Chemical Hygiene Plan

Title 8 California Code of Regulations Section 5191

Riverside Community College District

Last updated: 1-2023

Foreword

On 31 January 1990 the Federal Occupational Safety and Health Administration (OSHA) promulgated a final rule for occupational exposure to hazardous chemicals in laboratories. Included in the standard, which became effective on 1 May 1990, is a requirement for all employers covered by the standard to develop and carry out the provisions of a Chemical Hygiene Plan (CHP). The standard requires that the CHP must be developed and implemented by January 31, 1991.

Likewise, California adopted a similar standard on February 21, 1991 that was approved on March 25, 1991 with an effective date of April 24, 1991 and delayed start-up dated for the written Chemical Hygiene Plan of October 31, 1991.

A CHP is defined as a written program which sets forth procedures, equipment, personal protective equipment and work practices that are capable of protecting employees from the health hazards presented by hazardous chemicals used in that particular workplace. Components of the CHP must include standard operating procedures for safety and health, criteria for the implementation of control measures, measures to ensure proper operation of engineering controls, provisions for training and information dissemination, permitting requirements, provisions for medical consultation, designation of responsible personnel, and identification of particularly hazardous substances.

This CHP is maintained in the laboratory manager's office readily available to laboratory employees. All laboratory personnel must know and follow the procedures outlined in this plan. All operations performed in the laboratory must be planned and executed in accordance with the enclosed procedures. In addition, each employee is expected to develop safe personal chemical hygiene habits aimed at the reduction of chemical exposures to themselves and co-workers.

This document was developed to comply with paragraph (e) of the referenced Federal OSHA 1910.1450 standard as well as the California Code of Regulations Title 8, Chapter 4, Subchapter 7, Section 5191. The laboratory manager will maintain the facilities and procedures employed in the laboratory compatible with current knowledge and regulations in laboratory safety. This CHP will be reviewed, evaluated and updated at least annually and is readily available to employees, their representatives and any representative of the Assistant Secretary of Labor for Federal OSHA or CAL/OSHA.

Table of Contents

Standard Operating Procedures for Laboratory Chemicals

Chemical Procurement

The decision to procure a chemical shall be a commitment to handle and use the chemical properly from initial receipt to ultimate disposal.

Requests for procurement of new chemicals shall be submitted to the Chemical Hygiene Officer for approval. The form entitled "New Chemical Purchasing Request". Appendix C to this plan shall be used for this purpose. Information on proper handling, storage and disposal shall be known to all involved personnel prior to the procurement of the chemical. Chemicals utilized in the laboratory shall be those, which are appropriate for the ventilation system.

Personnel who receive chemical shipments shall be knowledgeable of the proper procedures for receipt. Chemical containers shall not be accepted without accompanying labels, material safety data sheets and packaging in accordance with all appropriate regulations. All chemical shipments should be dated when received and opened.

Chemical Storage

Received chemicals shall be immediately moved to the designated storage area, large glass containers shall be placed in carrying containers or shipping containers during transportation.

The storage area shall be well illuminated with all storage maintained below eye level. Large bottles shall be stored no more than two feet from ground level.

Chemicals shall be segregated by hazard classification and compatibility in a well- identified area, with local exhaust ventilation.

Mineral acids should be separated from flammable and combustible materials. Separation is defined by NFPA 49 as storage within the same fire area but separated by as much space as possible by intervening storage from incompatible materials.

Acid-resistant trays shall be placed under bottles of mineral acids.

Acid-sensitive materials such as cyanides and sulfides shall be separated from acids or protected from contact with acids.

Highly toxic chemicals or other chemicals whose containers have been opened shall be stored in unbreakable secondary containers.

The storage area shall be used as a preparation or repackaging area. It shall be accessible during normal working hours. The storage area is under the control of the laboratory manager or technician.

When chemicals are taken from the storage area, they shall be placed in an outside container or barrel.

Storage of chemicals at the lab or other work areas shall be limited to those amounts necessary for one operation or shift. Chemicals in the workplace shall not be exposed to sunlight or heat.

The Chemical Hygiene Officer or vendor of choice, shall periodically examine stored chemicals for replacement, deterioration, and container integrity. The inspection should determine whether any corrosion, deterioration, or damage has occurred to the storage facility as a result of leaking chemicals.

The Chemical Hygiene Officer shall conduct periodic inventories of chemicals outside the storage area. Unneeded items shall be properly discarded or returned to the storage area.

