

A Matter of Safety

Environmental Health and Safety Newsletter

Respirator Changes at Central Stores

Changes in the Central Stores catalog will soon be evident in the areas of respiratory protection. 3M, one of two major suppliers of respirators for Iowa State, has replaced their "Easi-air" half-face respirators (7300 models) and filter cartridges with new and improved models. Unfortunately, the new product line is not compatible with the old "Easi-air" product line. Therefore, Iowa State will be forced to implement the following changes.

- **Offering 3M's new half-face respirators (7500 models) at Central Stores.** These respirators will be available in three sizes (small, medium and large), compared to only two sizes as previously offered. The respirators are designed to be more comfortable to wear. The current "Easi-air" half-face models will no longer be available at Central Stores.
- **Offering 3M's new filter cartridge at Central Stores.** The

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The National Fire Protection Association has sponsored a Fire Prevention Week campaign for the last 81 years, using the week to raise public awareness to lifesaving fire safety information. The selected theme for this year's Fire Prevention Week is "When Fire Strikes: Get Out! Stay Out!", which underscores a very important lesson in fire safety. Many people are unprepared for how quickly fires can grow and spread. In a fire, you could have as little as two minutes to escape before heat and smoke prevent egress, therefore it is imperative that you exit without delay. If the fire alarm sounds in your building, don't just chill out, get out and stay out!

In the spirit of Fire Prevention Week, EH&S would like to take the opportunity to raise the university community's awareness of important fire emergency information. The following details what you need to know about building fire safety features and emergency exit procedures so that you will be prepared to react quickly and safely in the event of a fire emergency.

Building Fire Safety Features

- Smoke and heat detectors automatically sound building alarms when a fire

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Laser Safety: New and Improved Program

Are you using a Class IIIb or IV laser in your research? If so, be sure you complete the required training. Iowa State and Ames Laboratory continue to improve the laser safety program on campus. The newest improvement is the 2003 revision of the [Laser Safety Manual](#).

The revised manual includes changes in the classification of lasers, exposure definitions, medical surveillance procedures, and laser safety training procedures. Generally, all Class IIIb/IV laser users must receive initial laser safety training through Ames Laboratory and a baseline eye exam from Occupational Medicine prior to using the laser. Laser users are now required to complete the Iowa State University online Laser Safety Training Course every 5 years. If you have questions about the Laser Safety Program, contact Stephen Simpson, Iowa State Laser Safety Officer, at 294-7675 or James Withers, Ames Laboratory Laser Safety Officer, at 294-4743.

Links

[National Fire Protection Association](#)

[Chemical Inventory System](#)

[Online Training Center](#)

Hot Work Permit System to be Implemented



A fire in 2001 destroyed the dome of Iowa's historical Capitol building in Iowa City because of a failure to follow proper hot work procedures.

Hot work is defined by the National Fire Protection Association (NFPA) as any work involving burning, welding or similar operations capable of initiating fires or explosions. Hot work activities produce sparks, flames and heat that, when not carefully controlled, can ignite surrounding combustible materials. Examples of hot work operations include grinding, oxygen cutting, flame soldering, and brazing. The purpose of the hot work safety system will be to ensure the safety of hot work operators and to separate combustible materials from hot work ignition sources.

Once the new system is implemented all Iowa State University employees and contractors performing hot work on campus must first satisfy certain requirements before hot work may begin.

- A responsible fire watcher must be assigned to watch for dangerous sparks in the area, and will remain on the job site for 30 minutes after completion of hot work.
- Floors, walls and ceilings must be clear of combustible materials within 35 feet of the work area, or the surfaces must be covered with fire retardant covers.
- All flammable liquids and their containers must be removed from the area.
- Floor openings must be sealed or checked to ensure hot slag/sparks do not penetrate to lower areas (unless the lower area contains no combustible materials or surfaces).
- The hot work equipment to be used must be inspected and in proper working order.
- A fully-charged, operational fire extinguisher (with the correct rating for the hazards) must be within 35 feet of the work being performed.
- Emergency exits must be identified and the nearest manual fire alarm pull-station located.
- All appropriate personal protective equipment (PPE) must be worn by the hot work operator, including eye protection, skin protection and an appropriate welding helmet.
- Applicable energy sources must be locked out/tagged out.

