Expertech Furnace

These instructions are intended for reference only, and will *not* replace the thorough training required for proper system operation. Contact a clean room staff member with questions or to report a system problem.

CAUTION: Please be advised all furnace tubes are to be used for Front End of Line (FEOL) processes only. No metals are permitted in this tool. Additionally, wafers that have been processed in tooling that may have or has metals contamination are not permitted.

No resists or organic materials are permitted in the furnace as these will combust.

It is advisable to clean any wafers to be processed in the furnace with the standard RCA clean prior to processing in any of the furnace tubes.

DANGER! Very hot surfaces will be present when operating the furnace. Be extremely careful where you place any parts of your body as hot surfaces can cause serious injury. Product will require ample cooling time prior to achieving a temperature that can be safely handled.

There are four furnace tubes: Thermal oxide (diffusion), Anneal, LPCVD Oxide (additive), and LPCVD Nitride (additive). The Standard Operating Procedure (SOP) attempts to address all of these tubes under one procedure. However, the user will note there are some differences between the tubes. The major difference lies between the atmospheric and vacuum (LPCVD) tubes. The LPCVD tubes will require evacuation steps to achieve process conditions and vent steps to allow transfer motions.
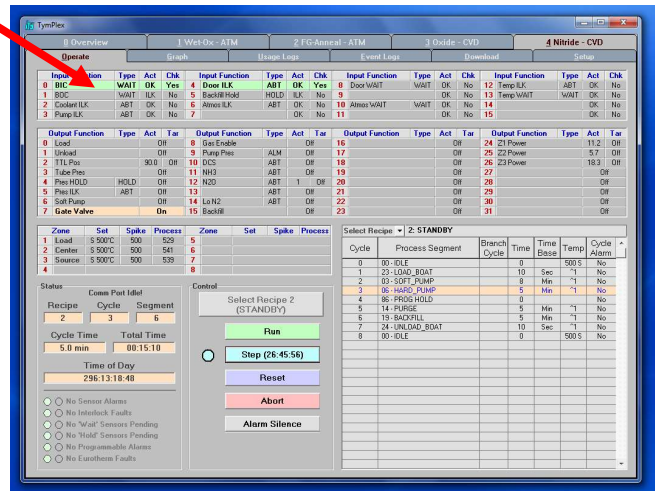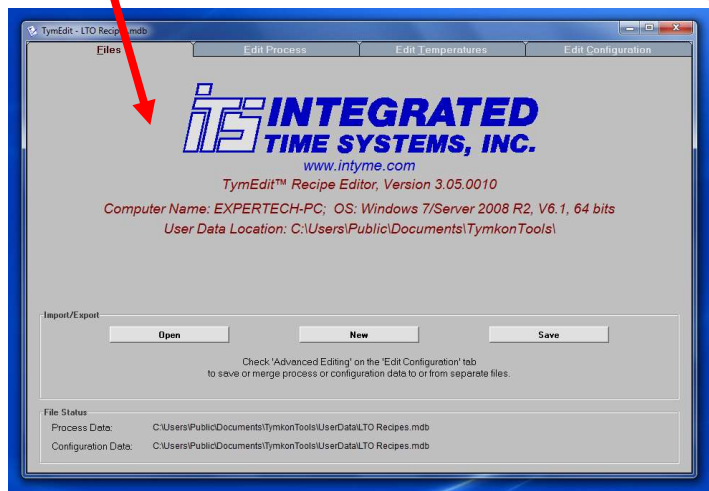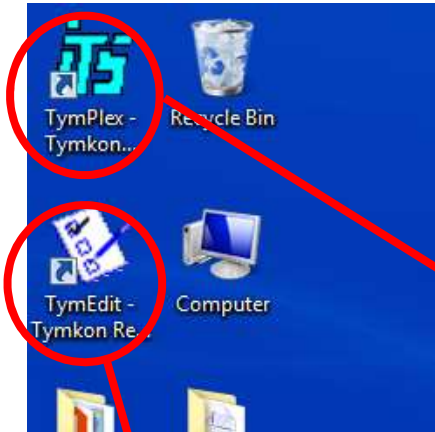
Introduction:

