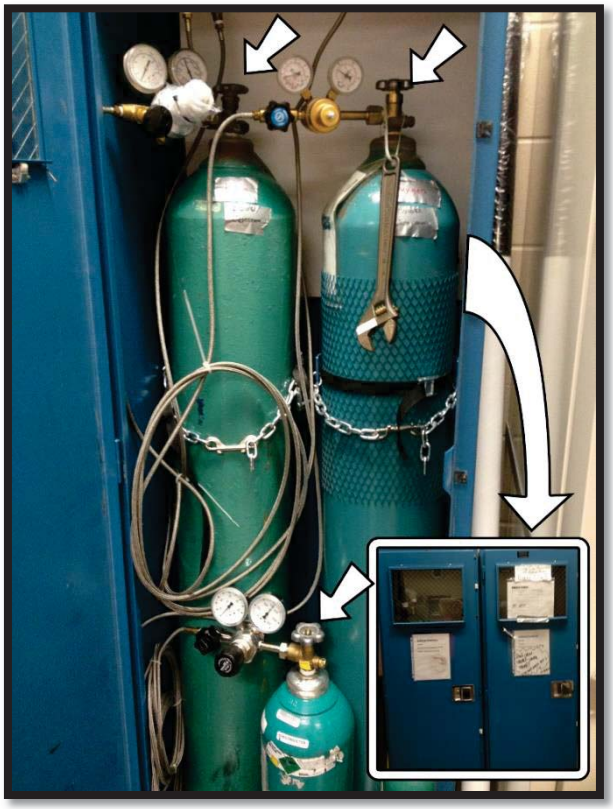
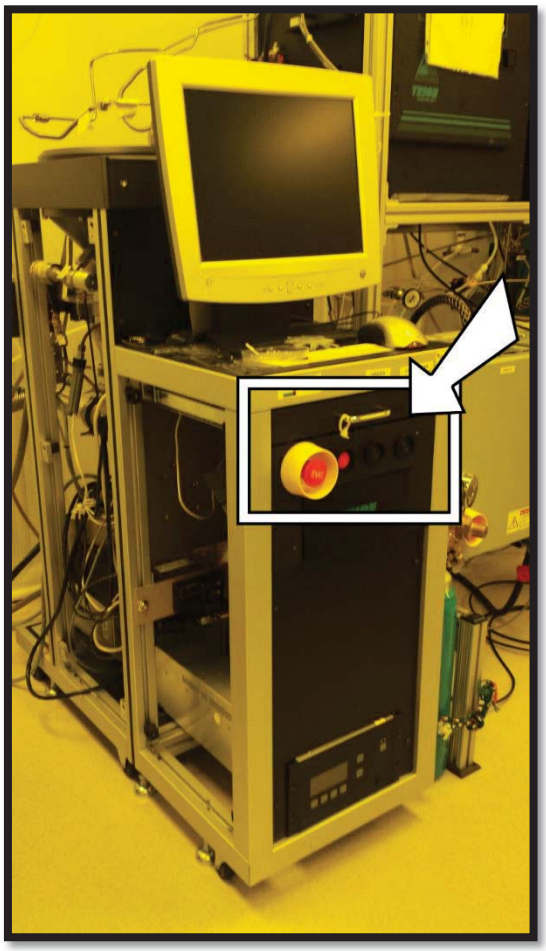
Trion PECVD SOP

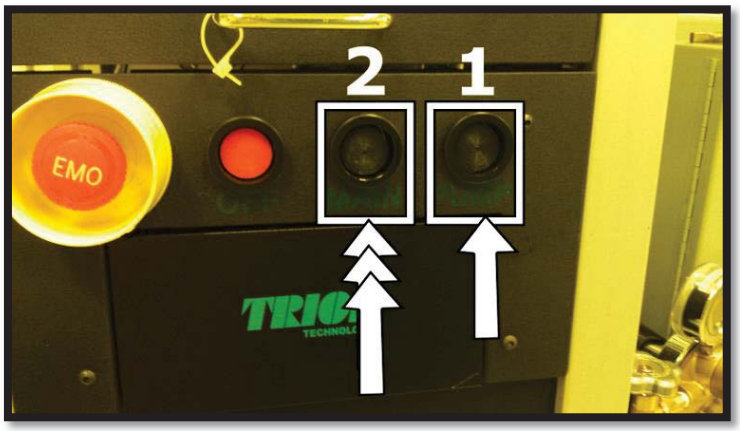
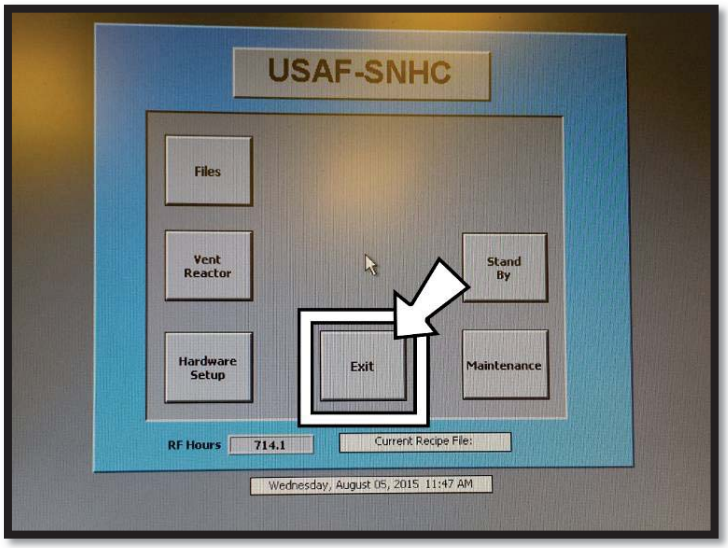
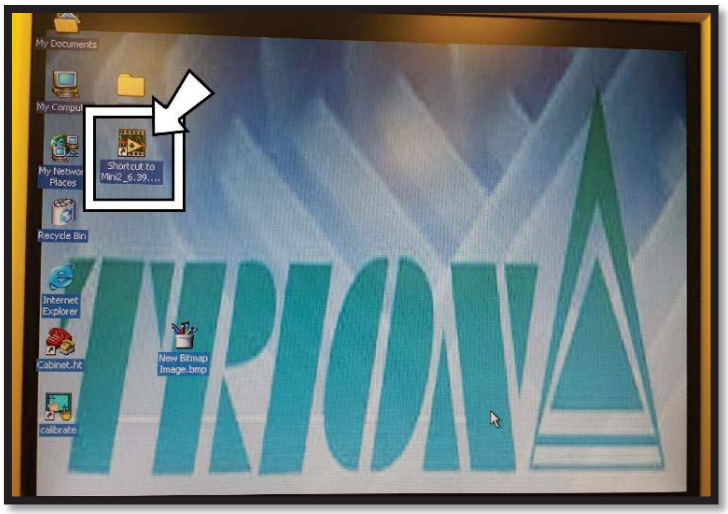
IMPORTANT: NO PLASTIC, TAPE, RESISTS, OR THERMAL PASTE ARE ALLOWED IN THE CHAMBER

