IIT Bombay Nanofabrication Facility

Tool Name: Rapid Thermal Processor (Annealsys AS-ONE)

Training and Usage Policy

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Equipment Category: **Semi Clean B**

Gases available: Ar, O_2, N_2, FGA, N_2O

Mass Flow Controller (MFC) Limit/Range: 2000 sccm

Materials allowed:

1.   **Only Si, Ge, and Diamond substrates are allowed.**
2.   **Allowed oxides**
     a.   **SiO_2, Gd_2O_3, ZrO_2, HfO_2, HZO, Al_2O_3**
3.   **Samples with metals are not allowed.**
4.   **Samples with photoresist are not allowed.**

Materials not allowed:

1.   Processing of Si wafers having back-side metal deposition.
2.   Metals and metal oxides are not allowed. Approval is required from FIC to process the wafers with metals and metal oxides.
3.   Organic material is not allowed.
4.   Wafer with traces of Photoresist.
5.   Other than Si, Ge and Diamond samples, please contact the system owners if you have any confusion.
6.   Samples with Au/Cu are not allowed. Samples processed in the GC tools are not allowed. In case of usage, Approval is required from process team and FIC.

CALIBRATION TABLES To be used (please do also note them on the latest log-book to verify):
1. Thermocouple calibration table:
2. For 4" Si wafer:
3. PID table for Si (PYRO1):

Note: Above will update according to the calibration. Please contact SO in case of any confusion.

Limitations:

1. Maximum allowed temperature for Pyro 1 is up to 1400°C. Bring own carrier wafer for the high-temperature (>1000 C) process.
2. Higher temperature process should not be run for a long time. (e.g., 60 s up to 900°C and 901 - 1400°C for 30 s). Maximum allowed time is **10 min**. For process requiring more than 10 min of time approval must be taken from SO, Process team and FIC.
3. The power percentage should be kept **maximum to 12%.**
4. The user must wait for **15 min after each process run for chamber opening** (this allows the Pyro1 to cool down to nominal temperature).
5. There should be a minimum **20 min gap between two process runs**.

Training Policy for RTP (Group IV):

Policy: Training is open for all CEN users.
Shadow training: To do a process or be with another user and go through the operating procedure if the user hasn't used the system for more than three months **(60 days)**.
Allowed break: **90 days**, after which you will have to give a re-authorization test.

Training Procedure:

For students/staff from the electrical Department:

1. User must register on Slot booking module, and (s)he has to send Training Request under Equipment usage form on slot booking module.
2. Minimum watching three runs performed by an authorized user.
3. If the trainee is confident, then (s)he has to do two runs in the presence of an SO or Operator. One independent run, including making a new process recipe from the beginning in the presence of SO.

For students/staff from other Departments:

1. E-mail from the respective guide to the FIC, Process team, Lab manager, who will subsequently send it to SO for training.

Rest everything is the same as in the above one.

Violations:

1. Ramp rate for Si processes could max be used as **60°C/s**.
2. Maximum temperature of annealing for Si should not exceed 1400°C.
3. Not entering in the log book after a process run.
4. Using samples with metals and photoresist.
5. Not cleaning the chamber before and after processing with IPA.
6. Higher temperature process should not be run for a long time. (e.g., 60 s up to 900°C and 901 - 1400°C for 30 s). Maximum allowed time is **10 min**.

Violation Policy:

1. System mishandling would lead to DAC and re-authorization by undergoing the training procedure again.
2. Standard sample mishandling and using non-allowed materials would lead to debarring from using the system. DAC, FIC and Process team will take the action.