There are two pieces of software that are necessary to operate the furnace:

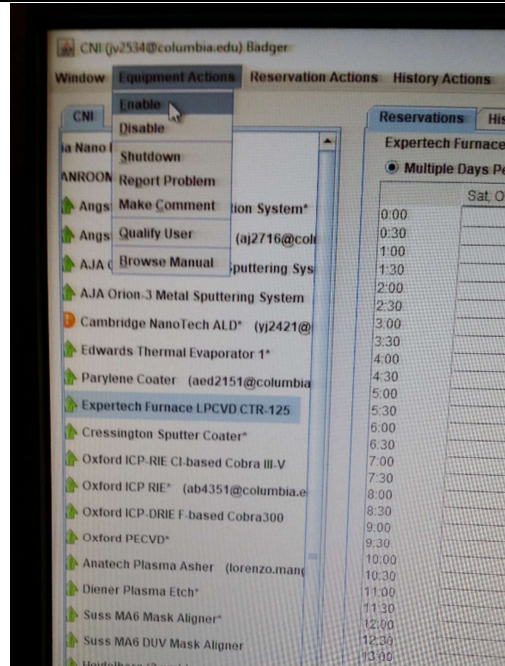TymEdit for recipe writing and TymPlex for operations:

It is important that the operator is familiar with these interfaces prior to operating the tool.

The SOP begins with the transfer arm fully extended in to the tube and in standby conditions.
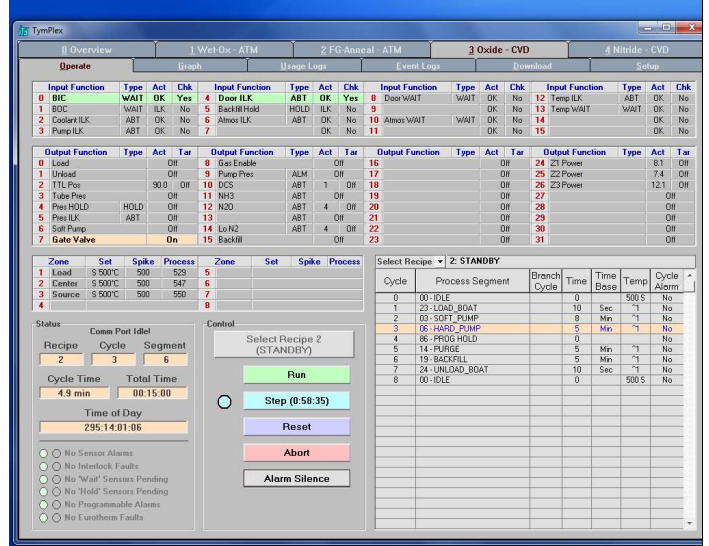
CNI Shared Facilities

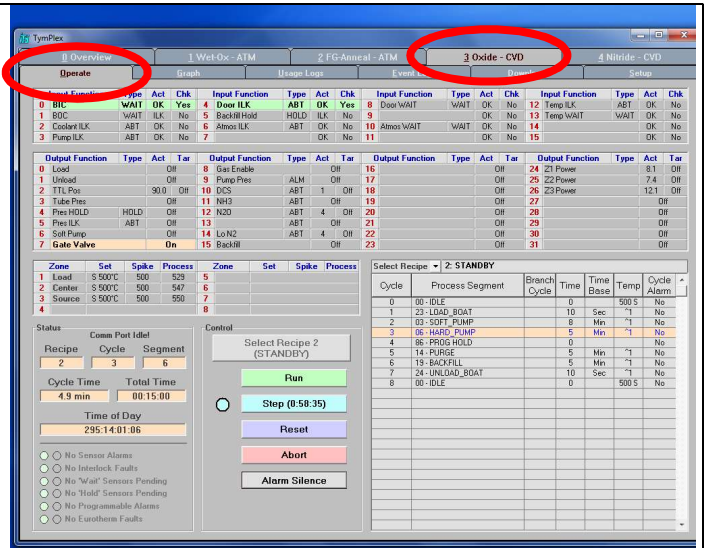| 1.	Enable the tool in **BADGER**	
2.	**Verify system status** You should expect to find the system with the process paddle fully extended in to the furnace tube with the tube at standby temperature. This will vary slightly from tube to tube. Tubes 3 and 4 will be under vacuum.	