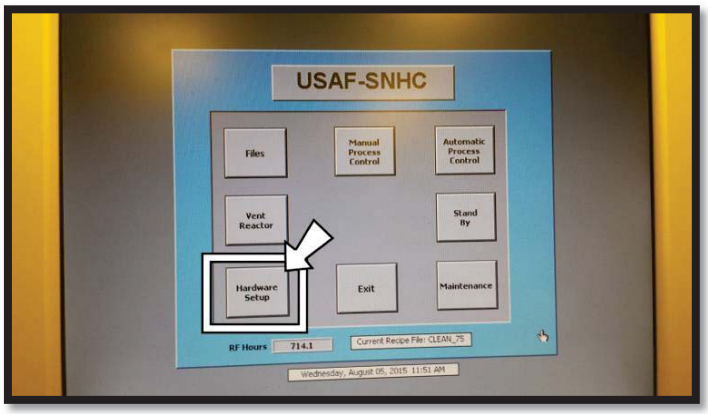
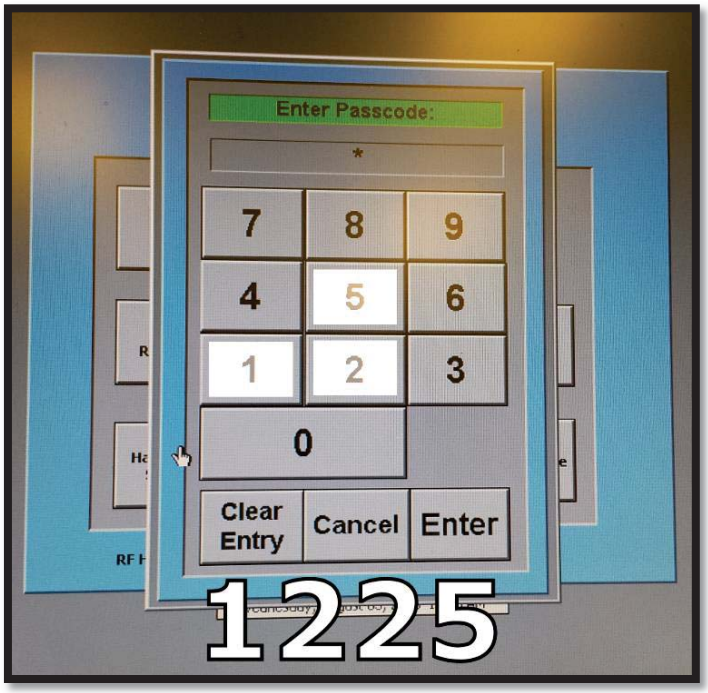
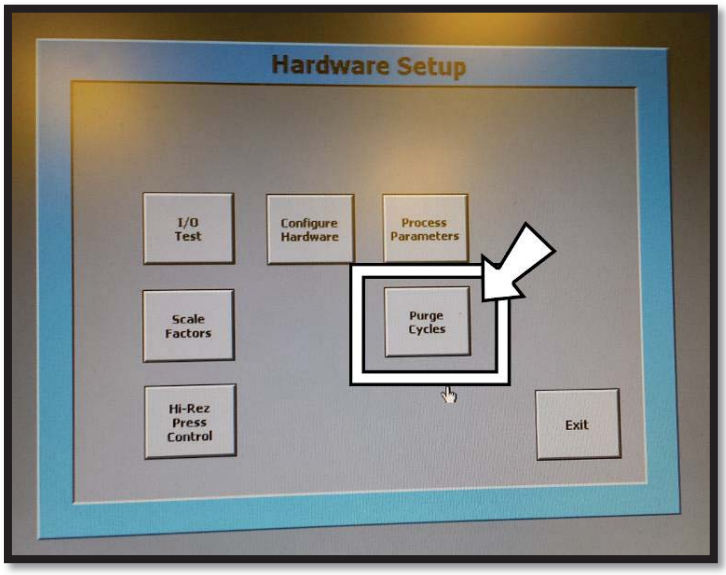
CAUTION: THE CHAMBER PLATE GETS EXTREMELY HOT

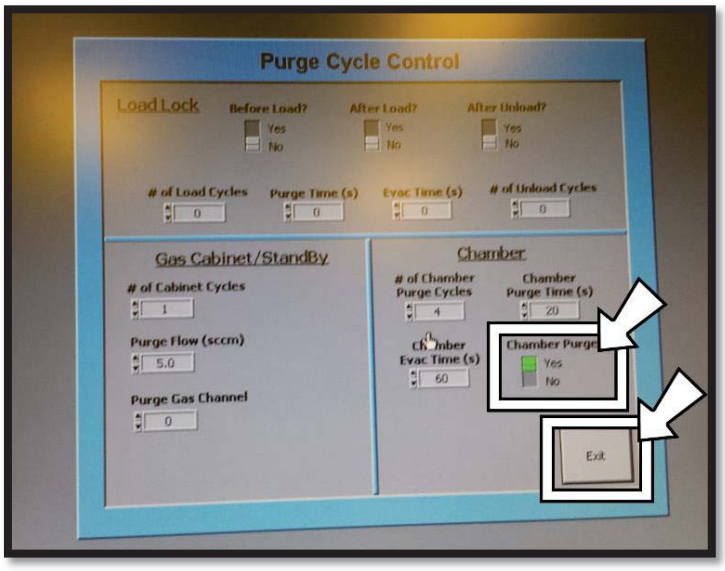
Start Up Procedure

1) Open bottle and regulator for Helium, CF4 and O2 in room 440. Helium needs to be on at all times when using PECVD, CF4 and O2 are for clean runs **NOTE**: Make sure to sign in on gas cabinet door for what gases are being used	
2) Open all other desired process gases	

