4D LABS

4D LABS, Simon Fraser University 8888 University Drive, Burnaby, B.C. V5A 1S6
E nanofabrication@4dlabs.ca T 778.782.8084 F 778.782.3765 W www.4dlabs.ca

XeF_2 Etcher

Standard Operating Procedure

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Revision: 1.0 — Last Updated: Oct.13/2011, Revised by Nathanael Sieb

Overview

This document will provide a detailed operation procedure of the Xactix XeF_2 Etcher. Formal Training is required for all users prior to using the system.

Revision History

#	Revised by:	Date	Modification
1	Nathanael Sieb	10/13/11	Initial release
2			
3			
4			
5			

Document No. 4DSOP000X

Where new materials take shape.

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General Information

The Xactix XeF_2 Etcher is used for isotropic etching of silicon. With etch-rates in the range of microns/minute and a very high degree of selectivity, XeF_2 etching is excellent for MEMS release or bulk silicon etching. The etch rates and uniformity are highly dependent on the amount of exposed silicon. There are several techniques available in this system, including pulsed mode, continuous flow, and a high-conductivity mode. Only the basic operation is covered in this document.

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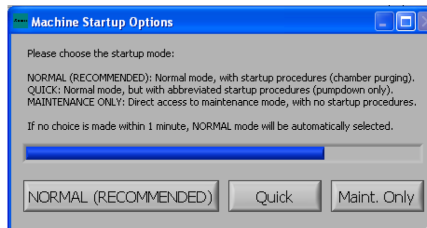
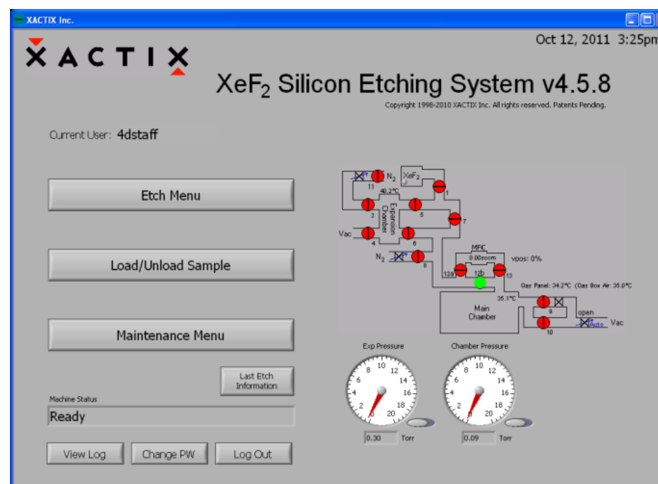
Operation

1. System start and sample loading

- Begin an entry in the log book beside the tool.
- Ensure the green system light is on.

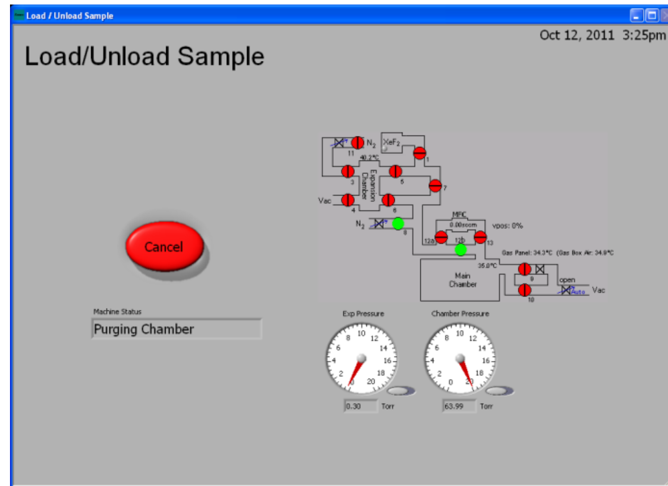
- Start Xetch and wait for the device channels to open.
- In the startup box, choose Normal 

. The system will complete an ~10 min initialization cycle.
- Login to the system. The main software window will open displaying the current system parameters.



Where new materials take shape.

