Morning Start Procedure to Open the Cleanroom Lab.

Sign up the CEM Cleanroom key from Security at the entrance of building 114. This key will open and close access doors to the Cleanroom (1220A PDMS room) and Cleanroom Service Area (1236) as well as the door to the Gowning area and the Main Cleanroom (1220). Once the lab doors are unlocked key should be left on top of the blue cabinet in the Cleanroom service area to be returned back to Security after locking the laboratory at the end of the super-user working day.

Note: the door to the gowning area is normally left unlocked, but can be locked if needed (e.g. to give someone access to the PDMS room but not the microfabrication area).

Cleanroom Ancillaries (Cleanroom Svce. Area, Rm. 114-1236)

Nitrogen Gas. Pharmaceutical grade low moisture 99.9999%

Nitrogen gas is used in the cleanroom to activate pneumatic valves in the processing equipment and during various steps in the process of wafer microfabrication. Though Nitrogen is safe to use, the major hazard will be in the handling of the high pressure gas (2500 psi) and by poorly done connections. N2 pressure also can lift cut skin from a person by compression/expansion. Note there are about 27,000 liters of N2 per tank.

The Cleanroom has 2 Nitrogen banks, 3 tanks per bank. We open one tank a day in the morning and close it at the end of the day; since our Nitrogen supply is very limited, an effort to save nitrogen is a priority for us.

Valve’s opening.

- Open tank main valve labeled as “in use” very slowly to avoid regulator blasting of the gas gauges. (Tank in use could also be labeled as “Partial”).

- Open “by-pass” valve in the purge manifold. These valves are delicate/expensive and must be open/closed with the fingers rather than with the wrist. **Note:** This valve remains open until the N2 supply is depleted to a 100 PSI in the gas cylinder at which the valve is closed to change to a new tank.

- If you have to change to a new gas cylinder in the N2 bank. Close valve in the used gas cylinder, close the “by-pass” valve in the purge manifold of the depleted gas cylinder and…

- Open gas cylinder valve in the new gas tank very slowly and proceed to open the “by-pass” valve in the new tank very slowly. **Note:** Both valves are going to be hard to open due to the extreme high pressure in the tank. Also do not open valves up to the end of the valve’s stem.

- Remove the “Full” tag to “Partial” tag in the new gas cylinder and proceed to remove the “partial” tag to “Empty” tag in the empty gas cylinder.
• Transfer “In Use” tag from the empty gas cylinder to the new gas cylinder.

• **Note:** Super Cleanroom lab user must be trained in the changing of the gas cylinder.

**Oxygen Gas:** (Semiconductor Grade 4-9’s or 99.99%)

**Fire and Safety Hazard:**

Oxygen gas is used as a process gas in the O₂ Plasma Systems as well as in the Sputtering System. It is supplied through polished 316 stainless steel lines and is regulated at only 10-15 psi at the O₂ gas manifold and delivered to the gas manifold from a full gas cylinder at a descending pressure of 2300-200 psi. Gas regulation at the tool is set according to equipments specs, around 5 psi. Regulation has been set by the Bio-MEMS staff and must not be changed by anyone.

**O₂ Valve’s opening.**

• Slowly open the O₂ gas cylinder and close it back again (two turns).

• Slowly open needle valve in the O₂ manifold (2 turns, you may hear a faint sound). Close needle valve but do not close it hard or over torque. Use fingers only – no wrist!

• Repeat above steps two more times. On the last step…..

• Leave valve in the O₂ gas cylinder 2 turns open. Open needle valve (two turns) and slowly open 90° supply valve.

**Nitrogen and City water,**

Nitrogen and City water valves for the Acid and Solvent fume-hoods inside the cleanroom is usually open upon request and should not be part of the standard start-up of the laboratory. The solvent fume-hood does not have the need for gas and city water since all SU-8 developing process is done with solvents and Nitrogen for the N₂ blow-gun is independent of the services provided to the fume-hood.

If you need to use the Acid fume-hood processing station you have to have the Nitrogen/City water services “on”, since all processing in the station are water based.

**Solvents Fume-Hood**

• Open “Cold Water” valve (yellow color) for the Solvent fume-hood. Valve is located across blue color chem. cabinet.

• Open N₂ valve (green color) located on the wall, below the cold water valve.

**Acids Fume-Hood**
• Open “Cold Water” valve (yellow color) for the Acids fume-hood. Valve is located on the left side of the pass-thru.

• Open N₂ valve (green color) located on the wall, below the cold water valve. Note that the N₂ valve for the solvent hood must also be open in order for N₂ to reach the acid hood.

• **Cleanroom Environmental Control.**

The Cleanroom should be maintained at a constant temp of 68°F and an RH between 35%-45% as read on the Cleanroom Environmental Control unit, HVAC system. No changes of any kind can be entered without the consent of the staff Cleanroom Staff but, please let the staff know of any unusual event in the working of the laboratory

• Check the HVAC Control unit Check hand-held Humidity/Temperature control monitor located on the wall across the HVAC Control unit.

• Press/release “set Temp” in the HVAC Control unit. The set temp and the actual temp appear in the display.

• Press/release “set Humidity” in the HVAC Control unit. The set humidity and the actual appear in the display.