"Safety Comes First"

Case Western Reserve Environmental Health and Safety

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In this issue:

New Globally Harmonized System

GHS for many college students is the name of a popular brand of guitar strings. While changing strings can make your tired old guitar sound better so can changing tired old regulations.

GHS stands for Globally Harmonized System. We are no longer isolated in the world and many products use components made in other countries that are then assembled in another country. Made in the USA or Made in China really can't be said anymore. Thus a system had to be put into place to allow the easy conveyance of safety information that could cross over between different work cultures. Hence the GHS system was established as a universal standard for global transference of safety information worldwide.

Over the next three years you will see changes to the symbols used in the laboratories to represent hazards as well as new symbols for hazard classes that did not exist previously in the OSHA Right To Know standard.

The time table for roll out is as follows:

December 1, 2013 - Train all employees in the new labeling and SDS (Safety Data Sheets) system. The SDS will be replacing the existing MSDS system with a new 16 section format that all chemical manufacturers must use. So if you want know the flashpoint of a chemical you will always look in the same section for the information.

June 1, 2015 - All manufactures will have to ship all products using the new system.

June 1, 2016 - All employers must have trained all of their employees and actively be using the new system.

Look to the EHS website, Case Daily, and this newsletter as updates become available.

Marc Rubin, Director of EHS

Safe Use of the Chemical Fume Hood

"The 'Shut the Sash' initiative at CWRU is valuable for safety and can save at least $1500 a year per VAV hood…."

There are over 700 chemical fume hoods throughout campus and the majority fall into three designs, (1) constant air velocity (CAV), (2) variable air velocity (VAV), both with a minimum capture velocity at 100 fpm at fully open position, and (3) low flow design. It's easy to determine what type you use simply by lowering the sash and observing the face velocity. If the airflow increases as you lower the sash you have a CAV design usually attenuated though an air bypass option. If you lower the sash and the flow is relatively constant then you have VAV design with the hood valve or baffle automatically adjusting the fan speed to the sash position for constant face velocity. The low flow fume hoods behave like a CAV but the capture velocity is lower; set to 70 fpm at a fully open position. The low flow hoods need special attention to minimize traffic, cross air currents and workspace loading. Any type of hood will protect you only if the sash is between you and your experiment. The "Shut the Sash" initiative at CWRU is valuable for safety and can save at least $1500 a year per VAV hood when the sash is lowed from 18" to 2" while you work. Presented below are some ideas to consider when you work with this major engineering control in you laboratory.

Before using a fume hood:

- Make sure you understand how the hood works; identify your hood type and air flow monitoring devices.
- You should be trained to use it properly after completing your laboratory site specific training.
- Know the hazards of the chemical with which you are working; refer to the chemical's Material Safety Data Sheet if you are unsure.

Ensure the hood is on by checking the air flow monitor and using a kim wipe draw technique.

- Make sure the sash is always between you and your work and no higher than the position indicated by arrows on the frame when setting up your experiment.

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Safe Use of the Chemical Fume Hood, Cont.

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- Make sure that the air gauge indicates that the air flow is within the required range and certification is up-to-date.

When using a fume hood:

- Never allow your head to enter the plane of the hood opening. For example, for vertical rising sashes, keep the sash below your chest; for horizontal sliding sashes, keep the sash positioned in front of you and work around the side of the sash.
- Use appropriate eye protection and other required PPE.
- Be sure nothing blocks the airflow through the baffles or through the baffle exhaust slots.
- Elevate large equipment (e.g., a centrifuge) at least two inches off the base of the hood interior.
- Keep all materials inside the hood at least six inches from the sash opening. When not working in the hood, close the sash.
- Do not permanently store any chemicals inside the hood.
- Promptly report any hood that is not functioning properly to your supervisor and EHS(368-2907). The sash should be closed and the hood "tagged" and taken out of service until repairs can be completed.
- When using extremely hazardous chemicals, understand your laboratory's action plan in case an emergency, such as a power failure, occurs.

One more issue that needs attention is what to do in the event of a planned maintenance or emergency repair of the hood. Preventive maintenance of the fume hoods is performed by Plant Services quarterly. It is the responsibility of the building administrator to post notification that alerts all building personnel at least twenty four hours in advance of the planned shutdown. For emergency repair, EHS will post notification on all affected hoods.

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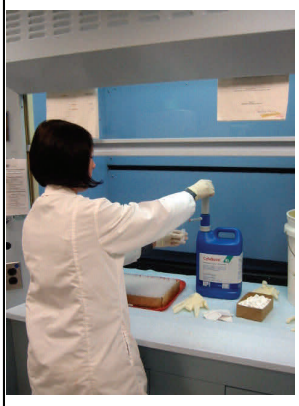
"Promptly report any hood that is not functioning properly to your supervisor and EHS (368-2907)."



Surveying Radioactive Packages

"Once the laboratory receives it's package, they must open and survey the package the SAME day that it arrives."

Before any radioisotopes can be delivered, they are first screened by the Radiation Safety Office. The outside of the package is checked for contamination to ensure that it can be safely handled and delivered to the laboratories and the Packing Slip is checked to ensure that the proper item ordered was shipped out. The Packing Slip, Package Receipt Form, and Purchasing Form are all attached to the top of the radioactive material containing package. The package may not be delivered without this paperwork attached.

