

UNIVERSITY OF MIAMI

CHEMICAL HYGIENE PLAN

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UNIVERSITY OF MIAMI CHEMICAL HYGIENE PLAN

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UNIVERSITY OF MIAMI

Chemical Hygiene Plan

The University of Miami through the Office of Environmental Health and Safety (EHS) has designed this Chemical Hygiene Plan. It is based on OSHA's Occupational Exposure to Hazardous Chemicals in Laboratories; Final Rule, commonly referred to as OSHA's Laboratory Standard (29 CFR ' 1910.1450).

The Chemical Hygiene Plan includes the following components:

1. **LABORATORY SAFETY MANUAL**

This document contains training and reference information for *all* employees who work directly or indirectly in the laboratory. Any laboratory employee who does not have access to a copy of this manual should contact EHS.

2. **RESPONSIBILITIES**

The implementation of the Chemical Hygiene Plan requires the cooperation of administrators and researchers throughout the University. Their responsibilities include the following:

2.1 Environmental Health and Safety

The primary function of the Office of Environmental Health and Safety is to support and assist departments and employees with issues concerning health and safety in the work area. The Director of EHS is Kenneth P. Capezzuto, MS, CHMM. The University's Chemical Hygiene Officers are Jairo Betancourt, Lizzeth Meza, Raul F. Garcia-Casariago, C.S.P., and Vaughan U. Munro. During regular working hours these individuals are available by telephone at 305-243-3400; at all other times, they can be reached through the Public Safety Dispatchers (Medical and South Campuses; 305-243-6000, Coral Gables Campus, 305-284-6666, RSMAS Campus; 305-361-4066).

The Chemical Hygiene Officers' duties include, but are not limited to:

- 2.1.1 Monitoring the purchase, use, and disposal of chemicals in the University's laboratory facilities.
- 2.1.2 Assuring that the appropriate audits and records of hazardous waste disposal are maintained and that laboratory safety assessments (laboratory safety inspections) are performed periodically and the appropriate records kept.
- 2.1.3 Assisting Principal Investigators in the development of particular projects, the implementation of the Standard Operating Procedures (SOP), and the design of the appropriate facilities.
- 2.1.4 Advising laboratory personnel and administration about proper handling and disposal procedures concerning regulated, hazardous or biohazardous substances or wastes.

2.2 Principal Investigator

The Principal Investigator (PI) has the ultimate responsibility for all activities conducted in the laboratory including chemical hygiene. These responsibilities include, but are not limited to:

- 2.2.1 Making sure that all Laboratory Employees are appropriately trained for the type of procedures they will be conducting.

- 2.2.2 Ensuring that all Laboratory Employees know and abide by this Chemical Hygiene Plan.
- 2.2.3 Making the Laboratory Safety Manual available to all employees so that they are familiar with its contents.
- 2.2.4 Ensuring the availability and use of the appropriate personal protective equipment at all times.
- 2.2.5 Performing routine chemical hygiene and housekeeping inspections and taking the proper corrective action as may be necessary. Contact EHS for further guidance as may be necessary.
- 2.2.6 Designating a Laboratory Supervisor to assume responsibility for chemical hygiene in the absence of the PI.

2.3 Laboratory Supervisor

The Laboratory Supervisor shall assume responsibility for chemical hygiene in the absence of the PI. These responsibilities include, but are not limited to those listed in sections 2.2.1 through 2.2.5.

2.4 Laboratory Employee

The Laboratory Employee is an individual employed in a laboratory workplace who may be exposed to hazardous chemicals in the course of his or her assignments. The responsibilities of the Laboratory Employee include, but are not limited to:

- 2.4.1 Planning and conducting each laboratory procedure or experiment in accordance with this Chemical Hygiene Plan and with all appropriate University policies and procedures.
- 2.4.2 Attending the necessary training offered by the Laboratory Supervisor and EHS pursuant to the UM Right-To-Know and Hazard Communication Policy.
- 2.4.3 Developing good personal working habits, including the use of appropriate personal protective equipment at all times.
- 2.4.4 Following the use and handling procedures listed on chemical labels and in Material Safety Data Sheets (MSDS).
- 2.4.5 Following instructions set forth by the PI, Laboratory Supervisor, and the Chemical Hygiene Officers.

