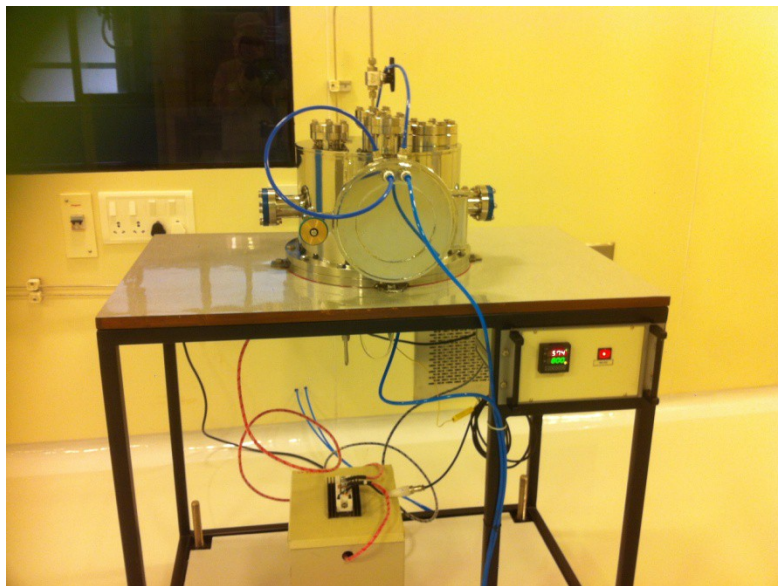


Graphene specific Argon annealing system

Process : Annealing of graphene samples

Documented on 24th June 2015

Equipment name	Argon annealing system
Samples acceptable	SiO ₂ /Si, and graphene related
Category	Clean room
System owner	Trupti Warang
Short name	Argon annealing system
Make	In house built
Foot print	1 m x 1 m
Equipment type	Deposition, Growth and Annealing systems
Location	CEN 1.2 Lab
Local dealer	Excel Instruments
Tool Facilities Requirements	Argon gas, Water connection
Lab phone no	4488
Substrate allowed	SiO ₂ /Si
Substrate Dimension	Pieces to 4 inch wafer
Gases allowed	Argon
Contamination remarks	Gold contaminated
Temperature range	100 ≥ C to 800 ≥ C



SOP :

SYSTEM INFORMATION

Graphene specific Argon annealing system

PROCESS CONTAMINATION CLEARANCE PROCEDURE

- For using the argon annealing system a process clearance is mandatory. The detailed description of your sample mentioning the materials in the sample should be mailed to the system owner.
- Professor Incharge for Contamination clearance – Prof. Anil Kottantharayil.

System owner

Email: truptiw@ee.iitb.ac.in

Authorised users:

Training

For training please contact system owner.

LOG BOOK:

Separate log book has been maintained please make an entry in the log book.

STANDARD OPERATING PROCEDURE

EQUIPMENT SPECIFICATIONS-

Graphene specific Argon annealing system

1. Naturally cooled, cold wall type furnace.
2. Available gases: Argon.
3. Ability to process up to 4" wafer (one wafer at a time), more than one sample if small pieces of samples.
4. Max Temp: $800 \geq C$.
5. Process Chamber dimensions