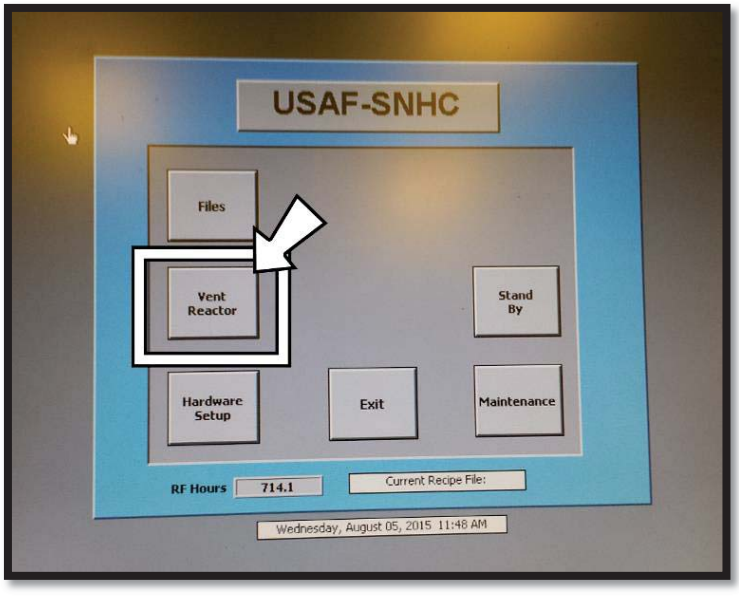
3) Release the EMO button	 

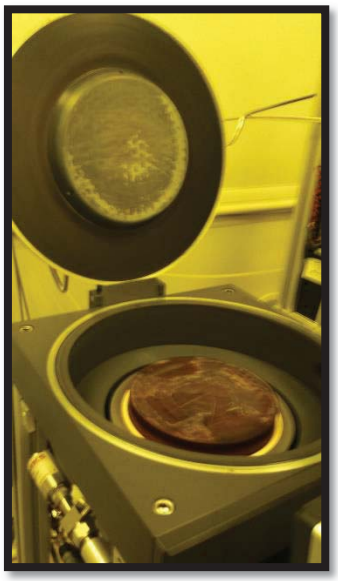
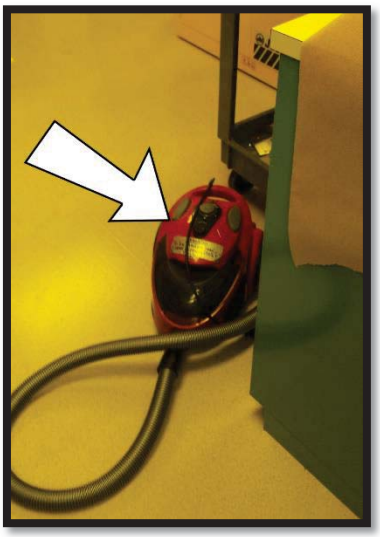
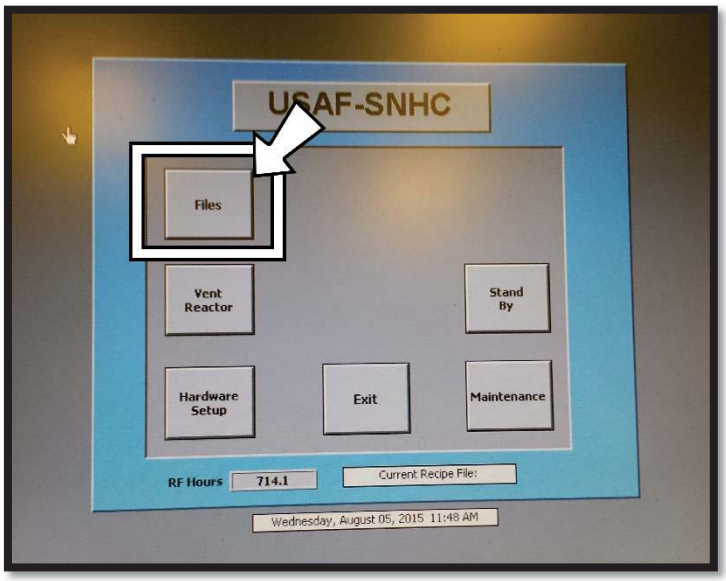
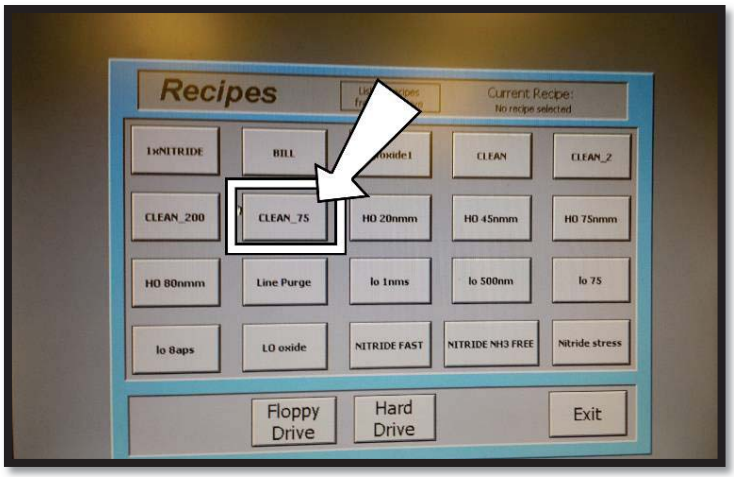
4) Press the PUMP button(1) and then the MAIN button(2), the main button may need to be pushed 2-3 times, you will know it worked when the computer turns on	
5) Exit the program that opens when the computer starts up	
6) Open Mini2_6.39.6i.exe, which is located on the desktop	

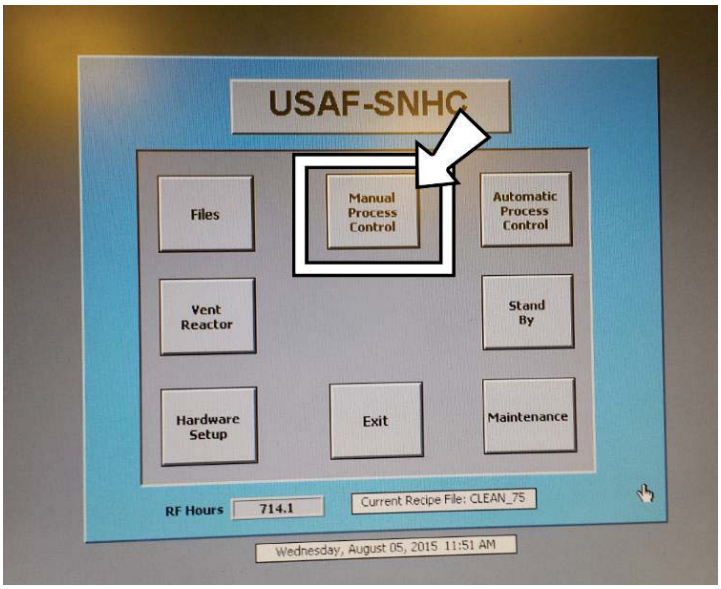
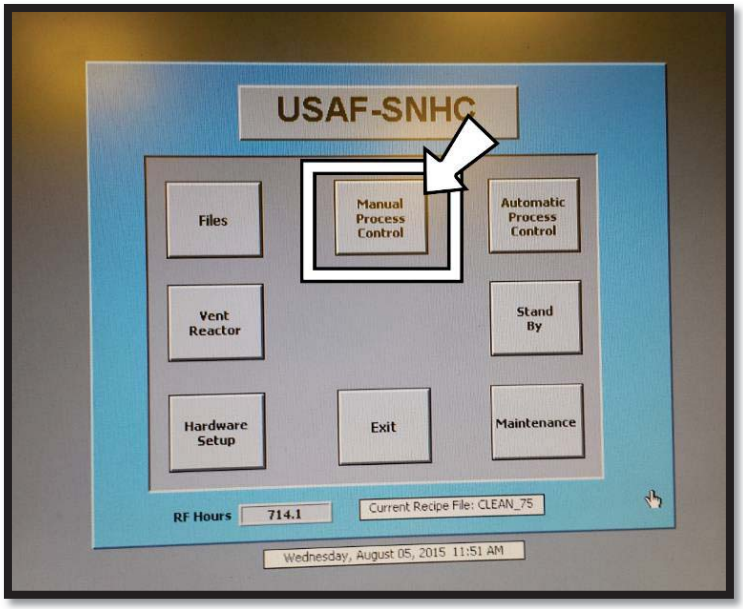
7) Click on hardware setup (**password=1225**)	 
8) Click on Purge Cycles	

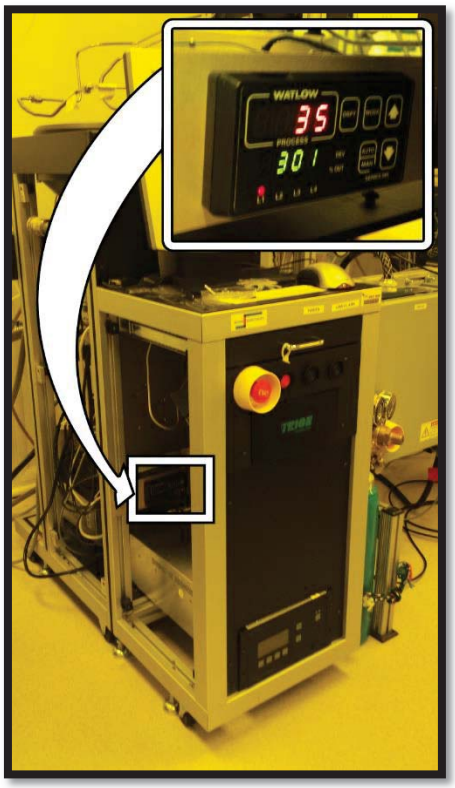
9) Switch chamber purge to “No” (square should be gray NOT GREEN). Exit Purge Cycle Control and exit Hardware Setup	

