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# The Waste-Paper

*The Hazardous Waste Disposal Monthly Update*

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## “Every university employee wants to do a good job...”

This applies to us all, not the least of which are the wonderful folks in the Building Services department. Our janitors work extremely hard to keep our floors clean and our waste receptacles from overflowing. In their effort to keep us from being buried beneath a mountain of our waste, items could be accidentally removed from the labs that are not intended for the regular trash. The responsibility for preventing this type of event from occurring falls on the lab personnel.

Communication is the key to prevention; written and verbal communication is essential to keep Building Services informed. Hazardous chemical waste must be labeled as such as soon as the first addition to a collection container is made – this is not just good practice, it’s a US EPA regulatory requirement. Janitors participate in biennial EHS training, a portion of which is dedicated to recognition of the hazardous waste labels. If waste labels are not readily available, the words “HAZARDOUS WASTE” and the list of chemical constituents must appear on the container. Standard labels (e.g., Avery®) are adequate in communicating the contents of a waste container.

In addition to adequate labeling, chemical waste container should never be situated at or near the standard trash receptacles. The mind set of building services is “if it’s stored near the trash it must be trash.” If your intention is to prevent a container from being removed and placed in a dumpster, keep it far from the trash receptacles.

Speaking of trash receptacles, *never* use a standard waste receptacle to store or move chemicals in the lab. This can obviously create confusion and could result in unintentional mishandling of chemicals and other materials.

For most labs, janitors will regularly empty trash and recycling containers. They will also remove full, sealed medical waste boxes (in some buildings) and glass or pipette boxes and replace with empty boxes. A couple times a year, they will wash the floors. If your lab needs other cleaning, either on a regular basis or occasionally, lab personnel must make those arrangements through the Building Services supervisor or via Customer Service (8-8000).

## As a reminder...

- NEVER ASK A JANITOR TO CLEAN A CHEMICAL SPILL, except water. Janitors are prohibited from cleaning up chemical spills.
- If you do not clean up a chemical spill immediately, leave a note or sign warning others that the spill is there. Signs are available in the gray pails of the spill kits provided by EHS, which are usually located near the elevators on the 100 level.
- When janitorial or maintenance staff must conduct work in your lab, such as changing a light bulb, move material out of their way so that they do not have to disturb them.
- Do not dispose of liquids in a trash receptacle, even non-hazardous liquids.
- When disposing of non-hazardous solids, ensure that the material is in a sealed bag or container to prevent the solid from dispersing into the air where it could be inhaled or go into someone’s eyes or face. Label the container or bag as to its contents.
- Do not place metal shavings and solder scraps in the regular trash. Collect them into a container and bring them to the waste pickup or bring them to a machine shop for recycling.



Next Waste Pickup

**February 22, 2007**

Bring wastes to pickup area on  
Wednesday, February 21

- 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. A common example is that of superheated liquids, which has occurred in our labs. Recently a lab worker was removing agar that had just been heated in the microwave, when the superheated agar explosively ejected from its container and scalded the lab worker.

Although this incident seems fairly isolated, thermal burns from scalding liquids are a common hazard associated with microwave ovens. Superheating occurs when a liquid is heated above its boiling point. The superheated state is unstable, and it can rapidly produce a large amount of vapor, thus forcing the boiling liquid out of the container. For example, heating one liter of water 1°C above its boiling point of 100°C can suddenly produce about 3 liters of steam. The rapid production of a substantial quantity of steam *within* the bulk of the water will cause it to boil vigorously and possibly eject from the container.

A number of factors contribute to the hazards of superheating, including using a container with a very smooth surface, such as unscratched glass or a glazed container; heating for too long; and quickly adding another substance (such as 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 lid may be loose to accommodate some expansion, the lid can seat upwards against the threads and containers can burst.

In addition to the heating-related issues, microwave ovens can pose other hazards. Metals, including foils and some stir-bars, can cause arcing, which could damage the magnetron or power tube of the oven and can also be an ignition source for flammable or combustible materials.

Plastics and other materials that are not suitable for a microwave oven can melt, causing spillage of the material.

Operating a microwave 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.

Safe practices to follow while using a microwave oven, particularly in a laboratory setting, are as follows:

- Keep your microwave oven clean, especially the sealing surface.
- 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.
- To prevent over-pressurization:
  - Do not cover or seal the container, or do so with paper towels or Kimwipes®.
  - If sterility is an issue, remove the cap and use a foam plug or cotton.
- Ensure the material to be heated is suitable for heating with the microwave oven
- Use non-metallic, microwave-safe containers
- Use boiling stones or glass beads if possible or needed.
- Ensure the microwave oven plug is grounded (three-pronged). Do not use in conjunction with an extension cord
- 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
- If ventilation is needed, avoid placing the microwave oven in a fume hood. The rest of the hood may be unusable and the air flow may be turbulent. There are other effective methods for ventilation that are less costly.

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

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