Oxford FlexAL SOP

Introduction:

The Oxford FlexAL system is an ALD processing system that can be configured to deposit a wide range of materials. The system features an automatic vacuum loadlock which allows substrates to be loaded without venting the main process chamber. The system can process a wide range of substrate sizes up to wafers of 200 mm (8”) in diameter. Substrates smaller than 200 mm are manually loaded on to a carrier wafer. The substrate, or carrier, to be processed is manually loaded into the loadlock. The system automatically transfers the substrate into the process chamber, runs the desired process, then returns the substrate to the loadlock.

The process chamber can be configured to run a plasma process or a thermal ALD process:

- The plasma process uses radio frequency power to create plasma inside a plasma source. The reactive ionic species generated within the plasma are guided on to the front surface of the substrate.
- The thermal process uses elevated temperatures to promote deposition on the front surface of the substrate.

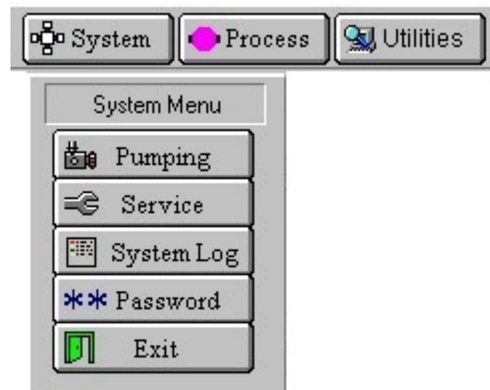
An Ozone Delivery System can be also be used to provide the oxidant for ALD processes. Ozone is delivered via the water vapour process gas line.

The films available on the FlexAL are: Al_2O_3, AlN, HfO_2 and TiN. Substrates allowed in the system include Silicon and III-V materials with special handling (see Appendix).

Safety:

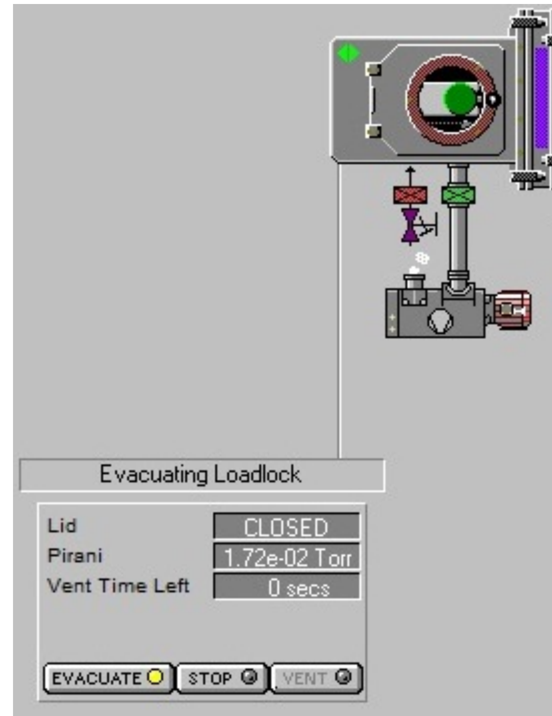
Procedure:

Log on to the system by clicking on the **System** button at the top of the screen and select **Password** from the drop down menu. The username is USER and the password is user.



To load a wafer into the system, click on the **Pumping** button from the **System** menu.

Under the Loadlock image, click on the **STOP** button, and then click on **VENT**.



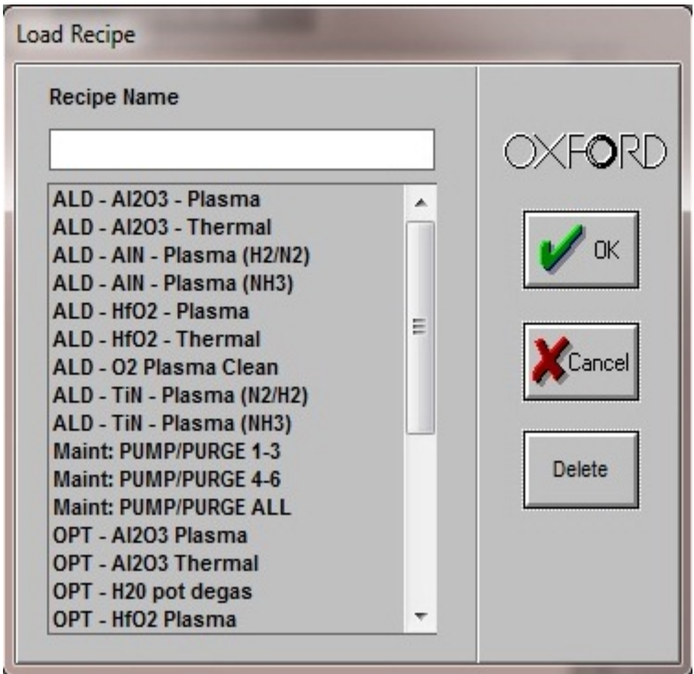
The Vent Time Left feedback will start counting down. When the loadlock reaches atmosphere, open the loadlock lid and place your wafer on the load arm. Close the lid and pump the chamber down by pressing **STOP** and then **EVACUATE**.

