Introduction

ALD system capable of depositing a wide range of dielectric materials for conformal coverage over flat and patterned substrates.
Note: These instructions are intended for reference only, and will not replace the thorough training required for proper system operation.

Features and Specifications

Substrate up to 4”
Substrate heating to 300°C for thermal ALD
Pulsed precursor delivery
ALD of dielectrics films
Conformal film growth

Safety and Precautions

- Precursors can be pyrophoric, corrosive, or flammable
- The chamber lid and the walls are HOT! Do not place any flammable materials on or near the ALD machine. Keep the heat shield on chamber at all times.
- The chamber lid cannot be lifted (sticky) if the chamber is cold. The temperature of the chamber outer heater should be set to at least 120°C before opening.
- Following materials are not allowed: Polymers, wet samples, anything with melting points/ignition points below 250°C, plastics including Teflon, non-encapsulated particles
- Sample loading/unloading is done at 120°C. Run IdleSystem recipe for that.
- Remove protective cover from the chamber only for loading and unloading of the samples.
Operating Procedure

Software must ALWAYS be running. DO NOT attempt to close it.
DO NOT EDIT recipe except # of cycles (limit 400 cycles).
Sign in to NUcore to activate the system.

1. Make sure that the initial condition of the system is: The system is pumped down.
   Idle_System Recipe is running.

2. To load your sample, click the ‘VENT’ button and wait ~30 seconds.

3. Do not force the chamber lid open. Lift the handle of the lid gently to see if the lid comes up.
   If it does, the chamber is done venting and you may open it.

4. Load your sample into the middle of the chuck and close the lid. Align the lid very well and
   while holding it in position, click the ‘PUMP’ button.

5. Select the recipe you want to run from related recipe folders, and click ‘OK’. Change the
   number of cycles needed (limit 400). Do not save recipe.

6. Click the ‘START’ button to start the process. The ‘START’ button will turn into an ‘ABORT’
   button.

7. Wait until the process is done. ‘Time Left’ becomes 0 and the ‘ABORT’ button turns back into
   a ‘START’ button.

8. Select and run the Idle_System recipe as soon as your deposition process is done in order to
   bring the chamber heater temperatures to 120°C and N₂ flow to Idle condition. Wait until
   chamber cools down to 120°C.
9. When chamber is at 120°C, click the ‘VENT’ button and wait ~30 seconds.

10. Lift the handle of the lid gently to see if the lid comes up. If it does, the chamber is done venting and you may open it and retrieve your sample.

11. Close the lid immediately after you are done removing your sample, align it and click ‘PUMP’.

12. Leave the system pumping. Do not close the software!

13. Select and run the Idle_System recipe at the end.
Ozone Generator Operating Instructions

The system is equipped with ozone generator. Most of the recipes work with H\textsubscript{2}O vapor as oxygen source. Ozone is preferred for some processes if higher reactivity is required. If you plan to use ozone generator, please contact staff prior to use. After your process is approved by staff, follow the procedure below to start/stop the generator.

1. Turn the power switch of Ozone generator to ON position.
2. Open O\textsubscript{2} supply to the generator.
3. Check that oxygen pressure on the gauge of the generator is $\sim$6 psi.
4. Check the flow of Oxygen is $\leq$ 0.4 liter/min.
5. Slowly increase the ozone output
6. After ensuring all parameters above, you can proceed with your deposition.
7. After the deposition, reduce the ozone output to 0
8. Close O\textsubscript{2} supply to the generator
9. Turn the power switch of the ozone generator to OFF position.