Chemical Handling

Each laboratory employee with the training, education and resources provided by supervision, shall develop and implement work habits consistent with this CHP to minimize personal and coworker exposure to the chemicals in the laboratory. Based on the realization that all chemicals inherently present hazards in certain conditions, exposure to all chemicals shall be minimized.

General precautions that shall be followed for the handling and use of all chemicals are:

- Skin contact with all chemicals shall be avoided.
- All employees shall wash all areas of exposed skin prior to leaving the laboratory.
- Mouth suction for pipetting or starting a siphon is prohibited.
- Eating, drinking, smoking, gum chewing, or application of cosmetics in areas where laboratory chemicals are present shall be avoided. These areas have been posted. Hands shall be thoroughly washed prior to performing these activities.
- Storage, handling and consumption of food or beverages shall not occur in storage areas, refrigerators, glassware or utensils also used for laboratory operations.
- Risk determinations shall be conservative in nature.

- Any chemical mixture shall be assumed to be as toxic as its most toxic component.

- Substances of unknown toxicity shall be assumed to be toxic.

Laboratory employees shall be familiar with the symptoms of exposure for the chemicals with which they work and the precautions necessary to prevent exposure.

The intent and procedures of this Chemical Hygiene Plan shall be continuously adhered to.

In all cases of chemical exposure, neither the Permissible Exposure Limits (PELs) of OSHA or the Threshold Limit Values (TLVs) of the American Conference of Governmental Industrial Hygienists (ACGIH) shall be exceeded.

The engineering controls and safety equipment in the laboratory shall be utilized and inspected in accordance with Appendix A of this plan.

Specific precautions based on the toxicological characteristics of individual chemicals shall be implemented as deemed necessary by the Chemical Hygiene Officer.

Laboratory Equipment and Glassware

Each employee shall keep the work area clean and uncluttered. All chemicals and equipment shall be properly labeled. At the completion of each work day or operation, the work area shall be thoroughly cleaned and all equipment properly cleaned and stored.

In addition, the following procedures shall apply to the use of laboratory equipment:

- All laboratory equipment shall be used only for its intended purpose.

- All glassware will be handled and stored with care to minimize breakage; all broken glassware will be immediately disposed of in the broken glass container.

- All evacuated glass apparatus shall be shielded to contain chemicals and glass fragments should implosion occur.

- Labels shall be attached to all chemical containers, identifying the contents and related hazards.

- Waste receptacles shall be identified as such.

- All laboratory equipment shall be inspected on a periodic basis by vendor and replaced or repaired as necessary

Personal Protective Equipment

- Safety glasses meeting ANSI Z87.1 are required for employees and visitors to the laboratory and will be worn at all times when in the laboratory. Contact lenses are prohibited in the laboratory, except as approved by the Chemical Hygiene Officer and supervisor.

- Chemical goggles and/or a full-face shield shall be worn during chemical transfer and handling operations as procedures dictate.

- Sandals, perforated shoes, sneakers and bare feet are prohibited. Safety shoes, per ANSI 47 are required where employees routinely lift heavy objects.

- Lab coats should be provided in the laboratory. Laboratory coats should be laundered on a periodic basis, not to exceed monthly. Laboratory coats shall be removed immediately upon discovery of significant contamination.

- Appropriate chemical-resistant gloves based on the Table in Appendix B shall be worn at all times when there may be skin contact with chemicals. Used gloves shall be inspected and washed prior to re-use. Damaged or deteriorated gloves will be immediately replaced. Gloves shall be washed prior to removal from the hands.

- Thermal-resistant gloves shall be worn for operations involving the handling of heated materials and exothermic reaction vessels. Thermal-resistant gloves shall be non-asbestos and shall be replaced when damaged or deteriorated.

- Respirator usage shall comply with the OSHA Respiratory Protection Standard, CCR Title 8, Section 5144.

Personal Work Practices

- Laboratory supervision must ensure that each employee knows and follows the rules and procedures established in this plan.

- All employees shall remain vigilant to unsafe practices and conditions in the laboratory and shall immediately report such practices and/or conditions to the laboratory supervisor. The supervisor must correct unsafe practices and or conditions promptly.

- Long hair and loose-fitting clothing shall be confined close to the body to avoid being caught in moving machine/equipment parts.

- Use only those chemicals appropriate for the ventilation system.

- Avoid unnecessary exposure to all chemicals by any route.

- Do not smell or taste any chemicals.

- Encourage safe work practices in coworkers by setting the proper example. Horseplay is strictly forbidden.

