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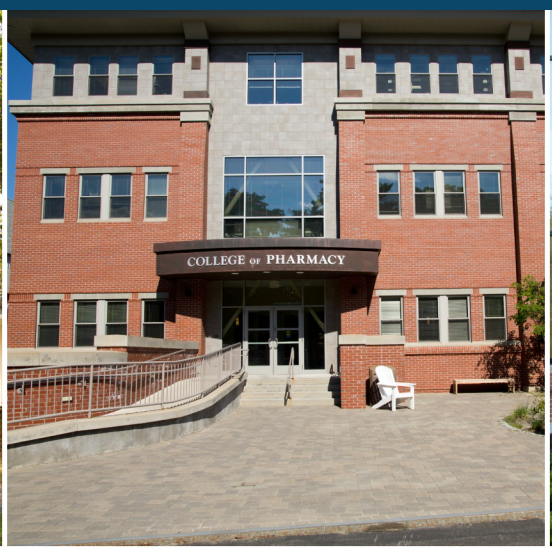
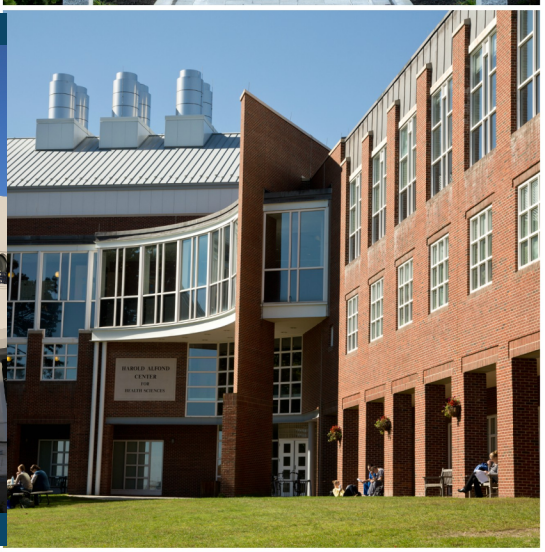
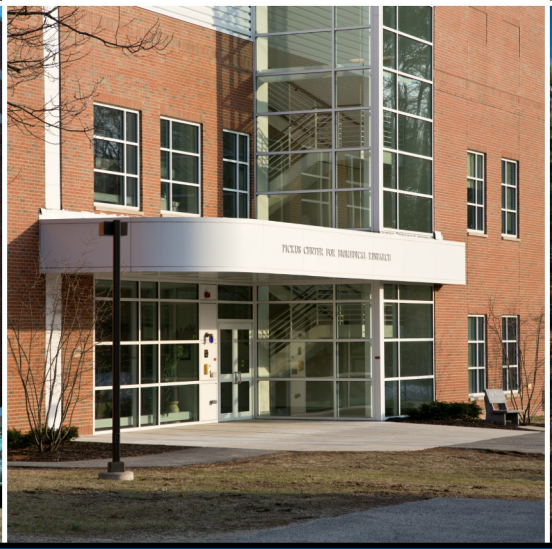
EHS Lab Chatter







UNE UNIVERSITY OF NEW ENGLAND
INNOVATION FOR A HEALTHIER PLANET

EHS ENVIRONMENTAL HEALTH AND SAFETY

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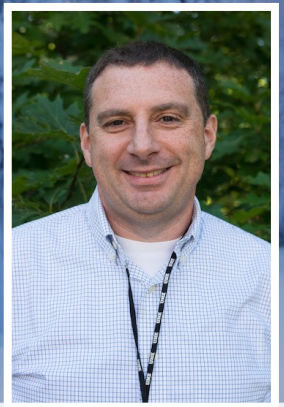

