California Institute of Technology

Hazard Communication Program

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INTRODUCTION

The purpose of the *Hazard Communication Program* is to increase employee awareness regarding hazardous substances used in the workplace. This document outlines how this will be accomplished.

Caltech's *Hazard Communication Program* is available upon request, to any employee, their designated representatives, and government regulators in accordance with the California Code of Regulations, Title 8, Section 5194 (8 CCR § 5194), Hazard Communication. This written program can be obtained or requested:

1. Online: Hazard Communication Program
2. In person by visiting the EH&S office in the Keith Spalding Administration Building Rm. B-125
3. By contacting the Environmental Health and Safety (EH&S) Office by email: safety@caltech.edu
4. By calling x6727 from a Caltech phone or by calling (626) 395-6727

SCOPE

The California Institute of Technology (Caltech, or the Institute) will provide and maintain this Program for all work areas where employees may potentially be exposed to hazardous substances.

Personnel working in research laboratories are exempt from the *Hazard Communication Program* and should refer to Caltech's online Chemical Hygiene Plan. The *Hazard Communication Program* applies to all non-research Institute employees and contractors who work with hazardous materials. Such materials include, but are not limited to, chemicals, paints, inks, glues, cleaning agents, and compressed gases.

EXEMPT OR PROVISIONALLY EXEMPT OPERATIONS AND SUBSTANCES

Certain operations and substances are exempt or provisionally exempt from the *Hazard Communication Program*.

Work operations where employees only handle chemicals in sealed containers that are not opened under normal conditions are provisionally exempt from the *Hazard Communication Program* under the following conditions:

A) Labels on incoming containers of hazardous chemicals are not removed or defaced;
B) Safety data sheets are accessible to employees by having hard copies or electronic access; and
C) Employees receive Hazard Communication training.

Such operations may include Institute stockrooms and shipping/receiving areas.

The following substances are exempt from the requirements of this *Hazard Communication Program*:

A) Hazardous waste;
B) Tobacco and tobacco products;
C) Wood and wood products that the only hazard they pose to employees is the potential for flammability or combustion;
D) Manufactured items that are
    i. formed in a specific shape or design during manufacture;
    ii. which have end use function(s) dependent upon their shape or design during end use; and
    iii. which do not release hazardous chemicals under normal conditions of use or in a reasonably foreseeable emergency;
E) Foods, drugs, and cosmetics intended for personal consumption by employees; and
F) Consumer products used in the workplace as a typical consumer would use them.

RESPONSIBILITIES

Supervisors

Supervisors are responsible for implementing the Caltech *Hazard Communication Program* at the local operational level for the areas they supervise and ensuring all employees under their jurisdiction are compliant with the Program.

Responsibilities include:

1. Identifying hazardous materials present in the work area;
2. Confirming that all containers of hazardous materials are properly labeled;
3. Providing employees access to current Safety Data Sheets (SDSs) for the hazardousmaterials in the workplace;
4. Confirming employees have completed general Hazard Communication training;
5. Providing training on job-specific chemical hazards to which employees may have an exposure risk;
6. Maintaining job-specific training records;
7. Maintaining a list of hazardous materials present in the areas under their jurisdiction, updated at least annually (see Appendix D for a Hazardous Materials List template);
8. Adequately alerting any non-Institute personnel in the same work area of hazardous substances that their employees may be exposed to (see Informing Non-Institute Workers); and
9. Immediately notifying Caltech EH&S of any new or significant chemical hazards in the workplace.

Employees

Employees are responsible for:

1. Adhering to the precautions outlined on container labels, SDSs, and established procedures;

2. Inspecting all chemical containers under their control to verify that each one is labeled according to the requirements given in Appendix A;
3. Completing Hazard Communication training, job-specific training, and requesting any additional training on hazards that they are unfamiliar with before beginning work;
4. Reviewing Safety Data Sheets to become familiar with the hazards and precautionarymeasures for working with hazardous materials in their work area; and
5. Using personal protective equipment as deemed necessary.

Environmental Health and Safety (EH&S)

EH&S is responsible for:

1. Maintaining, reviewing, and updating the written *Hazard Communication Program*;
2. Providing assistance to supervisors with identifying hazardous substances in the workarea, evaluating potential hazards of operations, determining appropriate controls, and training;
3. Maintaining employee and area exposure monitoring documentation per the Institute Records Retention and Disposition Guidelines (for the duration of employment plus 30 years).