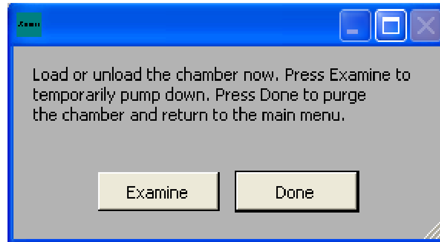
- Select Load/Unload Sample. Ensure the enclosure door is closed and select Yes to change the sample.
- A new window will open and the system will complete 3 purge cycles to remove any residual gases from the system.



- When prompted, open the chamber door.

- Load wafer into chamber and close the door.

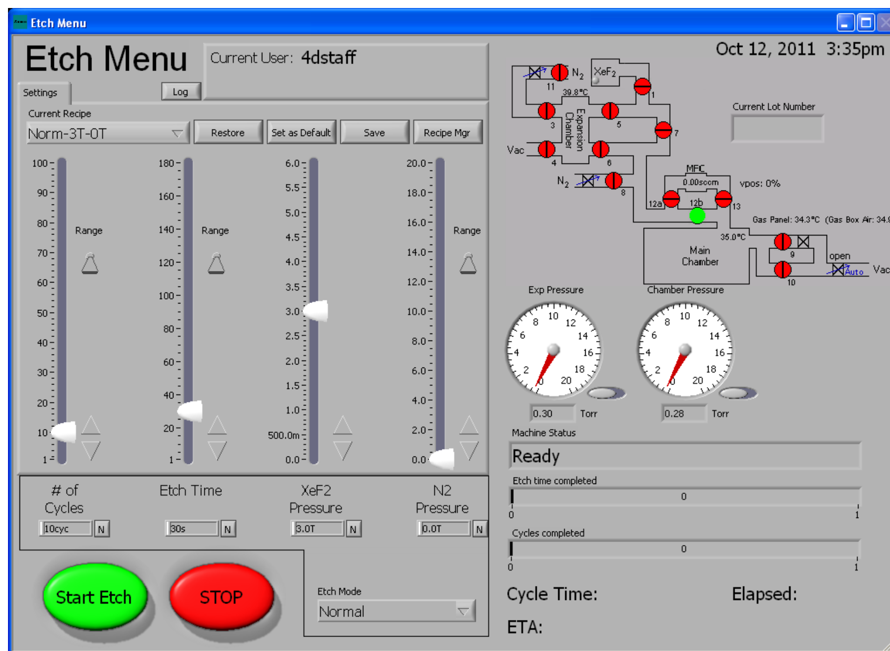
- Select done.



- The chamber will pump down and purge 3x.

2. *Etching*

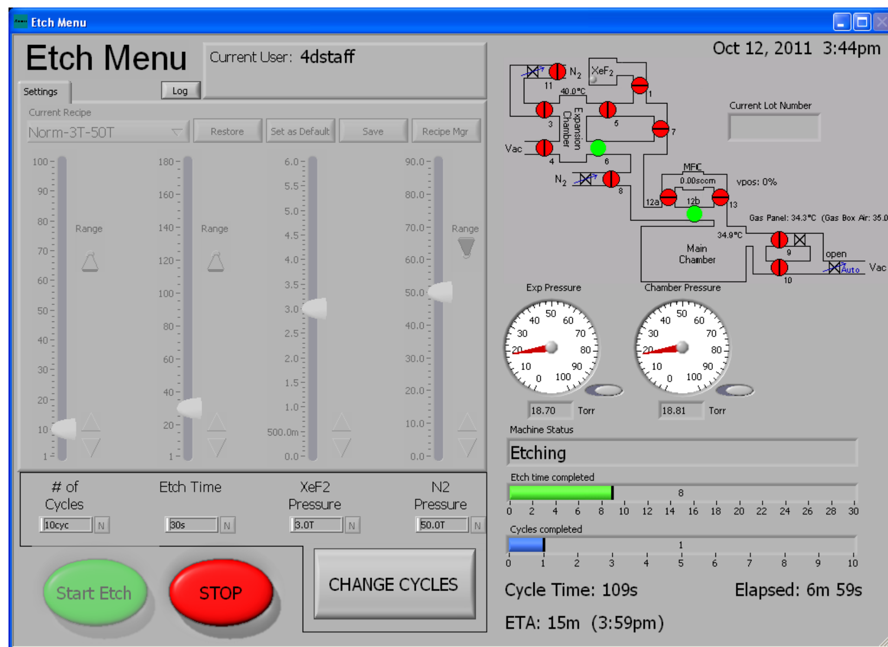
- Select Etch Menu from the main window.
- Enter a lot number or leave it blank.
- Select Etch Mode (e.g., normal),