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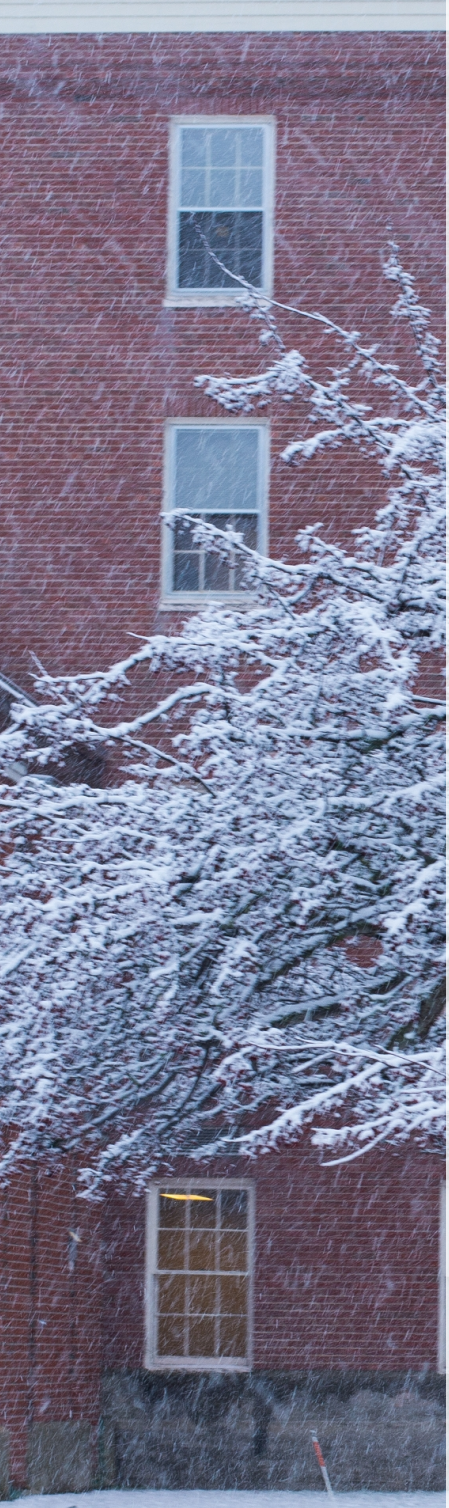


Safety Spotlight

Slips, Trips, and Falls

by Jess Tyre

Slips, trips and falls are very common workplace injuries. According to OSHA, they cause 15% of all accidental deaths, and are second only to motor vehicles as a cause of fatalities. All slips, trips and falls are preventable. As we head into winter with the snow and ice approaching, it is a good idea to remind all employees to be mindful when walking around campus and inside buildings. UNE Housekeeping and Facilities work hard to keep sidewalks cleared, parking lots plowed, and building entry ways shoveled and salted. But, conditions can change quickly so it is everyone's responsibility to pay attention and report any unsafe areas on campus. UNE also places salt bins in strategic locations on campus. These bins are not limited to use by Facilities staff; anyone is welcome to use the scoop inside the bin and spread salt on icy areas.

Aside from ice and snow as falling hazards, you also have to be mindful of things like:

- electrical cords running across floors
- floor mats that may be askew or rolled at the edges
- changes in walking surfaces such as going from tile floors to carpet
- contractor and vendor items in work areas that may not be present normally
- dips and holes in parking lots or across lawns
- puddles and water on slippery flooring
- furniture/stools in aisle ways

TO REPORT UNSAFE CONDITIONS:

- Call the Facilities front desk at X-2368

TO REPORT A SLIP, TRIP OR FALL INJURY

- Call UNE Security:
  - Emergency: 366 from any CAMPUS phone
  - Non-Emergency: (207) 602-2298
  - From off campus: (207) 283-0176
- Report any employee injuries or incidents to Human Resources within 24 hours as well.
- Report any student or visitor injuries or incidents to Risk Management to jtyre@une.edu.

Chemical Waste Minimization/Source Reduction

Source: University of Delaware EHS Website

Submitted by Ronnie Souza

Introduction

Federal and state regulations governing hazardous waste requires that generators of hazardous waste develop and implement waste minimization procedures. The guidelines listed below are some good examples of how to minimize waste generated in the laboratory. Waste minimization is not only good for the environment but also reduces University costs associated with chemical waste disposal.

All chemical waste must be disposed of through the Department of Environmental Health & Safety. Chemical waste includes but is not limited to:

- Unwanted laboratory reagent chemicals
- Chemical mixtures generated through laboratory research and education processes
- Glassware and debris contaminated with chemical residues
- Contaminated debris generated during chemical spill clean-ups
- Paints, oils, pesticides, cleaners, etc.

Guidelines for Reducing Chemical Waste

- Before disposing of a reagent grade chemical, determine if someone else has a need for the chemical.
- Establish chemical use parameters before placing order. This will minimize waste by purchasing chemicals in the container size that permits maximum consumption.
- Purchase chemicals in small quantities. The contents of small containers are more likely to be utilized than lost to contamination or degradation. Also, if disposal is required, volume and expense will be minimized if waste is in small containers.
- Whenever possible, substitute less-hazardous chemicals for hazardous ones. Examples: Substitute "no-Chromix" for chromerge; cyclohexane for benzene; non-mercury thermometers for mercury containing thermometers.
- Avoid stock piling of common chemicals. Stock piling involves the purchasing or accumulation of chemicals in large quantities for use longer than needed. This practice usually jeopardizes the chemicals' properties over a period of time. Also, many chemical suppliers offer "just in time" orders which still allow the purchaser to take advantage of bulk pricing.
- When chemicals are received take all precautions to store them according to manufacturers' recommendations such as by refrigeration, under an inert atmosphere or in a desiccator. Following special storage requirements can increase the shelf life of chemicals.
- When chemicals are received, date and store them in a manner that enables the older chemicals to be used first. This will develop a rotational system so that chemicals will be used before shelf life expires.

see next page...

waste minimization continued...