Program Guidelines

This *Hazard Communication Program* includes guidelines for:

- Identification and maintenance of a list of hazardous materials in the workplace
- Container Labeling
- Safety Data Sheets (SDSs)
- Training
- Non-routine and routine tasks involving hazardous materials
- Unlabeled Pipe systems
- Emergency Response
- Informing non-Institute workers

Applicable Regulations

- California Code of Regulations, Title 8, General Industry Safety Orders, § 5194

PROGRAM ELEMENTS

I. Identification of Hazardous Materials

Safety Data Sheets (SDSs), product labels, and various published regulatory and advisory agency lists may be utilized when assessing hazardous materials in the workplace. Additionally, any other substances determined by scientific evidence to present a hazard should also be considered hazardous. EH&S is available to assist with identifying hazardous materials.

The published regulatory and advisory lists of hazardous materials for reference include:

1. Chemicals on the Director's List of Hazardous Substances, 8 CCR 339
2. Chemicals on the Toxic and Hazardous Substances List, 29 CFR 1910, Subpart Z
3. Chemicals identified in the 15th Report on Carcinogens (RoC) by the National Toxicology Program
4. Chemicals identified by the International Agency for Research on Cancer (IARC)
5. Chemicals found listed on Proposition 65
6. Chemicals found to present a personal hazard as determined by scientific evidence

Identification of hazardous materials in the workplace is needed in order to fulfill the requirement for maintaining a hazardous materials list. Supervisors are responsible for maintaining the hazardous materials list and shall update it at least annually using the template in Appendix D, or the equivalent.

II. Container Labeling

All hazardous material containers must be labeled legibly and prominently, in English. Labels on incoming hazardous materials cannot be removed unless they are immediately replaced with a new label containing the appropriate information. Damaged labels must be replaced upon knowledge. Primary containers and secondary containers have specific labeling requirements. Appendix A, *Container Labeling*, contains the components of the Institute's labeling system. Supervisors are responsible for ensuring the proper labeling of hazardous substances used in their work areas.

Employees are to contact their Supervisor or EH&S for assistance with identifying hazardous substances or interpreting terminology.

For the labeling of primary and secondary containers as outlined in Appendix A, the Institute uses the hazard categories set forth in the Globally Harmonized System for Classification and Labeling of Chemicals (GHS). Many chemicals may fall into more than one chemical hazard category. GHS physical and health hazards are briefly described in Appendix C.

III. Safety Data Sheets (SDS)

Previously known as Material Safety Data Sheets (MSDSs), Safety Data Sheets (SDSs) are documents containing comprehensive information on substances and mixtures. The information provided in an SDS is summarized in Appendix B.

Each employee must know how to access current SDSs for all substances used in their work area. SDSs can be maintained as hard copies or be available electronically as long as there are no barriers to immediate employee access. The EH&S website http://safety.caltech.edu provides online resources for obtaining SDSs.

SDSs are created by manufacturers and should accompany all shipped hazardous materials. In cases where a manufacturer did not provide an SDS with a substance, the individual purchasing or obtaining the material is responsible for submitting a written request for an SDS to the manufacturer within seven (7) days of noting this missing information. A copy of the obtained SDS will be provided to the Supervisor and maintained locally per this Program for future reference.

IV. Employee Information and Training

Institute employees have the right to understand the risks associated with hazardous substances in the workplace to which they may be exposed. All Institute employees for whom this Program applies must receive appropriate information and training before beginning work that places them at potential risk of exposure to hazardous materials.

The Institute provides Hazard Communication training to employees, which covers the general requirements of the Program.

Job-specific training needs to be documented by an employee's Supervisor. Topics to be covered in job-specific training include:

- Operations in the workplace where hazardous materials are present;
- Location and availability of safety data sheets and the hazardous materials list;
- Physical and health hazards of the materials in the workplace;
- Methods for detecting the presence or release of hazardous materials in the work area (such as alarms, odors, label information, warnings, signs, etc.); and
- Safety measures implemented to protect employees from hazardous materials (such as specific procedures, work practices, personal protective equipment (PPE), and emergency procedures).