3. TRAINING

Any employee working in a laboratory must have the necessary education and background to responsibly perform all routine procedures used in that particular laboratory. The PI is responsible for providing the necessary training that will allow the Laboratory Employee to carry out his/her duties in a safe manner. This training must include, but not be limited to the following:

- 3.1 Instruction on the type of research procedures performed in the laboratory.
- 3.2 Training in the use of personal protective equipment.
- 3.3 Information on the use and location of safety equipment.
- 3.4 Procedures for emergency response and spill control.
- 3.5 Review of the UM Right-To-Know and Hazard Communication Policy.

4. UM RIGHT-TO-KNOW AND HAZARD COMMUNICATION POLICY

All employees working in the laboratory must attend the training sessions pursuant to the UM Right-To-Know and Hazard Communication Policy. This Policy defines the requirements for informing and training employees on their right to know the hazards in the workplace. It consists of sections on chemical inventories, employee rights, MSDS, labeling, and training. All employees must complete the Right-To-Know and Hazard Communication Policy checklist. See Appendix A.

5. STANDARD OPERATING PROCEDURES

The Principal Investigator (PI) has the ultimate responsibility to inform laboratory personnel of the appropriate research procedures. When using chemicals or biological agents, the PI should prepare written Standard Operating Procedures (SOP) outlining the necessary precautions to safely conduct research. An SOP is a set of specific guidelines designed to address the methods that will be used, the safe handling of chemicals and biological agents, and access restrictions to the research area. The SOP should address, but not be limited to, the following practices:

- 5.1 The name of the chemical(s) and/or biological agent(s).
- 5.2 Assignment of responsibility as appropriate to individuals and departments.
- 5.3 Training of laboratory personnel.
- 5.4 Methods.
- 5.5 Minimization of contact by any route of exposure (inhalation, ingestion, skin contact, mucous membrane contact, or accidental injection).
- 5.6 Engineering controls including ventilation requirements.
- 5.7 Access restrictions.
- 5.8 Use of personal protective equipment. If respiratory protection is necessary, the Laboratory Supervisor must require the Laboratory Employee to comply with the University's Respiratory Protection Program.
- 5.9 Decontamination procedures.
- 5.10 Waste disposal procedures.
- 5.11 Medical surveillance or monitoring of personnel as required.
- 5.12 Establishment of an emergency plan.
- 5.13 Regulatory compliance as necessary.

Researchers using extremely hazardous chemicals and/or hazardous biological agents are required to submit an SOP to **EHS** for review and approval before conducting activities. Contact **EHS** for additional information.

6. EXPOSURE EVALUATION AND MEDICAL CONSULTATION

The University, through EHS, will conduct an exposure evaluation under the following circumstances:

- 6.1 As a consequence of a laboratory procedure, when there is a reasonable suspicion that an employee has sustained an overexposure to a toxic substance (based on OSHA PEL or ACGIH TLV, as applicable).

- 6.2 As a consequence of a chemical spill, if necessary.
- 6.3 As a result of the potential for continuous exposure to low levels of a particular hazardous chemical, in spite of the use of personal protective equipment. This evaluation may be performed periodically by EHS.

The University, through EHS, allows for medical consultation, including a medical surveillance program for a Laboratory Employee as required by the appointed occupational physician, whenever an exposure evaluation reasonably indicates that the employee has sustained an overexposure to a hazardous chemical. Expenses associated with the medical consultation and surveillance will be paid by the Laboratory Employee's Department.

7. RECORD KEEPING

EHS and the appropriate personnel office will keep records of all exposure evaluations, medical consultations and surveillance program visits for the duration of the employment of that particular Laboratory Employee, plus thirty (30) years.

8. OCCUPATIONAL EXPOSURE TO HAZARDOUS CHEMICALS IN LABORATORIES; FINAL RULE, 29 CFR' 1910.1450 (OSHA LABORATORY STANDARD).

This document is the actual text of OSHA's Final Rule. See Appendix B.

APPENDIX A

UM RIGHT-TO-KNOW LAW AND HAZARD COMMUNICATION POLICY

APPENDIX B

OSHA LABORATORY STANDARD

1 Purpose

To protect our workers by informing them of the presence and properties of hazardous chemicals in the workplace and to provide training in the safe use of hazardous chemicals. This Policy fulfills all requirements of, and ensures compliance with Florida's Right-to-Know Act (RTK) and the Occupational Safety and Health Administration's (OSHA's) Hazard Communication Standard (HCS) 29 CFR 1910.1200 and constitutes the University's Hazard Communication Program.

