BRANSON BARREL ETCHER

LOCATION: Plasma Etch Area

PRIMARY TRAINER: Scott Munro (2-4826, smunro@ualberta.ca)

1. OVERVIEW

The Branson Barrel etcher is available to users who require oxygen plasma cleaning or activation of various films and surfaces. Set recipes include a photoresist ashing process and a surface activation process. Available gases are O_2 and N_2.

2. SAFETY PRECAUTIONS

There is potential for harmful gases to form during the etch process. The chamber is purged with Nitrogen and vented to minimize this hazard. Ensure that the chamber is fully vented before opening the chamber door.

Reflected power occurs when power is not fully transferred from the source to the plasma. A set of capacitors automatically adjust to minimize the reflected power. Running the plasma for an extended time with high reflected power may permanently damage the system. If the capacitors fail to adjust to minimize the reflected power and remains consistently above 10% the RF power, stop processing immediately by pressing the **Reset** button, and contact NanoFab staff.

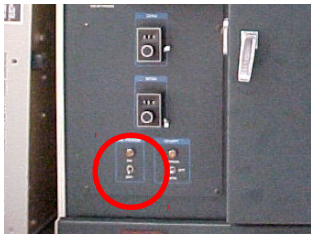
The chamber is heated during processing; allow enough time for the chamber to cool and use caution when opening the door and removing samples. Substrates containing heat sensitive materials may be damaged during the process as temperatures reach upwards of ~220ºC.

If you are bringing any new materials into the NanoFab for use in your process, it is necessary to fill out a chemical import form (available on our website, http://www.nanofab.ualberta.ca) and supply an MSDS data sheet to Stephanie Bozic.

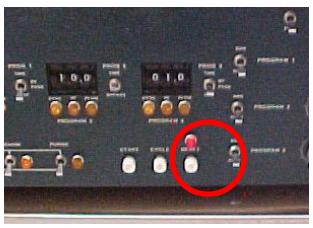
3. Operating Instructions

3.1 Sample Loading

3.1.1 There are three power switches that must be turned on; the **AC power** switch on the **Control Panel**, the power switch on the **Chamber**, the power switch on the **RF Power** supply. Ensure the chamber door is closed before powering on; the chamber will pump out the moment it is turned on.


3.1.2 Once the chamber reaches its base pressure of <200mT, the alarm will sound; press the Reset button to turn off the alarm and vent the chamber.



3.1.3 Open the chamber door by pulling the handle and rotating it ¼ turn clockwise. Do not force the door open, when the chamber reaches atmospheric pressure, the door will pop open.

3.1.4 Remove the quartz boat from the chamber and place it on top of a Kimwipe. Load sample(s) into the quartz boat.

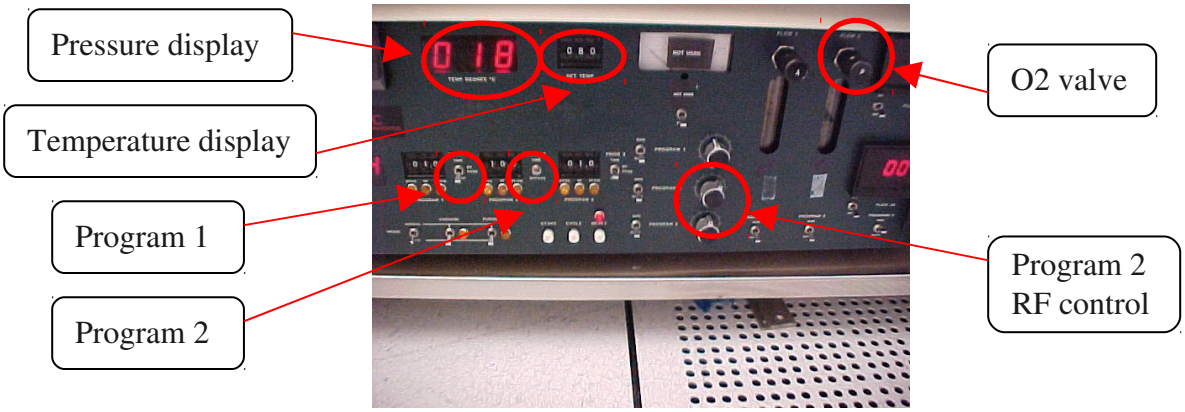
3.1.5 Place the quartz boat into the centre of the etch chamber, close the chamber door, rotate the handle ¼ turn counter-clockwise and flip the handle down. The chamber is now ready for processing.

3.1.6 Before starting the process, ensure the settings are correct for the desired process.

	Ashing Process	**O2 Activation**
Program 1 switch:	Temp	Bypass
Program 2 switch:	Time	Time
Temperature setting:	80°	N/A
RF Power (W):	600W	50W
Chamber Pressure (mT)	-	-
-N2 plasma	1T	N/A
-O2 plasma	1.4T	200mT

3.1.7 To adjust either process, ensure the above settings are set correctly. You may want to do the adjustments with an empty chamber to start. Press the **Start** button to begin the process. The chamber will pump out, and once at base pressure, gas will begin to flow. Chamber pressure will be displayed on the digital readout located on the left hand side of the module. Adjust the desired valve until the pressure reaches the setpoint. Once the pressure has stabilized, the RF power will turn on. To adjust the power, rotate the Program 2 dial until the required power is reached.

Typical ashing time is 10 minutes, and activation time is two minutes. It is recommended that a manual timer is used in place of the timer on the control panel for activation.



3.2 Sample Processing.

3.2.1 Press the **Start** button to begin the process. When the process is complete, the alarm will sound; press the **Reset** button to vent the chamber.

3.2.2 Open the chamber door by pulling the handle and rotating it ¼ turn clockwise. Do not pull on the chamber door, when the chamber reaches atmospheric pressure, the door will open.

3.2.3 **Caution: The quartz boat will be hot**. Allow to cool before handling. Once cool, remove the quartz boat from the chamber and place on a Kimwipe. Remove sample(s) from the quartz boat.

3.2.4 If more samples are to be processed, load samples and return to section 3.2.1

3.2.5 If processing is complete, return the boat to the chamber, close the chamber door, and rotate the handle ¼ turn counter-clockwise and flip down.

3.2.6 Turn off the Power switch on the RF power supply, the Power switch on the chamber, and the power switch on the Control Panel.

4. Troubleshooting

If you encounter an unexpected error or require assistance please contact the primary or secondary trainer listed above. Should they not be available, please contact any staff member for assistance.

5. Approval

Qualified Trainer: Scott Munro
Training Coordinator: Stephanie Bozic