



*"Safety Comes First"*

# Case Western Reserve Environmental Health and Safety

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## *Respect Yourself, Protect Yourself*

Working safely is everyone's responsibility. Your own safety should be your number one priority while you work in the laboratory. It is all too easy to get involved in what you are doing and forget either through lack of planning, lack of time, or just a simple oversight that how you do your work is just as important as the work itself. After all if you injure yourself what good is it even if you do complete your project?

As the new school year begins take a second to look over your intended work and make sure that you have all the items you need in place to do your work safely. It is your responsibility to keep yourself safe but it is the responsibility of your research advisor to make sure you have the items necessary to do your job safely. The only way they will know if you need an item is if you take the time to plan together with your advisor and identify the points in your process that might be dangerous. Then develop the procedures and implement the hazard controls necessary to protect yourself.

There are two areas where only you are in control of your safety and those are eating in the lab and the clothing you wear in the laboratory. Eating in a laboratory is like playing with a loaded gun. Eventually it will go off and someone will be injured. It may not happen today or even this month but eventually the odds will catch up with you. Don't eat or drink or apply cosmetics in a laboratory. Likewise with dress, if you expose your skin to a laboratory environment it is only a matter of time until you accidentally spill something on your exposed skin or drop something on your exposed toes. Respect yourself enough to protect yourself from the hazards you can control.

Be safe and have a wonderful fruitful year,

Marc Rubin, Director of EHS

## *Broken CFL (Compact Fluorescent Light) Bulb Guidelines*



*“CFLs  
contain ....  
less than  
1/100th of  
the amount  
in a  
mercury  
thermome-  
ter.”*

As many of us already know, CFLs contain mercury, which means that if you have a broken bulb, simply sweeping it up and tossing it into the trash container isn't considered safe disposal.

Keep in mind that CFLs contain a very small amount of mercury -- less than 1/100th of the amount in a mercury thermometer.

### **Cleaning Up a Broken CFL**

#### **1. Before cleanup**

- Have people and pets leave the room.
- Air out the room for 5-10 minutes by opening a window or door to the outdoor environment.
- Shut off the central forced air heating/air-conditioning (HVAC) system, if you have one.
- Collect materials needed to clean up broken bulb: stiff paper or cardboard; sticky tape; damp paper towels or disposable wet wipes (for hard surfaces); and a glass jar with a metal lid or a sealable plastic bag.

#### **2. During cleanup**

- DO NOT VACUUM - Vacuuming could spread mercury-containing powder or mercury vapor.
- Be thorough in collecting broken glass and visible powder. Use cardboard, sticky tape, etc.
- Place cleanup materials and broken pieces of CFL bulb in a sealable container.
- If vacuuming is needed after all visible materials are removed, vacuum the area where the bulb was broken.
- Remove the vacuum bag (or empty and wipe the canister), and put the bag or vacuum debris in a sealed plastic bag.

#### **3. After cleanup**

- Promptly place all bulb debris and cleanup materials outdoors in a trash container or protected area until materials can be disposed of properly.
- Avoid leaving any bulb fragments or cleanup materials indoors.
- For several hours, continue to air out the room where the bulb was broken and leave the HVAC system shut off.

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## *Broken CFL Bulb , Cont.*

*(Continued from page 2)*

### Recycling and Disposal After a CFL Burns Out

#### Why is Recycling of CFLs Important?

- **Recycling prevents the release of mercury into the environment.** CFLs and other fluorescent bulbs often break when thrown into a dumpster, trash can or compactor, or when they end up in a landfill or incinerator.
- **Other materials in the bulbs get reused.** Recycling CFLs and other fluorescent bulbs allows the reuse of the glass, metals and other materials that make up fluorescent lights. Virtually all components of a fluorescent bulb can be recycled.

**Your area may require recycling.** Some states and local jurisdictions have more stringent regulations than U.S. EPA does, and may require that you recycle CFLs and other mercury-containing light bulbs. [California](#), [Maine](#), [New Hampshire \(PDF\)](#), [Minnesota](#), [Vermont](#) and [Massachusetts](#), for example, all prohibit mercury-containing lamps from being discarded into landfills. Visit [Earth911.com](#) to contact your local waste collection agency, which can tell you if such requirement exists in your state or locality.