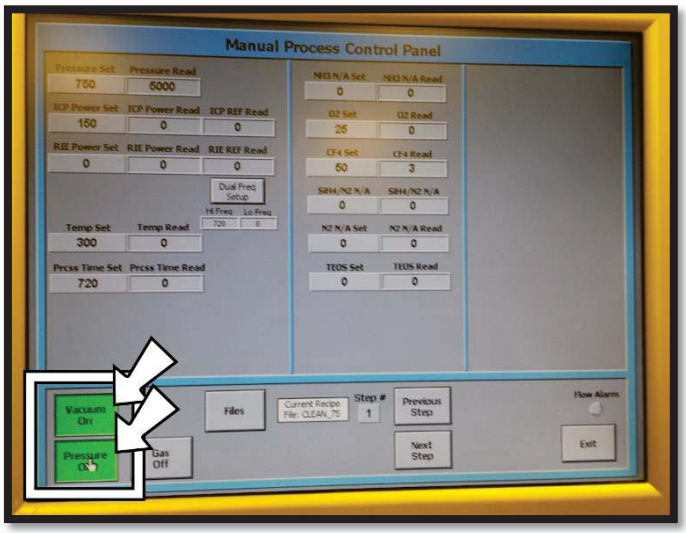
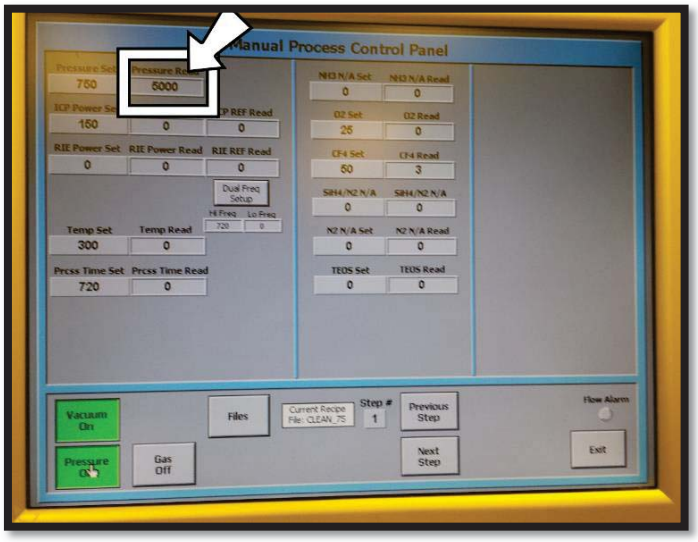
DRY CLEAN RUN PROCEDURE (MUST DO BEFORE AND AFTER EVERY USE)

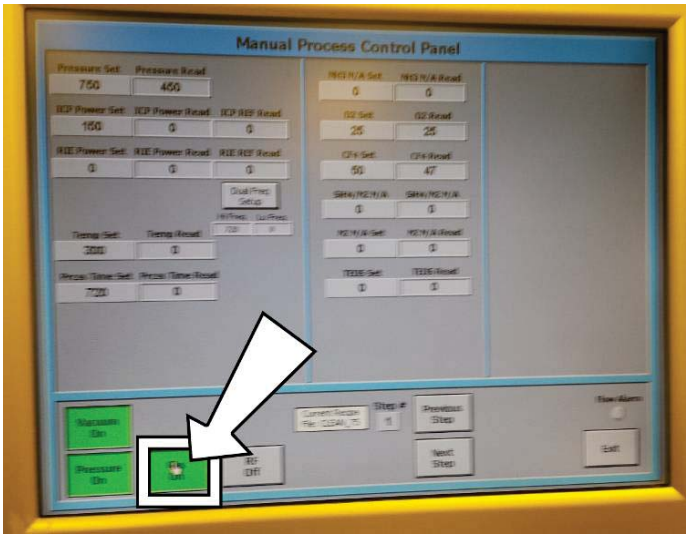
1) Click “Vent reactor”	

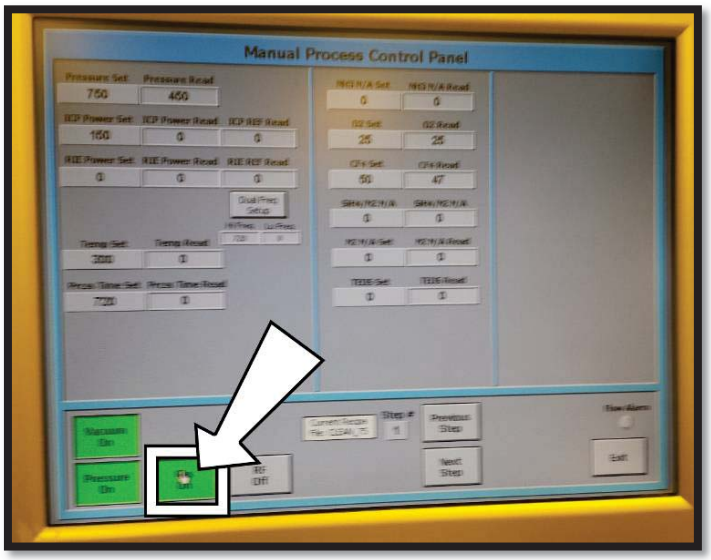
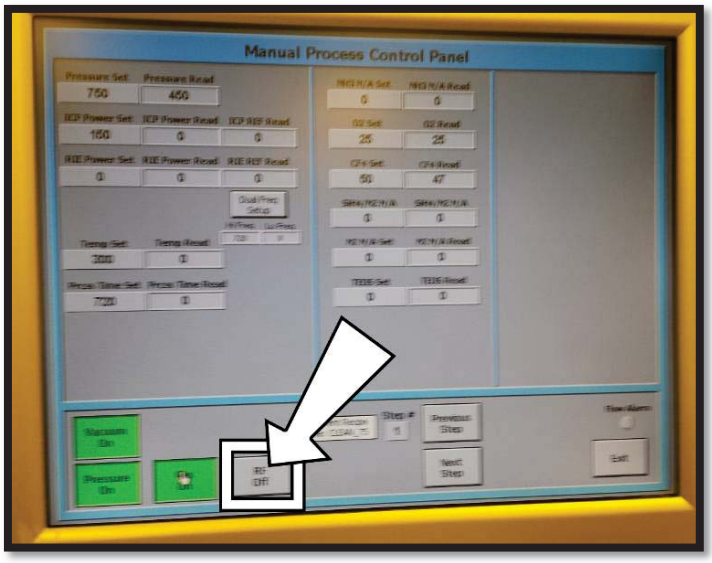
2) Once chamber is vented, open it and check the cleanliness of it **NOTE**: If the chamber is dirty you should do a vacuum clean on the chamber (make sure the plate is not hot before performing this clean)	 
3) Click on "Files"	
4) Select the recipe "Clean_75" then Exit	

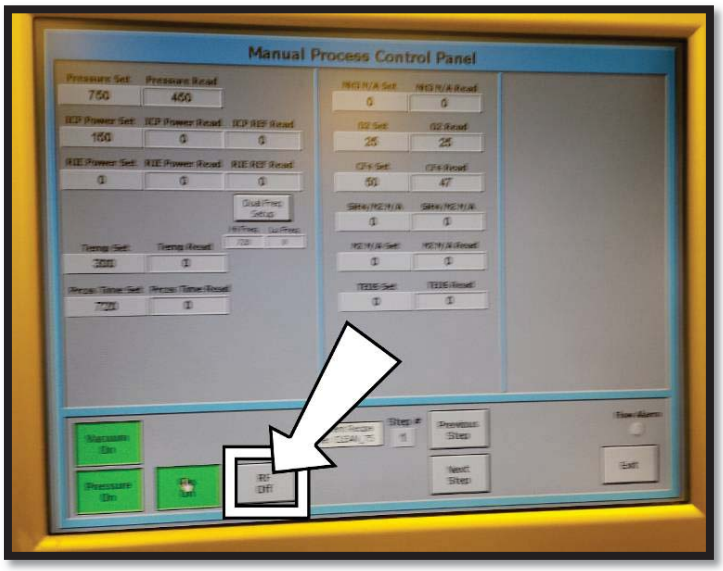
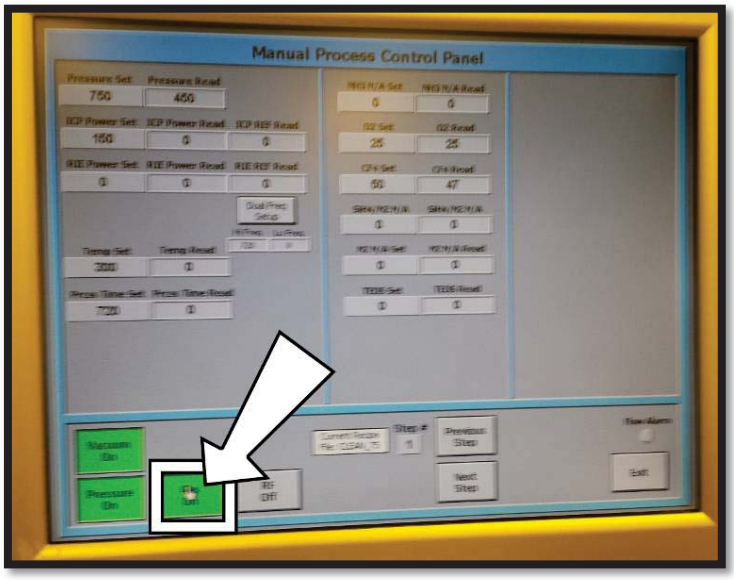
5) On the main menu click “Manual Process Control” **NOTE:** Automatic process control DOES NOT work.	 
6) Change the “Temp set” to 100 (this temperature is for the clean run, for actual deposition the temperature may be different and can be changed later)	