Supervisors will be responsible for ensuring that all of these hot work safety requirements have been met before work can proceed. The hot work safety system is currently being implemented for Iowa State University contractors and at the Biomass Energy Conversion Facility (Becon), which is a research facility affiliated with Iowa State. EH&S is working to implement the hot work safety program on campus by the end of the year.

Chemical Inventories

University policy requires campus laboratories to submit listings of chemicals used and stored to EH&S annually. According to EH&S records, over 2,700 lab spaces exist at Iowa State, yet only 625 of these labs have submitted inventories. EH&S would like to thank those researchers and labs that have submitted their inventories and to encourage those who haven't to please do so.

Chemical inventories will be stored in a database and made available for on-site use in the event of an emergency situation in a lab. In addition, EH&S will be able to use this information to compile required reports to regulatory agencies and to assist in exposure modeling. Individual chemical inventories are also available on the web to allow additions and editing.

Only hazardous chemicals are required to be listed. Examples of chemicals that do not require listing are

- household products that are used as intended
- growth agars
- sugars
- most buffers
- amino acids

Many researchers find it easier to submit entire listings of chemicals for their labs, rather than determining which chemicals might be considered hazardous.

There are two options for creating and submitting chemical lists.

- EH&S' website offers an [online method](#). This option requires users to establish client profiles and manually enter each chemical individually. The list is then saved, automatically submitted, and may be added to or edited online at any time.
- The easiest way to submit inventories is to send an Excel spreadsheet attached to an email to [Jim Gunning](#). The spreadsheet may also be submitted via campus mail. A [blank spreadsheet](#) is available for use as a template.

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is detected. Manual pull-stations are typically located near exit doors and will sound a building alarm when activated. As part of emergency planning, **all personnel should know where the alarm-pull stations are located.** In most campus buildings, the fire alarm will automatically notify the fire department, however 911 must still be dialed to ensure that the fire department has been notified.

- All primary exit locations and pathways should be marked with illuminated exit signs and emergency lights that will operate even if there is a power loss. All departments should have **two exit pathways out of the building and an emergency assembly area.** As part of emergency planning, departments should pre-determine emergency assembly locations and develop a system to account for all personnel.
- Fire-rated doors and walls are part of a compartmentalization system designed to confine smoke and heat to one location and to allow time for safe evacuation. Compartmentalization also limits property damage. **Please remember that fire doors are useless if they are blocked or wedged open.**
- Fire extinguishers are installed in each building and may be used to extinguish small fires, as long as there is no

threat to life and safety, and the operator has been trained. EH&S offers both online and hands-on fire extinguisher training. **Have you received your fire extinguisher training?**

- Automatic fire sprinklers are installed in select buildings on campus. To work properly, sprinkler heads must remain unobstructed. **No storage items, shelving, equipment, etc. are allowed within 18 inches of a sprinkler head.**
- EH&S offers an online Fire and Emergency Guidelines training module, which should be taken by all university personnel. The OSHA-required training program covers essential evacuation and fire extinguisher use information. Log in to the [Online Training Center](#) to take the module.

More information regarding fire safety at Iowa State University, including extinguisher selection charts and specific information for laboratories, is available on our [website](#).

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Harvest Season Fire Safety Reminder

Harvest season is a prime time for combine and tractor fires, which can cause large property losses, personal injuries and bring harvest operations to a standstill. Combine and tractor fires cause over \$20 million in property losses every year and cause 40 to 50 serious injuries. Perhaps a more serious problem for farmers is the amount of lost time a machine fire can cause, especially during the busy harvest season.

How do these fires occur? All a fire needs is a supply of fuel, heat and oxygen. Farm machinery, such as a combine, provides the heat source, plant materials and engine oils provide the fuel, and, as always, Mother Nature provides the oxygen. About 75% of all machinery fires start in the engine compartment because plant materials, dust, and oil accumulate and are ignited by hot engine components. The following maintenance tips will greatly reduce your risk of a machinery fire.

- Before harvest season, clean up your machines and pay special attention to the engine compartment. Use a pressure washer or high-pressure air compressor to remove caked-on grease, oil and crop residue.
- Ensure all bearings are adequately greased prior to operation. Check these locations frequently and re-grease as needed to minimize friction.
- Check engine fluid levels (coolant and oil) at the beginning of each day.
- Check fuel and oil supply lines for wear and repair damaged lines immediately.
- Closely monitor engine temperature gauges during operation of the equipment.
- Frequently blow leaves and chaff off the engine and out of the radiator with compressed air

or a portable leaf blower, and remove wrapped plant materials on or near bearings, belts or other moving parts.

