
The Waste-Paper

“Waste is a terrible thing to mind”

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Gas Cylinder Storage

Princeton University’s science and engineering departments conduct research that often involves the use of compressed or liquefied gases. These gases range from inert to highly toxic, corrosive or reactive. In the gaseous phase, chemicals are easily inhaled and therefore pose a high inhalation risk.

In addition to the chemical hazards presented by these materials, the pressurized cylinder itself exhibits potential for serious injury and property damage if mishandled. To protect against these hazards, be sure to:

- Secure cylinders upright, with no more than two per securing strap
- Protect valves by keeping the valve cap in place except while the cylinder is properly secured and in use
- Store highly toxic gases in specially designed cabinets with ventilation and monitoring
- Use a cylinder cart to transport cylinders to and from work and storage areas
- Use only pressure-rated piping and tubing
- Inspect all pipes, tubes and fittings for damage and leaks

For purposes of shipping and or waste disposal, all cylinders are considered hazardous materials, regardless of contents. When ordering cylinders, avoid lecture bottles and other cylinders that cannot be returned to the manufacturer. The high cost of disposal of unwanted, non-returnable cylinders is avoided when a returnable cylinder is used.

Do not stockpile cylinders that are not intended for immediate use. Contact the manufacturer or cylinder distributor to enquire about the return of the cylinder, thus avoiding unnecessary rental/demurrage fees. Some reactive and corrosive gases (e.g., chlorine) can damage the cylinder valve when stored for extended periods, increasing the disposal cost of the cylinder. Remember when returning unwanted cylinders, pressurized cylinders must be shipped as regulated hazardous materials. Contact EHS to arrange a return shipment.

Further information on cylinder storage, handling and management can be found online in the EH&S website. http://web.princeton.edu/sites/ehs/labguide/sec_2f.htm



What is wrong with this picture?

One strap on two cylinders.

The cylinder on the left has no cap or regulator. Every cylinder should be stored with the cylinder cap in place or a regulator attached.



Next Waste Pickup

February 28, 2008

Bring wastes to pickup area on
Wednesday, February 27

- Frick Loading Dock
- LTL Loading Dock
- E-Quad Room 7 (on dock)
- Jadwin Hall Room 125

Safe Microwave Oven Use In Labs

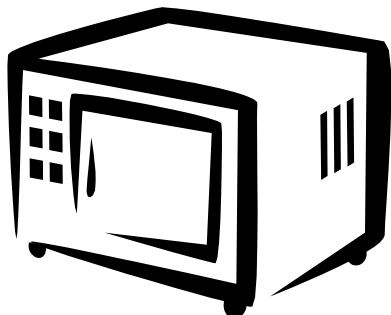
Microwave ovens are used everyday in offices, homes and labs. Our familiarity with the microwave oven makes it easy to overlook the hazards their use can present in the lab. A common hazard is superheating of liquids. Superheating occurs when a liquid is heated above its boiling point. The superheated state is unstable, and the liquid can suddenly begin vigorously boiling, causing the contents to be rapidly expelled from the container. To prevent the hazards of superheating:

- Before putting the liquid in the oven, place a non-metal object with a surface that is not smooth (e.g., a stirring rod) into the liquid.
- Use a container with a surface that is at least slightly scratched or not completely smooth.
- Tap the outside of the container with a solid object before removing it from the oven.
- Avoid quickly adding another substance (e.g. a powder) to the container

Capping or sealing vials or other containers can lead to pressure build-up. Microwave ovens can heat materials so quickly that even though the cap is loosened to accommodate expansion, the lid can seat upwards against the threads, causing the container to burst. To prevent over-pressurization:

- Do not cover or seal the container, or do so loosely with paper towels or Kimwipes®.
- If sterility is an issue, remove the cap and use a foam plug or cotton.

In addition to heating-related issues, microwave ovens can pose other hazards. Metals, including foils and some stir-bars, can cause arcing, which may damage the magnetron and be an ignition source for flammable or combustible vapors. Operating the oven without anything to absorb the energy can also damage the oven's magnetron. Manufacturers recommend that at least a glass of water be present while operating a microwave oven to act as a load safeguard.



Other tips for safe microwave use include:

- Keep your microwave oven clean - especially the sealing surface of the door, to avoid leakage of microwave radiation.
- Use non-metallic, microwave-safe containers to avoid melting and spillage.
- Use boiling stones or glass beads if needed.
- Ensure the microwave oven plug is grounded (three-pronged).
- Know the wattage of the unit and adjust the heating time accordingly.
- If you are unsure of a correct heating time, ask for assistance from someone familiar with the unit.
- Use heat resistant gloves, a long-sleeved lab coat and splash-resistant goggles when removing high-temperature materials from the microwave.
- Allow solutions to cool before moving them if you suspect they are superheated.

Microwave ovens serve as a tool to quickly and effectively heat materials in laboratories on a routine basis. Like any tool or power source, always exercise appropriate precautions.



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