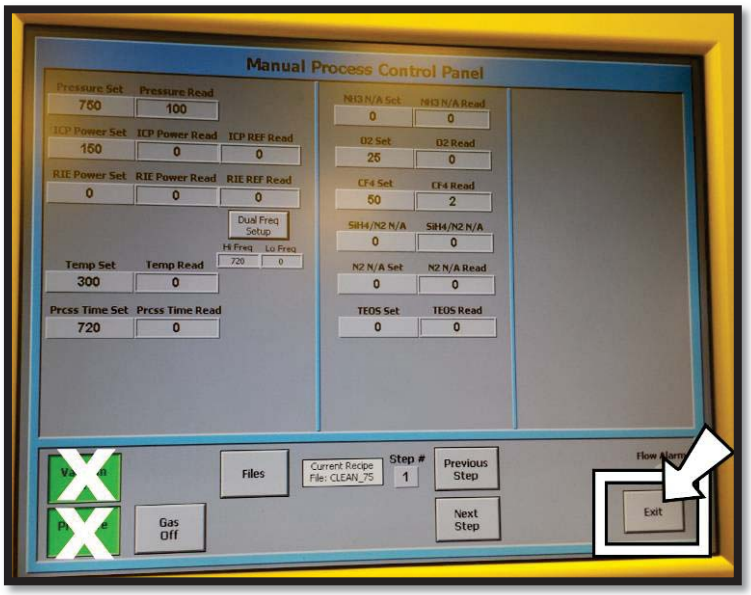
The temperature gauge is located behind the front panel on the chassis. The red light indicates the actual temperature and the green light indicates the set point. **NOTE**: If the green temperature is over by one degree that is fine **WARNING:** Temp will keep rising, or stay at set point, even If the chamber is open or if the process is done	 

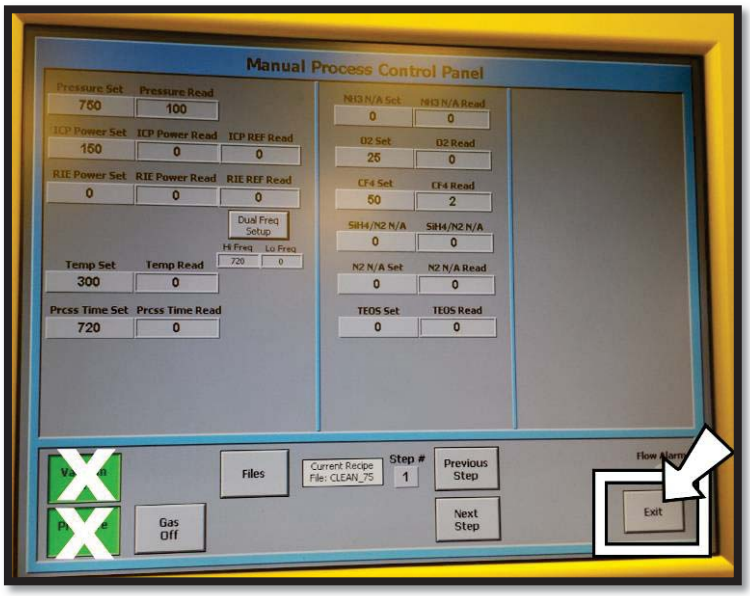
7) Click the button that says “Vacuum off” then “Pressure off” to open the vacuum valve and turn on the pressure gauge	
8) Wait until the pressure read in the top left of the screen is less than 100	

9) Open the CF4 and O2 valves located under the black gas box on the left	
10) Click the button that says “Gases off” to start introducing the gases into the chamber	

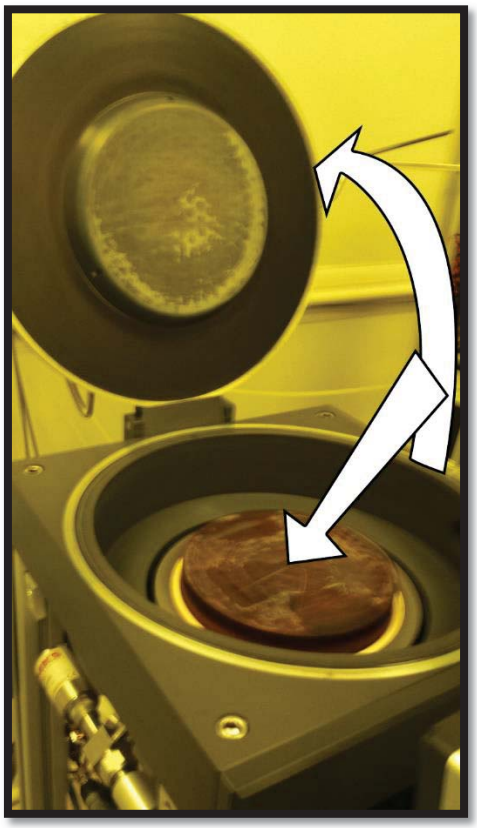
	
11) Wait till the pressure read stabilizes around the set point and make sure the gas readings stabilize at their set points (even after all are stabilized wait for 1 minute and check again before proceeding)	
12) After pressure stabilizes click the “RF Off” button to turn the RF on which will ignite the plasma and start the timer	

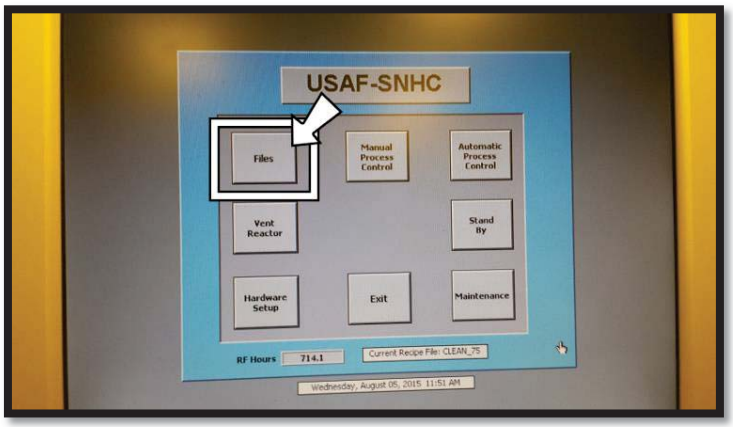
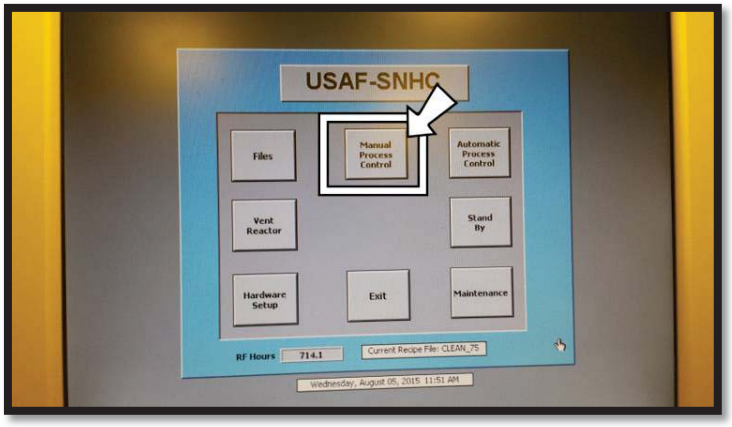
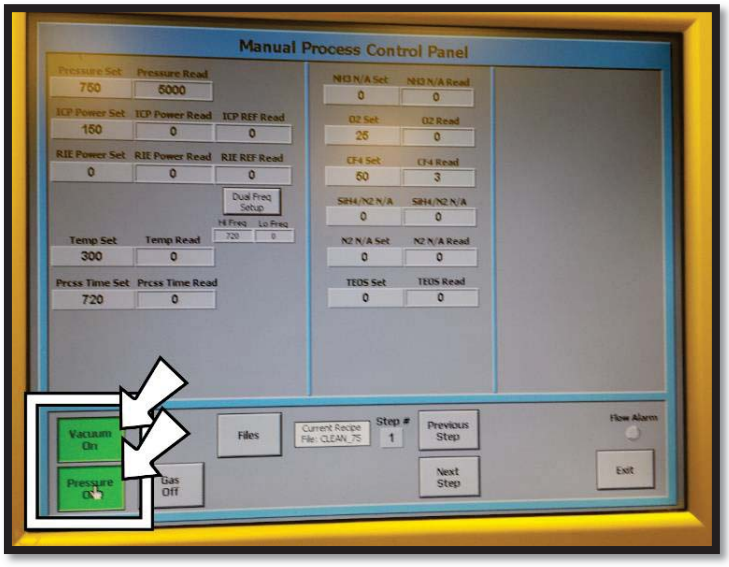
13) When the timer reaches the set time MANUALLY turn off the RF by clicking the green “RF on” button. **NOTE**: RF WILL NOT SHUT OFF AUROMATICALLY YOU MUST DO IT MANUALLY	
14) Click the gas button to turn the gases off **DO NOT** hit the Pressure or Vacuum buttons	