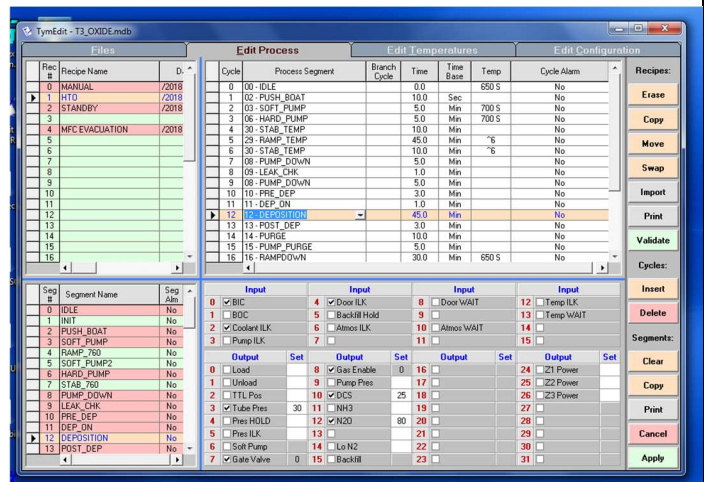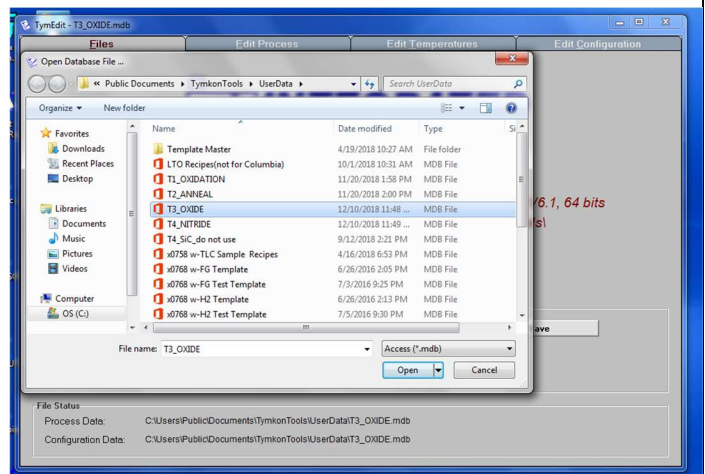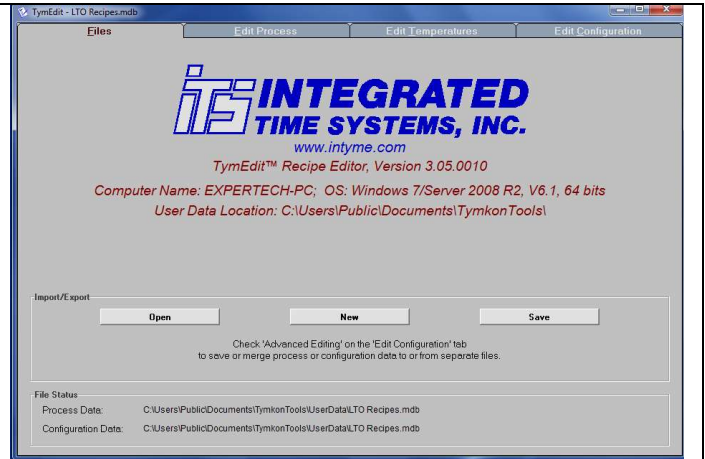|		
3.	**Exiting Standby/ Operations Ready:** From the TymPlex software, Click the tab representing the appropriate tube that you wish to operate. Click the 'operate' tab and press the green 'Run' button. This will advance the Standby recipe and automatically vent the tube (as applicable) and withdraw the arm from the process tube.	
4.	**Loading of samples:** Samples that enter the furnace must be metal free. If there is any question, do not process. DANGER! The process paddle will be very hot. Do not touch. Each tube has its own dedicated process boat. Do not exchange boat between tubes. It is advisable to use 'baffle' wafers at the start and end of your wafer load. This will help with uniformity issues as caused by the directional flow of gases.	