These steps will help reduce the risk of a machinery fire, however, it is important to always be prepared. Keep a cell phone or radio with you in case you need to call for help and keep an ABC-type fire extinguisher on your machinery. EH&S offers fire extinguisher training for Iowa State University employees who wish to learn how to use an extinguisher. Visit the [Online Training Center](#) for more information.

Accident Investigation For Supervisors

Someone trips over an electrical cord. A lab employee gets something hazardous in her eye. A custodian strains back muscles taking out the trash. These are all examples of accidents that can cause lost time on the job, decrease workplace safety, and diminish workplace morale. A new EH&S course, "Accident Investigation", will help supervisors identify the root causes of accidents that happen on campus, thus increasing workplace safety, helping personnel feel safer at work, increasing productivity and morale, and reducing lost work time.

Identifying the root cause of an accident is only one aspect that will be covered in this session. Participants will also learn how and when to conduct an investigation; and the ins and outs of the follow-up necessary after an accident or near-miss. Specifics of the session also include the definition of accident, contributing factors to accidents, and developing an investigative strategy.

EH&S encourages personnel in a supervisory role who may need to investigate a job-related accident to attend.

Office Ergonomics: New Information and Format

The Office Ergonomics session has a new face. This "new and Improved" session has been shortened, but provides a more precise introduction to relevant ergonomic issues. Participants will be introduced to repetitive stress injuries and ways to make the correct adjustments to workstations to prevent such injuries. Personnel looking for general information on ergonomic issues related to office workstations are encouraged to attend.

For more information, please contact EH&S for a personalized review of workstations, including recommendations for improvement.

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new cartridges attach to the respirator using a bayonet mount system that eliminates the need for retainer caps, meaning fewer parts to track. Also, new cartridge offerings will be simplified to two particulate filters (HEPA) and three chemical cartridges, easing cartridge selection. Limited supplies of replacement cartridges and parts for old "Easi-air" model respirators are still available.

- **Making cartridge adapters available.** The new filter cartridges are not compatible with 3M half-face and full-face respirators currently in use at Iowa State. This will require current 3M respirator users to obtain cartridge adapters or purchase the replacement respirator face-piece. EH&S will assist with adapter selection.
- **Offering a new 3M full-face respirator at Central Stores (6800 model).** These respirators are lighter weight, offer better visibility, are less expensive, and will accept the new cartridge type. The current 7800 full-face model will be dropped by Central Stores.

These changes will enable Iowa State to provide personnel with better fitting respirators that are more comfortable to wear and easier to use. However, it will also require that current 3M respirator users make some changes to their protective equipment. The changes will include obtaining an adapter or switching to the new product line. Personnel wishing to switch to the new respirators must complete a fit test for the new respirator style and obtain a respirator prescription from EH&S. If you need further assistance, please contact [Jim Gunning](#) at 294-5359.

Sprains and Strains

Sprains and strains training has been an important part of the EH&S training schedule for quite some time. After more than 400 employees participated in this training, we decided it was time for a new face for this session. Designed for employees conducting work practices involving repetitive motions prone to causing injury, this two-hour session takes an active look at how to prevent sprains and strains injuries. Participants will be introduced to stretching exercises that can be easily done prior to beginning work activities, with the intention of preventing sprains and strains.

