must do 2-3 process runs on her/his own in presence of system owner and also answer and demonstrate the questions asked by system owner through operation of the system.

Violation policy:

1. The authorized user must follow the clean room protocol.
 2. It is mandatory to follow the things mentioned in page 4 “THINGS MUST FOLLOW”.
 3. H/she should ensure smooth operation of the system during their use.
- If any authorized user found to violate any of above mentioned rules, her/his authorization will be cancelled and they will be required to go through the authorization process again.

THINGS MUST FOLLOW:

- **NEVER** touch boats or wafers with your hands even if you are wearing gloves. Use **ONLY** the appropriate boat holder. Boat Holder must be clean also.
- Use **ONLY** clean tweezers or vacuum wand dedicated for that tube. Clean these implements often using isopropyl alcohol, DI water and clean wipes.
- **ALWAYS** clean wafers using either piranha or RCA type clean right before loading them into the tube. Wafers must be clean and dry. Use spin rinse dryer whenever possible. Never load a contaminated wafer or boat into the tube as this will contaminate the tube as well.
 - Wafers and boats coming out of the tube are extremely hot. Do **NOT** set them on clean wipes, vinyl gloves or anything else which will melt. Set hot items on clean stainless steel bench or on dedicated quartz carrier.
- **ALWAYS** wear a face mask when loading and unloading your wafers into tube to minimize contamination from your breath.
- **ALWAYS** minimize the time that the boat and loader remains out of the furnace and makes sure the purge nitrogen is set to 5.0 liters or better to keep room air out of the tube.
- **ALWAYS** store dummy wafers in the tube which they are assigned. Dummy wafers not needed for a run, may be safely stored at the load station in a clean quartz carrier. Promptly return dummies back to the appropriate tube when your run is finished.

Specifications

- **Substrate:** Si only.
- **Substrate size:** 4" only.
- **Types of depositions:** Thin dry oxide
- **Pressure range :** Atmospheric pressure
- **Temperature range:** upto 1100oC
- **Gases presently connected to system:** O2
- **Mass Flow Controller (MFC) Limit/Range :**
O2: 5000 sccm

Operating Procedure

Things needed before entering the clean room

1. Switch On the mains.
2. Ensure that the heater switches in ON position.
3. Check for the GN2 pressure (from N2 plant). Minimum 5 bar pressure is required for smooth operation.
4. Check for the PN2 (5N purity) pressure (from cylinder). Minimum 4 bar pressure is required for smooth operation.
5. Check for the Oxygen gases. Ask PRADEEP or SANDEEP to open these gas valves. Minimum 2 bar pressure is required for smooth operation.
6. Ensure that the exhaust is ON. Contact PRADEEP or SANDEEP.

SWITCH ON Procedure after entering the clean room

7. Check the Log book for any remarks from the previous run. Contact system owner if any remarks have been written.
8. Press the GREEN push button switch located right to the touch screen.(If any alarm comes, the alarm page automatically displayed without login)
9. Click on LOGIN and enter the password by using the on-screen key board.
10. Press ENTER.
11. Click on “Thin dry oxide” button on the top tool bar. The OVERVIEW page is displayed.
12. Do not change the settings in the CONFIGURATION page. Contact system owner if it is required.

Editing the RECIPE

13. Go to RECIPE page by pressing the “RECIPE” button located on the bottom tool bar.
14. Press OPEN located at the top right corner for 2 seconds. A beep will be heard and some of the cells in the recipe page will be highlighted in green background.
15. Click on the cell to change its value. A small pop up key pad is displayed.
16. Enter the required value (within operational limits) and Press ENTER Press the cell once to change it into YES and vice-versa.
17. Set the BOAT CONTROL to IN in pre-standby step.
18. After editing all the cells press the SAVE button in the RECIPE page for 2 seconds.
19. Press OPEN once again to make the current recipe as active.

Boat-Out and Loading the wafers

20. After saving the recipe press OPERATION button located on the bottom tool bar.
21. Now press the BOAT-OUT button. It will take 2-3 minutes for complete boat out.
22. Load the Cleaned wafers in the required slots. Handle the wafers with care and do not touch the wafer boat and process tube interior with gloves.

Running the Recipe

23. Ensure that the recipe is saved after editing.
24. Press OVERVIEW button located at the bottom left corner.
25. Now press RUN on the top left located below the top tool bar and the RUN button starts blinking indicated that the process is started.
26. During process if any alarm comes refer Alarms page for corresponding action.

SHUTTING DOWN THE SYSTEM

1. Do not switch off the mains power directly from outside in any case (Power failure is exceptional).
2. Wait for the temperature of the three zones to ramp down up to 200oC.
3. Press SHUT DOWN located on the top right corner. A small pop up window with RUN and CLOSE buttons is displayed.
4. Press RUN (in the pop up window). The Shut down in the pop up window starts blinking.
5. After 2-3 minutes, the blinking stops.
6. Press the RED push button located to right of the touch screen.

Check List before Leaving the System

1. Make entry in the log book.
2. Let PN2 gas be flowing during ramp down.

Alarms

1. Tube 2 No Air flow detected
Indication: ORANGE indicator flashes.
Reason: GN2 pressure from N2 plant is less than 4 bar.
Action: Increase the GN2 pressure
2. Tube 2 No Gas flow is detected
Indication: ORANGE indicator flashes.
Reason: O2 pressure is low.
Action: Increase the pressure.

These are the generally observed alarms during process run. If you observe any alarm other than those described above please contact the system owner.