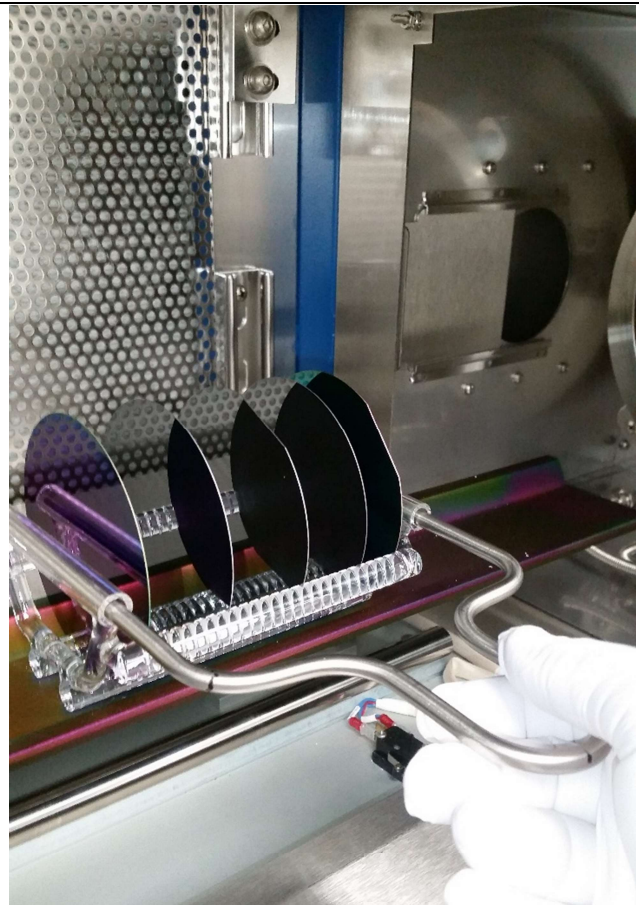
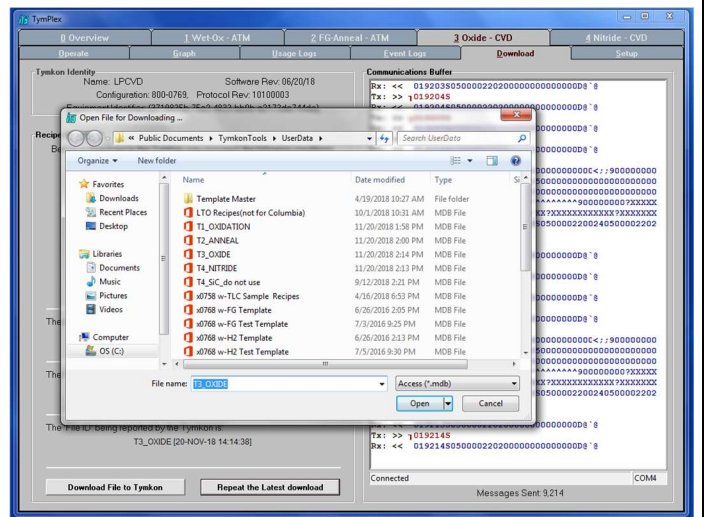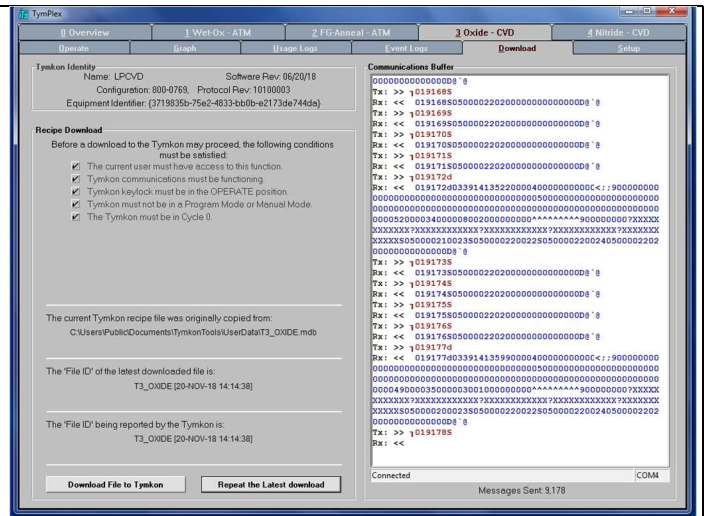| 5. | **Editing process time:** **(Do not edit gas flow, tube pressure or other process parameters as these changes will affect film properties.)** In the TymEdit software, click the 'open' button and select the process file bank for the tube you are working on. | |
| | Click the 'edit process' tab and select find the process you wish to run. Find the segment titled 'Deposition'. Edit time in accordance with your process needs. Click the green 'Apply' button. Click the 'Files' tab then click the save button. Your process change has now been stored. | |

