

Department of Biological Sciences
Eastern Illinois University

CHEMICAL HYGIENE PLAN

Emergency Contacts:

Gary Hanebrink Eastern Illinois University Safety Officer: 581-7068;
gwhanebrink@eiu.edu

All medical and fire emergencies: 911

CHEMICAL HYGIENE PLAN
BIOLOGICAL SCIENCES DEPARTMENT

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INTRODUCTION ([top](#))

The purpose of the Chemical Hygiene Plan (CHP) is to define work practices and procedures, in laboratories, to help ensure that laboratory workers within the Department of Biological Sciences are protected from health hazards/risks associated with the hazardous chemicals with which they work. The Chemical Hygiene Plan is part of the University's compliance with the regulations enacted on January 31, 1990 by the U.S. Department of Labor Occupational Safety and Health Administration (OSHA) entitled "Occupational Exposures to Hazardous Chemicals in Laboratories" ([Code of Federal Regulations, 29 CFR 1910.1450](#)).

OSHA has defined a hazardous chemical as a "chemical for which there is statistically significant evidence based on at least one study conducted in accordance with established scientific principals that acute or chronic health effects may occur in exposed employees". In addition, OSHA defines a laboratory as: "a workplace where relatively small quantities of hazardous chemicals are used on a non-production basis". Finally, laboratory workers are defined, in the OSHA Lab Standard, under the definition of "employee" as "an individual employed in a laboratory workplace who may be exposed to hazardous chemicals in the course of his or her assignments." An example of a laboratory worker would be a University teaching assistant or faculty member instructing an academic lab; the students in the academic laboratory would not be considered laboratory workers. If there is any confusion about whether a particular workplace is considered a laboratory which utilizes hazardous chemicals, or whether someone is considered a laboratory worker, the Campus Safety Officer or Chemical Hygiene Officer will upon request make this determination.

This Chemical Hygiene Plan shall be read carefully by all laboratory workers prior to the commencement of lab duties in Biological Sciences Department. In addition to the CHP, the laboratory workers shall be cognizant of and adhere to the [Eastern Illinois University Safety Manual, Chapter 7, Laboratory and Studio Safety](#) and any other sections of the Safety Manual relevant to their research. In addition to the formal health and safety policies found in the Safety Manual, the Environmental Health and Safety Department has prepared guidelines which represent cautious health and safety practices in a number of areas.

A written record stating that each laboratory worker has reviewed the Chemical Hygiene Plan and related health and safety policies and guides shall be kept by the person in charge of the lab or his supervisor.

This Chemical Hygiene Plan (referred to as CHP throughout this document) will be reviewed annually by the Biological Sciences Safety Committee.

STANDARD OPERATING PROCEDURES ([top](#))

"Standard operating procedures relevant to safety and health considerations to be followed when laboratory work involves the use of hazardous chemicals"

1910.1450(e)(3)(i)

The CHP represents a minimum set of guidelines for the handling of toxic chemicals on campus. Individual administrative units, laboratories or research groups are required to develop more detailed procedures as their situations warrant. Acceptable lab safety references such as those listed in [Appendix 1](#) of this document may be adopted in whole or may be useful in developing additional procedures. In all situations, individual faculty or staff will be responsible for enforcing adequate safety and hygiene measures in laboratories they supervise. If necessary, additional assistance from the Environmental Health and Safety Department is available (Gary Hanebrink: 581-7068 or e-mail: gwhanebrink@eiu.edu).

I. **General Standard Operating Procedures (SOP)** which apply to all labs on campus include the following. Respect and understand the safety and health hazards associated with the chemicals and equipment in your laboratory, and practice the following general safety guidelines at ALL times:

A. Be Well Informed

1. Read Material Safety Data Sheet for all chemicals that you will be working with in your lab; and,
2. Know protective equipment needed for each chemical.

B. Accident Response

1. If an injury requiring emergency treatment has occurred, call 911 immediately;
 - a) Fainting;
 - b) Loss of large amounts of blood;
2. If minor injury occurs (injured person can respond and treat their injury);
 - a) Minor chemical burns: Rinse thoroughly, immediately, at least 15 minutes under cool running water;
 - (1) If further treatment is required have them go to Health Services;
 - (2) Walk them to health services, if they need assistance;
 - b) Heat burns cool with water bath or ice pack, immediately, directly to burn for 20 minutes; and,
 - (1) If further treatment is required have them go to Health Services;
 - (2) Walk them to health services, if they need assistance;
 - c) Cuts and abrasions: have them cleanse wound, bandage it, if necessary, and go to Health Services;
 - (1) Do not treat wound for them;
 - (2) Walk them to health services, if they need assistance.

C. Unattended experiments

1. Leaving hazardous systems unattended is not good practice, and is prohibited.

D. Working alone

1. When working with hazardous materials, it is advisable to have a second person present, or at a minimum, maintain surveillance via telephone contact.

E. Housekeeping

1. Exits, aisles, electrical equipment (plugs and switches) and safety equipment must **NOT** be obstructed in any way with equipment, furniture, etc; and,
2. Work areas and floors are not to be used for excess storage.

F. Food, drink, cosmetics

1. Eating, drinking, and the application of cosmetics are forbidden in laboratories; and,
2. Do not store food in the same refrigerator with chemicals, biohazards or radioactive materials.

G. Horseplay

1. Horseplay is forbidden; and,
2. Children and other unauthorized persons and or pets may not be present in laboratories where hazardous chemicals and or equipment are in use.

H. Equipment

1. Use proper equipment that is in good condition;
 - a) For example, never use chipped or cracked glassware;
2. Shield pressurized or vacuum apparatus and safeguard against bumping or overheating;
3. Wear appropriate shielding (to cover face and neck), when working with pressurized glassware; and,
4. Tape all glassware that will be used under pressure or vacuum.

I. Disposal of chemicals

1. Disposal of all laboratory waste shall follow the procedures outlined in Eastern Illinois University Safety Manual, [Waste Disposal \[section 7-4.4\]](#).
2. All waste shall be collected in appropriate containers and labeled accurately with both name of chemical(s) hazard type beginning and ending dates;
3. Empty containers may be saved for waste disposal or disposed; and,
 - a) Rinse container and remove/deface label if disposing;
 - b) May be disposed in glass disposal bin;
4. When full, Environmental Health and Safety shall be contacted for pick-up (Gary Hanebrink 581-7068, gwhanebrink@eiu.edu).

J. Chemical spills and accident response

1. If chemical spill is small consult with Chemical Hygiene Officer Sandra Baumgartner (581-5026, ssbaumgartner@eiu.edu) about cleanup;

2. If spill is of concern (fumes, strong odors smoke), evacuate room/floor/building, as appropriate;
 - a) Contact Chemical Hygiene Officer Sandra Baumgartner (581-5026, ssbaumgartner@eiu.edu); and,
 - b) Environmental Health and Safety Department 581-7068 whenever there is a release to the ground, open waterway, sanitary sewer, storm drain, air, or even if the cause or extent of a spill is unknown; or,
 - c) Call 911 depending on type of spill;
3. If a toxic/hazardous chemical makes contact with your skin, begin flushing the area with water immediately; and,
4. If emergency treatment is needed call 911.