Employees must receive supplemental training by supervisors when new hazards are introduced or discovered. Supervisors will train affected employees on hazardous substance information contained in SDSs. Supervisors must inform employees within 30 days of receipt of a new or revised SDS if the new information indicates increased risk or different protection measures than the previous SDS. Caltech EH&S can assist with additional training by request.

V. Non-Routine Tasks Involving Hazardous Materials

Institute employees periodically perform non-routine tasks involving hazardous materials. These events may include emergencies and non-routine servicing of equipment. Affected employees must receive information about the hazardous materials or unique job hazards prior to starting work on such projects.

This information, provided by the employee's Supervisor, includes:

- Accessibility to SDS data;
- Specific hazards of materials;
- Required protective/safety measures to be utilized, including the proper and safe processes and procedures for handling the material; and
- Measures the Institute has taken to reduce the hazards including ventilation, respiratory protection, PPE, the presence of another employee, and/or emergency procedures.

VI. Routine Tasks Involving Hazardous Materials

Tasks which involve routine handling of hazardous materials require both Hazard Communication training and job-specific training.

Routine tasks include: manually handling, transporting, opening, and/or closing containers which can contain hazardous materials (e.g. solvents, paints, used oil). Supervisors will provide the necessary guidance and procedures for employees to work safely when performing these tasks.

VII. Unlabeled Pipe Systems

Work with unlabeled pipes shall only occur by authorized employees who have been trained on the hazards present. Supervisors must inform the authorized employee(s) of the following *prior to beginning work*:

- Compounds in the pipes;
- Potential hazards; and
- Necessary safety precautions.

VIII. Emergency Response

All employees must be familiar with their emergency escape routes and procedures, and follow the guidance of Floor Wardens and Building Coordinators in the event of an emergency or hazardous materials incident.

For direct or suspected chemical contact or exposure, consult the SDS for first aid procedures.

General guidelines for chemical contact or exposure include:

- Remove contaminated clothing;
- Flush the affected area with water for at least 15 minutes;

- Remove employee to fresh air in the event of inhalation of hazardous materials;
- Contact employee's Supervisor/Manager immediately;
- If injuries are beyond what is treatable by local first-aid, seek professional medical attention as quickly as possible by contacting Caltech Security at extension 5000 from a campus phone or by direct dial to (626) 395-5000.
- Caltech Security will contact appropriate authorities such as Fire, Emergency Services, and the EH&S department.

In an emergency, please dial extension 5000 or 626-395-5000.

If a chemical spill occurs, consult the SDS for guidance on how to respond to the spill. Only trained and knowledgeable personnel with access to the proper containment materials to clean a spill can do so.

Depending on the nature of the spill (such as the hazards involved, size of the spill, and/or if an injury has occurred) it may be considered an emergency. In such a case, immediately **dial extension 5000 or 626-395-5000.**

Additional information on emergency response procedures can be found in the Emergency Response Guide posted throughout campus buildings and available upon request from the EH&S Office by email: safety@caltech.edu, at extension 6727 from a campus phone, or by direct dial to (626) 395-6727.

IX. Proposition 65

The State of California has generated a list of chemicals that it considers may cause cancer and/or reproductive harm.

- This list is referred to as the Proposition (Prop) 65 list
- The Prop 65 list is located in Title 27 of the California Code of Regulations §25000-27001 (Safe Drinking Water and Toxic Enforcement Act of 1986)

The Laboratory and Workplace Safety Signs Program details how the Institute informs employees, visitors, contractors, etc. about the presence of Prop 65 chemicals in the workplace.

INFORMING NON-INSTITUTE WORKERS

This section applies to non-Institute personnel or temporary service providers (consultants, contractors, visitors) working on Caltech's campus. The primary Institute contact (i.e. the supervisor) shall inform contractors and contract workers of chemical hazards prior to beginning work by providing:

- A list of hazardous chemicals found in their work area;
- Precautionary measures required to protect the workers during normal operations;
- A description of the Institute labeling system;
- Access to SDSs for each hazardous substance the worker(s) may be exposed to while

working; and

- Emergency procedures.

Non-Institute contractors are to provide the primary Institute contact with SDSs for any chemical they bring on site.