| 6.	**Downloading Process Bank from TymEdit to TymPlex:** From the TymPlex software, Click the 'Download' tab. Then click the 'Download file to Tymkon' button. This will open a new window with a menu of available recipe banks. Select the file containing the recipe bank for the tube you wish to operate. Then click the 'Open' button. The prior window will close and Tymplex software will give indication that it is downloading the recipe bank. Wording will go from red to black upon download completion.	
7.	**Selecting the Process:** Click the drop down arrow next to the 'select recipe' wording. The available recipe bank will appear. Select the recipe you wish to run.	
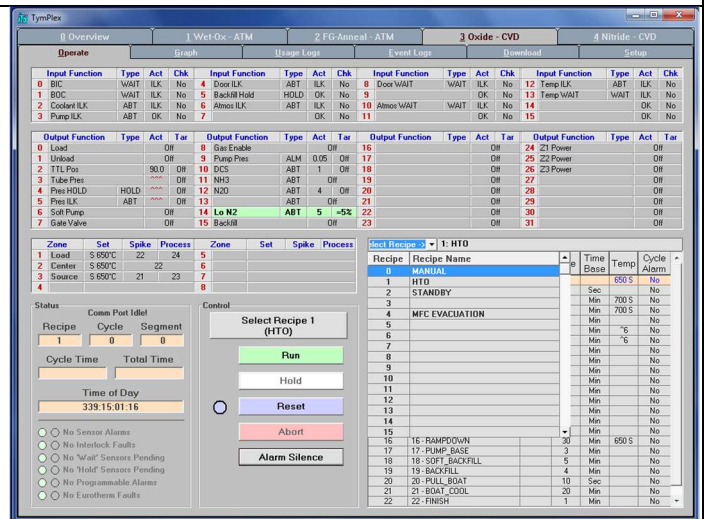
8.	**Starting the Process:**
	In the control portion of the panel, click the Process 'Recipe button (recipe chosen in prior step)'. This will cause the recipe segment table to go from light grey to black.
	The process is now available to run.
	Click the green 'Run' button to begin the process.
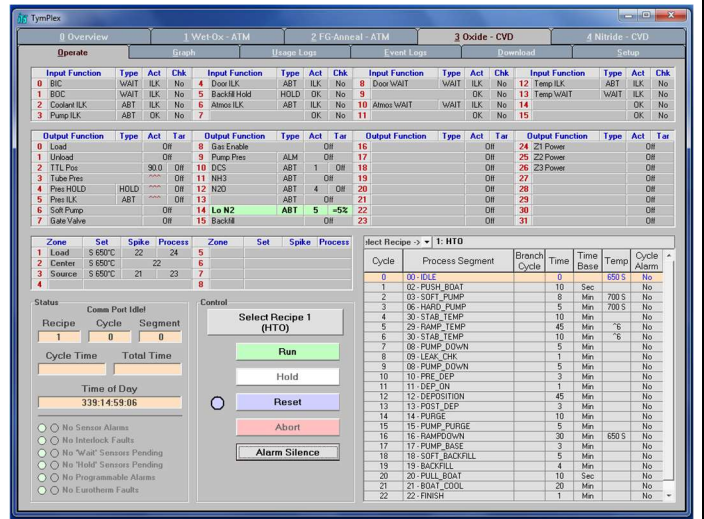
9.	**Process Completion:**
	A chime will indicate when the process has been completed. Click the yellow 'complete' button.
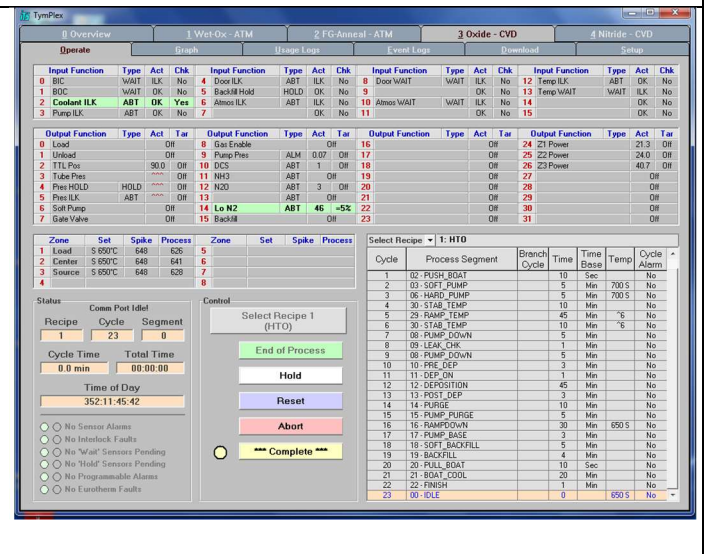
Then click the <mark>yellow</mark> 'press to reset button'.