2 Policy

Employees who work with hazardous chemicals or in an environment where these are known to be present shall be provided with information regarding the hazardous properties of these chemicals.

In situations where it is not clear whether or not an employee is exposed to hazardous chemicals; the Office of Environmental Health and Safety (EHS) will conduct a hazard assessment to determine if the employee(s) is(are) covered under this Policy and the Federal and State regulations on which this Policy is based.

Employees will also be informed and trained on the measures they should take to protect themselves from hazardous chemicals present in the workplace.

In addition, employees will be appraised of their rights under the Florida RTK Law and OSHA's HCS.

The Director of the Office of Environmental Health and Safety shall be in charge for overseeing compliance with the provisions made herein and, acting on behalf of the University, shall have overall responsibility for the Hazard Communication Program.

3 Inventories

3.1 Each and every University department where hazardous chemicals are known to be present shall conduct an annual inventory of chemicals that are either toxic or contain a toxic chemical in any amount greater than one percent. The only exceptions to this requirement are:

3.1.1 Consumer or retail chemicals used in the same form, approximate amount, concentration and manner as sold to consumers.

3.1.2 Commercial chemicals which are substantially equivalent in formulation to similar consumer products used for the same general purpose. To fall under this exception; these products must be used in a manner that does not result in an exposure significantly greater than that resulting from the principal consumer use.

3.1.3 Chemicals intended for personal consumption by employees in the workplace (e.g., deodorant, hair spray, etc).

3.1.4 Chemicals subject to FDA regulation.

3.1.5 Chemicals used as pesticides registered in the State if not used as intended (e.g., kerosene).

3.2 It shall be the responsibility of each department head to ascertain that their departments comply with this Program and that the inventory is periodically updated (at least annually). A designee may be appointed in which case his/her name along with a copy of the official appointment shall be submitted to EHS.

3.3 The inventories shall include the Chemical Abstract Service (CAS) number and, where requested, quantities. One copy of the inventory shall be filed with EHS; the other copy shall be retained by the department.

3.4 EHS shall maintain a list of all hazardous chemicals reported on the inventories received for a period of 30 years or as required by law.

4 Informing Employees of Their Rights

4.1 All Personnel Offices shall post the official Florida RTK poster at the following locations: Ashe Building, Max Orovitz Building, Rosenstiel Medical Science Building, University of Miami Hospital and Clinics, the Rosenstiel School of Marine and Atmospheric Science.

4.2 The Personnel Department shall inform all new employees of their rights under both Florida's RTK Act and OSHA's HCS, within thirty days from the date of employment. The Personnel Department shall make RTK/HCS training an integral part of their new employee orientation program. The training shall include information on the following:

4.2.1 The employees' right to know of the hazardous chemicals present in the workplace as well as those with which they work.

4.2.2 The employees' right to obtain a copy of the Material Safety Data Sheet (s) (MSDS) to which they are entitled by law.

(<https://myum.miami.edu/idcheck.asp>)

4.2.3 The right to refuse to work, under specified circumstances, with a hazardous chemicals, if not provided a copy of the MSDS for that chemical within five of the requesting employee's working days after submitting a written request to their employer.

4.2.4 The right to receive instruction, at the time of initial assignment to the workplace where hazardous chemicals are found and within 30 days of employment, and at least annually thereafter, on the physical and health hazards of hazardous chemical present in the workplace, their safe use, and what to do in the event of an emergency.

4.2.5 The right to obtain further information on the

properties and hazards of hazardous chemicals from the Toxic Substances Information Center.

4.2.6 The right to protection against discharge, discipline or discrimination for having exercised any of the rights listed under this Section.

4.3 During orientation, new employees will be provided with the location and telephone number of EHS and instructed on the proper procedure for requesting an MSDS; reporting chemical spills; reviewing the Hazard Communication Program and making general inquiries.

5 Material Safety Data Sheets (MSDS)

5.1 EHS shall maintain an MSDS (OSHA Form 174) library for all chemicals shown on chemical inventories submitted to EHS in compliance with Section 3 of this Policy.