Once the package reaches the laboratory, it must be opened and surveyed the SAME day it arrives. Both a wipe test and a meter survey should be performed and recorded on the Package Receipt Form that was attached to the top of the box by Radiation Safety. There is space on the form to record your survey results. The liquid scintillation counter print out must have the date and time of analysis on it and should be attached to this form by the laboratory. If the package contains a high energy beta emitter such as P32, Cl36, or Na22, the wipe may be checked with a Geiger counter rather than running it on a scintillation counter. These surveys should be kept in the laboratory's radiation notebook and be available for inspection by the Radiation Safety Office.

If no contamination is found, the laboratory may deface and dispose of the box and packaging materials as regular waste. If contamination is found it must be disposed of as radiation waste.

Regulatory References: OAC 3701:1-38-18, OAC 3701:1-50-17, 49 CFR 172, and 49 CFR 173

Failure to document inspections The central accumulation areas must be inspected once every seven days. The same is true for the satellite accumulation areas (labs). Things to be looked for include labels on the containers, leaks and missing caps.

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Introduction to Data Security

Data security is ensuring that unauthorized persons cannot access data, while ensuring that authorized persons can access data which is identical to the original. This can consist of several parts:

Redundancy: Avoiding data loss to random hardware failure.
Backup: Avoiding data loss due to localized failure.
Encryption: Preventing unauthorized reading of files.
Tamperproofing: Preventing unauthorized modification of files.

Redundancy consists of using several devices which can be used to take over for each other. The simplest form of electronic data redundancy is mirrored hard drives: both keep the same information, and if one fails it can be replaced; once it is replaced and the data replicated, the data is secure even if the second drive fails.

More sophisticated forms of redundancy exists. RAID level 5 allows for an array of any number of drives with only one redundant drives. If any single drive fails, no data is lost (though all data is lost if a second fails before the first is replaced and replicated). RAID level 6 allows arrays of any size with two redundant drives. This is not the same as mirrored (RAID 1+0) drives, even for the case of four drives where both have two redundant drives. RAID 6 can tolerate the loss of any two drives, while RAID 1+0 can fail if two paired drives are lost (though it can sustain the loss of two unpaired drives).

Offsite backup, on the other hand, protects against non-independent failures. For example, a flood or power surge might destroy all drives on an array; keeping a copy of the data elsewhere helps protect against these cases. Online backups are convenient but sometimes impractical for large amounts of data (though some services will ship drives with backup-up data for a fee, somewhat mitigating the disadvantage).

Encryption prevents people without the key from reading the data. Strong crypto is easily available which cannot be broken unless by exceptional effort.

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"Offsite backup, on the other hand, protects against non-independent failures."

Introduction to Data Security, Cont.

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There are disadvantages, though: if the key is lost then the data cannot be restored. Similarly, if there is damage to the physical media containing encrypted data it usually cannot be restored, even with the key, so encryption should rarely be used without redundancy or at least backup.

Tamperproofing can be used to show that a file has not been modified from its original form. The best form is digitally signing important files, which use cryptographic techniques to ensure that the file has not been modified. Strong hashes can also be used for this purpose, but this requires storing a small value (the "hash" or "digest") and comparing the hash of the file to the hash of the original. When available, digital signatures are preferred.

Using these techniques you should be able to protect your data against many of the common threats. Take action today! Set up an offsite backup if you don't already have one, and consider which of the others you may need (see below).

Which do I need?

Feature	*Needed when…*
Backup	Data should not be lost
Redundancy	Downtime is not acceptable
Encryption	Access control is not sufficient or data loss has financial or regulatory implications; useful against external threats
Tamperproofing	Data validity needs to be proven, or there are financial or other incentives to change data; useful against external and internal threats

"…. encryption should rarely be used without redundancy or at least backup."

Radioactive Packages, Cont.

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Failure to mark the accumulation start date

The containers must be dated when removed from the satellite accumulation areas (labs) and sent to the central chemical waste storage facilities.

For further information on container storage issues and solution, feel free to contact Environmental Health and Safety at 368-2906.

Source: The BLR Environmental Daily Advisor, August 21, 2012.

..Fume Hood, Cont.,

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The following steps need to be followed for a planned shutdown or unplanned hood failure:

- All activity in the hood must cease.
- All containers must be securely covered.
- Chemicals under hoods should be removed or secured so that fumes cannot escape.
- The hood sash must be closed.

When the exhaust fan and building ventilation systems are shut down, vapors may spill back into the room or escape through building duct work, exposing lab occupants and facilities mechanics to these hazardous vapors. It is up to laboratory personnel to make sure these steps are taken, so no one is exposed to any hazards during repair.

Finally, do not resume activity inside the hood until clearance is confirmed by the building administrator or Plant Services, or the notice is removed from the hood by EHS. Always verify the hood is operating properly by checking the flow.

Winter/Holiday Safety

The winter holidays are a time for celebration, and that means more cooking, home decorating, entertaining, and an increased risk of fire due to heating equipment.

Facts & figures

- During 2005-2009, U.S. fire departments responded to an average of 240 home structure fires that started with Christmas trees per year. These fires caused an average of 13 deaths, 27 injuries, and $16.7 million in direct property damage annually.
- During 2005-2009, an estimated 12,860 home structure fires started by candles were reported to local fire departments. These fires resulted in an estimated 136 civilian deaths, 1,041 civilian injuries and an estimated direct property loss of $471 million.
- Two of every five reported home fires start in the kitchen -- more than any other place in the home.
- Half of all home heating fires occurred in December, January and February in 2005-2009.

Source: NFPA's Fire Analysis and Research Division

Please, be safe this holiday season, EHS

"Half of all home heating fires occurred in December, January and February in 2005-2009."

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Please remember, all back issues of the EHS Newsletter can be found online at case.edu/ehs. Simply click on the "Newsletter" link in the left-hand column!

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