- Replace worn labels in a permanent, legible fashion. This will prevent an unknown chemical from being generated. Unknown chemicals are difficult and expensive to manage as a waste.
- Label all containers and reaction flasks that contain or will contain chemicals. DO NOT use abbreviations, trade names or chemical symbols. Only use the common chemical name or IUPAC nomenclature to identify each container's contents. This will prevent an unknown chemical from being generated.
- Replace faulty or damaged caps and lids. This will safeguard against the effects of air and moisture contamination.
- Inventory the chemicals in your laboratory every six months. During the inspection replace worn and damaged labels. Assure that chemicals are stored by compatibility and not alphabetically. Get rid of unwanted chemicals that will no longer be needed. This practice will prevent the disposal of large volumes of chemicals when a laboratory is vacated and reduce the potential of a chemical becoming an unknown due to a deteriorating label. Also get rid of chemicals that tend to form peroxides or become more reactive with time that are approaching the end of their shelf life. For example, ethyl ether and tetrahydrofuran tend to form explosive peroxides and picric acid becomes shock sensitive when dry.
- If repeated dispensing of liquids is required, utilize a calibrated pipette or bottle top dispenser. Decanting liquids in calibrated beakers or graduated cylinders tends to generate large quantities of waste. Potential hazards such as spillage and personal exposure are also reduced by using bottle top dispensers and pipettes.
- Reduce the scale of the experiment if protocol permits. Less chemicals used equates to less waste.
- Gas cylinders should be inspected on a regular basis. Ensure that the label is in good condition. Unknown gas cylinders present a serious hazard and are very expensive to manage as a waste. Utilize a gas vendor that will accept the cylinders back when they are no longer needed. Never refill a gas cylinder. Refilling of cylinders must only be completed by the gas cylinder vendor. Follow all safety procedures when utilizing compressed gases and liquids.

Special Notes

- Reagent grade chemicals are very expensive to dispose of compared to routine chemical wastes generated by research and education.
- A lecture size gas cylinder will typically cost between $150 to $1,000 to dispose of, depending on the cylinder's contents, age and condition. Unknown cylinders and highly reactive gases are much more expensive to handle.
- Very poisonous and reactive compounds such as sodium cyanide and concentrated organic peroxides have to be managed as individual containers which significantly increases disposal costs.

OSHA Hierarchy of Controls

Source: OSHA Laboratory Safety Guidance

Occupational safety and health professionals use a framework called the "hierarchy of controls" to select ways of dealing with workplace hazards. The hierarchy of controls prioritizes intervention strategies based on the premise that the best way to control a hazard is to systematically remove it from the workplace, rather than relying on workers to reduce their exposure. The types of measures that may be used to protect laboratory workers, prioritized from the most effective to least effective, are:

- engineering controls;
- administrative controls;
- work practices; and
- personal protective equipment (PPE).

Most employers use a combination of control methods. Employers must evaluate their particular workplace to develop a plan for protecting their workers that may combine both immediate actions as well as longer term solutions. A description of each type of control for non-production laboratories follows.

Engineering controls are those that involve making changes to the work environment to reduce work-related hazards. These types of controls are preferred over all others because they make permanent changes that reduce exposure to hazards and do not rely on worker behavior. By reducing a hazard in the workplace, engineering controls can be the most cost-effective solutions for employers to implement.

Examples include:

- Chemical Fume Hoods; and
- Biological Safety Cabinets (BSCs).

Administrative controls are those that modify workers' work schedules and tasks in ways that minimize their exposure to workplace hazards.

Examples include:

- Developing a Chemical Hygiene Plan; and
- Developing Standard Operating Procedures for chemical handling.

Work practices are procedures for safe and proper work that are used to reduce the duration, frequency or intensity of exposure to a hazard. When defining safe work practice controls, it is a good idea for the employer to ask workers for their suggestions, since they have firsthand experience with the tasks as actually performed. These controls need to be understood and followed by managers, supervisors and workers.