K. Oral pipetting

1. Oral pipetting is strictly forbidden; and,
2. Always use bulb or pump when pipetting any liquid.

L. Disposal of Sharps

1. Sharps are items that can easily puncture skin such as, but not limited to:
 - a) Needles, syringes with needles, lancets, scalpels, razor blades, contaminated microscope slides, broken vials;
2. Use OSHA approved disposal container (closable, puncture resistant, leak proof sharps container) or glass disposal box for uncontaminated broken glass (see STOCKROOM LFSB 1021);
3. Never recap or reuse needles, place directly in sharps container;
4. Decontaminate:
 - a) If contaminated with infectious agents (bacteria, blood, etc.), **AUTOCLAVE** the container;
 - b) Use autoclave tape to verify decontamination;
5. Deface any signage (biohazard labels/markings) on decontaminated sharps container (Only after autoclaving); and,
6. Contact Eastern Illinois University, Environmental Health and Safety Waste Management for pick-up of waste Hanebrink 581-7068).

M. Disposal of Biohazard waste (1910.1450(e) (3) (vii) (C) Procedures for safe removal of contaminated waste)

1. Place solid biohazard waste in OSHA approved Biological Hazard Waste bag;
2. Tape with autoclave tape over hazard warning;
3. Autoclave (see section N-R in SOP for autoclaving procedures);
4. Deface warning label to indicate item is sterile (, leave tape in place; and,
5. Contact Eastern Illinois University, Environmental Health and Safety Waste Management for pick-up of waste Hanebrink 581-7068.

N. Proper Autoclaving Procedure

1. Wear protective mitts when opening autoclave, and placing items in the autoclave;
2. Use autoclavable tray to hold items;

3. When autoclaving liquids, loosen caps on bottles; and,
4. Never autoclave items containing corrosives, solvents, or radioactive materials.

O. Loading Castle autoclave (Room 2020)

1. Load autoclavable tray, and items into chamber, using heat-resistant gloves;
2. Close door, turn lever on door to right, and turn wheel clockwise to tighten door;
3. Turn knob (above door) to STERILIZE; and,
4. Sterilize at about 15 psi for 10-20 minutes. (25 Minutes total is generally adequate).

P. Unloading Castle autoclave

1. Turn knob above door to liquid cool when autoclaving liquids or vent/dry when autoclaving dry items;
2. When pressure drops to 0, turn knob to off. Stand behind door when opening it and allow steam to escape before taking items from autoclave; and,
3. Wear protective mitts when opening autoclave and removing items from autoclave.

Q. Loading Consolidated autoclave (Room 3020)

1. Load autoclavable tray, and items into chamber, using heat-resistant gloves;
2. Close door and turn wheel clockwise to tighten;
3. Turn on "jacket" switch below door, set desired function above the door (Fast, Fluid, Dry), set timer to desired time and depress the "on/off" switch to begin the sterilization cycle; and,
4. See instructions posted on the autoclave for additional information.

R. Unloading Consolidated autoclave

1. After the sterilization process is finished, the pressure drops to 0 and the temperature is below 212F, turn the wheel on the door counterclockwise to open the door;
2. Stand behind door when opening it and allow steam to escape before taking items from autoclave;
3. Wear protective mitts when opening the autoclave and removing items from autoclave; and,
4. Press the "on/off" switch above the door to turn autoclave off. Turn off the "jacket" switch below the door.

II. Personal Protection and Hygiene

Personal protection and personal hygiene are two very basic aspects of laboratory safety therefore; practicing good personal hygiene, as described below, will minimize exposures to hazardous chemicals during routine use and in the event of an accident.

A. Attire

1. Wear a lab coat or apron;
2. Cover feet (no sandals or open-toed shoes); and,

3. Confine loose clothing and long hair, to prevent them from getting caught in mechanical equipment or from catching fire.

B. Gloves

1. Gloves are essential when working with hazardous substances;
2. The proper gloves will prevent skin absorption, infection and or burns;
3. All glove materials are not equally effective in protection from chemical hazards; and,
4. Consult a chemical resistance chart (Fisher Scientific Catalog), the stockroom manager, or the Campus Safety Officer (Gary Hanebrink 581-7068; gwhanebrink@eiu.edu) for assistance in appropriate selection.

C. Eye protection

1. It is state law and campus policy ([Chapter 4-11.1 of the Safety Manual](#)) that personnel working in laboratories must wear safety glasses, goggles, or face shields at all times when eye hazards (either chemical or physical) are a possibility;
2. Goggles are recommended when chemical splashes are possible; and,
3. The wearing of contact lenses in labs is a controversial issue;
 - a) If contact lenses must be worn, it is necessary to wear goggles at all times when in the lab;
 - b) Contact lenses are not eye protection.

D. Face Shields

1. Face shields which cover the neck and ear areas should be worn while conducting a procedure which may result in a violent reaction, and/or while working with items under pressure.

E. Glass tubing

1. When inserting tubing into stoppers, lubricate tubing and protect hands from being cut in the event of the tubing slipping and breaking.

F. Personal hygiene

1. Remove gloves and dispose of properly, before leaving the lab;
2. Hands should be washed frequently throughout the day, before leaving the lab, after contact with any hazardous material, and before eating, smoking and or applying cosmetics.

III Hazardous Material Handling and Storage

Hazards associated with various chemicals and gases vary widely. Understanding the hazards associated with a compound and minimizing the quantity used and stored in the lab will decrease chance of injury.

A. Chemical Recycling/Waste Minimization and Disposal Policy at EIU ([top](#))

1. It is the policy of this University that the minimum amount of chemicals necessary to perform the job or experiment be purchased;

2. Instructors and employees have the responsibility for recycling and minimizing waste;
3. Once it has been determined that a material is waste, then the instructor or employee has the responsibility for disposing of the waste in a manner consistent with the laws of the State of Illinois and the United States; and,
4. All hazardous waste must be disposed of in accordance with RCRA.

B. Disposal of Common Non-Hazardous Chemicals

1. Contact Stockroom manager for information on chemical disposal.

C. Chemical Waste Disposal

1. Always contact Stockroom manager if you are uncertain about disposal procedures;
2. Always place waste label on container;
 - a) Contact Stockroom manager to obtain labels;
 - b) Fill out label completely; and,
 - (1) Include date started to fill;
 - (2) Names of chemicals;
 - (3) Approximate % of each chemical;
 - (4) Date ready for removal;
 - c) Contact gwhanebrink@eiu.edu for pick-up of waste;

D. Chemical storage

1. Chemicals should be stored by compatibility, not by alphabetical arrangement;
2. Chemicals must be stored in easily accessible cabinets;
 - a) Do not store in cabinets where ladder is necessary to retrieve;
3. When volatiles must be stored in a cooled atmosphere, explosion-proof refrigerators or cold rooms designed for this purpose must be used;
4. Oxidizers should be separated from organics;
5. Air/water reactive chemicals must be stored in desiccators;
6. Cyanides should be stored away from acids; and,
7. Biological Sciences Stockroom has a video on proper storage of chemicals, for checkout.

E. Chemical handling

1. Use bottle carriers for transporting chemicals, especially strong acids/bases;

2. Close caps securely and avoid storing chemical containers in hard to reach areas;
3. Pour chemicals carefully;
4. Never add water to concentrated acid or base; and,
5. Metal containers and nonconductive containers (e.g., glass or plastic) holding more than five gallons must be grounded when transferring flammable liquids.

F. Cylinder storage

1. Cylinders must be stored in well ventilated areas with their protective caps screwed on and the cylinder secured (e.g., strapped or chained down) to reduce the chance of the cylinder being knocked over;
2. Do not store cylinders near heat source or high traffic areas;
3. Do not store flammables and oxidizers together;
4. Do not store empty and full cylinders together; and,
5. Storage of large quantities of cylinders must be done in an approved gas cylinder storage area.