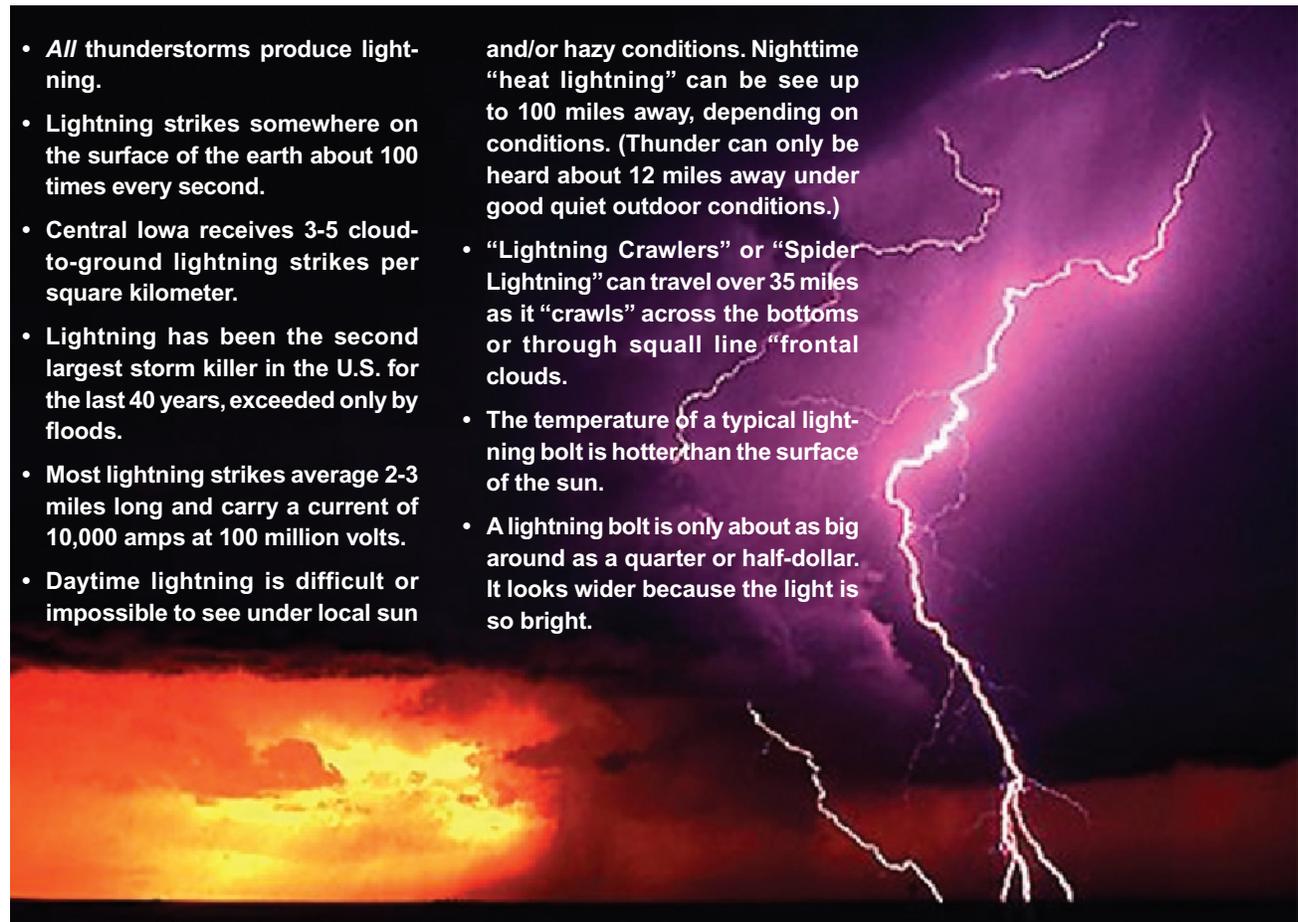
Online Training Center: Your resource for safety training

- Online Needs Assessment to determine your individual training needs
- Training History
- Online Training Modules
- Classroom Training Registration

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Lightning Facts



- **All thunderstorms produce lightning.**
- **Lightning strikes somewhere on the surface of the earth about 100 times every second.**
- **Central Iowa receives 3-5 cloud-to-ground lightning strikes per square kilometer.**
- **Lightning has been the second largest storm killer in the U.S. for the last 40 years, exceeded only by floods.**
- **Most lightning strikes average 2-3 miles long and carry a current of 10,000 amps at 100 million volts.**
- **Daytime lightning is difficult or impossible to see under local sun and/or hazy conditions. Nighttime “heat lightning” can be seen up to 100 miles away, depending on conditions. (Thunder can only be heard about 12 miles away under good quiet outdoor conditions.)**
- **“Lightning Crawlers” or “Spider Lightning” can travel over 35 miles as it “crawls” across the bottoms or through squall line “frontal clouds.**
- **The temperature of a typical lightning bolt is hotter than the surface of the sun.**
- **A lightning bolt is only about as big around as a quarter or half-dollar. It looks wider because the light is so bright.**

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Chuck Doswell's Outdoor Images, Inc. webserv.chatsystems.com/~doswell/Outdoor_Images/OutdoorImages.html

You may have encountered it before... It's the middle of winter with a snowstorm howling outside. A low rumble rattles the windows and you could have sworn you just saw lightning. But it's winter and lightning only occurs in the summer. Right?