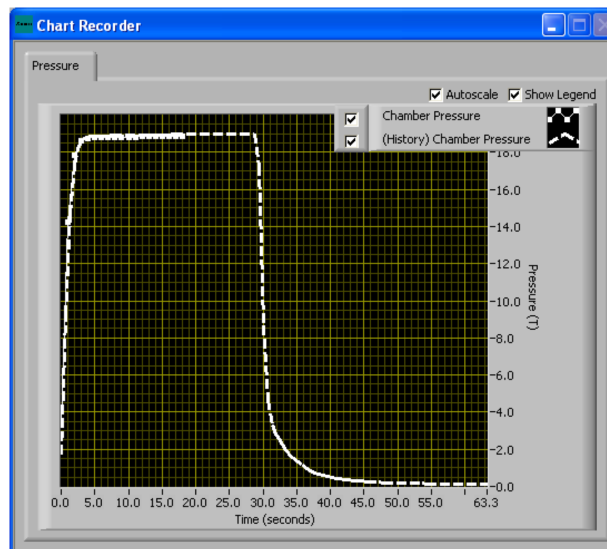
- Select #cycles, etch time, XeF_2 pressure, and N_2 pressure. A good starting recipe is as follows:

Cycles: 10
Etch Time: 30 s
XeF2 Pressure: 3.0 T
N2 Pressure: 0.0 T

- Save the recipe if desired. Record the parameters in the log book.
- One can also load an existing recipe from the drop-down list (e.g., Norm-3T-0T) instead of creating a new recipe.
- Select Start Etch.
- The etch will begin with pre-etch cycles to determine optimal valve timing. Next, the etch will commence and complete the specified number of cycles. An ETA is also given.



- During the etch the system pressure is displayed in a separate window.



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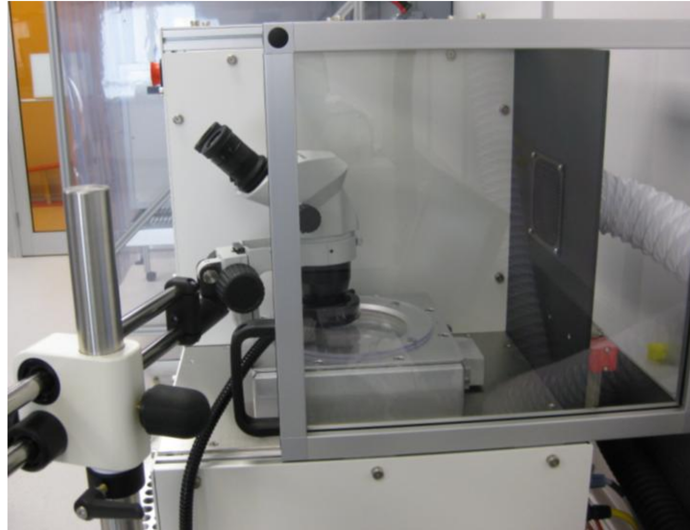
- The microscope can be used to observe progress.



3. Unloading sample

- After the etch is complete, select Load/Unload.
- Ensure the enclosure door is closed and select Yes to change.
- The system will complete 3 purge cycles and the vent.
- Open chamber door when prompted, unload the wafer from the chamber, and close the door.
- Select done to pump the system back down.
- Press Log Out.
- Complete entry in the log book.

References and Files

Xactix XeF_2 Etcher Manual and training notes.

Contact Information

Questions or comments in regard to this document should be directed towards Nathanael Sieb (sieb@4dlabs.ca) in 4D LABS at Simon Fraser University, Burnaby, BC, Canada.