G. Cylinder handling

1. Use appropriate hand carts to move cylinders;
2. Cylinders must be secured to the cart during transport;
3. Highly toxic gases should not be moved through the corridors, particularly during business hours; and,
4. Always consider cylinders as full and handle them with corresponding care.

H. Labels

1. Make sure all labels are legible, and integrity is intact;
2. Label all secondary containers with the chemical name and appropriate hazards, and date;
3. Date all chemicals upon receiving and opening;
4. Observe expiration dates;
 - a) dispose of chemicals when expiration date has passed;
5. Follow appropriate disposal methods always; and,
6. Contact Campus Safety Officer (Gary Hanebrink 581-7068) or stockroom manager, Sandra Baumgartner 581-5026, room 1021, if you have questions about chemical disposal.

I. Containers

1. Check the integrity of chemical containers;
2. Use original container in which the chemical was shipped; and,
 - a) If integrity of container is compromised transfer chemical to compatible container or dispose of properly;
3. Observe compatibilities with container type as well as other chemicals;
 - a) i.e. Hydrofluoric Acid must not be stored in glass, keep in tightly closed polyethylene containers;
 - b) Some oxidizers should not be stored in plastic containers.

CONTROLLING CHEMICAL EXPOSURES ([top](#))

"Criteria that the employer will use to determine and implement control measures to reduce employee exposure to hazardous chemicals including engineering controls, the use of personal protective equipment and hygiene practice; particular attention shall be given to the selection of control measures for chemicals that are known to be extremely hazardous"

[29 CFR 1910.1450 \(e\) \(3\) \(ii\)](#)

Three major routes of entry for a chemical to enter the body:

- Inhalation;
- Skin and eye contact; and,
- Ingestion.

Each route of entry a chemical can take to enter the body can be controlled by a number of varying controls, as explained below.

Three types of controls for prevention of these various routes of entry include:

- Engineering controls;
- Personal protective equipment; and,
- Administrative controls.

Inhalation hazards

Inhalation of chemicals is the most common route of entry a chemical can take to enter the body. To avoid significant inhalation exposures:

- Engineering Controls
 - Substitute a less volatile or a less toxic chemical; and,
 - Substitute a liquid or solid chemical for a gaseous one.

If substitution is not practical then:

- Ventilation should be used to lessen the chance of overexposure;
- Use well-functioning fume hood or room exhaust system to minimize exposure to hazardous chemicals; and,
- Dilution ventilation may be used to reduce exposure to non-hazardous nuisance odors.

For extremely toxic chemicals such as those classified as poison gases by State or Federal Department of Transportation (e.g., arsine, phosgene)

- Use closed systems, vented gas cabinets, failsafe scrubbing, detection or other stricter controls

When both substitution and engineering controls are unpractical:

- Personal Protective Equipment
 - Respiratory protection from dust masks to self-contained breathing apparatus may be utilized:
 - If respirators are worn by laboratory employees, requirements of the OSHA Respirator Standard (1910.134) must be met;
 - This Standard requires training on the proper use of respirators, medical surveillance to ensure the user is capable of wearing a respirator, and fit testing to ensure that the respirator fits properly; and,
 - A lab worker or his/her supervisor should contact the Campus Safety Officer in the event that respiratory protection is utilized to control exposures to hazardous chemicals.

Finally, in addition to the above controls it may be necessary to enforce administrative controls to reduce the risk of overexposure to hazardous chemicals. Some examples of administrative controls include:

- Administrative Controls
 - Minimization of exposure time for individual employees;
 - Restricted access to an area where a hazardous chemical is used;
 - Allowing a process that emanates nuisance odors to be done only after typical office hours, when most of the staff in the building have gone home; and,
 - Proper signage on lab doors to indicate special hazards within, a list of lab supervisor and occupants of the lab who should be contacted in the event of an emergency and appropriate telephone numbers.

Skin and or Eye Contact Hazards

To reduce the risk of a chemical entering the body via skin and eye contact:

- Engineering controls
 - Substitution; and,
 - Appropriate ventilation as described above in Inhalation hazards.
- Personal Protective Equipment
 - Goggles;
 - Face shields;
 - Gloves;
 - Chemical resistivity of gloves vary significantly, the lab supervisor should consult a glove chemical resistance chart, the stockroom manager, or Campus Safety Officer Gary Hanebrink 581-7068 or

other references to ascertain that the protective equipment material is resistant to the chemical being protected against.

- Shoes; and,
 - No sandals or open toed shoes allowed in labs
- Lab aprons or coats.
- Administrative Controls
 - Enforcement of policies pertaining to skin and eye protection; and,
 - Discarding of cracked or broken glassware.

Ingestion

Ingestion of chemicals is the least common route of entry into the body. Some methods are:

- Contaminated hands or writing utensils
 - Wash prior to eating, applying cosmetics, and smoking; and,
 - Never stick part of the hand or a writing tool into the mouth or rub eyes.
- Engineering controls
 - Isolate the hazardous substance so minimal contact is required (e.g., use glove box).
- Personal protective equipment
 - Wear gloves;
 - Wear face mask;
- Administrative controls
 - Prohibit mouth pipetting;
 - Encourage good personal hygiene; and,
 - Prohibit eating, drinking and applying cosmetics in lab areas.
 - Food and or drinks are forbidden from being stored in lab refrigerators with chemicals

At the request of faculty, staff or students, exposure evaluations may be conducted by the Environmental Health and Safety Department for any suspected overexposure to substances regulated by OSHA and/or ACGIH TLV. [Note: ACGIH TLV is "American Conference of Governmental Industrial Hygienists Threshold Limit Value".] Records of exposure evaluations will be kept at the Campus Safety Office.

Exposure Incident

A specific eye, mouth, other mucous membrane, non-intact skin contact with blood or other potentially infectious materials that result from the performance of an employee's duties.

Universal Precautions

Treat all human blood and certain human body fluids as if known to be infectious for HIV, HBV, and other Blood-borne pathogens.

Work Practice Controls

Controls that reduce the likelihood of exposure by altering the manner in which a task is performed;

- Prohibit recapping of needles;
- Protect the work surface with absorbent, non-porous material to limit potential spread of Blood-borne pathogens;
- Use disinfectants which conform to OSHA Blood-borne Pathogens protocol; and,
- Use proper disposal methods for needles, gloves, and paper products contaminated or potentially contaminated with Blood-borne pathogens.

FUME HOODS and OTHER ENGINEERING CONTROLS ([top](#))

"A requirement that fume hoods and other protective equipment are functioning properly and specific measures that shall be taken to ensure proper and adequate performance of such equipment"

OSHA Standard [29CFR 1910.1450 \(e\) \(3\) \(iii\)](#)

Adequately functioning fume hoods should be marked to indicate proper sash position for optimum hood performance. (In general, fume hoods should not be used with the sash fully open.) Fume hoods and other engineering controls such as vented gas cabinets should be surveyed annually by a qualified person (from the Campus Safety Officer, Physical Plant, outside contractor, etc.) with a written report of the results maintained by the unit in charge of the lab.

In most cases, academic units are financially responsible for the maintenance and functionality of the fume hoods. Because of this, routine maintenance of fume hoods in some laboratory buildings on campus is not conducted. Hence, the users of the fume hoods and other ventilation equipment need to be certain that the equipment is functioning. A simple visible test to ensure flow into fume hoods is to tape a Kim Wipe to the hood and note its movement when the exhaust fan is turned on. See further information on the topic <http://www.uwm.edu/Dept/EHSRM/LAB/fume.html#Sash>.

Protective equipment other than fume hoods should be checked periodically by the laboratory supervisor to ensure that the equipment is functioning properly.