The default process chamber temperature is 300°C; if a different chamber temperature is required it may be changed on the Chamber screen. To go to the chamber screen, click on **Process** button at the top of the screen and select **Chamber 1** from the drop down menu.

Adjust the process temperature using the Table Heater setting.

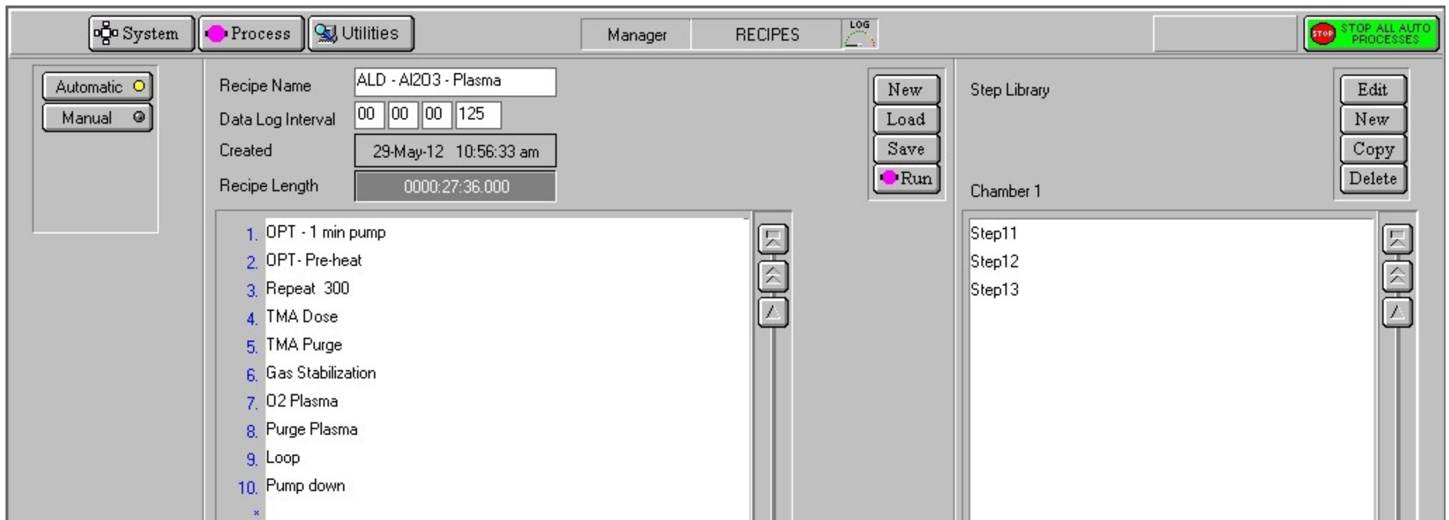
To process a wafer, click on the **Process** button and select **Recipes** from the drop down menu:

Click on the **Load** button to pull up the list of available recipes.