| 10. | **Retrieve Samples:** |
| | DANGER! The process paddle, wafer boat, and wafers will be very hot. Do not touch. |
| | Allow wafers and boat to cool to a safe temperature before handling. |

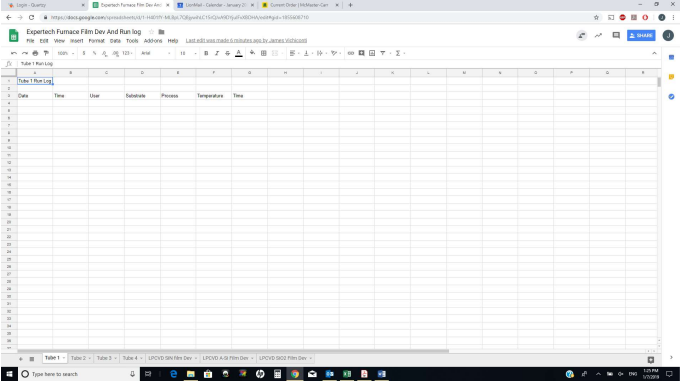| 11. | **Return to Standby**
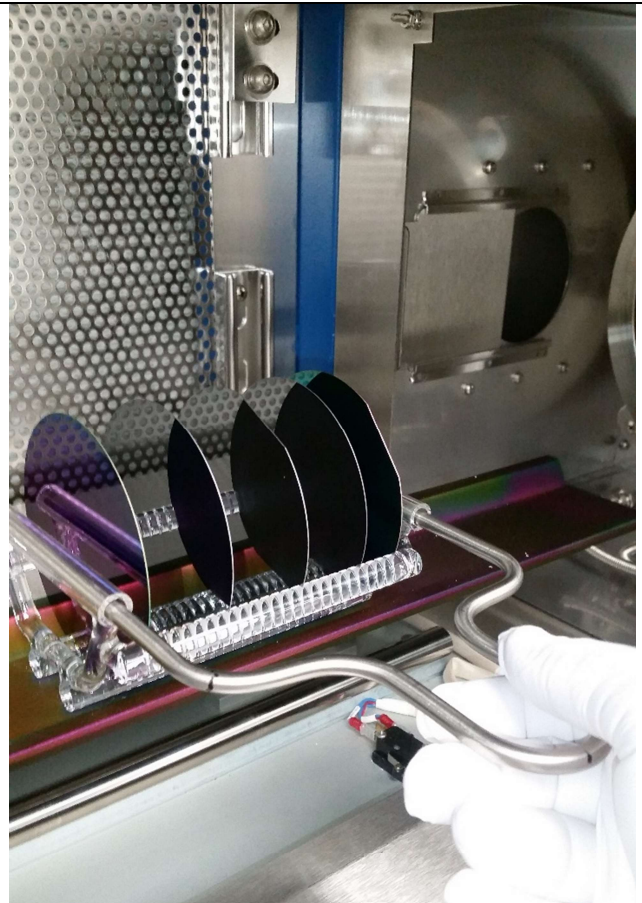
Return the tool to standby after processing. This will help keep the tool in a clean state.

