AGS Reactive Ion Etcher Operating Instructions

This machine is to be used by authorized personnel only. For training & consultation contact: Lab Manager, Omid Mahdavi, (520) 621-9849, omidm@email.arizona.edu

Enter all necessary information in the Log Book for each use.

1) Make sure the Operate Screen is being displayed, see Fig.1

2) If needed, Log-in on the main page to get to the operating menu:
   a. Username: **Lab User**, Password: **labuser**, see Fig.2
   b. If you can not access the operating menu, please contact an MFC staff member for assistance.

3) On the operating menu, click the **Continue** button on the bottom of the screen to vent the chamber to atmosphere.

4) Wait for the chamber to vent and for the green **Unload** button to appear on the bottom of the screen. See Fig.3

5) Using both hands, press and hold the two green buttons on the chamber lid to raise it. See Fig.4

6) Raise the chamber until you have sufficient access to place your sample/wafer on the platen.

7) Make sure the quartz liner is sitting on the platen.

8) Place samples/wafers on the quartz liner. Samples can not be greater than 0.5" in height.

9) Lower the lid by pressing and holding the two red buttons on the chamber top. Once the lid is lowered to the appropriate level, a green **Ready** button will appear on the bottom of the screen. See Fig.5

10) Using the mouse, click on and select a process recipe from the menu above the **Ready** button on the operating screen.

11) Click on the **Start** button on the bottom of the screen to start the recipe.

12) Upon process completion, the green **Unload** button should appear on the bottom of the screen. Raise the lid and remove your samples and then lower the lid.

13) Select the **HOLD** recipe from the menu above the **Ready** button to place chamber under vacuum**. You must always leave the chamber under vacuum when you are done using the tool.**

Table 1 – ASG Plasma Etcher Process Parameters for Basic Process Recipes

Parameter		Baseline Recipes			
		Ashrate	**Oxide_ER**	**Nitride_ER**	**Poly_ER**
O2 (sccm)	MFC1 (20 max)	20	0	4	0
CF4 (sccm)	MFC2 (42 max)	0	0	40	0
SF6 (sccm)	MFC3 (26 max)	0	0	0	20
Ar (sccm)	MFC4 (139 max)	0	4	0	15
CHF3 (sccm)	MFC5 (34 max)	0	34	0	0
H2 (sccm)	MFC6 (101 max)	0	0	0	0
Pressure (mTorr)		100	60	50	100
Power (Watt)		300	250	250	180
Process Time (min)		5	2	2	
Xover Press		150	150	150	150
Pump Down (min)		2	2	2	2
Cycle Purge		0	1	1	1

Table 2 – AGS Plasma Etcher Film Etchrates for various films
(etchrate data collected between 2/07 & 5/07)

Etched Film	Underlying Film	Tool Recipe	Substrate diameter (in)	Average Etchrate (Ang/min)	Uniformity	Etch time (min)
Thermal Oxide	Silicon	Oxide_ER	4	590	3.0	1
Photo Resist	Silicon	Ashrate	4	3880	2.9	2
LS Nitride	Silicon	Nitride_ER	6	1207	2.4	0.5
Low Temp Oxide(LTO)	Silicon	Oxide_ER	6	571	6.6	1
Poly Silicon	Oxide on Silicon	Poly_ER	6	1460	3	1

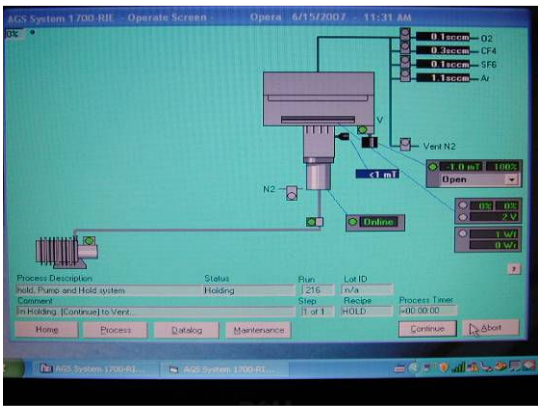

Fig. 1- Operating Menu

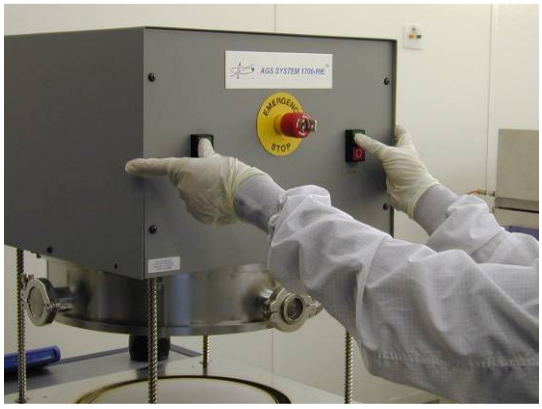

Fig. 4- Push & hold green buttons to open chamber

Fig. 2- Windows Log-In Screen

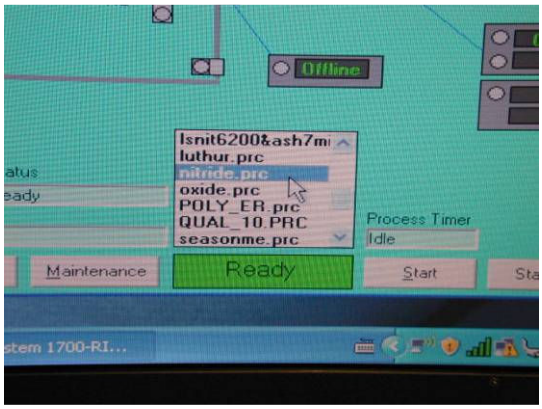

Fig. 5- Chamber is ready to run a process

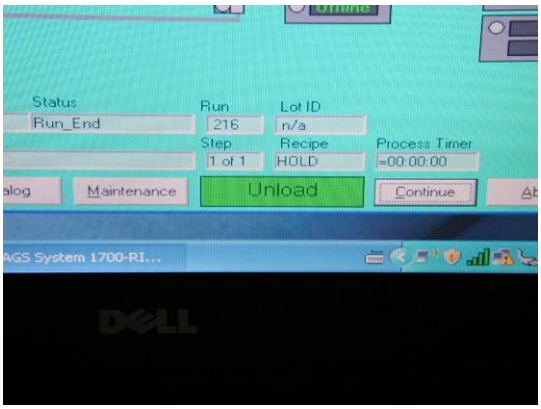

Fig. 3– Chamber ready to be opened