Any questions or requests for assistance in evaluation of fume hoods and other protective equipment may be directed to the Environmental Health and Safety Department or the Physical Plant (Gary Hanebrink: 581-7068 or e-mail: gwhanebrink@eiu.edu).

EMPLOYEE INFORMATION AND TRAINING ([top](#))

PEER INITIATIONS

OSHA Standard [29CFR 1910.1450 \(f\)](#)

"Provisions for employee information and training"

All individuals who work in laboratories who may be exposed to hazardous chemicals must be apprised of the hazards of chemicals present in their work area. This information and training as outlined below must be provided before initial assignment and before new exposure situations. Equipment necessary for the safe handling of hazardous substances must also be provided. Upon request by Departments or other administrative units, Environmental Health and Safety personnel will, from time to time, give presentations concerning general labs safety practices. However, training specific for the particular lab where and employee is assigned is the responsibility of the employee's supervisor. The frequency of refresher information and training shall be determined by the supervisor.

Laboratory workers shall be informed of the location and availability of the following:

1. 29 CFR Part 1910.1450 "Occupational Exposures to Hazardous Chemicals in Laboratories" (the OSHA Lab Standard);
2. This Chemical Hygiene Plan;
3. Reference materials on chemical safety, including Material Safety Data Sheets (MSDS);
4. Permissible exposure limits (PEL) for OSHA regulated substances, or if there is no applicable OSHA standard, the recommended exposure limits or threshold limit value (TLV) may be provided; and,
5. Signs and symptoms associated with exposure to the hazardous chemicals found in the lab.

Training

Laboratory worker training shall include:

1. Detection methods and observations that may be used to detect the presence or release of a hazardous chemical. Examples of detection methods include visual appearance, odor, and an understanding of chemical monitoring devices;
2. Physical and health hazards of the chemicals; and,

3. The work practices, personal protective equipment, and emergency procedures to be used to ensure that the employee may protect himself/herself from overexposure to hazardous chemicals.

The manufacturer's Material Safety Data Sheets will generally contain much of the above information needed to comply with the information and training requirements of the OSHA Lab Standard. Hence, employees should peruse and understand the relevant MSDS and/or other comparable literature on the hazardous chemicals which are used or stored in their laboratory. Additional training for specific lab hazards must be provided by the employee's supervisor.

The OSHA Lab Standard, the EIU Chemical Hygiene Plan, a library of MSDS and other health and safety references are maintained at the Environmental Health and Safety Department, Central Stores, and are available to students, faculty or staff upon request. A list of safety and industrial hygiene literature available from the Campus Safety Officer is found in Appendix 1 of this document.

Copies of MSDS may be obtained from the chemical supplier, in the Biological Sciences Stockroom (LFSB 1021), and from the Division of Environmental Health and Safety.

PRIOR APPROVAL ([top](#))

OSHA Standard [29 CFR 1910.1450\(e\)\(3\)\(v\)](#)

"The circumstances under which a particular laboratory operation, procedure or activity shall require prior approval from the employer or the employer's designee before implementation"

The responsibility for approval of the acquisition and use of toxic chemical agents rests with the laboratory supervisor. Certain materials including radioactive materials, recombinant DNA and certain biohazards require prior internal approval at various levels. If there are questions concerning the need for approval, the Campus Safety Officer should be consulted (Gary Hanebrink: 581-7068 or e-mail: gwhanebrink@eiu.edu)

MEDICAL CONSULTATION ([top](#))

[29 CFR 1910.1450\(g\)](#)

"Provisions for medical consultation and medical examination"

An opportunity to receive medical consultation shall be provided under the following circumstances:

- If an employee develops any symptoms thought to arise from chemical overexposure;
- After an event such as a major spill, leak or explosion which may have resulted in an overexposure; and or,
- When an overexposure is identified as the result of an evaluation by the Chemical Hygiene Officer.

Health Service will designate one or more physicians at any given time to be consulting physicians. Following notification of overexposure, arrangements for an appropriate medical examination must be completed before the exposed individual may return to work. Any medical examination required by the CHP shall be provided without cost to the employee, without loss of pay and at a reasonable time and place. Records of any medical examination will be maintained at Health Service.

CHEMICAL HYGIENE OFFICER ([top](#))

[29 CFR 1910.1450\(e\)\(3\)\(vii\)](#)

"Designation of personnel responsible for implementation of the Chemical Hygiene Plan including the assignment of a Chemical Hygiene Officer and, if appropriate, establishment of a Chemical Hygiene Committee"

The Campus Safety Officer or a Division staff person designated by the Director will be designated as the Chemical Hygiene Officer for Eastern Illinois University. The Eastern Illinois University Environmental Health and Safety Committee will serve at the Eastern Illinois University Chemical Hygiene Committee.

Chemical Hygiene officer for Biological Sciences and current chair of Department Safety Committee:

Sandra Baumgartner

Office: LFSB 1021

Phone: 581-5026

E-mail: ssbaumgartner@eiu.edu

Other Safety Committee members:

Steven Malehorn

Office: LFSB Greenhouse

Phone: 581-2513

E-mail: shmalehorn@eiu.edu

SPECIAL PROVISIONS for SELECT CARCINOGENS, REPRODUCTIVE TOXINS and ACUTELY TOXIC CHEMICALS ([top](#))

[29 CFR 1910.1450 \(e\) \(3\) \(viii\)](#)

"Provisions for additional employee protection for work with particularly hazardous substances" These include "select carcinogens," reproductive toxins and substances which have a high degree of acute toxicity. Specific consideration shall be given to the following provisions which shall be included where appropriate:

- Establishment of a designated area;
- Use of containment devices such as fume hoods or glove boxes;
- Procedures for safe removal of contaminated waste; and,
- Decontamination procedures.

In addition to the general safety guidelines mentioned in the first section and throughout the CHP, special precautions are needed when handling genotoxins, reproductive toxins and chemicals with a high degree of acute toxicity. A minimum set of guidelines that should be followed are listed below. The lab supervisor should ensure that these and other precautions designed to minimize risk of exposure to these substances are taken.

- Quantities of these chemicals used and stored in the laboratory should be minimized, as should their concentrations in solution or mixtures;
- Work with genotoxins, reproductive toxins and acutely toxic chemicals should be performed within a functioning fume hood, biological safety cabinet, ventilated glove box, sealed system, or other system designed to minimize exposure to these substances;
 - The exhaust air from the ventilation systems may require scrubbing before being released into the atmosphere;
- In all cases, work with these types of chemicals shall be done in such a manner that the OSHA permissible exposure limits or similar standards are not exceeded;
- Compressed gas cylinders which contain acutely toxic chemicals such as arsine and nitrogen dioxide should (and may be required to) be kept in ventilated gas cabinets;
- The ventilation efficiency of the designated fume hood, glove box or gas cabinet, and the operational effectiveness of mechanical and electrical equipment used to contain or manipulate these special substances, should be evaluated periodically at intervals determined by the laboratory supervisor;
 - The interval of evaluating systems may vary from weekly to biannually depending upon the frequency of usage, quantities employed and level of hazard;
 - Contact Campus Safety Officer to set up evaluation.
 - Gary Hanebrink, gwhanebrink@eiu.edu
- Each laboratory utilizing these substances must designate an area for this purpose and must sign or mark this area with an appropriate hazard warning;
- The designated area may be an entire laboratory, an area of the laboratory or a device such as a fume hood or glove box;

