Plasma Sciences Dry Etch

SOP

1.0 Turn main power ON, black power strip left of the electronics rack. (Figure 2)

2.0 Turn on Argon and SF6 gas by turning the main cylinder valve and the low pressure valve. *If you are not sure about the cylinders, follow the gas lines to the back of the mass flow controllers.* (Figure 1)

3.0 Turn on the vent on the etchers front panel. (Figure 2)

Note: Make sure N2 Valve on wall behind sputter tool is on.

4.0 Open chamber lid and load sample centered on the plate, close lid.

***Note:* When using Photo resist as a hard mask. Samples need additional 2min, 112C bake before loading into chamber.**

5.0 Turn off vent on tools front panel. (Figure 2)

6.0 Turn on roughing pump, under the tool (Figure 3), and wait for vacuum gauge to reach < 3torr. (Figure 2)

7.0 Turn on turbo pump and wait for vacuum gauge to reach 70mtorr or less. (Figure 2)

8.0 Press the Main Gas Inlet button 

on dry etchers front panel.

9.0 Multi Gas Controller set up:

9.1 On the main menu ensure INPUT DIRECT is displayed on bottom right.

If not, go into to: (1) USER DISPLAY and change using the arrows.

9.2 Select (2) EXTENDED DISPLAY: (use arrors and press 

)

Press 

this will enable the controller. You should see FLOW ON after pressing ON and ALL.

9.3 Turn ON CH1(SF6) and CH2(Ar) Press 

and 

9.4 To initiate a gas flow, use the arrows to hover over the SETPOINT. Set point ranges from 0 to 1.000. ie 0.500 will open the mass flow controller 50%

9.5 To stop a gas flow: set SETPOINT to 0.000 or press 

or 

. This will stop the flow for CH1 or CH2.

10.0 Flow CH2 (0.400%) Argon for 30 seconds to purge the chamber then turn it off. 

and SETPOINT CH2 (0.400) 

. Then 

.

11.0 Gas Etch Recipes.

11.1

GAS	Gas SETPOINT	Power (W)
Ar	0.500	150
Ar + SF_6	Ar 0.200 + SF_6 0.400	150
SF_6	0.400	150

12.0 Turn ON RF power and increase dial slowly to 150 W. Adjust Reflective power dial to minimize Reflective Power. Start your timer when power reaches 150W. Check the color of the plasma inside the chamber.

Etch rates will vary depending on gas flow and power. Please record your etch rates and power (W) on the log sheet provided.

13.0 When done, turn OFF RF power and turn down power knob. Turn off gases on MKS controller.

14.0 Flow 0.400 of Argon (CH2), and turn off turbo pump and wait for vacuum gauge to go over 800mtorr.

15.0 Turn off roughing pump and turn Ar off. Vent chamber.

16.0 Turn off Argon and SF6 cylinders both low pressure valve and main valve. ***Do not over tighten the valves***(Figure 1)