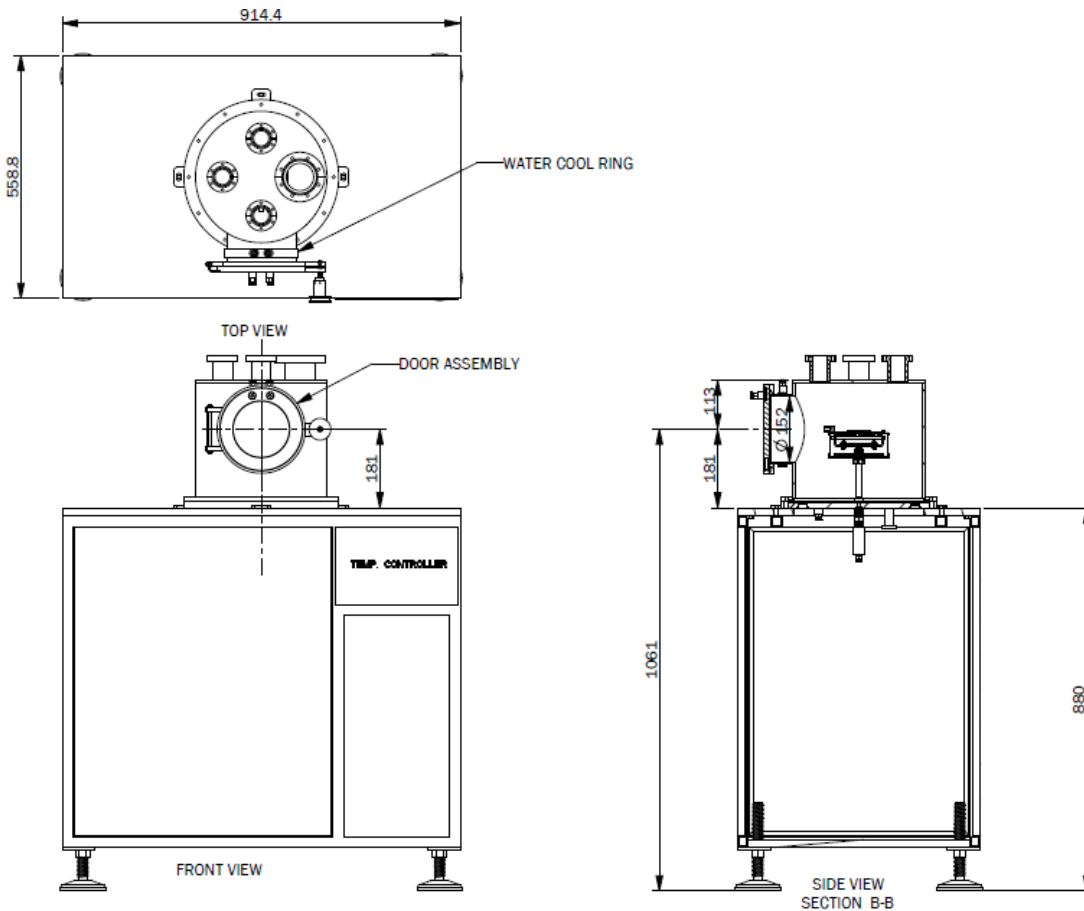


Figure 2: Schematic layout of Argon annealing system with dimensions

Start Up

1. **Manually open the door of argon annealing chamber, load your wafer–(4" wafer : one wafer at a time, more than one sample if small pieces of samples)**
2. **First open the Argon cylinder at the CEN 1.2 service corridor, set the linepressure to 2 bar to 4 bar**
3. **The gas flowing into the chamber can be controlled by flow meters present near theArgon annealing system.**
4. **Switch on the chillers (mostly on 24*7).**
5. **Start the water cooling WATER IN line and WATER OUT line located at the Service corridor of CEN 1.1 lab corresponding to argon annealing system.**

6. **The gas flowing into the chamber can be controlled by flow meters present near the Argon annealing system. After entering clean room, start the flow meter and set it at 0.8 slm. Open the gas inlet valve and gas outlet valves connected to argon annealing system chamber.**
7. **Switch on the MAIN power switch of the system**
8. **Switch ON the temperature controller switch located at the table of argon annealing system.**
9. **Set the temperature controller programme for the required annealing temperature and annealing time. (NOTE: Do not set the temperature above $800 \geq C$)**
10. **After the complete process run of annealing, temperature will be ramped down as per natural cooling.**
11. **When the temperature is below $100 \geq C$, switch off the argon gas supply from cylinder end. Close the flow meter. Close the gas inlet valve and gas outlet valve.**
12. **Close the water cooling WATER IN line and WATER OUT line located at the Service corridor of CEN 1.1 lab corresponding to argon annealing system.**