5.1.1 MSDS shall be kept on file for a period of thirty years or as required by law.

5.1.2 Inventory and MSDS information will be provided to those agencies and individuals having statutory need

to know and will be made readily available to all employees.

5.1.3 Upon receipt from suppliers, EHS will verify that the MSDS (OSHA Form 174) has been fully completed.

5.2 The Purchasing Department will require that all vendors and suppliers of any hazardous chemical covered under the RTK or OSHA's HCS send to Purchasing a fully completed copy of the MSDS (OSHA Form 174) for the chemical(s) ordered. Purchasing will make this requirement a part of the terms and conditions listed on the purchase order or document.

5.2.1 MSDS that meet the requirements of the HCS and Section 5.2 of this Policy must be received at the facility either prior to, or at the time of receipt of, the first shipment of any potentially hazardous chemical purchased.

5.2.2 Procurement from vendors, suppliers or manufacturers who fail to provide MSDS as required by this Policy in a timely manner may be discontinued by the Director of Purchasing upon the recommendation of the Director of EHS.

- 5.3 The Purchasing Department will forward all MSDS received to EHS. It will be the responsibility of EHS to maintain the original MSDS on file for the term specified by law.
- 5.4 When an MSDS (OSHA Form 174) is not readily available; EHS will request one from the manufacturer, supplier or from the Toxic Substance Information Center and will provide the requesting department or employee with interim safety information from other sources.
- 5.5 Departments manufacturing any hazardous chemicals for which an MSDS is required by law but not available, shall produce one and submit a fully completed copy of OSHA Form 174 to EHS.
- 5.6 When ordering chemicals, departments shall select the least hazardous chemical consistent with the chemical's intended use and function.
- 5.7 The Director of EHS may either ban, or order that a chemical be substituted with a less hazardous one, when the former poses an undue risk to employees in the workplace.
- 5.8 Departments choosing not to purchase or obtain hazardous

chemicals through the University's Purchasing Department must obtain an MSDS from the supplier and provide the original to EHS and retain a copy for their records.

6 Labeling

6.1 The Purchasing Department will require that all vendors or suppliers of hazardous chemicals covered under OSHA's HCS meet the provisions and specific requirements contained under this Section in regards to labeling.

6.2 No department or employee shall use, store, or allow any other person to use or store, any hazardous chemical in a University building or facility if the container does not meet the labeling requirements outlined in OSHA Regulation (29 CFR 1910.1200 (f) (4)).

6.2.1 Identity of the chemical and appropriate hazard warnings are shown. The hazard warning may be words, pictures, or symbols which provide an immediate understanding of the primary health and/or physical hazard(s) of the chemical.

6.2.2 The name and address of the manufacturer, importer or

other responsible party.

6.2.3 Label message must be legible, permanently displayed and written in English.

6.2.4 For purposes of this Section a container shall include bags, barrels, bottles, boxes, cans, cylinders, drums and reaction vessels. Pipes and piping systems do not have to be labeled.

6.3 Supervisors shall be responsible for providing information on the contents of any pipes used for transferring hazardous chemicals.

6.4 The existing label on a container received into the workplace from a supplier shall not be removed, altered or defaced.

6.5 In the event that a chemical container's original label must be replaced; the new label shall contain the same information as the original. Only labels, inks and markings that are not soluble in the liquid content of the container shall be used.

6.6 The following containers used in laboratories will be exempt from the requirements of this Section: portable containers

(Section 6.5),

test tubes, flasks and beakers.

- 6.7 The recipient of a hazardous chemical whose name appears on the purchase order or document shall verify that label information matches that shown on the MSDS. Any discrepancy shall be immediately reported to EHS.
- 6.8 The EHS representative conducting a lab or safety inspection shall check containers to ascertain that hazardous chemicals containers are labeled in accordance with Section 6.2.
- 6.9 All labels for in-house chemical storage containers shall meet the requirements outlined under Section 6.2 of this document. Portable containers where hazardous chemicals are stored beyond an employee's work shift are also subject to the labeling requirements under this Section.
- 6.10 The Receiving Department Managers will ensure that all hazardous chemicals entering the University through their Departments are properly labeled.

