

Muffle Furnace Protocol

V1: 8/27/24 S.McGregor

Overview:

The muffle furnace is a well insulated oven with a maximum temperature of 1100 °C. It is typically used in METAL for removing organics from glassware, ashing filters and ashing organic-rich rocks such as shales. Uses that deviate from standard use need to be discussed with staff members. There are alternate furnaces in EMC that may be better suited to those applications. METAL staff MUST be consulted prior to putting plastics or anything which is likely to volatilize toxic gases in the furnace.

Video SOP: <https://www.youtube.com/watch?v=buE5sAhHMac>

Safety/PPE:

- Very hot temperatures.
- Use of protective eyewear and gloves are mandatory.
 - Gloves for furnace are found in the drawer underneath.
- Know the melting point or flash combustion point of the items before placing them inside furnace.
- In the case of smoke or strange smells, turn the furnace OFF and leave the area. Pull the fire alarm if heavy smoke or flames are present. Only when cool, crack the door open and stand to the side to check the inside.
- Ensure the exhaust is running.

Protocol:

1. Cover open ends of any pyrex materials with aluminum foil. Place filters in designated pyrex dishes.
2. Place items CAREFULLY inside furnace, avoiding touching the sides where the coils are. Avoid the thermocouple in back of the furnace.
3. Close the door and turn on the main power switch on the front of the furnace.
4. To check/change the temperature of the furnace, the timer will need to be switched to MAN → ON. The furnace will begin to heat up. Click the TEMP button and it will display the current set temperature. To change it use the arrows.
5. To use the timer function please refer to the “furnace timer protocol”.
6. Once the furnace has started heating up it will take about 30 min to 1 hour to reach the set temp.
7. Fill out the log sheet next the furnace with your information.
8. Once session is complete, either turn the furnace off manually or, if you used the timer function, it will have automatically shut off.
9. It needs about 2 hours minimum (longer is better) to cool down the items inside before they can be removed. Always assume that whatever is inside is hot and use gloves and tongs to remove items.
 - a. If items are still warm, place them on the ceramic plate to the right of the furnace to cool to room temperature before handling further.

Standard Uses:

- Pyrex glassware → 500C for 4 hours
- Filters → 400C for 4 hours