UIC UNIVERSITY OF ILLINOIS AT CHICAGO

THE SAFETY OBSERVER

A Quarterly Newsletter by the Environmental Health and Safety Office

Environmental Health And Safety Office

www.uic.edu/depts/

FALL NEWSLETTER

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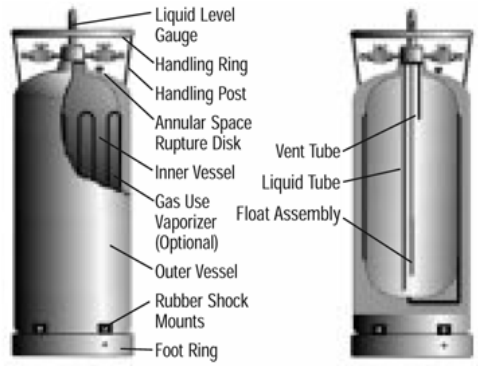
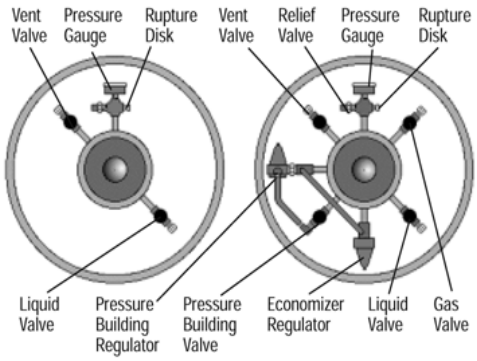
Liquid Nitrogen Safety

Nitrogen is an inert, colorless, odorless, non-corrosive, non-flammable, and extremely cold gas. Although it is nontoxic, it can act as an asphyxiant by displacing oxygen in the air to levels below the required threshold to support life. At extreme cold temperatures (77K-63 K), nitrogen becomes a cryogenic liquid. In its liquid state it can cause severe burns and blisters to human tissue. So in order to prepare ourselves to address the risks associated with using liquid nitrogen, it is crucial to understand what Personnel Protective Equipment (PPE) to wear and what to do when a gas cylinder malfunctions in our research laboratories. To achieve this we must first understand the cylinder that carries liquid nitrogen. It comes in an insulated, vacuum-jacketed pressure vessel. These containers operate at pressures up to 350 psig and have capacities between 80 and 450 liters of liquid. The diagram below will illustrate the layout of the cryogenic tank.

NEWSLETTER SPOTLIGHT



Side View



Top Views

Notice the top view of the diagram on the right hand side. The two cylinder tops in this diagram show the most common cylinders used for liquid nitrogen. Become familiar with the vent valve and the pressure gauge. Look to see if these parts are in working order. Clean ice off the valves if it starts to build-up. If the tank starts to vent, this a normal occurrence to handle increased pressure, but if it starts to rapidly vent, there are some precautionary measures to take.

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PORTABLE ELECTRIC SPACE HEATERS

Portable electric heaters manufactured after 1991 include many new performance requirements to enhance safety. For portable electric heaters that may present a fire hazard when tipped over, a tip-over switch will turn the heater off until it is turned upright again. New heaters also include indicator lights to let users know that the heater is plugged in or is turned on. Some manufacturers have included technically innovative safety controls such as infrared or proximity sensors, which can turn a heater off when objects come too close, or when children or pets are near. These kinds of controls may prevent burn injuries to children who might play too near a heater, or reduce the risk of ignition of combustible materials that could contact the heater. The following is a list of safety measures to keep in mind when using an electrical space heater.

- Use heaters on the floor. Never place heaters on furniture, since they may fall, dislodging or breaking parts in the heater, which could result in a fire or shock hazard.
- Unless certified for that purpose, do not use heaters in wet or moist places, such as bathrooms; corrosion or damage to parts in the heater may lead to a fire or shock hazard.
- Do not hide cords under rugs or carpets. Placing anything on top of the cord could cause the cord to overheat, and can cause a fire.