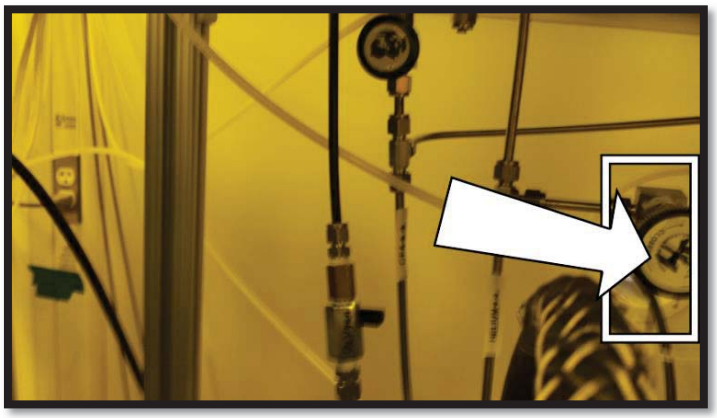
	
15) Close the O2 and CF4 gas valves under the gas box	

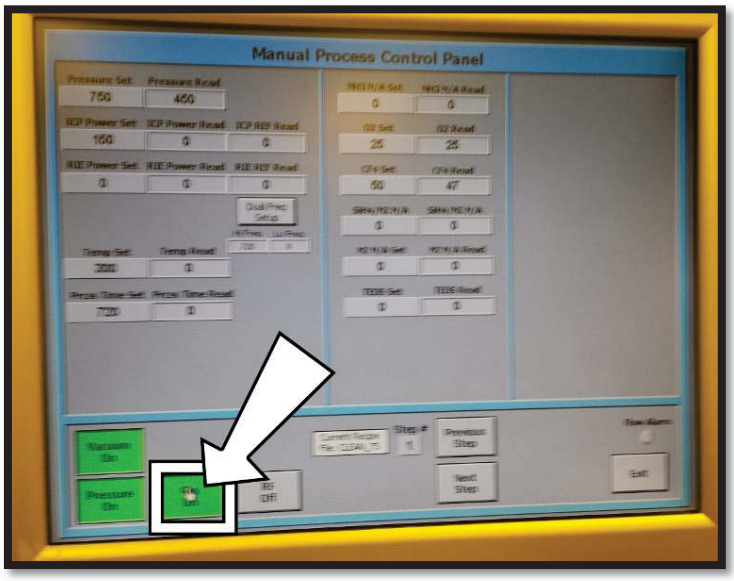
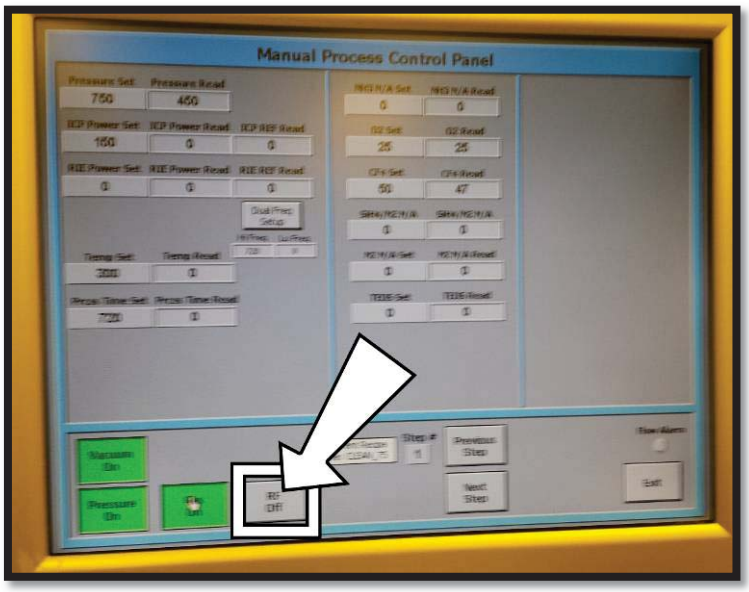
16) Exit to the main screen	

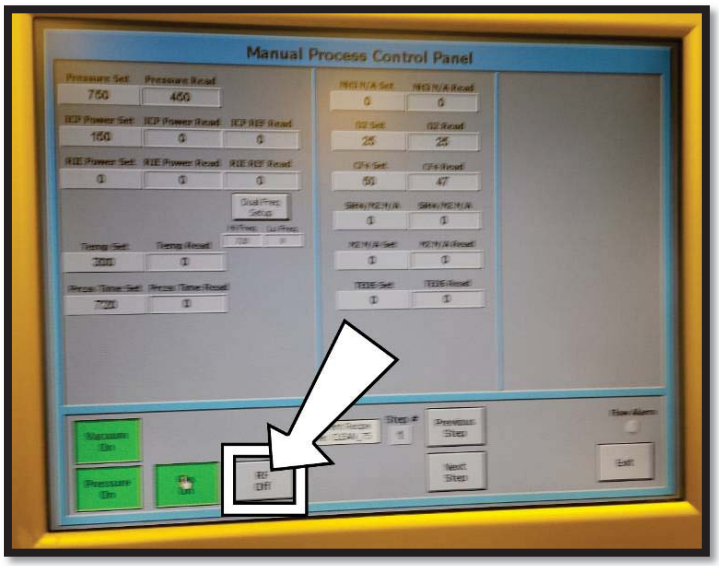
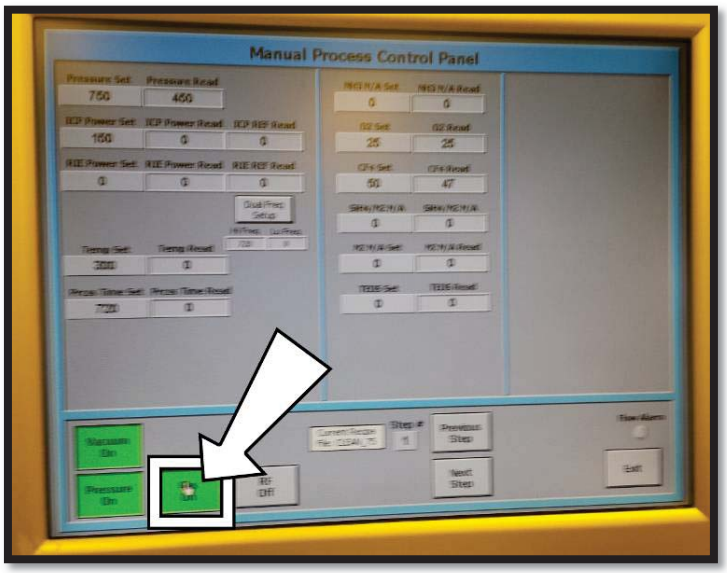
PROCESS PROCEDURE