7 Training

In addition to informing employees of their rights (Section 4), all employees who will be working with, or are potentially exposed to, hazardous chemicals shall:

7.1 Attend a Chemical Safety training session offered by EHS prior to using any hazardous chemical in the workplace. This training session may take place at the time of new employee orientation and will include generic treatment of the following subjects:

7.1.1 General chemical safety.

7.1.2 Interpreting and using MSDS.

7.1.3 Flammable.

7.1.4 Carcinogens.

7.1.5 Corrosives.

7.1.6 Explosives.

7.1.7 Poisons.

7.1.8 Oxidizers.

7.1.9 Accident prevention and reporting.

7.1.10 Emergency response (fire, spills, etc.).

7.1.11 General provisions under the Florida RTK Act and OSHA's HCS.

7.1.12 Location and availability of the University's Hazard Communication Program.

7.1.13 The contents of this Policy.

7.2 Attend a Chemical Safety refresher course at least annually thereafter. Refresher courses will be offered by EHS on a departmental basis upon request. When a department has less than five employees needing to attend, a list with the employees' names shall be submitted to EHS. The requesting department will be notified as soon as there are enough participants from other departments to hold a class.

7.3 Be required to complete and sign an acknowledgment form after each segment of training. This form shall be retained by the Personnel Department and made a permanent part of the employee's

personnel file.

- 7.4 Receive instruction from their supervisor on the proper procedures and safeguards to be used when working with specific hazardous chemicals present in the workplace.

Supervisors shall complete the HAZARD COMMUNICATION TRAINING CHECKLIST and submit it to the Department Head or Chair who, after signing it, shall send it to the Personnel Department. This segment of instruction shall be updated and reviewed with the employee every time a new hazard is introduced in the workplace and shall contain but not be limited to the following:

- 7.4.1 The chemical, common names, physical characteristics and release detection methods of the chemicals present in the workplace.
- 7.4.2 The location of hazardous chemicals in the workplace.
- 7.4.3 The proper and safe handling practices and precautions in working with hazardous chemicals present in the workplace.
- 7.4.4 Appropriate emergency procedures including first aid

treatment.

- 7.4.5 The possible adverse health effects of the chemicals present in the workplace.
- 7.4.6 Proper procedures for handling chemical spills including the location and use of chemical spill kits.
- 7.4.7 Potential for flammability, explosion and reactivity of the chemicals present in the workplace.
- 7.4.8 Proper methods and procedures for summoning help in the event of an emergency.
- 7.4.9 Location, use and maintenance of personal safety equipment to be used while working with hazardous chemicals including but not limited to: lab coats, aprons, eye protection, respirators, and gloves.
- 7.4.10 Location and use of emergency and safety equipment including but not limited to: hoods, fire extinguisher, fire pull stations, eye wash fountains and safety showers.

7.4.11 Location of the nearest evacuation plan, emergency exits and procedures to be followed when there is a need to evacuate the workplace.

7.4.12 Location of MSDS, manuals, policies and procedures, telephone numbers, contacts and resources on other related and pertinent safety topics such as biohazard and radiation control.

7.5 Each department shall require that employees who are covered under this Policy receive the training prescribed under this Section before being allowed to work with any hazardous chemical and within 30 days of employment, as mandated by law.

7.6 The Personnel Department shall ascertain that no one is employed in a capacity which requires working with any hazardous chemical prior to completing all levels of training outlined under this Section.

Receipt by the Personnel Department of a properly executed HAZARD COMMUNICATION CHECKLIST and other appropriate acknowledgement forms shall constitute prima facie evidence of training under which the Personnel Department may grant a clearance for the employee to work with hazardous chemicals.

7.7 The EHS Director shall be empowered to monitor employee training and make changes as appropriate to ascertain regulatory compliance and establish that an acceptable level of training is being offered to employees.

CHECKLIST FOR UM RIGHT-TO-KNOW AND HAZARD COMMUNICATION POLICY

TO BE COMPLETED BY ALL NEW/TRANSFER EMPLOYEES AND THEIR SUPERVISORS ON OR BEFORE THE FIRST DAY OF EMPLOYMENT OR UPON THE INTRODUCTION OF A NEW HAZARD INTO THE WORKPLACE. THIS COMPLETED FORM IS REQUIRED AND MUST BE SUBMITTED TO THE APPROPRIATE PERSONNEL OFFICE AS SHOWN BELOW AND A COPY TO ENVIRONMENTAL HEALTH AND SAFETY.

