

# Hazard Communication Program

## **Introduction**

The College of Science and Engineering (COSE) has developed a Hazard Communication Program (HAZCOM) that complies with the Cal-OSHA Hazard Communication Standard (HAZCOM), found in California Code of Regulations, Title 8, §5194.

### **Objective**

The objectives of this HAZCOM program are two-fold:

- To provide employees with enough information to safely work with hazardous materials in their workplace.
- To put in writing policies and procedures that meet or exceed SFSU HAZCOM requirements.

### **Scope**

This program applies to all work and research operations in the COSE where an employee may encounter hazardous materials, not only under normal conditions, but also during non-routine tasks.

Each Department is responsible for complying with the first six (6) sections in this program.

- 1) Chemical inventory;
- 2) Access to material safety data sheets;
- 3) Labeling & warnings;
- 4) Employee training;
- 5) Procedures for non-routine tasks;
- 6) Contractor requirements;
- 7) Program review.

The Department Chair is responsible for ensuring that all program requirements are met.

Department:           <insert department name>          

Dept. Office:           <office location>           Phone:           <office phone>          

Chair/Director:           <insert name>          

Safety Coordinator:           <insert name>

## I. Inventory of Hazardous Materials

Departments are required to maintain an inventory of the hazardous materials they use or store in areas under their jurisdiction. The person in charge of each area is responsible for providing a hazardous chemical inventory to the Department Safety Coordinator at least annually or when new hazardous materials are introduced.

- Each hazardous material must be listed by the name on the original manufacturer's label.
  1. The names on the manufacturer's label, its Material Safety Data Sheet, and inventory listing should match.
  2. Other names may be cross-referenced on an index as long as the name on the inventory entry matches the label name.
- Materials no longer present must be deleted from the inventory and their associated Material Safety Data Sheets forwarded to EHOS archives
- The Department Safety Coordinator submits an updated chemical inventory each spring to EHOS.

### Availability

This inventory is available to all employees during regular working hours in the Department Office and/or Stockroom.

- The COSE recommends that Principal Investigators (PIs) and supervisors keep a current inventory of their own areas available for their staff and students.
- Inventories must be updated whenever new materials are ordered
- EHOS submits an annual hazardous materials inventory to the City as part of the SFSU Business Plan
- The department inventory is maintained by the Department Safety Coordinator

## II. Material Safety Data Sheets

Material Safety Data Sheets (MSDS), the cornerstone of a HAZCOM Program, provide specific and detailed information for hazardous chemicals.

- San Francisco State University relies on the initial hazard evaluation performed by the manufacturer, importer or distributor of the product.

- An MSDS for a hazardous material includes the following information:
  1. Identification, other designations and warnings
  2. Hazardous ingredients & occupational exposure limits
  3. Physical data-*molecular weight, specific gravity*
  4. Fire and explosion details – *flash point*
  5. Reactivity and incompatibility information
  6. Health hazard, routes of entry, first aid
  7. Spill, leak and disposal procedures and labeling
  8. Protective equipment
  9. Storage and shipping information

### Obtaining MSDSs

- Request a hard copy of an MSDS from the manufacturer by phone or by fax.
- Ask the Department Safety Coordinator or EHOS for a hard copy of an MSDS.
- If an MSDS was not supplied with the shipment, the Department Safety Coordinator or EHOS must request one from the vendor or manufacturer within two weeks.
- View MSDSs on-line. Web-based MSDSs are freely available from any computer with internet access.

Access the SFSU homepage at [www.sfsu.edu](http://www.sfsu.edu) and type "MSDS" in the search box. This loads the Biology Dept homepage, [www.sfsu.edu ~ biology](http://www.sfsu.edu/~biology), with links to several MSDS sites. Bookmark these sites:

<http://www.vetmed.ucdavis.edu/msds/>

<http://www.ilpi.com/msds/index.html#Manufacturers>

- Employees are not required to work with a hazardous material for which no MSDS is available.

## III. Product Labels and Other Warnings

The purpose of labeling hazardous material containers is to provide users with information concerning potential hazards and the product or chemical name for cross-referencing with the MSDS. All containers must be labeled, tagged, or otherwise marked with the **product name, identity, and appropriate hazard warnings** – adding the owner's name and date received is highly recommended.

An effective label is one where any handler can identify the chemical and its specific hazards.

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Container labels and hazard warnings must be legible and never intentionally defaced. The PI or area supervisor is responsible for making sure chemical labels are affixed and legible on all containers.

### **Synthesized Chemicals**

Hazardous chemicals generated in a laboratory, such as those synthesized for research and organic solutions, must be labeled with the material identifier and appropriate hazard warnings. When it is impossible or impractical to place a label directly on a container, use alternatives such as affixing a tag onto a rack holding microvials or placing a label onto the outside of a beaker with microtubes, as long as all the tubes/vials inside contain the same chemical.

