

Hot plates and other heat producing equipment used in laboratories present many potential dangers to the user. Fires can result when hot devices are located too close to flammable or combustible materials, or because of sparks caused by older or faulty wiring/switches. There is also the risk of burns from accidental contact with a hot surface. Hot chemical reagents also pose greater environmental and health risks.

Basic Precautions:

- Periodically test the function of the “off” switch on each hot plate, heating mantle, and water bath to verify that it works and the device cools quickly when the switch is in the “off” position.
- Always check equipment prior to use. Do not use if the plug or cord are worn, frayed, or damaged, if the grounding pin has been removed, or if a spark is observed. Check for corrosion of the thermostat, which can also cause a spark.
- Never store flammable chemicals or combustible materials near the hot plate.
- Limit the use of flammable materials when using an older model hot plate.
- Never heat a closed system.
- Read manufacturer’s instructions before using heating devices, and register the device with the manufacturer so you will be notified of any warnings or recalls.

Tips for Working Safely with Hot Plates:

- Use only heat-resistant, borosilicate glassware, and check for cracks before heating. Make sure that the surface of the plate is larger than the object being heated.
- Use boiling stones or stir bars in liquids to facilitate even heating and boiling. Do not evaporate all the solvent or otherwise heat a mixture to dryness – this may result in the glass cracking.
 - Use the appropriate setting when heating liquids, including water. Do not use high setting to heat low-boiling liquids as this can produce surface temperatures as high as 540 °C (1004 °F).
 - Rapid change in temperature can damage glassware. Heat and cool slowly.
 - Do not overfill glassware. Use the appropriate size vessel for what you will be heating. Never fill vessel more than 1/2 of the way full.
 - Use care when removing hot glassware or when pouring hot liquids. Use tongs or heat-resistant gripping devices/gloves, and remember that glassware may stay hot for some time.
 - Use appropriate ventilation, such as a fume hood or snorkel.
 - Turn off and unplug hot plates and all other heating devices after use!



Additional safety information on heat producing appliances can be requested by contacting the PSU Environmental Health & Safety Department.