Click the drop down arrow next to the 'select recipe' wording. The available recipe bank will appear. Select the standby recipe.

In the control portion of the panel, click the Process 'Recipe button'. This will cause the recipe segment table to go from light grey to black.
The process is now available to run.
Click the green 'Run' button to begin the process. |
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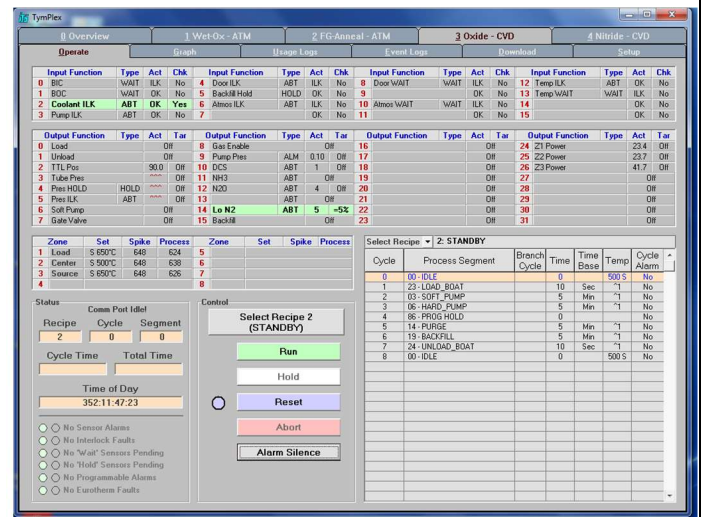
12.	**Log sheet** Please record you run on the Google Sheets Log titled 'Expertech Furnace Film Dev And Run Log'. Each tube has a dedicated page	
13.	**BADGER LOGOUT:** Don't forget to disable the tool in badger after you're done.	