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DIRECTOR'S CORNER

October is National Fire Prevention Month. Electrical hazards are one of the major causes of serious, fatal fire events. Many electrical hazards are associated with improper installation of electrical devices by do-it-yourselfers or modifications in electrical appliances that render them unsafe. Before buying an appliance, look for the label of a recognized testing laboratory such as Underwriters Laboratory or Factory Mutual. This is especially critical for laboratory refrigerators built for safe storage of flammable and heat-reactive chemicals. Inspect appliances regularly to make sure they operate properly. If an appliance smells funny when in use, makes unusual sounds, the cord feels warm to touch, or the unit does not perform properly, shut it off, pull the plug out of the power outlet and have the unit repaired or replaced. Don't repair it yourself. Keep appliances in cool, uncluttered locations. Appliances generate heat. Having paper and other flammable debris accumulate around and behind these units can result in ignition and fire. If an appliance has a three-prong plug, use it only in a three-slot outlet. Never force it to fit into a two-slot outlet or extension cord or bend or file a prong to force it to fit. Extension cords are another common cause of electrical fires. Extension cords are generally not permitted at UIC and should never be used as a long term solution to the need for another receptacle. Extension cords must never be run inside walls, through wall or door penetrations or under rugs or furniture. The use of improperly rated devices such as switches or receptacles and loose connections at these devices are other common errors. Both can lead to overheating and arcing that can start fires. So can overloaded circuits by plugging too many devices into one outlet and by using equipment that has a frayed power cord or open plug.
Be alert to potential electrical fire hazards and REPORT THEM! Here are a few safety guidelines:

- Flickering lights. If the lights dim every time you turn on an appliance that circuit is overloaded or has a loose connection.
- Sparks. If sparks appear when you insert or remove a plug, they could be a sign of loose connections.
- Warm electrical cord. If an electrical cord is warm to the touch, the cord is underrated or defective.
- Frequent blown fuses or broken circuits. A fuse or breaker that keeps tripping is an important warning sign of problems.
- Frequent bulb burnout. A light bulb that burns out frequently is a sign that the bulb is too high a wattage for the fixture.
- Smokey or ozone-like odor can be signs of overheated electrical circuits.

Take a few minutes now to inspect your work areas for electrical safety. For further information, search the web for "electrical fires" and "electrical safety."

Continued From Page 1. In order to lessen the hazard of rapid venting, which is asphyxiation, store and use this product with adequate ventilation. Do not store it in a confined space. If the liquid nitrogen tank is continuously venting move the cylinder into a fume hood nearby or onto a dock outside of the building. Make sure you never get in an elevator with the tank but meet the tank on the ground floor by taking the stairs. You can always call 6-SAFE, a 24 hr emergency campus safety phone for advice on how to handle this situation.

The eyes are the most sensitive body part to the extreme cold of the liquid and vapors of cryogenic liquids. The recommended personal protective equipment for handling cryogens includes a full face shield over safety glasses, loose-fitting thermal insulated gloves, long sleeve shirts, and trousers without cuffs. In addition, safety shoes are recommended for people involved in the handling of containers. Never allow any unprotected part of the body to come in contact with un-insulated pipes or equipment that contains a cryogenic product. The extremely cold metal will cause the flesh to stick fast and tear when one attempts to withdraw from it. Use a suitable hand truck for container movement. Containers should be handled and stored in an upright position. Do not drop, tip, or roll containers on their sides. Do not remove or interchange connections. Contact the vendor if you experience any difficulty operating the container valve or with the container connections. Airgas, our main campus vendor can be reached at 630-510-8813 Or at 708-352-8533 after hours.

Here at UIC, if you suspect that your gas tanks may be malfunctioning, or hissing improperly, please notify The Environment Health and Safety Office at 6-SAFE, before calling the police or fire department. This will allow EHSO to evaluate and determine the risks associated with the cylinder and to prepare a proper response to the incident. If you have further questions regarding gas cylinder safety please visit our website .

CDC Says "Take 3" Steps To Fight The Flu

The Centers for Disease Control and Prevention (CDC) urges you to take the following steps to protect yourself and others from influenza.

1 Take time to get a flu vaccine.

- CDC recommends a yearly flu vaccine as the first and most important step in protecting against this serious disease.
- While there are many different flu viruses, the flu vaccine protects against the three main flu strains that research indicates will cause the most illness during the flu season.
- The vaccine can protect you from getting sick from these three viruses or it can make your illness milder if you get a different flu virus.
- Getting a vaccine is very important for people at high risk for serious flu complications, including young children, pregnant women, people with chronic health conditions like asthma, diabetes or heart or lung disease, and people 65 and older.
- People who live with or care for those at high risk should also get a flu vaccine to protect their high-risk contact.

2 Take everyday preventative actions.

- Cover your nose and mouth with a tissue when you cough or sneeze. Throw the tissue in the trash after you use it.
- Wash your hands often with soap and water, especially after you cough or sneeze. Alcohol-based hand cleaners are also effective.
- Try to avoid close contact with sick people.
- If you get the flu, CDC recommends that you stay home from work or school and limit contact with others to keep from infecting them.
- Avoid touching your eyes, nose or mouth. Germs spread this way.