EMPLOYEE'S

NAME _____

SOCIAL

SECURITY _____ DEPARTMENT _____

EMPLOYEE'S TITLE _____ PAYROLL CLASS (circle): FACULTY,

STUDENT, STAFF, ADMINISTRATION,

This checklist certifies that instruction and training on proper procedures (as applicable) has been given to the employee by the supervisor in accordance with the following (check as appropriate):

____ Employee will not be exposed to hazardous substances, bloodborne pathogens or infectious agents. Complete Section 1 only.

____ Employee will be potentially exposed to hazardous chemicals. Complete Sections 1 and 2.

____ Employee will be potentially exposed to bloodborne pathogens and infectious agents. Complete Sections 1 and 3.

Supervisor
Employee
(initials)

SECTION 1 (General Safety)

Emergency procedures and exits, evacuation plan, fire pull stations,
fire
extinguishers.....
.....

Engineering controls, guards, personal protective

equipment.....

Respiratory protection, UM Respiratory Protection
Policy.....

MSDS* availability, UM Right-to-Know and Hazard Communication
Policy.....

Warning labels and hazard information
symbols.....

SECTION 2 (Chemical Safety)

Chemical storage procedures (segregation and incompatibility),
location and use of spill
kits.....

Properties of hazardous chemicals, detection
methods.....

Nearest safety shower, eyewash fountain, first aid
kit.....

Chemical waste reduction and disposal, UM Policy and Procedure for
Hazardous Waste
Disposal.....

UM Laboratory Safety Manual, UM Chemical Hygiene
Plan.....

SECTION 3 (Biological Safety)

UM Policy and Procedure for Handling of Biohazardous
Waste.....

UM Bloodborne Pathogens Policy and Procedures (Exposure Control

Plan)

UM Tuberculosis Policy and
Procedures.....

*MSDS (Material Safety Data
Sheet)

_____/_____/_____
 _____ Employee's Name (Print) Signature
 Date

_____/_____/_____

 Supervisor's Name Signature
 Date

Comments:

Original to appropriate personnel office with Personnel Event Form upon

employment.

Copy to Office of Environmental Health and Safety.

Copy of the Policy, forms, questions: Office of Environmental Health and Safety (R-23), P.O. Box 016960, Miami, FL 33101, Medical Campus, Telephone: 243-3400, FAX: 243-3272

CHECKLIST INSTRUCTIONS

UM RIGHT-TO-KNOW AND HAZARD COMMUNICATION POLICY

General safety information is provided by Environmental Health and Safety to all employees during new employee orientation. It is the supervisor's responsibility to train the new employee in the recognition of those hazards which may be present in the employee's workplace. There is no substitute for the supervisor's role in training the new employee on hazard recognition and safe work practices. Only the employee's supervisor is in a position to determine those hazards present in the workplace, and the accepted methods and techniques the employee should follow to prevent exposure or injury.

The following guidelines should be followed as part of the training. Not all sections may apply.

SECTION 1 (General Safety)

- o Emergency procedures and exits, evacuation plan, fire pull stations, fire extinguishers.
 - * Review with the employee the building's fire plan.
 - * Show the employee:
 - o at least two ways to exit the work area.
 - o the location of the nearest fire extinguisher, its type, and how it should be used.
 - o the location of the nearest fire pull station.
 - o where emergency telephone numbers may be found and how to summon help.

- o Engineering controls, guards, personal protective equipment.
 - * Go over the various engineering controls and personal protective equipment available. These may include sharps containers, gloves, protective eye/foot wear, machine guards, respirators, fall protection, etc.

- o Respiratory protection, UM Respiratory Protection Policy.
 - * If a respirator is to be used by the employee, review the UM Respiratory Protection Policy. Contact EHS, who will provide training, fit testing, and compliance assistance.

- o MSDS availability, UM Right-to-Know and Hazard Communication Policy.

- * Instruct the employee on how to obtain information about hazardous substances.
- * MSDS information may be obtained from EHS (243-3400). If maintained by the department, the employee should be shown how to access MSDS.

- o Warning labels and hazard information symbols.

- * Explain to the employee how to read hazard labels, signs, and symbols, as well as the various procedures and equipment that should be used.

