

YES Oven (HMDS #1)

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Location: Optical Lithography

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OVERVIEW

The YES HMDS Oven is used to promote photoresist adhesion to silicon, silicon dioxide, and silicon nitride. Adsorbed water is removed from the substrates with a bake step, followed by gas-phase hexamethyldisilazane (HMDS) treatment which yields hydrophobic wafer surfaces. Although it is recommended to spin-coat substrates with photoresist immediately after HMDS treatment, the hydrophobicity persists for at least three days, so wafers should exhibit adequate resist adhesion if coated within this time.

SAFETY PRECAUTIONS

HMDS reacts with moisture on the skin, eyes, and mucous membranes to produce ammonia, which is destructive to these tissues and can cause burning sensations. HMDS may be fatal if inhaled.

Before bringing any new materials into the nanoFAB for processing, it is necessary to fill out a new chemical import form (www.nanofab.ualberta.ca/user-information/user-forms/chemical-import-form/).

OPERATING PROCEDURE

N.B. Wafers with resist, polymer, or any other organic film are NOT allowed in the YES Oven!

1. If necessary, turn the oven power on by flipping the breaker on the back of the tool then pressing the green power button on the front. The oven will heat to its operation temperature of 150 °C in approximately 45 minutes.
2. Place substrates in the specified HMDS carriers located in the container on top of the oven.
3. Place carrier(s) into the oven.
4. Ensure that **1** is shown in the **ENTER RECIPE NUMBER** button of the touchscreen display. If not, press this button, then touch **1** → **Enter** → **Done** to select Recipe 1.
5. Touch the **PRESS TO START** button to start the HMDS vapour prime process (Recipe 1). The process duration is 20 minutes, with completion indicated by an alarm.
6. Touch the **PRESS TO SILENCE ALARM** button, followed by the **PRESS TO RESET** button.
7. Remove substrates from oven and replace carrier in the container.
8. Do not turn off the oven after use: it will be turned off by nanoFAB staff at the end of the week.

TROUBLESHOOTING

If the oven is idle, but cannot be opened to load/unload substrates because it is under vacuum, vent the chamber by running Recipe 0 (**ENTER RECIPE NUMBER** → **0** → **Enter** → **Done** → **PRESS TO START**).

If the HMDS prime process aborts, touch the **PRESS TO RESET** button and start Recipe 1 again. If it aborts a second time, contact a staff member for maintenance.

If you encounter any unexpected errors or require assistance, please contact the primary or secondary trainer listed above. If they are not available, please contact any nanoFAB staff member for assistance.

APPROVAL

Qualified Trainer: Stephanie Bozic

Group Leader – Fabrication: Aaron Hryciw