If your state or local environmental regulatory agency permits you to put used or broken CFLs in the garbage, seal the bulb in two plastic bags and put it into the outside trash, or other protected outside location, for the next scheduled trash collection. Never send a fluorescent light bulb or any other mercury-containing product to an incinerator.

EPA recommends that consumers take advantage of available local recycling options for compact fluorescent light bulbs. EPA is working with CFL manufacturers and major U.S. retailers to expand recycling and disposal options. Consumers can contact their local municipal solid waste agency directly, or go to [epa.gov/cfl/cflrecycling.html](#) or [www.earth911.org](#) to identify local recycling options.

Visit your local retailers. Ace Hardware, TrueValue, Home Depot (see Figure 1. on page 7), IKEA, Lowe's, Orchard Supply and other retailers offer in-store recycling. Check directly with the store before you go; not all stores in regional or nationwide chains may be equipped to recycle.

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*“EPA recommends that consumers take advantage of available local recycling options....”*



## Six Most Common Chemical Waste Container Violations

*“Each lab is treated as a satellite accumulation area.”*

Chemical wastes do not have to be removed right away. The chemicals can be held and stored in container until enough material has been collected in a laboratory which is also called a satellite accumulation area. Having said that, remember that there are some rules that need to be followed when storing chemical wastes in a container.

These are the six most common violations found by federal and state EPA inspectors during a site visitor inspection.

**Containers not closed** Often the containers will have a funnel sticking out of them and might be left in a chemical fume hood. The containers are supposed to be sealed at all times unless chemical wastes are being added to the container.

**Failure to label the containers** All containers must be labeled with the words, “**Hazardous Waste**”, and a description of the contents from the moment a chemical waste is placed in a container. This is often not done until the labs are ready to have the chemical wastes removed. Other required information is the location of the laboratory and the Primary Investigator for the laboratory.

**Using improper, damaged containers or containers in poor condition** The containers must be made of a substance that will not react with the chemicals inside, cannot leak and must have a stopper or lid so that the container cannot tip over and spill the contents.

**Failure to comply with satellite accumulation area rules** Each lab is treated as a satellite accumulation area. Proper containers with caps must be used, the containers must be labeled with the contents and the words, “**Hazardous Waste**”. This includes the laboratory location and the PI in charge of the lab. The chemicals waste must be stored properly. An example is a chemical waste that is flammable. These containers must be stored in a Flammable Liquids Storage Cabinet (FLSC). Each lab cannot have more than 55 gal. of Hazardous Waste or 2 lbs of Acutely Hazardous Wastes. An Acutely Hazardous Waste is an extreme poison such as a cyanide.



## ***DUTIES OF THE LABORATORY LASER SUPERVISOR***

The Laser Laboratory Primary Investigator (PI) and the Laboratory Laser Supervisor (LLS) are responsible for the safe operation of lasers in the department's laser lab in accordance with the Guidance for the Laser Site SOP notes issued by the LSO and the safety rules and suggestions found in the EHS Laser Safety Manual and laser slide presentation notes.

The PI and the LLS should ensure that:

1. All CASE lasers are registered with the EHS Laser Safety Officer.
2. All lasers are labelled in accordance with all handouts, the EHS Laser Safety manual and the ANSI Z136.1-2007, the American National Standard for the Safe Use of Lasers.
3. All personnel intending to work with Class 3B lasers or above are trained to work with lasers (EHS Laser Safety training and site specific PI/LLS laser training).
4. All Class 3B or 4 laser workers after receiving training noted above in the safe use of lasers declare and document that they have read and understood the lab site's laser SOP.
5. Laser safety goggles (for the correct OD and wavelength) are provided for all work with Class 3B lasers and above where the beam is not enclosed.
6. Always work with the minimum practical power to the laser.