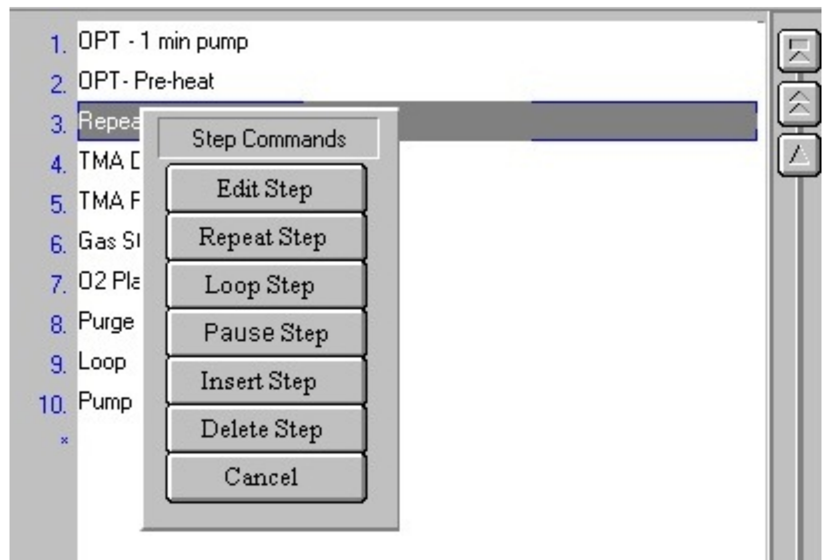


Click on the desired recipe and click **OK**.

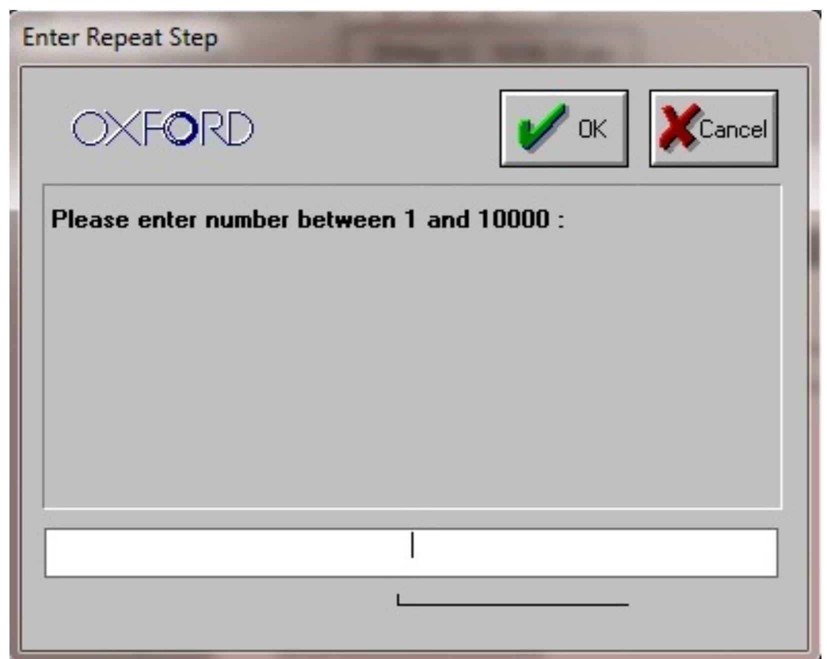
The recipe steps will be displayed on the screen.



Click on the **Repeat Step** button.

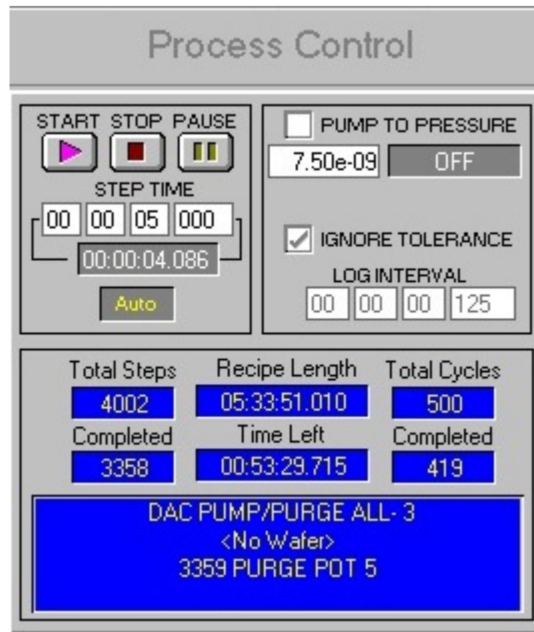


Enter the number of cycles you require for the desired film thickness.



Click on the **Run** button to begin processing the wafer.

The wafer progress may be monitored from the main chamber screen, and the time to completion is detailed in the Process Control section.



When the wafer has completed running, it will be returned to the loadlock for removal.

APPENDIX

When running III-V materials, two freshly RCA'd Silicon wafers must be available. The first will be used as a handle wafer to hold the III-V pieces during processing, and the second will be used during an O_2 clean which is to be run after the process is complete.