Construction contractors will be provided the above information during the pre-construction meeting as outlined in the Contractor Safety Guide

Visiting researchers must consult with Lab Managers / Principal Investigators who supervise their operations to receive training on laboratory guidelines *prior to performing any research.* In addition, the requirements of the Institute Chemical Hygiene Plan must also be followed.

APPENDIX A: CONTAINER LABELING

Primary Containers

A primary container is the container received from the manufacturer or distributor. The Hazard Communication standard requires that labels on primary containers have the following information:

- Product identifier;
- Pictogram(s) that convey specific information about the hazards of the chemical;
- Signal words: a single word used to indicate the relative level of severity of the hazard that alerts the reader to a potential hazard on the label. The signal words used can either be “danger” or “warning”. “Danger” is used for the more severe hazards, while “warning” is used for less severe hazards;
- Hazard statement: a statement assigned to a hazard class and category that describes the nature of the hazard(s) of a chemical, including, where appropriate, the degree of hazard;
- Precautionary Statement: a phrase that describes recommended measures to be taken to minimize or prevent adverse effects resulting from exposures to a hazardous chemical or improper storage or handling of a hazardous chemical; and
- Name, address, and phone number of the manufacturer.

Sample Primary Label

The label below is an example of an appropriate label for a primary container.

Source: General Label Company, Inc.

Secondary Containers

A secondary container is the container in which the product is transferred and dispensed for use. To further confirm employees are aware of the hazards of materials used in their work areas, Caltech personnel must appropriately label all secondary containers. Examples of secondary containers include squeeze bottles and chemical baths.

Secondary containers must be labeled with, at minimum, the following:

- Identity of the hazardous substance; and
- Appropriate hazard warning(s) (i.e., flammable, corrosive, etc.) using words, pictograms, NFPA symbol, and/or a combination thereof.

Exception Containers

Portable containers do not require labels when:

a. Hazardous materials are transferred from appropriately labeled containers;
b. The transferred hazardous material is under the control of and used only by the person who transferred it; and
c. The containers are intended for use within the work shift in which the transfer occurred.

Important Note: Employees who use exception containers are required to follow Institute policies and procedures for the proper disposal of the hazardous materials immediately after they have completed the task requiring the use of the material.

APPENDIX B: SAFETY DATA SHEETS (SDS)

General Information

The Safety Data Sheet, SDS, must include, at a minimum, the information in the described sections below and in the order listed. Although the style and layout may vary by manufacturer or distributor, every section must be complete, even if the item is not applicable (indicated by N/A).

The SDS is prepared by the manufacturer or importer of the product. Other sources of data on toxic and health effects can be consulted for more complete information. You may contact the manufacturer or EH&S if additional information or clarification is needed.

Section 1: Identification of the substance or mixture and of the supplier

- GHS product identifier;
- Other means of identification such as other common names or synonyms by which the substance is known;
- Recommended use of the chemical and restrictions on its use;
- Supplier's details (including name, address, phone number, etc.); and
- Emergency phone number.

Section 2: Hazard(s) identification

- GHS classification of the substance/mixture and any national or regional information;
- GHS label elements, including precautionary statements (Hazard symbols may be provided as a graphical reproduction of the symbols in black and white or the name of the symbol, e.g., flame, skull and crossbones, ...); and
- Other hazards which do not result in classification (e.g., dust explosion hazard) or are not covered by the GHS.

Section 3: Composition/information on ingredients

Substance

- Chemical identity;
- Common name, synonyms, etc.;
- Chemical Abstracts Services (CAS) number and other unique identifiers; and
- Impurities and stabilizing additives, which are themselves classified and which contribute to the classification of the substance.

Mixtures

- Same information required for substances;
- The chemical identity and concentration or concentration ranges of all ingredients that are hazardous within the meaning of the GHS and are present above their cutoff levels.

Section 4: First Aid Measures

- Necessary first-aid measures, subdivided according to the different routes of exposure, i.e., inhalation, skin and eye contact, and ingestion
- Description of most important symptoms/effects, acute and delayed
- Recommendations for immediate medical attention and special treatment needed, when necessary.