### **Labeling Exception**

There is a specific exception to labeling process containers if, and only if, all the following criteria are met:

1. It is intended for **immediate use** (within sight and during work shift) by the employee performing the transfer;.
2. The container is always within sight and completely used up before the employee leaves the area (*includes bathroom/lunch breaks*)

As this exception rarely applies in the workplace, make it standard practice to **PUT A LABEL ON ALL CONTAINERS**.

Even bottles containing deionized or distilled water, a harmless and colorless liquid, must have an identifying label. Many chemicals like acetone, methanol, and hydrochloric acid can't be visually distinguished from water.

### **Additional Information**

Additional labeling systems such as the HMIS (*Hazardous Materials Identification System*) and NFPA (*National Fire Protection Agency*) may be used to complement, but not replace, the information required on labels.

Forward questions about proper interpretation of warnings and labeling requirements to the COSE Health & Safety Specialist at x8-6892; lvadura@sfsu.edu or to EHOS (x8-1449).

## **IV. Employee Training**

Training in the provisions of the HAZCOM program is required for all employees who work with or around hazardous materials.

### **New Employees**

New employees must attend an orientation within 30 days of initial employment in the Department. The orientation is divided into two parts: 1) job-specific information and 2) review of general program.

The Principal Investigator/supervisor is responsible for providing instruction on the job specific physical and health hazards of the materials to which the employee may potentially be exposed.

This training must include the following information:

1. A list of hazardous materials used or stored in the employee's work place
2. The physical and health hazards of the materials (*may be grouped by hazard type for more efficient instruction*)
3. Specific measures to prevent injury or illness, which may include gloves, eye protection, clothing, special handling procedures and things to avoid
4. MSDS availability and demonstration of how an MSDS can be obtained for a particular material

Employees should have this training prior to any job assignment involving work with hazardous materials. Documentation of such training must be forwarded to the Department Safety Coordinator. Additionally, the PI may arrange for Hazard Communication and Hazardous Waste training conducted by EHOS or COSE Health & Safety Specialist.

The general HAZCOM standard orientation should include the following information:

1. Review of the Cal-OSHA HAZCOM Standard and this program
2. Obtaining MSDSs and other information
3. Reading and understanding Material Safety Data Sheets
4. Explanation of physical properties and hazards
5. Explanation of signs and symptoms of exposure types of health hazards
6. Methods used to detect the presence or release of chemicals
7. Work practices to minimize risk of exposure
8. Using personal protective equipment.  
Note: Use of respirators is subject to prior review and

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approval of EHOS. EHOS provides separate training annually to all individuals assigned a respirator.

### **Existing Employees**

The PI is responsible to provide additional training in the safe use of hazardous materials when 1) **new** hazards are introduced into the work area; 2) **changes** are made to the operation that could affect or increase the existing hazards.

Refresher training in HAZCOM and other hazardous materials and waste disposal practices are required at least every three (3) years. Training provided must be documented and a copy provided to the Department Safety Coordinator.

### **Recordkeeping**

These records are used to maintain a database of safety training for the COSE and the originals are submitted to EHOS for the master file. PIs should keep copies of records or summary logs. The COSE Health & Safety Specialist maintains a training log for departments within the COSE.

## ***V. Non-Routine Tasks***

Employees may encounter special hazards when performing non-routine tasks, such as cleaning, moving, and maintaining or adjusting materials or equipment.

The employee's PI or supervisor is responsible for evaluating the hazards of the task and providing the necessary training to do it safely. This training should include instruction in the use of special protective equipment or techniques, emergency and hazard information, and other exposure or injury control measures.

Assistance in evaluating the hazards of non-routine tasks and determining the appropriate precautions, approvals, and protective measures is available from EHOS.

## ***VI. Contractor Requirements***

Outside contractors are also covered under the HAZCOM Standard and must be informed of any potential chemical hazards their workers could come across during their work. **The SFSU Project Manager is responsible for providing this information to contractors working in areas where hazardous materials could pose a health or safety risk to contractor employees.**

Contractors who bring hazardous materials into a Department work area are expected to inform and provide the SFSU Project Manager with a chemical inventory and associated MSDSs. **The**

**SFSU Project Manager is responsible for ensuring that EHOS has this information before the work starts.**

The contractor is responsible for removing all unused portions of products/chemicals and any waste products from the University.

For information and follow up concerning contractor chemicals or materials, contact EHOS at x8-1449 or COSE Health & Safety Specialist at x8-6892. Staff in the COSE or EHOS can obtain the required information from the SFSU Project Manager and forward it on to the department upon request.