Wrong. While admittedly much less common than its summer counterpart, winter lightning is just as dangerous, if not more.

Lightning is produced by rapid lift within clouds. When you have lift, ice particles in the clouds rub together, producing a static charge. The more energetically they rub together, the greater the charge that builds up.

During wintertime, lift in the atmosphere is less energetic. Since the lift is usually not as rapid, fewer static charges build up and lightning is less likely to occur.

It is important to realize however, the relatively shallow clouds in winter **can** produce lightning flashes that cause personal injury and material damage. During winter there is the added danger that flashes will have relatively large peak currents and subsequent large continuing currents,

potentially causing more damage than a typical summer bolt.

Outdoor Lightning Safety:

- Postpone activities promptly. Don't wait for rain.
- Be at the lowest point. Lightning generally hits the tallest object.
- Keep an eye on the sky.
- Listen for thunder.
- Stay away from trees.
- Avoid metal, such as golf clubs, fishing rods and tools.
- Move away from groups of people.

Indoor Lightning Safety:

- Avoid corded phones and electrical equipment.
- Avoid contact with water, including showering and doing laundry.
- Stay away from doors and windows, and avoid porches.
- Do not lie on concrete floors or lean against concrete walls.

Closing the Door on Lab Safety Hazards



Most of us think of laboratory doors simply as workplace entrances and exits. But they also serve important purposes in life safety and hazard control. There is a natural tendency for lab staff to prop laboratory doors open when walking frequently between rooms. While this practice may be more convenient, it can compromise the safety of individuals in the laboratory and nearby.

Consider the following:

1 Most laboratories are designed so that air flows from the corridor into the laboratory space and is then exhausted outside. This ventilation design feature is based on the doors being in the closed position. Thus, a closed door helps contain chemical vapors and odors within the workplace and facilitates their efficient removal by the ventilation system. With the door open, the air balance between the laboratory and

the corridor is easily defeated, allowing hazardous (or at least malodorous) chemical vapors to escape in the hallways.

2 Certain exit access corridors are separated from other part of the building by walls having a 1-hour fire resistance rating. Laboratory doors opening into the corridors must have a minimum 20-minute fire protection rating.

By keeping doors open, the fire safety of the corridors is negated.

3 Since doors obviously serve as an exit from the laboratory space, it is very important not to place obstruction near the door so personnel can quickly exit in the event of an emergency. Even in modular labs where there may be more than one door, a good policy is to ensure that at least two doors are readily accessible and not blocked.

4 Glass window panes in laboratory doors must not be blocked by laboratory coats, paper, or other items that would obstruct view into the laboratory by security and emergency personnel. The ability to see into the laboratory is necessary to identify, notify and assist individuals during emergency evacuations and to assist security personnel in locating individuals in need of medical assistance, espe-

cially after normal working hours. If a person were to have an accident, or become ill and be unable to summon help, the blocked window becomes an obstacle in providing timely assistance if responders cannot see the injured or disabled person. For laboratories with locked doors in accordance with radiation safety, select agent, and other requirements, it is even more critical that the glass not be blocked. Passersby who suspect a problem in a locked laboratory, even though they might not be able to obtain entrance, could see into the laboratory area and summon help if required.

5 Fire codes usually permit information signs to be installed on the surface of laboratory doors with a fire rating. However, the total area of all attached signs should never exceed 5 percent of the area of the door to which they are attached, lest the door itself should become visually obscured. Signs shall not obstruct or be attached to the windows of these doors.

As you take an active interest in maintaining the safest possible workplace, remember that when it comes to laboratories, keeping a closed door generally means keeping an open mind to safety.

Reprinted with permission. "Closing the Door on Lab Safety Hazards," *Laboratory Safety and Environmental Management (LS&EM)*, Volume 10, No. 3, Fall 2002. For more information on LS&EM, please visit [their website](#).