Section 5: Firefighting measures

- Suitable (and unsuitable) extinguishing media for fire caused by chemical
- Specific hazards arising from the chemical (e.g., nature of any hazardous combustion products)
- Recommendations on special protective equipment and precautions for firefighters

Section 6: Accidental release measures

- Personal precautions, protective equipment and emergency procedures
- Environmental precautions
- Methods and materials for containment and clean-up

Section 7: Handling and storage

- Precautions for safe handling
- Conditions for safe storage, including any incompatibilities

Section 8: Exposure controls/personal protection

- Control parameters, e.g., occupational exposure limit values or biological limit values
- Appropriate engineering controls
- Individual protection measures, such as personal protective equipment

Section 9: Physical and chemical properties

- Appearance (physical state, color, etc.)
- Odor
- Odor threshold
- pH
- Melting point/freezing point
- Initial boiling point and boiling range
- Flash point
- Evaporation rate
- Flammability (solid, gas)
- Upper/lower flammability or explosive limit

- Vapor pressure
- Vapor density
- Relative density
- Solubility(ies)
- Partition coefficient: n-octanol/water
- Autoignition temperature
- Decomposition temperature

Section 10: Stability and reactivity

- Chemical stability
- Possibility of hazardous reactions
- Conditions to avoid (e.g., static discharge, shock or vibration)
- Incompatible materials
- Hazardous decomposition products

Section 11: Toxicological information

Concise but complete and comprehensible description of the various toxicological (health) effects and the available data used to identify those effects, including:

- Information on the likely routes of exposure (inhalation, ingestion, skin and eye contact)
- Symptoms related to the physical, chemical and toxicological characteristics
- Acute and chronic effects from short- and long-term exposure
- Numerical measures of toxicity (such as acute toxicity estimates)

Section 12: Ecological information

- Ecotoxicity (aquatic and terrestrial, where available)
- Persistence and degradability
- Bioaccumulative potential
- Mobility in soil
- Other adverse effects

Section 13: Disposal considerations

Description of waste residues and information on their safe handling and methods of disposal, including the disposal of any contaminated packaging.

Section 14: Transport information

- UN Number
- UN Proper shipping name
- Transport Hazard class(es)

- Packing group, if applicable
- Marine pollutant (Yes/No)
- Special precautions which a user needs to be aware of or needs to comply with in connection with transport or conveyance either within or outside their premises.

Section 15: Regulatory information

Safety, health and environmental regulations specific for the product in question.

Section 16: Other information including information on preparation and revision of the SD

Availability of SDS

Supervisors are responsible for ensuring Safety Data Sheets (SDSs) are maintained and readily accessible for all hazardous substances that employees use.

Caltech EH&S provides online resources for obtaining SDS on their website at http://safety.caltech.edu, or alternatively, Institute employees may contact the Caltech EH&S office for further assistance by calling extension 6727 or (626) 395-6727.

APPENDIX C: GHS PICTOGRAMS GUIDE

Health Hazard  ▪ Carcinogen ▪ Mutagenicity ▪ Reproductive Toxicity ▪ Respiratory Sensitizer ▪ Target Organ Toxicity ▪ Aspiration Toxicity	**Flame**  ▪ Flammables ▪ Pyrophorics ▪ Self-Heating ▪ Emits Flammable Gas ▪ Self-Reactives ▪ Organic Peroxides	**Exclamation Mark**  ▪ Irritant (skin and eye) ▪ Skin Sensitizer ▪ Acute Toxicity (harmful) ▪ Narcotic Effects ▪ Respiratory Tract Irritant ▪ Hazardous to Ozone Layer (Non-Mandatory)
Gas Cylinder  ▪ Gases Under Pressure	**Corrosion**  ▪ Skin Corrosion/Burn ▪ Eye Damage ▪ Corrosive to Metals	**Exploding Bomb**  ▪ Explosives ▪ Self-Reactives ▪ Organic Peroxides
Flame Over Circle  ▪ Oxidizers	**Environment** (Non-Mandatory)  ▪ Aquatic Toxicity	**Skull and Crossbones**  ▪ Acute Toxicity (fatal or severe)

APPENDIX D: HAZARDOUS MATERIALS LIST

Department and Location: _____

Prepared By: _____ **Date:** _____

MATERIAL NAME	MANUFACTURER	QUANTITY	SDS ON FILE?