## ***VII. Written Program Review***

At least annually, the COSE Health & Safety Specialist will review this written HAZCOM program and update it as necessary.

**Latest Revision: January 9, 2007**

**Last Review: January 9, 2007**

Minor edit of Section III Product Labels & Other Warnings

Deletion of old Appendix A

By *Linda Vadura*, COSE Health & Safety Specialist

**APPENDIX A - Definition of Common Terms**

**APPENDIX B - General Training Outline**

## APPENDIX A

### Reading and Understanding Material Safety Data Sheet Information

Per the California Occupational Safety and Health Administration (OSHA) Hazard Communication Standard, employers are required to obtain Material Safety Data Sheets (MSDSs) from the manufacturer and maintain them in such a way that they are accessible to personnel. A system should be in place to catalogue MSDSs when received. If an MSDS is not received with a shipment, it may easily be obtained by requesting one from the manufacturer. In many cases, the MSDS may have been sent to the "Safety Officer", and may have been received by the Department Safety coordinator or EHOS. Several chemical distributors, such as Sigma-Adrich and Fisher, have MSDSs available on the Web at <http://www.ilpi.com/msds/index.html#Manufacturers>

Following is an explanation of terms commonly used in manufacturers' MSDSs to help interpret the information found there. While the format of these data sheets varies from manufacturer to manufacturer, certain components appear on each sheet.

#### Product Identification

This section gives the name and address of the manufacturer and an emergency phone number where questions about toxicity and chemical hazards can be directed.

<i>Product Name:</i>	Commercial or marketing name.
<i>Synonym:</i>	Approved chemical name and/or synonyms.
<i>Chemical Family:</i>	Group of chemicals with related physical and chemical properties.
<i>Formula:</i>	Chemical formula, if applicable; i.e., the conventional scientific definition for a material.
<i>CAS Number:</i>	Number assigned to chemicals or materials by the Chemical Abstracts Service, where applicable.

#### Hazardous Ingredients of Mixtures

This section describes the percent composition of the substance, listing chemicals present in the mixture. If it was tested as a mixture, lists chemicals that contribute to its hazardous nature. Otherwise, lists ingredients making up more than 1% and all carcinogens.

The OSHA **permissible exposure limit (PEL)**, National Institute for Occupational Safety and Health (NIOSH) **recommended exposure limit (REL)**, and/or the American Conference of Governmental Industrial Hygienists (ACGIH) **threshold limit value (TLV)** will also be listed, if appropriate. The **OSHA PEL is the regulated standard**, while the others are recommended limits.

The PEL is usually a **time-weighted average (TWA)**, which is a concentration averaged over an eight hour day. The PEL is usually expressed as follows:

**ppm:** parts per million parts of air

**mg/m<sup>3</sup>:** milligrams of dust or vapor per cubic meter of air

Sometimes, a **STEL** or **short term exposure limit** may be listed. The STEL is a 15-minute TWA that should not be exceeded. A **ceiling limit** is a concentration that may not be exceeded at any time. A **skin** notation means absorption through the skin significantly contributes to the overall exposure.

#### Physical Data

This section outlines the physical properties of the material. The information may be used to determine conditions for exposure. The following information is usually included:

**Boiling Point:** temperature at which liquid changes to vapor state

**Melting Point:** temperature at which a solid begins to change to liquid

**Vapor Pressure:** a measure of how volatile a substance is and how quickly it evaporates. For comparison, the VP of water (at 20° C) is 17.5 mm Hg, Vaseline (non-volatile) is close to 0 mm Hg, and diethyl ether (very volatile) is 440 mm Hg.

**Vapor Density** (air = 1): weight of a gas or vapor compared to weight of an equal volume of air. Density greater than 1 indicates it is heavier than air; less than 1 indicates it is lighter than air. Vapors heavier than air can flow along just above ground, where they may pose a fire or explosion hazard.

**Specific Gravity** (water = 1): ratio of volume weight of material to equal volume weight of water.

**Solubility in Water:** percentage of material that will dissolve in water, usually at ambient temperature. Since the much of the human body is made of water, water-soluble substances more readily absorb and distribute.

**Appearance/Odor:** color, physical state at room temperature, size of particles, consistency, odor, as compared to common substances. Odor threshold refers to the concentration required in the air before vapors are detected or recognized.

**% Volatile by Volume:** Percentage of a liquid or solid, by volume, that evaporates at a temperature of 70°F.

**Evaporation Rate:** usually expressed as a time ratio with ethyl ether = 1, unless otherwise specified.

**Viscosity:** internal resistance to flow exhibited by a fluid, normally measured in centiStoke time or Saybolt Universal Secs.