- The designated area should be marked with a “DANGER”, specific agent, AUTHORIZED PERSONNEL ONLY or comparable warning sign;
- All laboratory workers who work in a laboratory, which has an area designed for use with genotoxins, reproductive toxins and acutely toxic chemicals, must be trained about the deleterious effects of these substances, as well as signs and symptoms regarding exposure to these substances, whether or not they actually work with the substance themselves
- Training to ensure the safe handling and storage of these substances is required for those who use these materials. This training is the responsibility of the laboratory supervisor and must be done prior to the use of any of these materials;
- Laboratory workers using these chemicals must have access to appropriate protective equipment and clothing and must be trained on how to properly utilize the safety equipment;
 - For example, when working with highly toxic gases, it is often recommended that the workers have available and be trained to use self-contained breathing apparatus;
- Detection equipment may be required in laboratories where chemicals (especially poisonous gases) with a high degree of acute toxicity are utilized
- All wastes contaminated with these substances shall be collected and disposed of in a timely manner and appropriately, as outlined in the Campus Safety Office Safety Manual;
 - For special disposal information, call the Campus Safety Officer (Gary Hanebrink: 581-7068 or e-mail: gwhhanebrink@eiu.edu);
- If possible, and as soon as practical, waste products shall be destroyed by a suitable, generally acceptable, chemical procedure to lessen or eliminate their toxicity;
- The designated working area shall be thoroughly and appropriately decontaminated and cleaned at regular intervals determined by the laboratory supervisor;
 - The interval may be as short as one day or as long as six months depending upon the frequency of usage and level of hazard;
- Special precautions to avoid release and exposure to highly toxic chemicals, genotoxins and reproductive toxins must be utilized, and;
 - For instance, volatile substances should be kept cool and contained;
 - gases should have properly functioning valves, check valves, regulators, containment which can withstand pressure buildup, and appropriate piping, and;
 - Dispersive solids should be kept in closed containers, used in places with minimum air currents, and appropriate contact materials should be used to avoid static charging.
- Emergency response planning for releases or spills shall be prepared by the lab supervisor and included in the training of the laboratory workers and others who may be affected in the building. The Campus Safety Officer and the Charleston Fire Department should be involved in this planning.

Formaldehyde Standard [OSHA Standard [1910.1048](#)] ([top](#))

Basic guidelines for use of hazardous chemicals should be strictly followed. Although this covers Formaldehyde, it can be applied to any chemical which fits into the same general category. Material Safety Data Sheets are available and should be read before working with any hazardous substance.

- Chemical Name: Formaldehyde;
- Aldehyde Family;
- Synonyms - Formalin, Formic Aldehyde, Formalin (methanol free);
- Colorless liquid, pungent odor;
- Hazards associated with exposure, depend on form (liquid, gas, solid) and concentration present;
 - Treat with care, follow all basic laboratory regulations;
- Attire – Wear appropriate protective clothing, goggles and gloves when working with formaldehyde;
- ALWAYS use functioning fume hood when working with formaldehyde;
- Keep containers closed when not in use;
- Skin contact - rinse contact area well with water;
- Spills – small: dilute with water to produce nonflammable mixture;
 - Contain mixture for proper disposal; and,
- For large spills, evacuate the area and call the 911.

Pesticides ([top](#)) (from EIU Safety Manual)

The information in this handout should serve as a brief explanation of the rules and regulations that pertain to pesticides. For a complete guide of the rules and regulations please refer to, the [Code of Federal Regulations; 40 CFR Part 150-189, Pesticides Programs](#).

What are the Pesticide Regulations that I need to comply with?

The Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), as amended, regulates the production, distribution, sale, use and disposal of pesticides in the United States. All pesticides must be registered with EPA under FIFRA before they may be distributed or sold in the U.S. All registered pesticides must be used in exact accordance with the label directions specific for each product. In addition, individuals who have been certified under FIFRA or an equivalent state program may use certain pesticides considered to present unreasonable risks to man or the environment. Such products are classified as restricted use pesticides and may only be used by certified applicators. Congress set up the enforcement of FIFRA by assigning the Agency the primary responsibility for enforcing pesticide use {if the State has state authorities to carry out this responsibility}. All Region 5 States have state authorities to enforce pesticide use.

As a College or University, do I need a certification? And if so, where do I get this?

Colleges and universities may be subject to FIFRA for the certification of applicators that may use **restricted use pesticides**. These institutions may also be subject to more restrictive state authorities that require the certification of applicators that use any pesticide in the course of the work. It is imperative that colleges and universities consult with the appropriate state lead agency to determine the requirements for the certification of individuals **who use any pesticide on the institution's property** and any record keeping requirements on pesticide use by campus personnel.

1910.1450(e)(3)(viii)(A)

Establishment of a designated area:

1910.1450(e)(3)(viii)(B)

Use of containment devices such as fume hoods or glove boxes;

Blood-borne Pathogens Exposure Control Plan ([top](#))

([Eastern Illinois University Exposure Control Plan](#) Safety Manual Chapter 17 for employees that may potentially be exposed to Blood-borne pathogens); for another source for information: [OSHA guidelines for Blood-borne Pathogens and Needle stick Prevention](#) (29 CFR 1910.1030)

Blood-borne Pathogens

- Pathogenic microorganisms that are present in human blood and can cause disease in humans; and,
- These pathogens include, but are not limited to, hepatitis B virus (HBV) and human immunodeficiency virus (HIV).

Contaminated

- The presence or the reasonably anticipated presence of blood or other potentially infectious materials on an item or surface.

Contaminated Sharps

- Any contaminated object that can penetrate the skin including, but not limited to, needles, scalpels, broken glass, broken capillary tubes, and exposed ends of dental wires; and,
- Proper [disposal](#) of sharps after use is essential (see: Standard Operating Procedures; general lab practices, Disposal of Sharps).

Decontamination

- Use of physical or chemical means to remove, inactivate, or destroy Blood-borne pathogens on a surface or item to the point where they are no longer capable of transmitting infectious particles and the surface or item is rendered safe for handling, use, or disposal;
 - Use disinfectants that meet OSHA's Blood-borne Pathogen Standard;
 - Wipe down work zones;
 - Autoclave
 - Dispose of paper, and glove waste in biohazard waste disposal bags; and,

Dispose of sharps in appropriate OSHA recommended disposal containers.

[Appendix 1 \(top\)](#)

References available at the Environmental Health and Safety Department as of May 1, 1992:

Safety Manual, Chapter 7, Laboratory and Studio Safety, Eastern Illinois University, Charleston, Illinois

Handbook of Compressed Gases, 3rd ed., Compressed Gas Association, Arlington, Virginia, 1990

Handbook of Laboratory Safety, 3rd ed., edited by A. Keith Furr, CRC Press, 1990

Hawley's Condensed Chemical Dictionary, 11th ed., Irving Sax and Richard J. Lewis, Sr., Van Nostrand Reinhold Company, 1978.

Industrial Ventilation, 20th ed., American Conference of Governmental Industrial Hygienists, 1988

Laboratory Safety Manual, Indiana University Department of Chemistry, Bloomington, Indiana, 1989

Laboratory Safety: Practices for Progress, University of Michigan Department of Occupational Safety and Environmental Health, 1990.

NIOSH Pocket Guide to Chemical Hazards, DHHS (NIOSH), June 1990, DHHS (NIOSH) Publication No. 90-117.