The PI/LLS should undertake routine surveys of each laser installation to monitor compliance with the lab Laser Safety SOP. To facilitate these tasks, the EHS Laser Audit and Compliance checklist may be used. The LLS should check that the precautions specified have been fulfilled. Below are some explanations:

1. Remote Interlock—Interlocked to the door or the enclosure, required for all Class 4 and higher powered Class 3B lasers.
2. Key Control—Required for all lasers of Class 3B and above to ensure that only authorised personnel use the laser. The key should not be left in the laser controls but should be removed between use.
3. Emission Indicator—Required for all lasers of Class 3B and above to indicate laser is powered on. There may also be an emission indicator sited outside the door of the lab or laser enclosure to warn before entry to the lab or enclosure.
4. Beam Shutter—Should be provided for all lasers of Class 3B and above.

*(Continued on page 6)*



***“There may also be an emission indicator sited outside the door of the lab or laser enclosure to warn before entry to the lab or enclosure.”***

**DUTIES OF LASER SUPERVISOR, Cont.**

**Container Violations, Cont.**



*“Training (is) required for all laser users.”*

*(Continued from page 5)*

5. Beam Stop—Required for lasers of Class 2 and above to ensure that the laser beam is terminated within the confines of the laser bench or experimental area.
6. Beam Level—Avoid eye level to reduce danger of accidental beam impinging on eye.
7. Beam Enclosure—Required to guard against specular reflection from lasers of Class 3R and above. This can mean anything from screening the experimental area to total enclosure.
8. Eye Protection—Required for lasers of Class 3B and above in areas not screened by beam enclosure.
9. Protective Clothing—May be required for lasers of Class 4.
10. Eye Examinations—Only required after an accident but should be available to all laser users if they so request.
11. Training—Required for all laser users. The level of training required will depend on the class of laser.
12. Laser Signs—All lasers should display the appropriate signs which will include class and/or power of laser and indicate the laser emission and direction.
13. Door Signs—Required for all areas where lasers of Class 3R or above are used.

It is highly recommended that you visit the following web site: [http://www.osha.gov/dts/osta/otm/otm\\_iii/otm\\_iii\\_6.html](http://www.osha.gov/dts/osta/otm/otm_iii/otm_iii_6.html). This site gives an excellent overview of the ANSI Standards requirements and explains the requirements for laser interlocks, door closures, curtains, signs, labels, certifications, etc.

*(Continued from page 4)*

**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.

**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.

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

*.....Broken CFL , Cont.**(Continued from page 3)*

If your ENERGY STAR qualified CFL product burns out before it should, look at the CFL base to find the manufacturer's name. Visit the manufacturer's web site to find the customer service contact information to inquire about a refund or replacement. Manufacturers producing ENERGY STAR qualified CFLs are required to offer at least a two-year limited warranty (covering manufacturer defects) for CFLs used at home. In the future, save your receipts to document the date of purchase.



**Figure 1.** CFL recycling bin at Home Depot.

*Electrical Safety in the Lab*

While working in the laboratory there are a large variety of hazards that come in all shapes and forms. One the biggest hazards that is often overlooked is electricity. Here are a few pointers that will help keep you and your colleagues safe this fall.

- Be sure to always use a surge protector when plugging multiple things into one outlet.
- Never piggyback power strips, as this could overload the circuits and cause a fire. Power strips should always be plugged directly into the wall outlet.
- Extension cords should not be used as permanent wiring.
- Make sure that all junction boxes are closed. Any open junction boxes should be reported to Facilities Services.
- Periodically check all power cords for signs of wear and tear. Any damaged cords should be replaced by a certified electrician, prior to using that piece of equipment again.

If you witness someone being electrocuted **DO NOT TOUCH THEM!** Turn the power off if possible, and use a non-conductive material such as wood to try and move the person away from the electrical contact. For emergencies call 216-368-3333 or 911. If you call 911 first, please call Case Police at 216-368-3333 after.

Questions? Contact EHS at 216-368-2907

Regards,

The Fire and Life Safety Team



*“One the biggest hazards that is often overlooked is electricity”*

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