# NEOCERA Chamber Standard Operating Procedure (SOP)

## Loading/Unloading

1. Set $N_2$ pressure to about 10kPa
2. Press ↓ on cold cathode controller to turn off gauge
3. Close gate valve
4. Flip **Pump** switch to turn off RP and TMP
5. Open black valve on $N_2$ line (near regulator)

a Open process gas valve on back side of the chamber

6. Loosen nuts on port
7. Wait for TMP to reach ~500Hz. Solenoid valve will open (should be able to hear) to vent TMP.
8. Open **Vent** valve

   a Note: The pressure needs to be at atmosphere within two minutes.
9. Close the black valve, the **Vent** valve, and the process gas valve once atmosphere is reached

10. Disconnect power and thermocouple cables and remove heater column

    a Make sure to cover opening with white plastic cover once heater column is removed
11. Load clean substrate onto sample holder by tightening clips over top the substrate.

## Pumping Down

1. Insert heater column and secure with nuts
2. Make sure **Process Gas** and **Course** valves are closed

   a Open **Process Gas** only, if you're going to grow in process gas
3. Open gate valve
4. Flip **Pump** switch and wait for pressure to drop to ~1 mTorr
5. Press ↑ on cold cathode gauge controller
6. Wait ~30 minutes to reach $10^{-6}$ Torr

## Deposition

1. Move middle mirror in optics tower to zero.
2. Open **Control Target Motors** window in the Neocera PLD program.
3. Use single laser pulses to figure out where to position the turret
4. Use both rotation and rastering (generally target position +- 5-10 degrees)
5. Turn on process gas flow if you're using one.
   a. Allow to flush for at least 5 minutes
6. Turn on the power to the temperature controller and the heater. Set to desired substrate temperature and set ramp rate in Neocera PLD program.
   a. Don't exceed 10C/min
   b. Ramp up and ramp down can be programmed by the computer
8. After finished depositing, turn off raster and rotation.
9. Shut off process gas if needed.

## Process Gas

1. Make sure **Process Gas** valve is open before you start pumping down. Gas cylinder should be closed.
2. Pump down the chamber.
3. Turn switches on MFC to **On** and **Flow**
4. Adjust flow rate to get desired pressure
   a. If going above 10 mTorr, almost close the gate valve.