



HAZARD ALERT: MUFFLE FURNACE FIRE/BURN RISK

KNOW THE CONTENTS IN THE FURNACE



Furnace with ceramic muffle.
<https://ch.vwr.com/store/product/it/26086365/muffle-furnaces>



Debris from meltdown and combustion of plastic material placed in a muffle furnace with glass objects.
Photo credit: anonymous



This extreme heat-protection glove with a sleeve, is rated for temperatures up to 900 °C for 20 seconds. It should be used in muffle furnace processes that are not to exceed 800 °C.

<https://ie.vwr.com/store/product/8903776/heat-resistant-gloves-ihr-540>

A muffle furnace is a type of heating unit that uniformly heats an inner insulated or “muffled” chamber to temperatures as high as 1800 °C. There are many potential hazards associated with heating equipment and materials to such a high temperature; the following precautions and protocols should be followed to minimize those hazards.

PREVENTING MUFFLE FURNACE INCIDENTS:

- **Know the melting point or combustion point of objects to be heated.** This includes knowing all of the components of an object.
- **Avoid heating incompatible materials at the same time.** It is important to know the properties of the materials being heated.
- **Do not leave the muffle furnace unattended** until the desired temperature is met and stabilizes. If the furnace is not equipped with an auto shut-off, a malfunction may require a person to turn it off.
- **Avoid opening the furnace door until the temperature is ≤ 100 °C,** or at a safe level for the materials being heated. This ensures that the objects inside have cooled adequately to prevent implosion. (Thermal shock of objects is more likely to occur with an abrupt temperature change if the furnace door is opened when the temperature is higher than 100 °C.)
- **Stand behind the door or away from the opening of the muffle furnace when opening.** This is to avoid exposure to high temperatures and possible projectiles.
- **Calibrate the furnace monthly or to the manufacturer's standards** to verify that the desired temperature is being reached without issue.

APPROPRIATE CONTROLS AND PPE:

- **Always Exhaust:** Combustion by-products and fumes will be created and escape the muffle furnace as objects are heated. The furnace should be directly exhausted or placed in an exhausted enclosure.
- **Extreme Heat-Protection Gloves:** Gloves should be rated for temperatures above the expected working temperature, and have a sleeve to cover most of the wearer’s forearm.
- **Tongs or Forceps:** Must be long enough to reach objects in the back of the muffle furnace without the user placing their gloved hand inside.
- **Safety Glasses and Face Shield:** Both need to be worn to protect the user from possible object implosion when unloading the furnace.