

How to change a sample with the ILL furnace:

1. Prepare the system for a sample change.
 - a. Set temperature setpoint to 0°C.
 - b. Turn off power to the heating elements by moving the furnace power switch to OFF with a pull-then-flip, as in Figure 1.
2. Remove the previous sample.

Furnace temperature must be 100°C or lower before removing sample stick.

 - a. Press the power button on the turbo pump controller, as in Figure 2, and wait for it to spin down to 0 Hz (5-10 min).
 - b. Once the turbo has spun down to 0 Hz, close the vacuum valve to the backing pump, as in Figure 3.
 - c. Carefully disconnect both thermocouple leads on the sample stick.

Never have open the vent valve and vacuum valve at the same time, to prevent the vacuum pump from emptying the gas cylinder.
 - d. Open the vent valve slowly to vent the furnace to atmospheric pressure. Avoid over-pressurizing the furnace.
 - e. Remove the clamp holding the sample stick in place.
 - f. Leaving the vent valve open, carefully remove the stick and hang from the stick holder in the sample pit.
 - g. Place the blank over the sample stick port and close the vent valve.
 - h. Scan sample with RadEye G radiation monitor. If the monitor alarms, call the RCT (865-274-8658).

Caution: Sample may be hot. Thermal gloves should be worn if needed.
 - i. Unscrew sample from stick, as in Figure 4, and put it in the Radiological Materials Area with its ITEMS barcode tag.
3. Load new sample.
 - a. Screw new sample onto stick.
 - b. Check that the sample height is correct, as measured from the bottom of the flange. The height to the beam position should be 30.75 inches.
 - c. Open vent valve and remove blank from sample stick port.
 - d. Carefully place stick into furnace, ensuring that the O-ring is in place.
 - e. Replace sample stick clamp and close vent valve.
 - f. Reconnect both thermocouple leads, being careful to match the orientation marks.
 - g. Open the vacuum valve to the backing pump.
 - h. Once the pressure is below 1.0 mbar, press the power button on the turbo pump controller to start spinning it up.
4. Prepare the system for heating.
 - a. Once the pressure is below approximately 5×10^{-4} mbar, the furnace is ready to heat.
 - b. Clear the furnace alarm by holding the up-arrow button until the display reads “---°C” on the blue furnace controller.
 - c. After verifying that the setpoint is 0°C, flip the furnace power to ON.

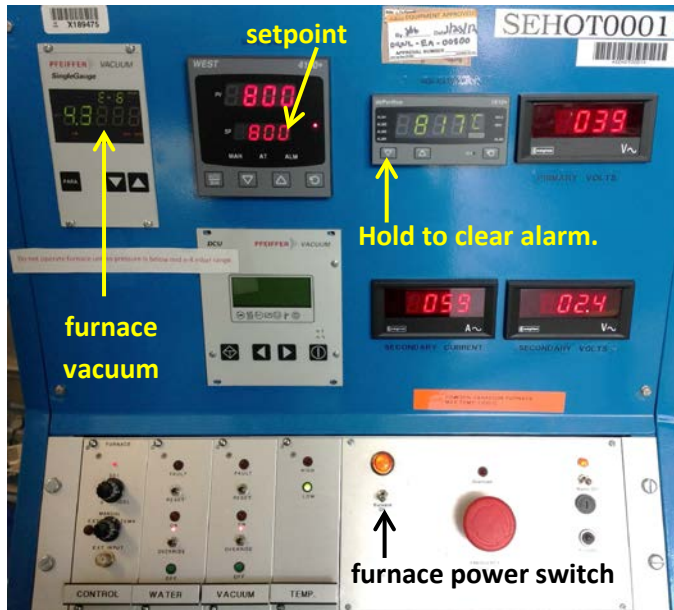


Figure 1. ILL furnace controller.

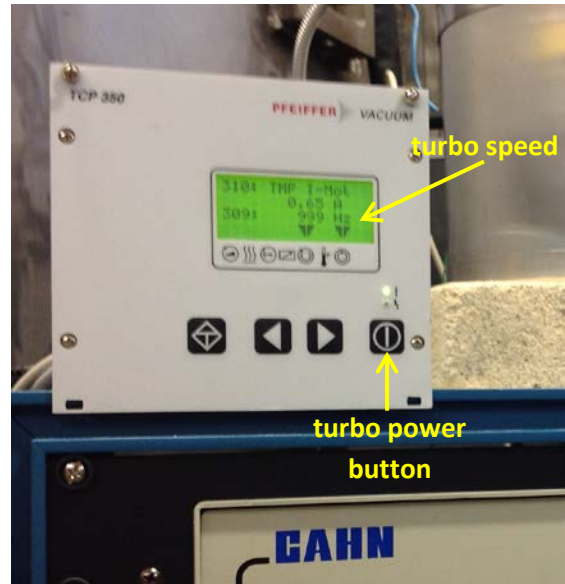


Figure 2. Turbo-pump controller.

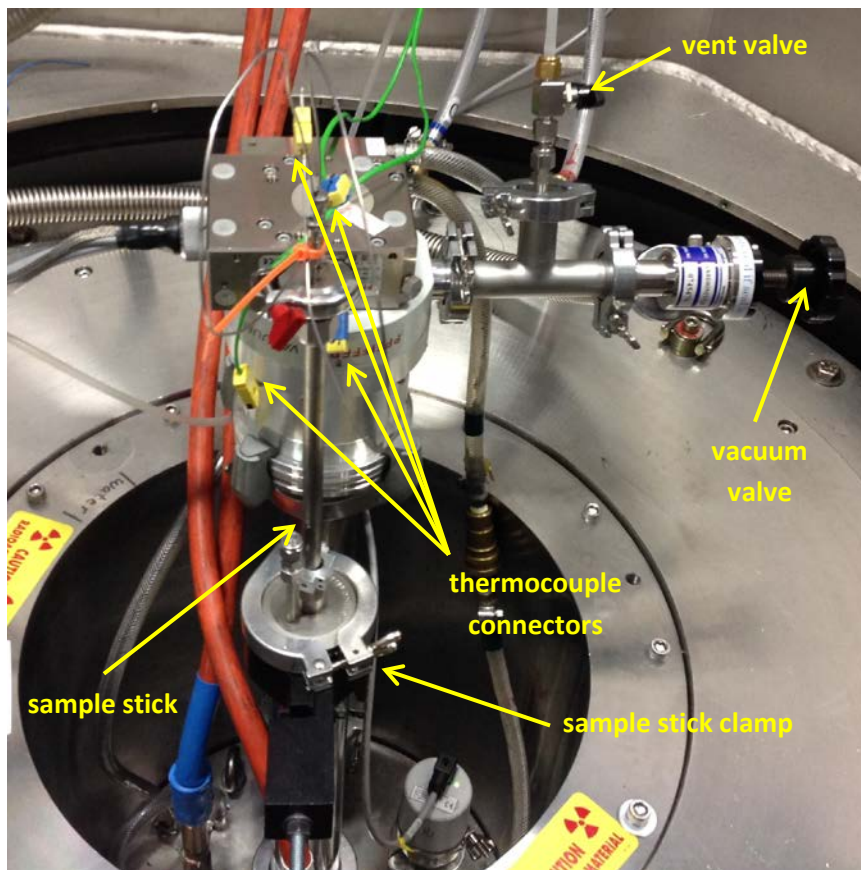


Figure 3. ILL furnace.



Figure 4. Sample can on stick.