OSHA Safety and Health Standards, (29 CFR 1910), United States Department of Labor, U.S. Government Printing Office, 1988

Patty's Industrial Hygiene and Toxicology, 3rd ed., Patty, F.A., Volumes 1.2(A,B,C), and 3(A,B), Wiley-Interscience, 1978

Prudent Practices for Disposal of Chemicals from Laboratories, National Research Council, National Academy Press, 1983

Prudent Practices for Handling Hazardous Chemicals in Laboratories, National Research Council, National Academy Press, 1981

Purdue Right-to-Know and Hazardous Materials Safety Manual, Purdue University Radiological and Environmental Management, West Lafayette, IndianaAppendix 1, Cont.

Safety in Academic Chemistry Laboratories, 5th ed., Committee on Chemical Safety, American Chemical Society: Washington, D.C., 1990.

TLV: Threshold Limit Values and Biological Exposures Indices for 1988-1989, American Conference of Governmental Industrial Hygienists, 1988.

Appendix 2

OSHA Laboratory Standard ([top](#))

[29 CFR 1910.1450](#): Occupational Exposure to Hazardous Chemicals in Laboratories

1910.1450 (a)

Scope and Application

1910.1450 (a)(1)

This section shall apply to all employers engaged in the laboratory use of hazardous chemicals as defined below.

1910.1450 (a)(2)

Where this section applies, it shall supersede, for laboratories, the requirements of all other OSHA health standards in 29 CFR, part 1910, subpart Z, except as follows:

1910.1450 (a)(2)(i)

For any OSHA health standard, only the requirement to limit employee exposure to the specific permissible exposure limit shall apply for laboratories, unless that particular standard states otherwise or unless the conditions of paragraph (a)(2)(iii) of this section apply.

1910.1450 (a)(2)(ii)

Prohibition of eye and skin contact where specified by any OSHA health standard shall be observed.

1910.1450 (a)(2)(iii)

Where the action level (or in the absence of an action level, the permissible exposure limit) is routinely exceeded for an OSHA regulated substance with exposure monitoring and medical surveillance requirements, paragraphs (d) and (g)(1)(ii) of this section shall apply.

1910.1450 (a)(3)

This section shall not apply to:

1910.1450 (a)(3)(i)

Uses of hazardous chemicals which do not meet the definition of laboratory use, and in such cases, the employer shall comply with the relevant standard in 29 CFR, part 1910, subpart 2, even if such use occurs in a laboratory.

1910.1450 (a)(3)(ii)

Laboratory uses of hazardous chemicals which provide **no potential for employee exposure**. Examples of such conditions might include:

1910.1450 (a)(3)(ii)(A)

Procedures using chemically-impregnated test media such as Dip-and-Read tests where a reagent strip is dipped into the specimen to be tested and the results are interpreted by comparing the color reaction to a color chart supplied by the manufacturer of the test strip; and

1910.1450 (a)(3)(ii)(B)

Commercially prepared kits such as those used in performing pregnancy tests in which all of the reagents needed to conduct the test are contained in the kit.

1910.1450(b)

Definitions:

Action level

A concentration designated in 29 CFR, part 1910, for a specific substance, calculated as an eight (8)-hour time-weighted average, which initiates certain required activities such as exposure monitoring and medical surveillance

Assistant Secretary

The Assistant Secretary of Labor for Occupational Safety and Health, U.S. Department of Labor, or designee

Carcinogen

(See "select carcinogen")

Chemical Hygiene Officer

An employee, who is designated by his/her employer to be Chemical Hygiene Officer, must be qualified by training or experience, to provide technical guidance in the development and implementation of the provisions of the Chemical Hygiene Plan. This definition is not intended to place limitations on the position description or job classification that the designated individual shall hold within the employer's organizational structure.

Chemical Hygiene Plan

A written program developed and implemented by the employer which sets forth procedures, equipment, personal protective equipment and work practices that (i) are capable of protecting employees from the health hazards presented by hazardous chemicals used in that particular workplace and (ii) meets the requirements of paragraph (e) of this section.

Combustible liquid

Any liquid having a flashpoint at or above 100°F. (37.8°C), but below 200°F. (93.3°C), except any mixture having components with flashpoints of 200°F. 93.3°C., or higher, the total volume of which make up 99 percent or more of the total volume of the mixture.

Compressed gas

- A gas or mixture of gases having, in a container, an absolute pressure exceeding 40 psi at 70°F. (21.1°C.); or
- A gas or mixture of gases having, in a container, an absolute pressure exceeding 104 psi at 130°F. (54.4°C.) regardless of the pressure at 70°F. (21.1°C.); or
- A liquid having a vapor pressure exceeding 40 psi at 100°F. (37.8°C.), as determined by ASTM D-323-72.

Designated area

- An area which may be used for work with "select carcinogens," reproductive toxins or substances which have a high degree of acute toxicity
- A designated area may be the entire laboratory, an area of a laboratory, or a device such as a laboratory hood

Emergency

- Any occurrence such as, but not limited to, equipment failure, rupture of containers or failure of control equipment which results in an uncontrolled release of a hazardous chemical into the workplace

Employee

- An individual employed in a laboratory workplace that may be exposed to hazardous chemicals in the course of his or her assignments.

Explosive

- A chemical that causes a sudden, almost instantaneous release of pressure, gas, and heat when subjected to sudden shock, pressure, or high temperature

Flammable

- A chemical that falls into one of the following categories
 - "Aerosol, flammable"
 - an aerosol that, when tested by the method described in 16 CFR 1500.45, yields a flame protection exceeding 18 inches at full valve opening, or
 - a flashback (a flame extending back to the valve) at any degree of valve opening
 - "Gas, flammable"
 - A gas that, at ambient temperature and pressure, forms a flammable mixture with air at a concentration of 13 percent by volume or less; or
 - A gas that, at ambient temperature and pressure, forms a range of flammable mixtures with air wider than 12 percent by volume, regardless of the lower limit
 - "Liquid, flammable"
 - Any liquid having a flashpoint below 100°F. (37.8°C.)

- Except any mixture having components with flashpoints of 100°F.(37.8°C.) or higher, the total of which make up 99 percent or more of the total volume of the mixture
- "Solid, flammable"
 - A solid, other than a blasting agent or explosive as defined in 1910.109(a), that is liable to cause fire through friction, absorption of moisture, spontaneous chemical change, or retained heat from manufacturing or processing, or
 - Which can be ignited readily and when ignited burns so vigorously and persistently as to create a serious hazard
 - A chemical shall be considered to be flammable solid if, when tested by the method described in 16 CFR 1500.44, it ignites and burns with a self-sustained flame at a rate greater than one-tenth of an inch per second along its major axis.

Flashpoint

- The minimum temperature at which a liquid gives off a vapor in sufficient concentration to ignite when tested
 - Tagliabue Closed Tester (See American National Standard Method of Test for Flash Point by Tag Closed Tester, Z11.24-1979 (ASTM D 56-79))-for liquids with a viscosity of less than 45 Saybold Universal Seconds (SUS) at 100°F. (37.8 °C.), that do not contain suspended solids and do not have a tendency to form a surface film under test; or
 - Pensky-Martens Closed Tester (see American National Standard Method of Test for Flash Point by Pensky-Martens Closed Tester, Z11.7-1979 (ASTM D 93-79)) -for liquids with a viscosity equal to or greater than 45 SUS at 100°F. (37.8°C.), or that contain suspended solids, or that have a tendency to form a surface film under test; or
 - Setaflash Closed Tester (see American National Standard Method of Test for Flash Point by Setaflash Closed Tester (ASTM D 3278-78)).

* Organic peroxides, which undergo auto-accelerating thermal decomposition, are excluded from any of the flashpoint determination methods specified above.