17.0 Remove your sample turn off vent and power off main power strip.

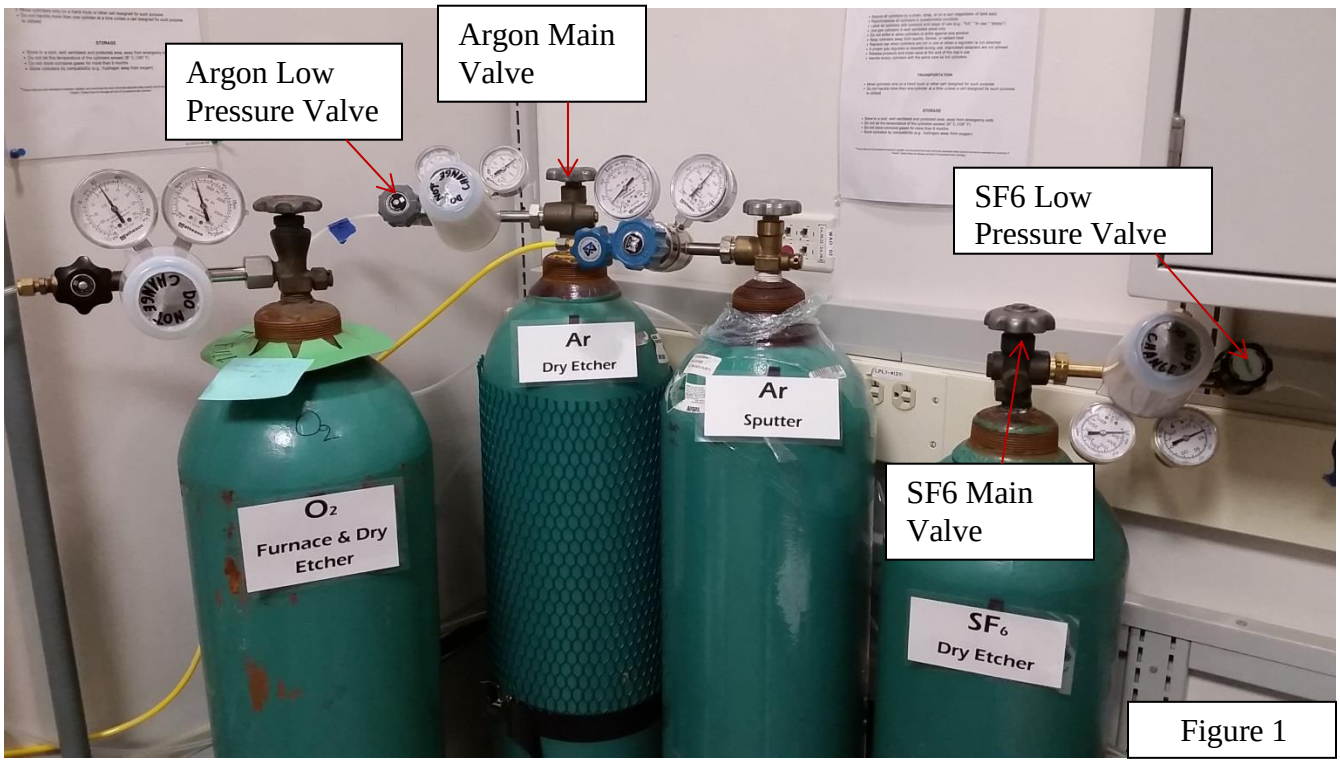