SECTION 2 (Chemical Safety)

- o Chemical storage procedures (segregation and incompatibility), location and use of spill kits.

- * Identify chemical storage areas for use by the employee.
- * Show employee how to segregate incompatible chemicals.
- * Train the employee on how to use spill kit(s), also its(their) location.
- * Train the employee on the use and availability of personal protective equipment.
- * Review the chemical disposal procedures.

- o Properties of hazardous chemicals, detection methods.

- * Explain what are the symptoms of exposure from chemicals used by the employee.
- * Show how to recognize those chemicals present in the workplace.
- * Test the employee's ability to identify the various chemicals stored or used, and the properties (flammable, corrosive, toxic, carcinogen, etc.) of those hazardous substances stored or used.
- o Nearest safety shower, eyewash fountain, first aid kit.
 - * Show the employee where these items are located and how to use them in an emergency.
- o Chemical waste reduction and disposal, UM Policy and Procedure for Hazardous Waste Disposal.
 - * Review minimization techniques used in the workplace.
 - * Go over the UM Policy and Procedure for Hazardous Waste Disposal.
- o UM Laboratory Safety Manual, UM Chemical Hygiene Plan.
 - * Show where these documents are kept and review them with the employee.
 - * Conduct a mock safety inspection using the checklist contained in the UM Laboratory Safety Manual.

SECTION 3 (Biological Safety)

- UM Policy and Procedure for Handling of Biohazardous Waste.
 - * Show the employee how to handle and dispose of infectious waste.
 - * If waste must be inactivated before disposal, show how.
 - * Instruct employee on what containers should be used (i.e., red bags, sharps containers), and where these are located.
 - * Explain what precautions must be taken to avoid contamination.

- UM Bloodborne Pathogens Policy and Procedures (Exposure Control Plan).
 - * Review the UM Bloodborne Pathogens Policy and Procedure with employee and show where it is kept.
 - * Ascertain that the employee has undergone training required by law.
 - * Have employee sign a vaccination (consent/declination) form.
 - * Issue personal protective equipment to employee and provide instruction on its use.
 - * Train employee on safe work practices and the use of Universal Precautions.

- UM Tuberculosis Policy and Procedures.
 - * Review the UM Tuberculosis Policy and Procedures with employee
 - * Ascertain if the employee will have routine patient contact, work in areas where the ventilation is shared with patients, or

work with human subjects from groups with high incidence of tuberculosis.

FOR ADDITIONAL ASSISTANCE IN COMPLETING THIS CHECKLIST, PLEASE CALL ENVIRONMENTAL HEALTH AND SAFETY AT 243-3400.



OSHA Regulations (Standards - 29 CFR)

Occupational exposure to hazardous chemicals in laboratories. - 1910.1450

[OSHA Regulations \(Standards - 29 CFR\) - Table of Contents](#)

- **Standard Number:** 1910.1450
 - **Standard Title:** Occupational exposure to hazardous chemicals in laboratories.
 - **SubPart Number:** Z
 - **SubPart Title:** Toxic and Hazardous Substances
-

(a)

Scope and application.

(a)(1)

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

(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:

(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.

(a)(2)(ii)

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

(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.

(a)(3)

This section shall not apply to:

..1910.1450(a)(3)(i)

(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.

(a)(3)(ii)

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

(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

(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.

(b)

Definitions -

"Action level" means 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" means the Assistant Secretary of Labor for Occupational Safety and Health, U.S. Department of Labor, or designee.

"Carcinogen" (see "select carcinogen").

"Chemical Hygiene Officer" means an employee who is designated by the employer, and who is 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" means 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" means any liquid having a flashpoint at or above 100 deg. F (37.8 deg. C), but below 200 deg. F (93.3 deg. C), except any mixture having components with flashpoints of 200 deg. F (93.3 deg. C), or higher, the total volume of which make up 99 percent or more of the total volume of the mixture.

"Compressed gas" means:

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

"Designated area" means 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" means 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" means an individual employed in a laboratory workplace who may be exposed to hazardous chemicals in the course of his or her assignments.

"Explosive" means a chemical that causes a sudden, almost instantaneous release of pressure, gas, and heat when subjected to sudden shock, pressure, or high temperature.