3 Take flu antiviral drugs if your doctor recommends them.

- If you do get the flu, antiviral drugs are an important treatment option. (They are not a substitute for vaccination.)
- Antiviral drugs are prescription medicines (pills, liquid or inhaler) that fight the flu by keeping flu viruses from reproducing in your body.
- Antiviral drugs can make your illness milder and make you feel better faster. They may also prevent serious flu complications. This could be especially important for people at high risk.
- For treatment, antiviral drugs work best if started soon after getting sick (within 2 days of symptoms).
- Flu symptoms include fever (usually high), headache, extreme tiredness, dry cough, sore throat, runny or stuffy nose and muscle aches.

Adapted Version: CDC Says "Take 3" Steps To Fight The Flu. For more information, visit www.cdc.gov/flu or call 800-CDC-INFO.

Continued From Page 1.

- Do not use an extension cord unless absolutely necessary. Using a light-duty, household extension cord with high-wattage appliances can start a fire. If you must use an extension cord, it must be marked #14 or #12 A WG; this tells the thickness or gauge of the wire in the cord. (The smaller the number, the greater the thickness of the wire.) For example, a cord sold as an air conditioner extension cord will have these heavy wires. Do not use a cord marked #16 or #18 AWG. Only use extension cords bearing the label of an independent testing laboratory such a U.L. or E.T.L.

- Be sure the plug fits snugly in the outlet. Since a loose plug can overheat, have a qualified repairman replace the worn-out plug or outlet. Since heaters draw lots of power, the cord and plug may feel warm. If the plug feels hot, unplug the heater and have a qualified repairman check for problems. If the heater and its plug are found to be working properly, have the outlet replaced. Using a heater with a hot cord or plug could start a fire. Broken heaters should be checked and repaired by a qualified appliance service center. Do not attempt to repair, adjust or replace parts in the heater yourself.

- Here at UIC, the only type approved for use on campus are ceramic oil-filled space heaters. These space heaters are completely enclosed with no elements exposed. Make sure to always consult a campus electrician to see if your outlet is capable of handling a space heater. For more information regarding space heaters please contact the Health and Safety Office at 6-7411.

Source: US Consumer Product Safety Commission, Washington DC,20207 www.cpsc.gov.

Environmental Health and Safety Office
Radiation Safety Section 312-996-7429
Health and Safety Section 312-996-7411
Emergency: 312-966-7233 (6-SAFE)

In Case of Emergency

LESSONS TO BE LEARNED

Generated from Actual Incidents at UIC

Issue No. 26 June 18, 2008

Type of Incident: Fire alarm was averted by quick thinking researcher

Details of Incident: A researcher had collected biohazardous waste, placed the red bag waste into a secondary container and loaded the bags into a steam sterilizer/autoclave. The autoclave door was closed and the sterilizer program was initiated. As the sterilizer filled with hot steam and pressure, a large leak became evident around the sealed door. The researcher immediately aborted the program but due to a delay in the programming, the sterilizer continued to release a considerable amount of steam into the room. The hot steam condensed on the surfaces in the room making everything very wet. The researcher had immediately called the emergency safety number (6-SAFE) to ask for assistance. The steam leak eventually subsided and the sterilizer program stopped. No injuries occurred during the incident.
If the researcher had not remained at the autoclave as the cycle began, the continuous leak of hot steam would have set off the fire sprinkler head and fire alarm. The room would have quickly flooded and caused considerable water damage to the laboratory and to rooms located on floors below the facility.

Immediate Cause: The steam leak was caused by a worn out gasket that lines the door to the chamber of the autoclave.

Root Causes: The gasket failure of the sterilizer was the result of a lack of thorough inspection and routine servicing and testing of the autoclave.

Corrective Actions:
Ensure preventative maintenance: call your service representative to inspect and test the autoclave on an annual basis.

Have appropriate personal protective equipment available for loading and unloading the autoclave.

Provide documented training to individuals who will be using the autoclave; include information on the operation of the autoclave, package of waste, proper loading and unloading techniques, and stopping the autoclave in case of an emergency.

Know what items can and cannot be safely autoclaved.

Become familiar with quality control measures of autoclave performance such as the use of physical, chemical and biological indicators.

Know what actions to take in case of a medical emergency (call 5-5555, UIC Police).