- Seek information and advice from knowledgeable persons, standards and codes about the hazards present in the laboratory. Plan operations, equipment and protective measures accordingly.

- Use engineering controls in accordance with Section 3.0.

- Inspect personal protective equipment prior to use, and wear appropriate protective equipment as procedures dictate and when necessary to avoid exposure.

Labeling

- All containers in the laboratory shall be labeled. This includes chemicals containers and waste containers. The label shall be informative and durable, and at a minimum, will identify contents, source, and date of acquisition, storage location and indication of hazard.

- Portable containers shall be labeled by the individual using the container

- Exemptions for labeling requirements shall be made for chemical transfers from a labeled container into a container that is intended only for the immediate use of the employee who performed the transfer.

- The labeling program shall be periodically inspected by the Chemical Hygiene Officer to ensure that labels have not been defaced or removed. The form entitled "Chemical Hazard Audit Checklist", Appendix D to this plan, shall be used for this purpose.

Criteria for Implementation of Control Measures

Air Sampling

Air sampling for evaluating employee exposure to chemical substances shall be conducted periodically or as specified by specific codes or regulations.

Upon addition of new chemical or changes in control procedures, additional air sampling will be considered to determine the exposure. Conduct air sampling if there is reason to believe that exposure levels for regulated substances that require sampling routinely exceed the action level, the PEL. Air sampling will be implemented when usage of highly toxic substances exceeds three times per week.

The results of air sampling studies performed in the laboratory are maintained and recorded on the form shown in Appendix E to this plan.

Housekeeping

Each laboratory worker is directly responsible for the cleanliness of his or her work space, and jointly responsible for common areas of the laboratory. Laboratory management shall insist on the maintenance of housekeeping standards.
The following procedures apply to the housekeeping standards of the laboratory:

- All spills on lab stations or floors shall be immediately cleaned and properly disposed of. Large spills will necessitate the implementation of the Emergency Action Plan per CCR Title 8, Section 8414 and 5192.

- The lab stations shall be kept clear of equipment and chemicals except those necessary for the work currently being performed.

- The work area shall be cleaned at the end of each operation and each shift.

- All apparatus shall be thoroughly cleaned and returned to storage upon completion of usage.

- All floors, aisles, exits, fire extinguishing equipment, eyewashes, and showers, electrical disconnects and other emergency equipment shall remain unobstructed.

- All labels shall face front.

- Chemical containers shall be clean, properly labeled and returned to storage upon completion of usage.

- All chemical wastes will be disposed of in accordance with the waste disposal process.

Safety and Emergency Equipment

All laboratory personnel will be trained in the proper use of fire extinguishers when hired and annually thereafter, via Target Solution online training. Prior to the procurement of new chemical, the Chemical Hygiene Officer shall verify that existing extinguishers and other emergency equipment are appropriate for such chemicals.

All employees who might be exposed to chemical splashes shall be instructed in the location and proper usage of emergency showers and eyewashes. The eyewash and emergency shower shall be inspected regularly. The laboratory employees shall perform these inspections. These inspections shall be in accordance with OSHA regulations. Records shall be maintained.

Location signs for safety and emergency equipment have been posted.

Engineering Controls

Intent

The engineering controls installed in the laboratory are intended to minimize employee exposure to chemical and physical hazards in the workplace. These controls must be maintained in proper working order for this goal to be realized.

Modification

No modification of engineering controls will occur.

Improper Function

Improper function of engineering controls must be reported to the Chemical Hygiene Officer immediately. The system shall be taken out of service until proper repairs have been executed.

Usage

All employees shall follow proper work practices when using the engineering controls.

Local Exhaust Ventilation

The following procedures shall apply to the use of local exhaust ventilation:

- Openings of hoods shall be placed as close as possible to sources of the air contaminant.
- Clear the screen on the face of the hood prior to usage. Hood fans shall operate when hoods are being used.
- After using hoods, operate the fan for an additional period of time sufficient to clear residual contaminants from the ductwork.
- The ventilation system shall be inspected regularly. The duct velocity shall be maintained at the appropriate test speeds. The Chemical Hygiene Officer shall work with the vendor on the certification process.

Laboratory Hoods

The following hoods shall be utilized for all chemical procedures that might result in release of hazardous chemical vapors or dust. As a general rule, the hood shall be used for all chemical procedures involving substance which are appreciably volatile and have a permissible exposure limit (PEL) less than 50 ppm.