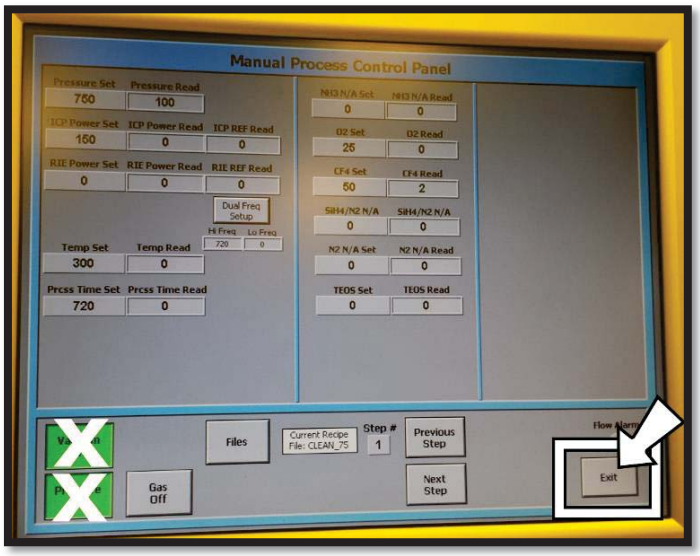
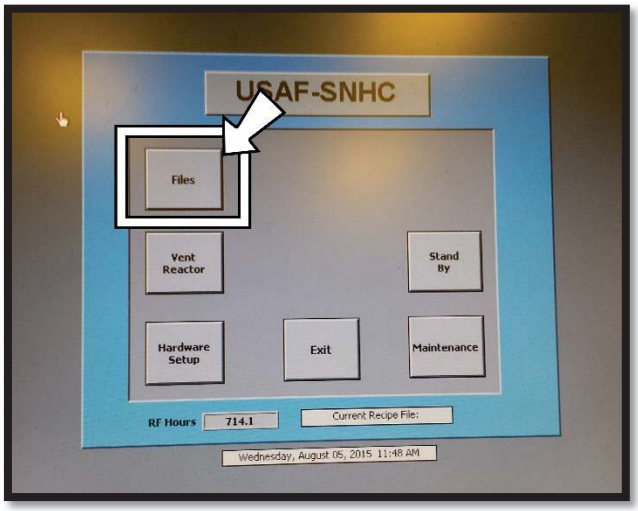
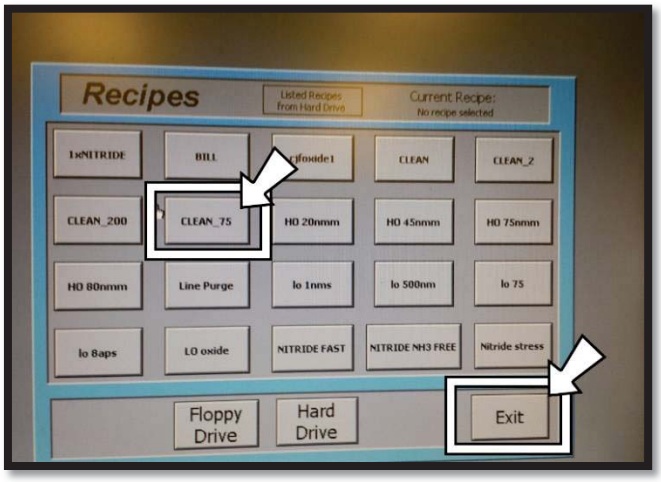
1) If temperature is at the desired set pt, Vent chamber and place your samples on the plate (check recipe for proper temperature). If it is not at the set pt, wait for it to reach the set pt and then vent the chamber and place the sample. **NOTE: DO NOT LET GLOVES OR ANY PLASTIC TOUCH THE PLATE, IT WILL MELT. DO NOT USE PLASTIC TIP TWEEXERS OR KAPTON** TAPE **THEY WILL MELT. MAKE SURE THERE ARE NO TYPES OF RESIST ON YOUR SAMPLE.**	 
2) Close the chamber.	

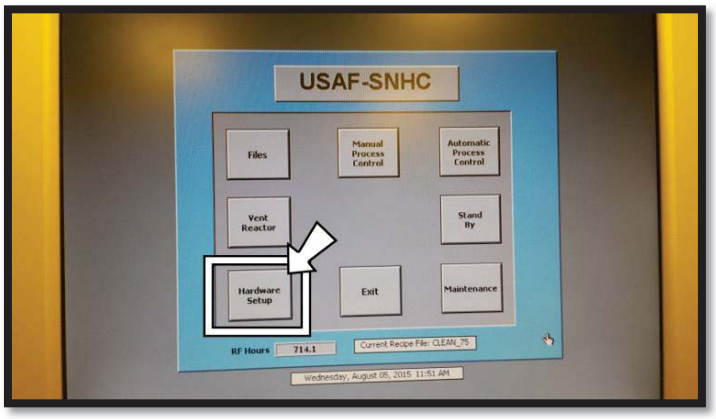
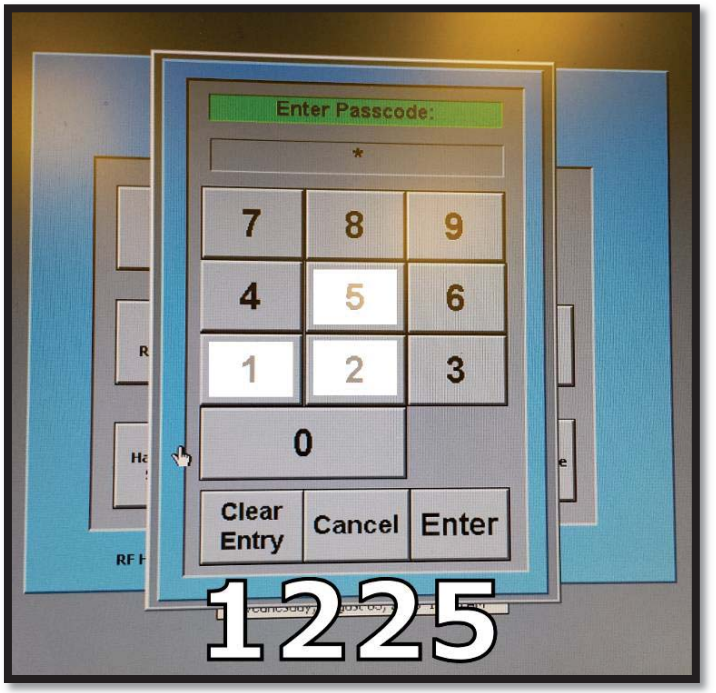
3) Click on files	
4) Choose recipe, the best and recommended recipe is “LO oxide”, the deposition rate of this recipe is 1.4-2 nm/s	
5) Click exit, click on manual process control	
6) Turn on vacuum and pressure	

