



CRITICAL POINT DRIER



LOCATION: Plasma Etch Area

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

1. OVERVIEW

This document outlines the process for drying micro- and nanodevices to reduce static friction, or “stiction”. The sample may be a full wafer, maximum 4” diameter, or individual die.

2. SAFETY PRECAUTIONS

IPA handling and exposure hazards. Note that IPA (isopropyl alcohol, or 2-propanol) is a solvent, and a highly flammable substance.

CO₂ expansion will cool transfer tubing and other components to temperatures that could cause injury. Take care not to touch the chamber during processing, or other parts of the device such as metal tubing.



Under normal operation, the process chamber will hold pressures as high as ~1500 psi. It contains a blow-out device rated for 2000 psi. Extreme care must be taken to ensure that the top cover is properly fastened. See the operation manual for details.

The CO₂ bottles are heavy and require frequent changing. Do not attempt to do this yourself; notify a NanoFab staff member.

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. PROCESS COMPONENTS OR FEATURES

Samples are typically dried at the end of a longer process stream, involving many steps. Most samples will have been released using a wet chemical method, and critical-point drying is required in order to prevent stiction. Samples to be dried should be thoroughly rinsed prior to drying, as residual chemicals left over from the wet etch may damage the process chamber. Please consult a Nanofab staff member regarding all prior preparation work that is done at the NanoFab.

4. OPERATING INSTRUCTIONS

4.1 Detailed operating instructions can be found in the supplied manual. Refer to the Operation section (p.10-14) for these instructions.

4.2 If using smaller pieces, use the Teflon spacers, found in the container below the table, to minimize the IPA volume and speed up the process.

4.3 When the drier has finished processing, the chamber pressure will be zero. Do not attempt to open the chamber if the pressure is above zero.

4.4 Once finished, record you run in the log book, and document the final weight of the CO₂ cylinders. Empty the condenser into the waste container on the floor.

5. TROUBLESHOOTING

Flashing lights on the display is indicative of the CO₂ cylinders running low. Users may have to manually vent the chamber. Before venting, ensure the chamber is at or above the critical point (31.1°C and 1071psi). Press the Bleed button to start the venting process, which will take several minutes. Wait until the chamber pressure has reached zero before opening.

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.

6. APPROVAL

QUALIFIED TRAINER: Scott Munro
TRAINING COORDINATOR: Stephanie Bozic