CORAL Name: Vacuum-Oven

Location: Bay U4
Purpose: Diffusion
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Introduction

The Vacuum-Oven (model: T-MVAC Products SS806NS-14) heats samples under low pressure for various applications. The oven has a large chamber and can fit randomly sized samples up to 10”. It can be heated up to 600C and pull vacuum down to 10mT. It also has the capability to continuously purge the chamber with N2 (will result in a slightly higher pressure).
Note: this oven is not semiconductor grade, as it is steel, not quartz construction.



Safety

This oven runs at high temperatures, use caution when loading and unloading samples as the oven, carrier and samples may be hot.
Sample materials and process flow must be approved for the temperature and pressure by the PTC. Many materials will thermally decompose at higher temperatures and some byproducts may be hazardous.
Use quartz or metal boats for sample loading and transfer. Plastic boats such as PFA or PTFE will decompose at high temperatures and off-gas hydrogen fluoride (HF).
In an emergency, push off the “Heat” and “Vacuum” buttons to turn the system off.

User Qualifications and Responsibilities

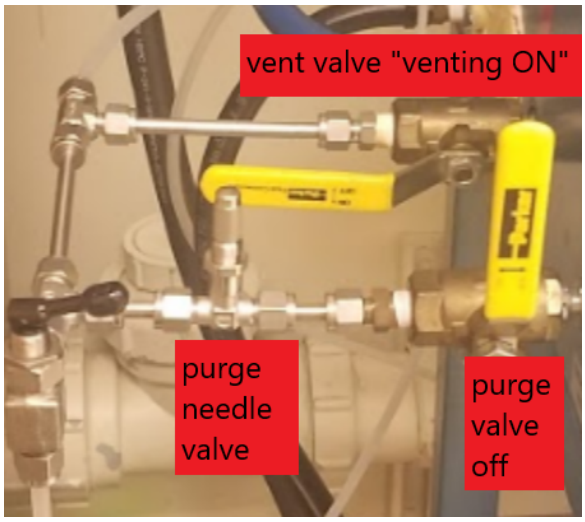
Samples must be correctly cleaned prior to using this system as at high temperatures, random contaminations like fingerprints are spread throughout the equipment.
Users must report problems or concerns via CORAL.

Operating Procedures

1. Check reservations in CORAL to ensure you have reserved the correct machine at the correct time. Engage the tool in CORAL.
2. Load samples onto a dummy wafer placed horizontally on one of the dedicated quartz boats, or if the samples are wafer sized, they may be placed directly into one of the quartz boats.



3. Open the chamber door, load the samples, close the door.
4. Press the Vacuum button ON.
5. Set the temperature by pressing the temperature controller Setup, which shows SP (set point). Arrow up or down to desired temperature, press SET UP twice to enter the set point.
6. Press HEAT.
7. Run process for the desired amount of time.
8. When the process is complete, set temperature controller to below 20C, push the Heat button OFF.
9. Press the Vacuum button OFF to turn off the vacuum pumps.
10. To vent, open the yellow Vent valve (make sure yellow Purge Valve is off). The oven will vent to atmosphere in approximately 1 minute.
11. Turn Vent valve off once venting is complete.
12. When samples are cool enough to move, remove quartz boat with samples and close the chamber door.
13. Close the oven door, pump the system down to 1 Torr, then shut off the vacuum pump again.
14. Ensure the system is in a safe state and Disengage the tool in CORAL being sure to enter the correct data in the report fields.



Appendices

Tips and Tricks:

1. Heating Ramp Rate: ~20 min to reach 100C. 10 min more for every 100C additional.
2. Cooling Rates: in most cases, samples will cool to 75C in one hour. Samples may be removed at higher temperatures, but caution must be used to avoid getting burned.
3. If desired, continuous N2 purge is available: open the yellow valve labeled Purge, use the purge needle valve to adjust flow (value will be reflected in the overall pressure).
4. Temperature data logging is available on the connected computer.
    a. Click the button on the computer screen that says “Start Logging”. Temperature data is collected once per minute.
    b. Click “Stop Logging” to end collection. Data files are stored in “Desktop\Vacuum Oven Temp Files and can be transferred to a USB thumb drive.