Operating Instructions P-ALD

Starting Up

- Log in to the computer of the gas monitoring system in the Processing Lab W 2.05 and enable P-ALD and gas you want to use. Ar needs to be turn on by default
- Go to MANUAL (page 2) and set the chamber temperature TE1 and TE2 according to your need. TE2 is the process temperature while TE1 is heater temperature (TE1 should be 200C more than TE2). If you need heated source, set the temperature of that as well
- If using NH3 process, go to MANUAL and open valve 621.

Loading Sample

- In the P-ALD software, click on DEPOSIT and press OPEN LID. If this button is grayed, go to ACTIONS (page 1) and press OPEN LID button at the top. Go back to DEPOSIT menu.
- Click on HANDYMAN to enter into loading/unloading page
- Vent the load-lock by rotating the pump/vent knob to right and wait till the pressure reaches 1000 hPa as seen at the top of the page
- Open the lid and place your sample
- Slowly rotate the pump/vent knob to left to start evacuating the load-lock
- Once the load-lock is pumped (less than 10 hPa), you are ready to transfer the sample.
- Rotate the pump/vent knob to neutral position (vertical)
- Press LOAD WAFER and the gate valve will be opened
- Wait 5 seconds and manually insert the arm inside the chamber
- Press PICK WAFER and wait 5 seconds
- Remove the arm fully and press CLOSE GATE
- Go to DEPOSIT/ACTIONS page and press CLOSE LID

Editing RECIPE

- Click on **RECIPE** to enter the recipe menu.
- Click on SELECT button in the Recipe control section and select the recipe you want to use.
- Click LOAD to load the recipe in the software.
- There are six pages in the recipe:
    1. Set the deposition temperature and end temperature equal. Set the N2 flow of the line you are using to 150 sccm and water to 125 sccm.
    2. Select the deposition sources in lines 3 and 4 and set the required number of cycles
    3. Set the temperatures of lines A1 and B1 as below from Pi-Chart:

A1		B1	
Source Bottle	TE110	Source Bottle	TE210
End temp.	TE110	End temp.	TE210
Neck trace heater	TE122	Neck trace heater	TE222
End temp.	TE122	End temp.	TE222

4. Set the pulse and purge time
5. Is only for high-aspect-ratio-structure. Disable V6 if you are not using this feature
6. Is only for lines A1 and B1 (heated sources). Set the line you want to deposit as Master and the other as Slave. Set the boosting times.

Depositing Layer
- Open the Manual Valve of the precursor
- Go to **DEPOSIT** page and press START to run the recipe.

Unloading Sample & Standby
- After the deposition is completed, **M** button will blink thereby reminding to close the manual source valve.
- Press the OPEN LID button and go to HANDYMAN
- Press UNLOAD WAFER and the gate valve will be opened
- Wait 5 seconds and insert the arm
- Press UNPICK WAFER and wait 5 seconds
- Remove the arm all the way out
- Press CLOSE GATE and RESET SEQUENCE
- Press CLOSE LID button if that is your last process
- Vent the load-lock by turning the pump/vent knob to right
- Unload the sample after the load-lock is at atmosphere (1000 hPa)
- Pump the load-lock by turning the pump/vent knob to left until the pressure is less than 20 hPa
- Rotate the pump/vent knob to neutral position (vertical)

Shutting Down

- Log out of the gas monitoring system