"Flammable" means a chemical that falls into one of the following categories:

(i) "Aerosol, flammable" means 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;

(ii) "Gas, flammable" means:

(A) 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

(B) 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.

(iii) "Liquid, flammable" means any liquid having a flashpoint below 100 deg F (37.8 deg. C), except any mixture having components with flashpoints of 100 deg. C) or higher, the total of which make up 99 percent or more of the total volume of the mixture.

(iv) "Solid, flammable" means 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 a 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" means the minimum temperature at which a liquid gives off a vapor in sufficient concentration to ignite when tested as follows:

(i) Tagliabue Closed Tester (See American National Standard Method of Test for Flash Point by Tagliabue Closed Tester, Z11.24 - 1979 (ASTM D 56-79)) - for liquids with a viscosity of less than 45 Saybolt Universal Seconds (SUS) at 100 deg. F (37.8 deg. C), that do not contain suspended solids and do not have a tendency to form a surface film under test; or

(ii) Pensky-Martens Closed Tester (See American National Standard Method of Test for Flashpoint 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 deg. F (37.8 deg. C), or that contain suspended solids, or that have a tendency to form a surface film under test; or

(iii) 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 autoaccelerating thermal decomposition, are excluded from any of the flashpoint determination methods specified above.

"Hazardous chemical" means a chemical for which there is statistically 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, 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" means 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" means 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" means a device located in a laboratory, enclosure on five sides with a movable 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" means 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" means 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" means 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" means 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" means a chemical for which there is scientifically valid evidence that it is a combustible liquid, a compressed gas, explosive, flammable, an organic peroxide, an oxidizer pyrophoric, unstable (reactive) or water-reactive.

"Protective laboratory practices and equipment" means 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 toxins" means chemicals which affect the reproductive capabilities including chromosomal damage (mutations) and effects on fetuses (teratogenesis).

"Select carcinogen" means 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)" means 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" means a chemical that reacts with water to release a gas that is either flammable or presents a health hazard.

(c)

Permissible exposure limits. For laboratory uses 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)

(d)

Employee exposure determination -

(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).

(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.

(d)(3)

Termination of monitoring. Monitoring may be terminated in accordance with the relevant standard.

(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.

(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).

(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:

(e)(1)(i)

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

..1910.1450(e)(1)(ii)

(e)(1)(ii)

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

(e)(2)

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

(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;

(e)(3)(i)

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

(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;

(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)

(e)(3)(iv)

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

(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;

(e)(3)(vi)

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

(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

(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:

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

Establishment of a designated area;

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

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

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

Procedures for safe removal of contaminated waste; and

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

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

Decontamination procedures.

(e)(4)

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

(f)

Employee information and training.

(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 area.

(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.

(f)(3)

Information. Employees shall be informed of:

(f)(3)(i)

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

(f)(3)(ii)

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

..1910.1450(f)(3)(iii)

(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;

(f)(3)(iv)

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

(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.

(f)(4)

Training.

(f)(4)(i)

Employee training shall include:

(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.);

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

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

(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)

(f)(4)(ii)

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

(g)

Medical consultation and medical examinations.

(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:

(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.

(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.

(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)

(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.

(g)(3)

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

(g)(3)(i)

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

(g)(3)(ii)

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

(g)(3)(iii)

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

(g)(4)

Physician's written opinion.

(g)(4)(i)

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

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

Any recommendation for further medical follow-up;

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

The results of the medical examination and any associated tests;

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

(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 workplace; and

(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.

(g)(4)(ii)

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

(h)

Hazard identification.

(h)(1)

With respect to labels and material safety data sheets:

(h)(1)(i)

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

(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.

(h)(2)

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

..1910.1450(h)(2)(i)

(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.

(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.

(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.

(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.

(j)

Recordkeeping.

(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 examinations including tests or written opinions required by this standard.

..1910.1450(j)(2)

(j)(2)

The employer shall assure that such records are kept, transferred, and made available in accordance with 29 CFR 1910.1020.

(k)

Dates -

(k)(1)

Effective date. This section shall become effective May 1, 1990.

(k)(2)

Start-up dates.

(k)(2)(i)

Employers shall have developed and implemented a written Chemical Hygiene Plan no later than January 31, 1991.

(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.

(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.

[61 FR 5507, Feb. 13, 1996]

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