Examples include:

• No mouth pipetting; and

• Chemical substitution where feasible (e.g., selecting a less hazardous chemical for a specific procedure).

Personal Protective Equipment (PPE) is protective gear needed to keep workers safe while performing their jobs. Examples of PPE include respirators (for example, N95), face shields, goggles and disposable gloves. While engineering and administrative controls and proper work practices are considered to be more effective in minimizing exposure to many workplace hazards, the use of PPE is also very important in laboratory settings.

It is important that PPE be:

• Selected based upon the hazard to the worker;

• Properly fitted and in some cases periodically refitted (e.g., respirators);

• Conscientiously and properly worn;

• Regularly maintained and replaced in accord with the manufacturer's specifications;

• Properly removed and disposed of to avoid contamination of self, others or the environment; and

For more information from the OSHA Laboratory Safety Guidance document, please go to:

https://www.osha.gov/Publications/laboratory/OSHA3404laboratory-safety-guidance.pdf

Safe Handling and Storage of Dry Ice

By Peter Nagle

Dry Ice is frozen Carbon Dioxide. Unlike most solids, it does not melt into a liquid, but instead sublimates (changes directly into a gas). Sublimation will occur at a temperature of –78.5C (-109.3 F) or higher. Also, the thermal expansion of dry ice is considerable. One pound of dry ice produces about 250 liters of gaseous carbon dioxide, so during sublimation a significant amount of gaseous carbon dioxide is released in relation to the original amount in solid form. These properties make it especially important that proper handling and storage procedures are followed to avoid any injuries, incidents or damage to equipment. Below are guidelines to follow when handling and storing dry ice and first aid procedures in case of exposure.

Storage:

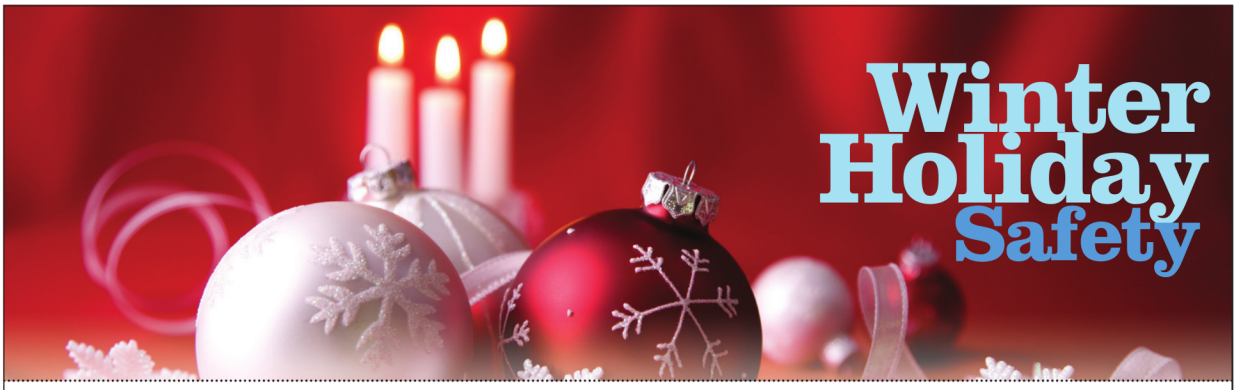
- Dry ice **must** be stored in a well-ventilated location and placed in a Styrofoam chest, insulated cooler, or a special cooler designed for the storage of dry ice.
- Dry ice is **NEVER** to be stored in any type of tightly sealed devices such as an ultra-low freezer or plastic/glass container. The sublimation of Dry Ice into Carbon Dioxide gas will cause an airtight container to expand, rupture, or burst.
- **Always** handle dry ice in a well ventilated area. Gaseous carbon dioxide is heavier than air and will collect in low spots (breathing zone) in poorly ventilated areas displacing oxygen and possibly causing asphyxiation.
- Dry ice will sublimate about five to ten pounds every 24 hours (blocks last longer) in a typical storage cooler. Plan on purchasing dry ice as close as possible to the time needed.
- Some surfaces such as tile or laminated counters that are left in direct contact with Dry Ice may be damaged by the extreme cold because the adhesives may become brittle and break.
- Dispose of any unneeded dry ice by letting the unused portion sublimate in a well ventilated area.

Handling:

- **Never** handle dry ice with bare hands. Using bare hands can cause burns/frostbite to the skin in a short period of time.
- **Always** handle dry ice with cryogenic gloves or other gloves designed to handle extremely cold objects.
- Avoid eye or skin contact.
- **Always** wear appropriate eye protection and lab coat when handling dry ice.