## Appendix A, (continued)

**Other Pertinent Physical Data:** information such as freezing point is given, as appropriate.

### Fire and Explosion Hazard Data

This section includes information regarding the flammability of the material and information for fighting fires involving the material.

**Flashpoint:** the lowest temperature at which a liquid gives off enough vapors to ignite when a source of ignition is present.

**Auto-ignition Temperature:** the approximate temperature at which a flammable gas-air mixture will ignite without spark or flame. Vapors and gases will spontaneously ignite at lower temperatures in oxygen than in air.

**Flammable Limits:** the lower explosive limit (LEL) and upper explosive limit (UEL) define the range of concentration of a gas or vapor in air at which combustion can occur. For instance, an automobile carburetor controls this mixture - too lean (not enough chemical) or too rich (not enough air, as when you flood your engine), will not ignite.

**Extinguishing Media:** appropriate extinguishing agent(s) for the material.

**Fire-fighting Procedures:** Appropriate equipment and methods are indicated for limiting hazards encountered in fire situations.

**Fire or Explosion Hazards:** Hazards and/or conditions that may cause fire or explosions are defined.

### Health Hazard Data

This section defines the medical signs and symptoms that may be encountered with normal exposure or overexposure to this material or its components. Information on the toxicity of the substance may also be presented. Results of animal studies are most often given. i.e.  $LD_{50} \text{ (mouse)} = 250 \text{ mg/kg}$ . Usually expressed in weight of chemical per kg of body weight.  $LD_{50}$  or *lethal dose 50* is the dose of a substance that will cause the death of half the experimental animals.  $LC_{50}$  is the concentration of the substance in air that will cause the death of half the experimental animals.

Health hazard information may also distinguish the effects of acute (short term) and chronic (long-term) exposure.

### Emergency And First Aid Procedures

Based on the toxicity of the product, degree of exposure and route of contact (eye, skin, inhalation, ingestion, or injection), emergency and first aid procedures are recommended in this section.

Additional cautionary statements, i.e., *Note to Physician*, for first aid procedures, when necessary, will also appear here.

### Reactivity Data

This section includes information regarding the stability of the material and any special storage or use considerations.

**Stability:** "unstable" indicates that a chemical may decompose spontaneously under normal temperatures, pressures, and mechanical shocks. Rapid decomposition produces heat and may cause fire or explosion. Conditions to avoid are listed in this section.

**Incompatibility:** certain chemicals, when mixed may create hazardous conditions. Incompatible chemicals should not be stored together.

**Hazardous Decomposition Products:** chemical substances which may be created when the chemical decomposes or burns.

**Hazardous Polymerization:** rapid polymerization may produce enough heat to cause containers to explode. Conditions to avoid are listed in this section.

### Spill, Leak and Disposal Procedures

This section outlines general procedures, precautions and methods for cleanup of spills. Appropriate waste disposal methods are provided for safety and environmental protection.

### Personal Protection Information

This section includes general information about appropriate personal protective equipment for handling this material. Many times, this section of the MSDS is written for large scale use of the material. Appropriate personal protection may be determined by considering the amount of the material being used and the actual manipulations to be performed.

**Eye Protection:** recommendations are dependent upon the irritancy, corrosivity, and special handling procedures.

**Skin Protection:** describes the particular types of protective garments and appropriate glove materials to provide personnel protection.

**Respiratory Protection:** appropriate respirators for conditions exceeding the recommended occupational exposure limits.

**Ventilation:** airflow schemes (general, local) are listed to limit hazardous substances in the atmosphere.

## APPENDIX B

### HAZARD COMMUNICATION TRAINING

#### Course Outline - General Training

#### I. Provisions of the OSHA Hazard Communication Standard

- A. *Scope and Purpose of Act* - to reduce the incidence of chemical source illnesses and injuries through hazard evaluation of chemicals and through the transmittal of information on hazardous materials to employers and employees
- B. *Elements of the Standard*
  - 1. Hazard Evaluation - performed by manufacturers, importers, or distributors
  - 2. Labels and Other Forms of Warning
  - 3. Material Safety Data Sheets (MSDS)
  - 4. Written Hazard Communication Program
  - 5. Training

#### II. Health Hazards and Physical Hazards of Chemicals

- 1. General Toxicology
- 2. Flammable Materials
- 3. Compressed Gases
- 4. Understanding MSDSs

#### III. Personal Protective Equipment

- 1. Eye Protection
- 2. Glove Selection and Use
- 3. Respiratory Protection

#### IV. Chemical Spills

- 1. Reporting Large Spills
- 2. Cleaning up Small Spills

#### V. Hazardous Waste Disposal

- 1. Segregating Waste
- 2. Satellite Accumulation Areas
- 3. Labels, Tags, and Signs