The following work practices shall apply to the use of hoods:

- Confirm adequate hood ventilation performance prior to opening chemical containers inside the hood. An inward flow of air can be confirmed by holding a piece of paper at the face of the hood and observing the movement of the paper.

- Storage of chemicals and equipment inside the hood shall be kept to a minimum. Minimize interference with the inward flow of air into the hood.
- Leave the hood operating when it is not in active use of hazardous chemicals are contained inside the hood or if it is uncertain whether adequate general laboratory ventilation will be maintained when the hood is non-operational.
- The ventilation system shall be inspected regularly. The hood face velocity shall be maintained between 75 and 125 feet per minute. The Chemical Hygiene Officer shall work with the vendor on certification process.
- The hood shall not be used as a means of disposal for volatile chemicals. Prior to the introduction of new chemicals, the lab technician shall determine the adequacy of hood ventilation systems.

Glove Boxes and Isolation Rooms

The exhaust air form a glove box or isolation room will pass through scrubbers or other treatment before release into the regular exhaust system.

Storage Cabinets

Storage cabinets for flammable and hazardous chemicals will be ventilated as needed.

Employee Information and Training

Hazard Information

All employees will be apprised of the hazards presented by the chemicals in use in the laboratory. Each employee shall receive training at the time of initial assignment to the laboratory, proper to assignments involving new exposure situations, and at a regular frequency as determined by the Chemical Hygiene Officer.

Forms

The form in Appendices F-H entitled “New Employee Chemical Hygiene Orientation and Training Checklist”, “Transfer Chemical Hygiene Training Checklist”, and “New Chemical Training Checklist” shall be used for these purposes.

Training

This training shall include methods of detecting the presence of a hazardous chemical, physical and health hazard of chemicals in the lab, and measures employees can take to protect themselves from these hazards. The training shall present the details of the Chemical Hygiene Plan, and shall include:

- The contents of the CAL/OSHA laboratory standard, and its appendices; the location and availability of the Chemical Hygiene Plan;

- The permissible exposure limits for OSHA regulated substances or recommended exposure values for other hazardous chemicals not regulated by OSHA which are present in the laboratory;

- Signs and symptoms associated with exposure to the chemicals present in the laboratory; Location and availability of reference material on chemical hygiene; the laboratory manager or his designee shall conduct Training.

- The following materials are used during training:
    - Online training through Target Solution
    - Audiovisual Programs
    - Written Materials and Other Training Materials.

Prior Approval of Laboratory Activities

Off-Hours Work Procedures

Laboratory personnel are not permitted to work after hours in the lab, except when permitted.

Sole Occupancy

At no time shall work be performed in the laboratory when the only person in the building is the laboratory person performing the work. Under unusual conditions, crosschecks, periodic security guard checks, closed circuit television, or other measures may be taken when permitted.

Hazardous Work

All hazardous operations are to be performed during a time when at least two personnel are present at the laboratory. At no time shall a laboratory person, while working alone in the laboratory, perform work that is considered hazardous. The determination of hazardous operations shall be made by the laboratory supervisor and permitted.

Unattended Operations

When laboratory operations are performed which will be unattended by laboratory personnel (continuous operations, overnight reactions, etc.) the following procedures will be employed:

- The laboratory supervisor will review work procedures to ensure for the safe completion of the operation.
- An appropriate sign should be posted. The overhead lights in the laboratory will be left on.
- Precautions shall be made for the interruption of utility service during the unattended operation (loss of water pressure, electricity, etc.)

The person responsible for the operation will return to the laboratory at the conclusion of the operation to assist in the dismantling of the experiment.

Medical Consultations and Examinations

An opportunity to receive medical attention is available to all employees who work with hazardous chemicals in the laboratory. The opportunity for medical attention will be made available to employees under the following circumstances:

- Whenever an employee develops signs or symptoms associated with a hazardous chemical to which the employee may have been exposed in the laboratory,
- Medical surveillance programs will be established where exposure monitoring and medical surveillance requirements, and/or,
- Whenever an event takes place in the laboratory such as a spill, leak, explosion or other occurrence resulting in the likelihood of a hazardous exposure the employee will be provided an opportunity for medical consultation for the purpose of determining the need for medical examination.
- These medical consultations and examinations shall be administered by or under the direct supervision of a licensed physician. The Chemical Hygiene Officer will refer employees to call Medcor at 800-775-5866 who will then refer the employee to an available physician.