Figure 1

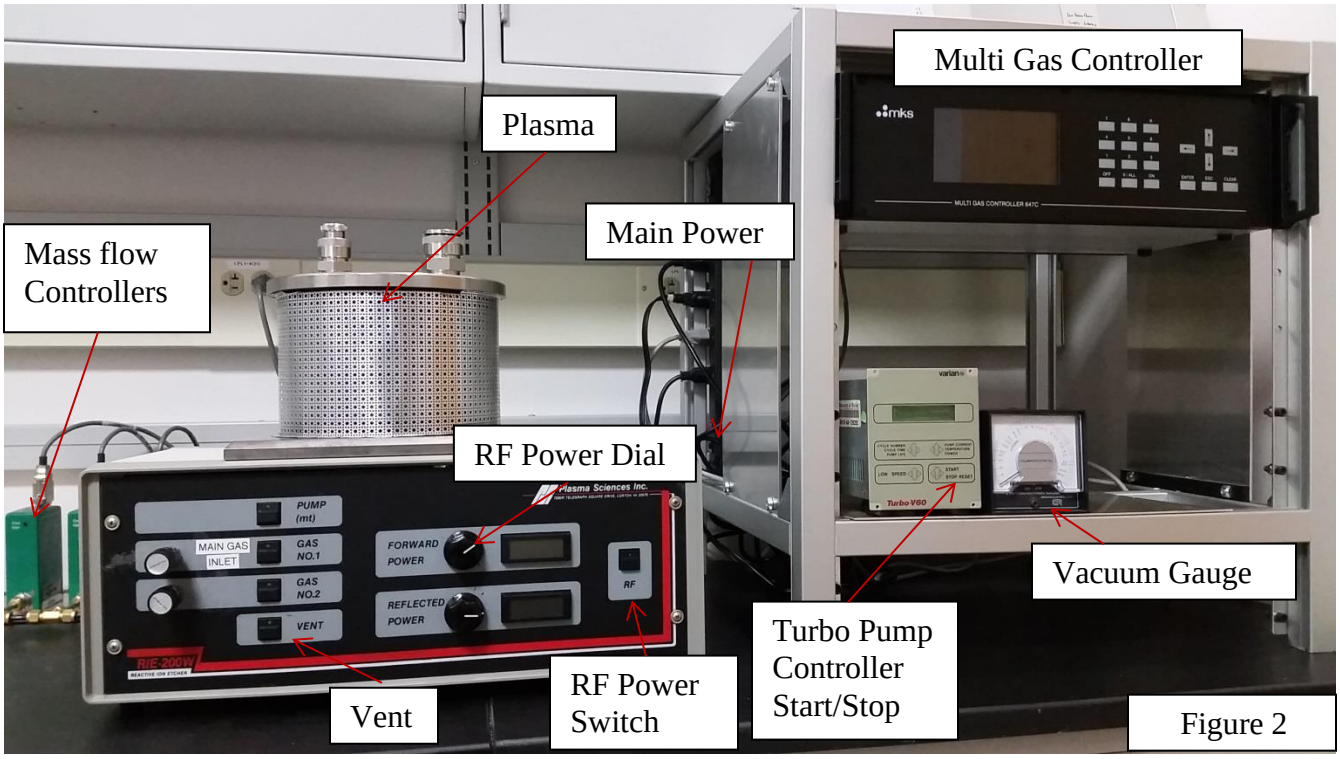

Figure 2

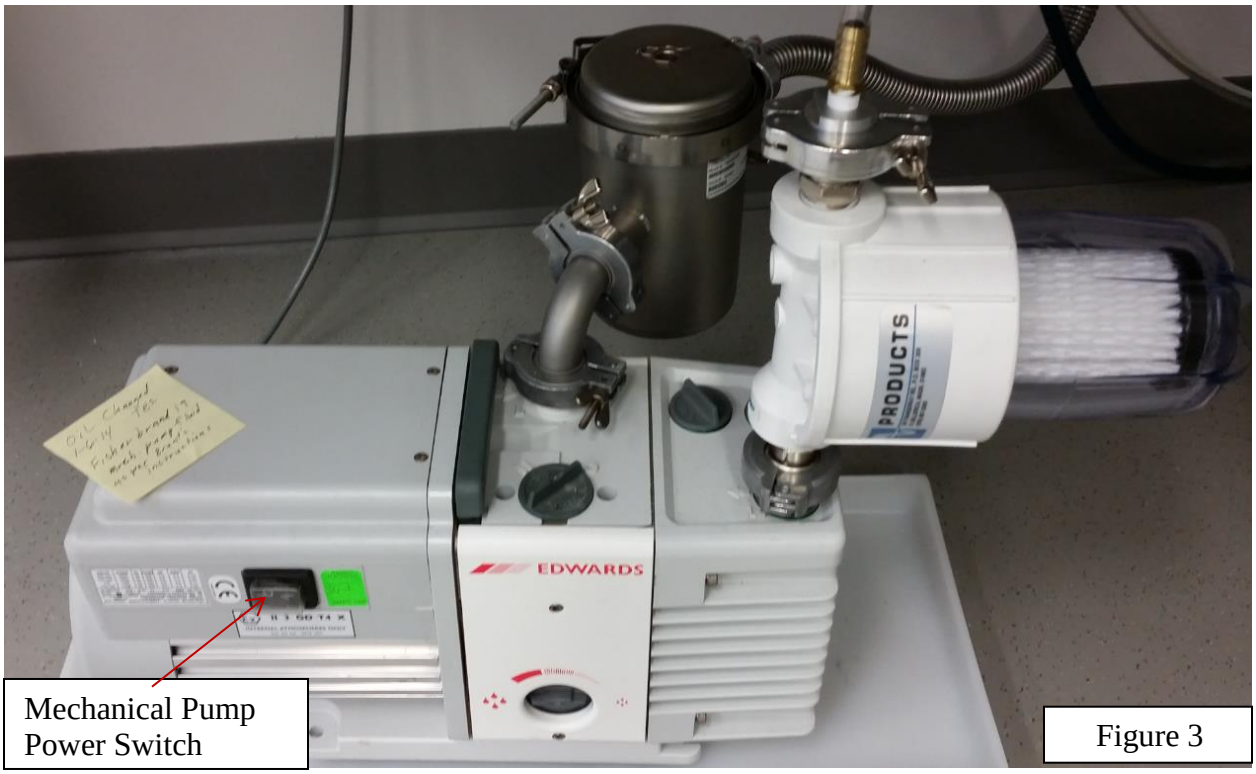

Figure 3