First Aid:

- Remove any clothing that is not frozen to the skin.
- **Do NOT** rub frozen body parts because tissue damage may result.
- Obtain medical assistance as soon as possible.
- Place the affected part of the body in a warm water bath (not above 40°C). **Never** use dry heat.



Winter Holiday Safety

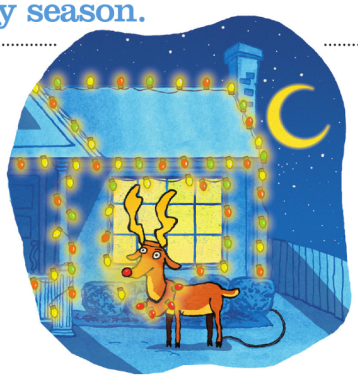
Winter holidays are a time for families and friends to get together. But that also means a greater risk for fire. Following a few simple tips will ensure a happy and fire-safe holiday season.

HOLIDAY DECORATING

- Be careful with holiday decorations. Choose decorations that are flame resistant or flame retardant.
- Keep lit candles away from decorations and other things that can burn.
- Some lights are only for indoor or outdoor use, but not both.
- Replace any string of lights with worn or broken cords or loose bulb connections. Read manufacturer's instructions for number of light strands to connect.
- Use clips, not nails, to hang lights so the cords do not get damaged.
- Keep decorations away from windows and doors.

HOLIDAY ENTERTAINING

- Test your smoke alarms and tell guests about your home fire escape plan.
- Keep children and pets away from lit candles.
- Keep matches and lighters up high in a locked cabinet.
- Stay in the kitchen when cooking on the stovetop.
- Ask smokers to smoke outside. Remind smokers to keep their smoking materials with them so young children do not touch them.
- Provide large, deep ashtrays for smokers. Wet cigarette butts with water before discarding.



Before Heading Out or to Bed

Blow out lit candles when you leave the room or go to bed. **Turn off** all light strings and decorations before leaving home or going to bed.

FACTS

- **More than a third** of home decoration fires are started by candles.
- **Forty-two percent** of decoration fires happen because decorations are placed too close to a heat source.

NFPA
NATIONAL FIRE PROTECTION ASSOCIATION
The leading information and knowledge resource on fire, electrical and related hazards

Christmas Tree Safety

As you deck the halls this holiday season, be fire smart. A small fire that spreads to a Christmas tree can grow large very quickly.

PICKING THE TREE

- Choose a tree with fresh, green needles that do not fall off when touched.

PLACING THE TREE

- Before placing the tree in the stand, cut 2" from the base of the trunk.
- Make sure the tree is at least three feet away from any heat source, like fireplaces, radiators, candles, heat vents or lights.
- Make sure the tree is not blocking an exit.
- Add water to the tree stand. Be sure to add water daily.

LIGHTING THE TREE

- Use lights that have the label of a recognized testing laboratory. Some lights are only for indoor or outdoor use.
- Replace any string of lights with worn or broken cords or loose bulb connections. Read manufacturer's instructions for number of light strands to connect.
- Never use lit candles to decorate the tree.
- Always turn off Christmas tree lights before leaving home or going to bed.

After Christmas

Get rid of the tree after Christmas or when it is dry. Dried-out trees are a fire danger and should not be left in the home or garage, or placed outside against the home.

Check with your local community to find a recycling program.

Bring outdoor electrical lights inside after the holidays to prevent hazards and make them last longer.

FACTS

- **One** of every three home Christmas tree fires is caused by electrical problems.
- Although Christmas tree fires are not common, when they do occur, they are more likely to be serious.
- A heat source too close to the tree causes roughly **one in every four** of the fires.

NATIONAL FIRE PROTECTION ASSOCIATION
The leading information and knowledge resource on fire, electrical and related hazards

Your Logo

UNE Chemical Sharing Program

The UNE Chemical Sharing Program is a great way to reduce hazardous waste, reduce costs for your department, and have a positive environmental impact on campus. If you have any commonly used lab chemicals that you are thinking of disposing, please contact EHS so they can be listed in the next issues of EHS Lab Chatter as available for the UNE Chemical Sharing Program.

Equipment available:

The following equipment is available through the Chemistry Department:

- **over 1000, 250 mL Erlenmeyer flasks in the original packaging**
- **over 500 white plastic test tube racks**

To claim available items, please contact: jtyre@une.edu

To contribute a topic or article to EHS Lab Chatter,

email: jtyre@une.edu

****All background images are taken from the UNE Digital Asset Manager files****