Chemical Hygiene Responsibilities

Chief Executive officer

Dean: _____

He/she has the ultimate responsibility for chemical hygiene throughout the laboratory and with assistance of other program administrators, will provide continued support for chemical hygiene.

Chemical Hygiene Officer

Chemical Hygiene Officer: Dean/Department Chair purchasing the chemicals

The Chemical Hygiene Officer shall:

- Work with administrators and other employees to develop and implement appropriate chemical hygiene policies and practices,
- Monitor procurement and use of chemicals in the lab, including determining that facilities and training levels are adequate for the chemical in use,
- Perform regular, formal chemical hygiene and housekeeping inspections including inspections for emergency equipment,
- Help project directors develop precautions and adequate facilities,
- Maintain current knowledge concerning the legal requirements of regulated substances in the laboratory,
- Review and improve the Chemical Hygiene Plan on an annual basis, ensure that workers know and follow the chemical hygiene rules,
- Determine the proper level of personal protective equipment is available and in working order,
- Ensure that appropriate training has been provided to employees, Monitor the waste disposal program.

Laboratory Workers

The laboratory workers are individually responsible for:

- Planning and conducting each laboratory operation in accordance with the Chemical Hygiene Plan,
- Developing good personal chemical hygiene habits.

Special Precautions

When laboratory procedures change to require the use of additional classifications of chemicals (allergens, teratogens, carcinogens, etc.), additional special precautions shall be implemented as deemed necessary by the Chemical Hygiene Officer.

Working with Allergens (Special Precautions)

Suitable gloves to prevent hand contact shall be worn when exposed to allergens or substances of unknown allergen activity.

The supervisor and Chemical Hygiene Officer will be notified of spills and other exposure incidents. A physician will be consulted when appropriate.

Working with Chemicals of Moderate Chronic or High Acute Toxicity (Special Precautions)

Areas where these chemicals are stored and used are of restricted access and have special warning signs.

A special hood with a minimum face velocity of 60 linear feet per minute or other containment device will be used. Released vapors will not discharge with the hood exhaust, but will be trapped.

Gloves and long sleeves will be used. Hands and arms will be washed immediately after working with these chemicals.

Two people will always be present during work with these chemicals.

Working with Chemicals of High Chronic Toxicity (Special Precautions)

All transfer and work with these substances shall be in a designated area: a restricted access hood, glove box or portion of lab. Approval of the supervisor will be obtained before use.
Vacuum pumps must have scrubbers or high efficiency particulate absolute (HEPA) filters.

Any contaminated equipment or glassware will be decontaminated in the hood before removing them from the designated area.

For powders, a wet mop or vacuum with a HEPA filter will be used for cleanup.

Containers will be stored in a ventilated limited access area in labeled, unbreakable, chemically resistant, secondary containers.

Recordkeeping

The immediate supervisor will conduct accident investigations with the assistance from other personnel as deemed necessary. Accidents reports will be retained for five years. Exposure records for hazardous chemicals and harmful physical agents will be maintained for 30 years per CCR Title 8, Section 3204

Medical records for employees exposed to hazardous chemicals and harmful physical agents will be maintained for the duration of employment plus 30 years per CCR Title 8, Section 3204 through the Districts Workers Compensation Carrier.

Inventory and usage records for high-risk substances (amounts of substances on- hand, amounts used and names of workers involved) shall be maintained for five years.

Records of inspections of equipment will be maintained for five years.

Records of employee training will be maintained for five years through Target Solutions online training platform.

Annual Chemical Hygiene Plan Audit

The Chemical Hygiene Officer will conduct an audit of all phases of the Chemical Hygiene Plan each year. Appendix J will be used as a guide for the audit.

References and Recommended Reading

National Research Council, Prudent Practices for Handling Hazardous Chemicals in Laboratories, National Academy Press, Washington, D.C. 1981.

National Research Council, Prudent Practices for Disposal of Chemicals from Laboratories, National Academy Press, Washington, D.C., 1982.

Freeman, N.T., Introduction to Safety in the Chemical Laboratory, Academy Press, 1982.

Manufacturing Chemists' Association, Inc., Guide for Safety in the Chemical Laboratory, D. Van Nostrand Company, Inc., 1954.

Green, Michael E., Safety in Working with Chemicals, MacMillan Publishing Co., Inc. 1978.
Pipitone, David A., Safe Storage of Laboratory Chemicals, Wiley & Sons, Inc. 1984.
Code of Federal Regulations, 29 CFR part 1910 subpart Z section 1910.1450, Occupational Exposure to Hazardous Chemicals in Laboratories, 1990.