Hazardous chemical

A chemical for which there is statically significant evidence based on at least one study conducted in accordance with established scientific principles that acute or chronic health effects may occur in exposed employees. The term "health hazard" includes chemicals which are carcinogens, toxic or highly toxic agents, reproductive toxins, irritants, corrosives, sensitizers, hepatotoxins, nephrotoxins, and neurotoxins, agents which act on the hematopoietic systems, and agents which damage the lungs, skin, eyes, or mucous membranes.

Appendices A and B of the Hazard Communication Standard (29 CFR 1910.1200) provide further guidance in defining the scope of health hazards and determining whether or not a chemical is to be considered hazardous for purposes of this standard.

Laboratory

A facility where the "laboratory use of hazardous chemicals" occurs. It is a workplace where relatively small quantities of hazardous chemicals are used on a non-production basis.

Laboratory scale

Work with substances in which the containers used for reactions, transfers, and other handling of substances are designed to be easily and safely manipulated by one person.

Laboratory scale

Excludes those workplaces whose function is to produce commercial quantities of materials.

Laboratory-type hood

A device located in a laboratory, enclosure on five sides with a moveable sash or fixed partial enclosed on the remaining side; constructed and maintained to draw air from the laboratory and to prevent or minimize the escape of air contaminants into the laboratory; and allows chemical manipulations to be conducted in the enclosure without insertion of any portion of the employee's body other than hands and arms.

Walk-in hoods with adjustable sashes meet the above definition provided that the sashes are adjusted during use so that the airflow and the exhaust of air contaminants are not compromised and employees do not work inside the enclosure during the release of airborne hazardous chemicals.

Laboratory use of hazardous chemicals

Handling or use of such chemicals in which all of the following conditions are met:

- (i) Chemical manipulations are carried out on a "laboratory scale;"
- (ii) Multiple chemical procedures or chemicals are used;
- (iii) The procedures involved are not part of a production process, nor in any way simulate a production process; and
- (iv) "Protective laboratory practices and equipment" are available and in common use to minimize the potential for employee exposure to hazardous chemicals.

Medical consultation

A consultation which takes place between an employee and a licensed physician for the purpose of determining what medical examinations or procedures, if any, are appropriate in cases where a significant exposure to a hazardous chemical may have taken place.

Organic peroxide

An organic compound that contains the bivalent -o-o- structure and which may be considered to be a structural derivative of hydrogen peroxide where one or both of the hydrogen atoms has been replaced by an organic radical.

Oxidizer

A chemical other than a blasting agent or explosive as defined in §1910.109(a), that initiates or promotes combustion in other materials, thereby causing fire either of itself or through the release of oxygen or other gases.

Physical hazard

A chemical for which there is scientifically valid evidence that it is a combustible liquid, a compressed gas, explosive, flammable, or an organic peroxide, an oxidizer, pyrophoric, unstable (reactive) or water-reactive.

Protective laboratory practices and equipment

Those laboratory procedures, practices and equipment accepted by laboratory health and safety experts as effective, or that the employer can show to be effective, in minimizing the potential for employee exposure to hazardous chemicals.

Reproductive Toxin

Chemicals which affect the reproductive capabilities including chromosomal damage (mutations) and effects on fetuses (teratogenesis).

Select carcinogen

Any substance which meets one of the following criteria:

- (i) It is regulated by OSHA as a carcinogen; or
- (ii) It is listed under the category, "known to be carcinogens" in the Annual Report on Carcinogens published by the National Toxicology Program (NTP) (latest edition); or
- (iii) It is listed under Group 1 ("carcinogenic to humans") by the International Agency for Research on Cancer Monographs (IARC) (latest editions); or
- (iv) It is listed in either Group 2A or 2B by IARC or under the category "reasonably anticipated to be carcinogens" by NTP, and causes statistically significant tumor incidence in experimental animals in accordance with any of the following criteria:
 - (A) After inhalation exposure of 6-7 hours per day, 5 days per week, for a significant portion of a lifetime to dosages of less than 10 mg/m³;
 - (B) After repeated skin application of less than 300 (mg/kg of body weight) per week; or
 - (C) After oral dosages of less than 50 mg/kg of body weight per day.

Unstable (reactive)

A chemical which is the pure state, or as produced or transported, will vigorously polymerize, decompose, condense, or will become self-reactive under conditions of shocks, pressure or temperature.

Water-reactive

A chemical that reacts with water to release a gas that is either flammable or presents a health hazard.

1910.1450(c)

Permissible exposure limits

For laboratory users of OSHA regulated substances, the employer shall assure that laboratory employees' exposures to such substances do not exceed the permissible exposure limits specified in 29 CFR, part 1910, subpart Z.

1910.1450(d)

Employee exposure determination

1910.1450(d)(1)

Initial monitoring

The employer shall measure the employee's exposure to any substance regulated by a standard which requires monitoring if there is reason to believe that exposure levels for that substance routinely exceed the action level (or in the absence of an action level, the PEL).

1910.1450(d)(2)

Periodic monitoring

If the initial monitoring prescribed by paragraph (d)(1) of this section discloses employee exposure over the action level (or in the absence of an action level, the PEL), the employer shall immediately comply with the exposure monitoring provisions of the relevant standard.

1910.1450(d)(3)

Termination of monitoring

Monitoring may be terminated in accordance with the relevant standard.

1910.1450(d)(4)

Employee notification of monitoring results

The employer shall, within 15 working days after the receipt of any monitoring results, notify the employee of these results in writing either individually or by posting results in an appropriate location that is accessible to employees.

1910.1450(e)

Chemical Hygiene Plan - General

(Appendix A of this section is non-mandatory but provides guidance to assist employers in the development of the Chemical Hygiene Plan.)

1910.1450(e)(1)

Where hazardous chemicals as defined by this standard are used in the workplace, the employer shall develop and carry out the provisions of a written Chemical Hygiene Plan which is:

(i) Capable of protecting employees from health hazards associated with hazardous chemicals in that laboratory and

(ii) Capable of keeping exposures below the limits specified in paragraph (c) of this section.

1910.1450(e)(2)

The Chemical Hygiene Plan shall be readily available to employees, employee representatives and, upon request, to the Assistant Secretary.

1910.1450(e)(3)

The Chemical Hygiene Plan shall include each of the following elements and shall indicate specific measures that the employer will take to ensure laboratory employee protection:

1910.1450(e)(3)(i)

Standard operating procedures relevant to safety and health considerations to be followed when laboratory work involves the use of hazardous chemicals;

1910.1450(e)(3)(ii)

Criteria that the employer will use to determine and implement control measures to reduce employee exposure to hazardous chemicals including engineering controls, the use of personal protective equipment and hygiene practices; particular attention shall be given to the selection of control measures for chemicals that are known to be extremely hazardous;

1910.1450(e)(3)(iii)

A requirement that fume hoods and other protective equipment are functioning properly and specific measures that shall be taken to ensure proper and adequate performance of such equipment;

1910.1450(e)(3)(iv)

Provisions for employee information and training as prescribed in paragraph (f) of this section;

1910.1450(e)(3)(v)

The circumstances under which a particular laboratory operation, procedure or activity shall require prior approval from the employer or the employer's designee before implementation;

1910.1450(e)(3)(vi)

Provisions for medical consultation and medical examinations in accordance with paragraph (g) of this section:

1910.1450(e)(3)(vii)

Designation of personnel responsible for implementation of the Chemical Hygiene Plan including the assignment of a Chemical Hygiene Officer and, if appropriate, establishment of a Chemical Hygiene Committee; and

1910.1450(e)(3)(viii)

Provisions for additional employee protection for work with particularly hazardous substances. These include "select carcinogens," reproductive toxins and substances which have a high degree of acute toxicity. Specific consideration shall be given to the following provisions which shall be included where appropriate:

1910.1450(e)(3)(viii)(A)

Establishment of a designated area:

1910.1450(e)(3)(viii)(B)

Use of containment devices such as fume hoods or glove boxes;

1910.1450(e)(3)(viii)(C)

Procedures for safe removal of contaminated waste; and

1910.1450(e)(3)(viii)(D)

Decontamination procedures.