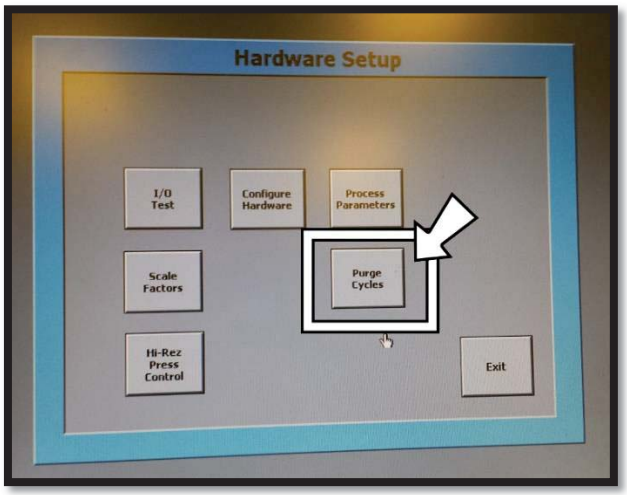
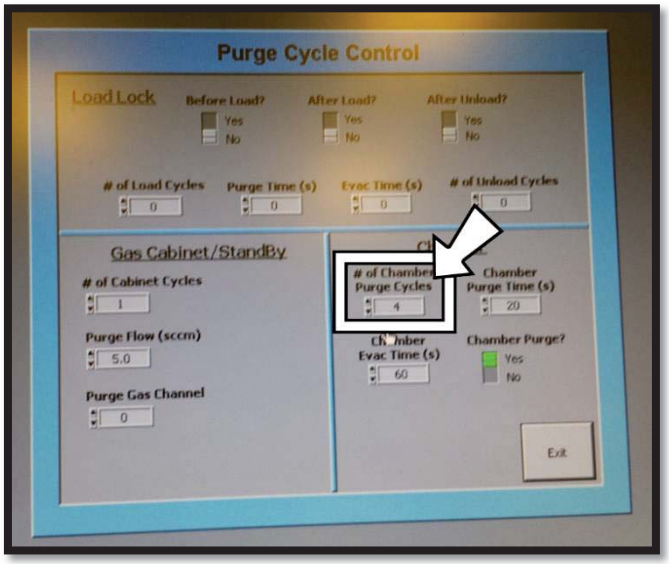
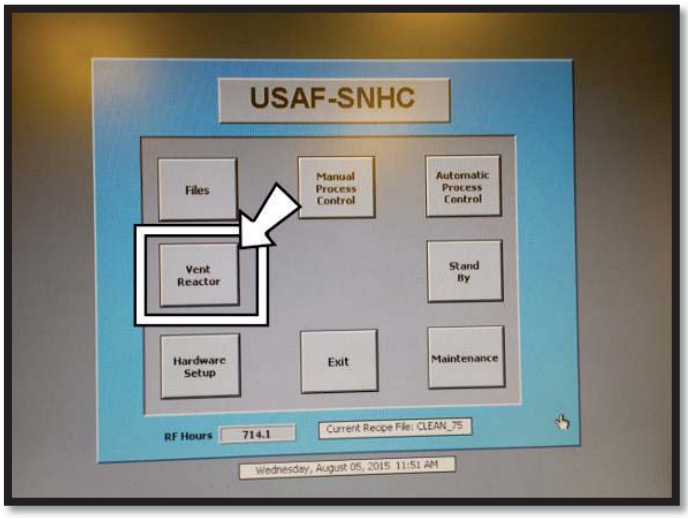
7) MAKE SURE THAT HELIUM IS OPEN	
8) When pressure read is at or below 100 you must open the TEOS CAREFULLY **(READ THROUGH THIS STEP BEFORE OPENING)** which is located inside the black gas box. A. Open "outlet" valve on the right side (the horizontal green valve) VERY SLOWLY. B. Open the "inlet" valve on the left side (the circular valve) VERY SLOWLY. You will feel a small rumble near the beginning of opening it, when this happens **STOP** for 1-2 min and then continue opening slowly till fully open.	
9) Make sure O2 valve is open	

10) Click “Gases off” to turn the gases on	
11) After pressure and gases stabilizes around their set point, turn the RF on **NOTE:** Watch the reflected power, it should stay between 0-10W, if it exceeds this stop the process immediately and contact Seth Calhoun.	

12) When the Timer reaches the set time and the process is finished, turn the RF off MANUALLY by clicking the green “RF on” button.	
13) Turn the gases off	

14) Exit to the main menu.	
15) Go to files, click on “Clean_75”, then go to manual process control, then exit back to the main menu. This will set the temp set point to 75 and the plate will start to cool.	 

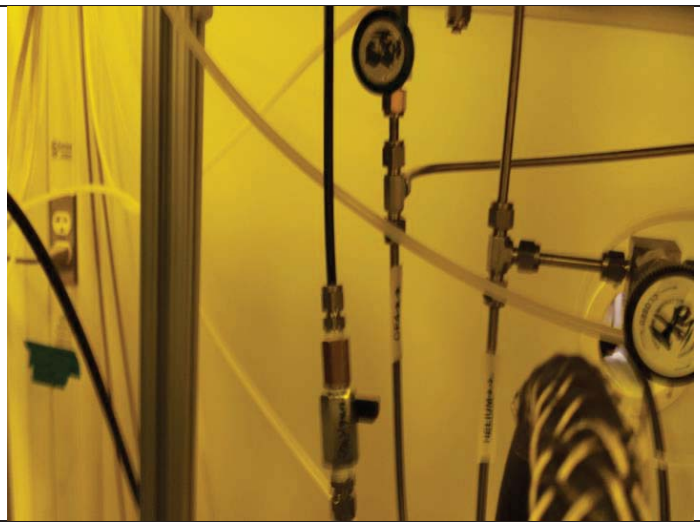
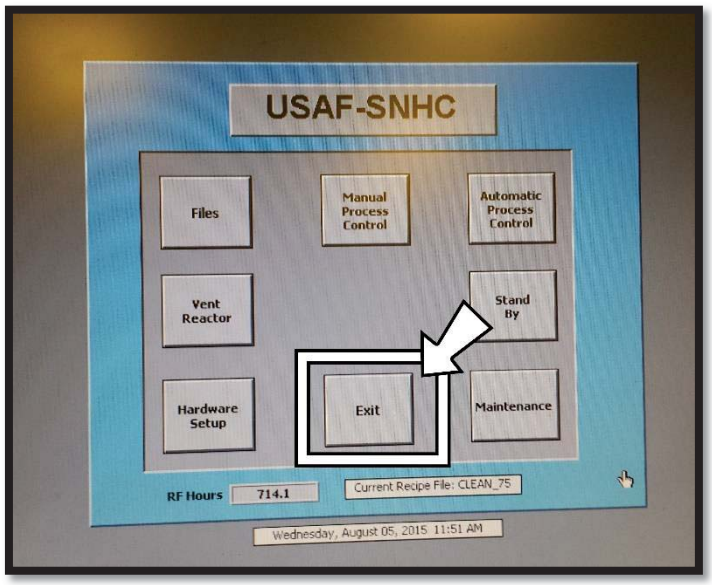
16) Click on hardware setup (password=1225)	 

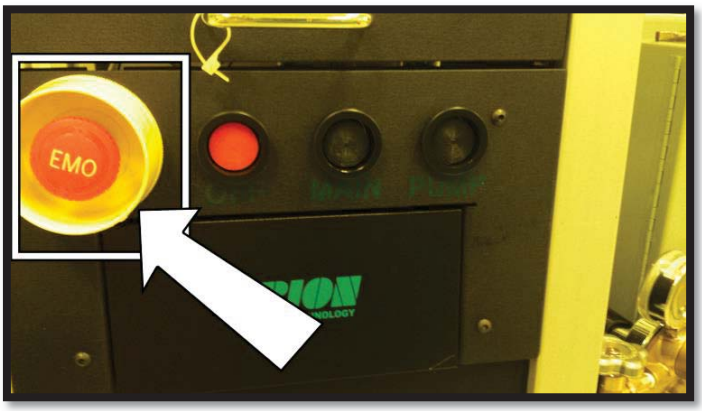
17) Turn chamber purge to “yes” (square should be green), make sure the # of chamber purge cycles is 10 or greater	 
18) Go to main menu and click vent reactor	

19) Once the temperature is at or less than 100, open the chamber and remove your samples. **NOTE: THE CHAMBER IS STILL HOT, DO NOT TOUCH WITH GLOVES OR ANY PLASTIC.**	
20) Close the Chamber	
21) Close the TEOS valves if you are done with your depositions A. Close the Inlet first B. Close the outlet second	

DO A CLEAN RUN BY REPEATING THE DRY CLEAN RUN PROCEDURE, MAKE SURE THE RUN IS TWICE AS LONG AS YOUR DEPOSITION TIME

SHUT DOWN PROCEDURE

1) Close the CF4 and O2 valves under the black gas box	
2) Exit the program	
3) Shut down the computer	

4) Press the EMO button	
5) Close the gases in room 440 if they are not being used by anyone else