1910.1450(e)(4)

The employer shall review and evaluate the effectiveness of the Chemical Hygiene Plan at least annually and update it as necessary.

1910.1450(f)

Employee information and training.

1910.1450(f)(1)

The employer shall provide employees with information and training to ensure that they are apprised of the hazards of chemicals present in their work areas.

1910.1450(f)(2)

Such information shall be provided at the time of an employee's initial assignment to a work area where hazardous chemicals are present and prior to assignments involving new exposure situations. The frequency of refresher information and training shall be determined by the employer.

1910.1450(f)(3)

Information.

Employees shall be informed of:

1910.1450(f)(3)(i)

The contents of this standard and its appendices which shall be made available to employees;

1910.1450(f)(3)(ii)

The location and availability of the employer's Chemical Hygiene Plan;

1910.1450(f)(3)(iii)

The permissible exposure limits for OSHA regulated substances or recommended exposure limits for other hazardous chemicals where there is no applicable OSHA standard;

1910.1450(f)(3)(iv)

Signs and symptoms associated with exposures to hazardous chemicals used in the laboratory; and

1910.1450(f)(3)(v)

The location and availability of known reference material on the hazards, safe handling, storage and disposal of hazardous chemicals found in the laboratory including, but not limited to, Material Safety Data Sheets received from the chemical supplier.

1910.1450(f)(4)

Training.

1910.1450(f)(4)(i)

Employee training shall include:

1910.1450(f)(4)(i)(A)

Methods and observations that may be used to detect the presence or release of a hazardous chemical (such as monitoring conducted by the employer, continuous monitoring devices, visual appearance or odor of hazardous chemicals when being released, etc.);

1910.1450(f)(4)(i)(B)

The physical and health hazards of chemicals in the work area; and

1910.1450(f)(4)(i)(C)

The measures employees can take to protect themselves from these hazards, including specific procedures the employer has implemented to protect employees from exposure to hazardous chemicals, such as appropriate work practices, emergency procedures, and personal protective equipment to be used.

1910.1450(f)(4)(ii)

The employee shall be trained on the applicable details of the employer's written Chemical Hygiene Plan.

1910.1450(g)

Medical consultation and medical examinations.

1910.1450(g)(1)

The employer shall provide all employees who work with hazardous chemicals an opportunity to receive medical attention, including any follow-up examinations which the examining physician determines to be necessary, under the following circumstances:

1910.1450(g)(1)(i)

Whenever an employee develops signs or symptoms associated with a hazardous chemical to which the employee may have been exposed in the laboratory, the employee shall be provided an opportunity to receive an appropriate medical examination.

1910.1450(g)(1)(ii)

Where exposure monitoring reveals an exposure level routinely above the action level (or in the absence of an action level, the PEL) for an OSHA regulated substance for which there are exposure monitoring and medical surveillance requirements, medical surveillance shall be established for the affected employee as prescribed by the particular standard.

1910.1450(g)(1)(iii)

Whenever an event takes place in the work area such as a spill, leak, explosion or other occurrence resulting in the likelihood of a hazardous exposure, the affected employee shall be provided an opportunity for a medical consultation. Such consultation shall be for the purpose of determining the need for a medical examination.

1910.1450(g)(2)

All medical examinations and consultations shall be performed by or under the direct supervision of a licensed physician and shall be provided without cost to the employee, without loss of pay and at a reasonable time and place.

1910.1450(g)(3)

Information provided to the physician. The employer shall provide the following information to the physician:

1910.1450(g)(3)(i)

The identity of the hazardous chemical(s) to which the employee may have been exposed;

1910.1450(g)(3)(ii)

A description of the conditions under which the exposure occurred including quantitative exposure data, if available; and

1910.1450(g)(3)(iii)

A description of the signs and symptoms of exposure that the employee is experiencing, if any.

1910.1450(g)(4)

Physician's written opinion.

1910.1450(g)(4)(i)

For examination of consultation required under this standard, the employer shall obtain a written opinion from the examining physician which shall include the following:

1910.1450(g)(4)(i)(A)

Any recommendation for further medical follow-up;

1910.1450(g)(4)(i)(B)

The results of the medical examination and any associated tests;

1910.1450(g)(4)(i)(C)

Any medical condition which may be revealed in the course of the examination which may place the employee at increased risk as a result of exposure to a hazardous chemical found in the workplace;

1910.1450(g)(4)(i)(D)

A statement that the employee has been informed by the physician of the results of the consultation or medical examination and any medical condition that may require further examination or treatment.

1910.1450(g)(4)(ii)

The written opinion shall not reveal specific findings of diagnoses unrelated to occupational exposure.

1910.1450(h)

Hazard identification.

1910.1450(h)(1)

With respect to labels and material safety data sheets:

1910.1450(h)(1)(i)

Employers shall ensure that labels on incoming containers of hazardous chemicals are not removed or defaced.

1910.1450(h)(1)(ii)

Employers shall maintain any material safety data sheets that are received with incoming shipments of hazardous chemicals, and ensure that they are readily accessible to laboratory employees.

1910.1450(h)(2)

The following provisions shall apply to chemical substances developed in the laboratory:

1910.1450(h)(2)(i)

If the composition of the chemical substance which is produced exclusively for the laboratory's use is known, the employer shall determine if it is a hazardous chemical as defined in paragraph (b) of this section. If the chemical is determined to be hazardous, the employer shall provide appropriate training as required under paragraph (f) of this section.

1910.1450(h)(2)(ii)

If the chemical produced is a byproduct whose composition is not known, the employer shall assume that the substance is hazardous and shall implement paragraph (e) of this section.

1910.1450(h)(2)(iii)

If the chemical substance is produced for another user outside of the laboratory, the employer shall comply with the Hazard Communication Standard (29 CFR 1910.1200) including the requirements for preparation of material safety data sheets and labeling.

1910.1450(i)

Use of respirators.

Where the use of respirators is necessary to maintain exposure below permissible exposure limits, the employer shall provide, at no cost to the employee, the proper respiratory equipment. Respirators shall be selected and used in accordance with the requirements of 29 CFR 1910.134.

1910.1450(j)

Recordkeeping.

1910.1450(j)(1)

The employer shall establish and maintain for each employee an accurate record of any measurements taken to monitor employee exposures and any medical consultation and examination including tests or written opinions required by this standard.

1910.1450(j)(2)

The employer shall assure that such records are kept, transferred, and made available in accordance with 29 CFR 1910.20.

1910.1450(k)
Dates.

1910.1450(k)(1)
Effective date.

This section shall become effective May 1, 1990.

1910.1450(k)(2)
Start-up dates.

1910.1450(k)(2)(i)
Employers shall have developed and implemented a written Chemical Hygiene Plan no later than January 31, 1991.

1910.1450(k)(2)(ii)
Paragraph (a)(2) of this section shall not take effect until the employer has developed and implemented a written Chemical Hygiene Plan.

1910.1450(k)(2)(l)
Appendices.

The information contained in the appendices is not intended, by itself, to create any additional obligations not otherwise imposed or to detract from any existing obligation.