Appendices

A. Laboratory Safety Equipment Inspection Schedule

B. Resistance to Chemicals of Common Glove Materials

C. New Chemical Purchasing Request

D. Air Sampling Data Record

E. New Employee Chemical Hygiene Orientation and Training Checklist

F. Transfer Chemical Hygiene Training Checklist

G. New Chemical Training Checklist

H. Chemical Hygiene Permit

APPENDIX A

Resistance to Chemicals of Common Glove Materials

RESISTANCE TO CHEMICALS OF COMMON GLOVE MATERIALS				
CHEMICAL	NATURAL RUBBER	NEOPRENE	NITRILE	VINYL
Acetaldehyde	G	G	E	G
Acetic Acid	E	E	E	E
Acetone	G	G	G	F
Acrylonitrile	P	G	--	F
Ammonium hydroxide (sat)	G	E	E	E
Aniline	F	G	E	G
Benzaldehyde	F	F	E	G
Benzene[a]	P	F	G	F
Benzyl chloride[a]	F	P	G	P
Bromine	G	G	--	G
Butane	P	E	--	P
Butyraldehyde	P	G	--	G
Calcium hypochlorite	P	G	G	G
Carbon disulfide	P	P	G	F
Carbon tetrachloride[a]	P	F	G	F
Chlorine	G	G	--	G
Chloroacetone	F	E	--	P
Chloroform[a]	P	F	G	P
Chromic acid	P	F	F	E
Cyclohexane	F	E	--	P
Dibenzyl ether	F	G	--	P
Dibutyl phtalate	F	G	--	P
Diethanolamine	F	E	--	E
Diethyl ether	F	G	E	P
Dimethyl sulfoxide [b]	--	--	--	--
Ethyl acetate	F	G	G	F
Ethylene dichloride[a]	P	F	G	P
Ethylene glycol	G	G	E	E
Ethylene trichloride[a]	P	P	--	P
Fluorine	G	G	--	G
Formaldehyde	G	E	E	E
Formic acid	G	E	E	E
Glycerol	G	G	E	E
Hexane	P	E	--	P
Hydrobromic acid (40%)	G	E	--	E
Hydrochloric acid (conc.)	G	G	G	E
Hydrofluoric acid (30%)	G	G	G	E
Hydrogen peroxide	G	G	G	E
Iodine	G	G	--	G
Methylamine	G	G	E	E

Methyl Cellosolve	**F**	**E**	**--**	**P**
Methyl chloride[a]	**P**	**E**	**--**	**P**
Methyl ethyl ketone	**F**	**G**	**G**	**P**
Methylene chloride[a]	**F**	**F**	**G**	**F**
Monoethanolanmine	**F**	**E**	**--**	**E**
Morpholine	**F**	**E**	**--**	**E**
Napthalene[a]	**G**	**G**	**E**	**G**
Nitric acid (conc)	**P**	**P**	**P**	**G**
Perchloric acid	**F**	**G**	**F**	**E**
Phenol	**G**	**E**	**--**	**E**
Phosphoric acid	**G**	**E**	**--**	**E**
Potassium hydroxide (sat)	**G**	**G**	**G**	**E**
Propylene dichloride[a]	**P**	**F**	**--**	**P**
Sodium hydroxide	**G**	**F**	**G**	**E**
Sodium hypochlorite	**G**	**P**	**F**	**G**
Sulfuric acid (conc)	**G**	**G**	**F**	**G**
Toluene[a]	**P**	**F**	**G**	**F**
Trichloroethylene[a]	**P**	**F**	**G**	**F**
Tricresyl phosphate	**P**	**F**	**--**	**F**
Triethanolamine	**F**	**E**	**E**	**E**
Trinitrotoluene	**P**	**E**	**--**	**P**

(E=Excellent, G=Good, F=Fair, P=Poor)

[a] Aromatic and halogenated hydrocarbons will attack all types of natural and synthetic glove materials. Should swelling occur, the user should change to fresh gloves and allow the swollen gloves to dry and return to normal.

[b] No data on the resistance to dimethyl sulfoxide of natural rubber, neoprene, nitrile rubber, or vinyl materials are available; the manufacturer of the substance recommends the use of butyl rubber gloves.

OSHA HAZARDOUS CHEMICALS IN LABORATORIES
STANDARD COMPLIANCE CHECKLIST

PURPOSE: This laboratory chemical hygiene program checklist is intended for use by companies in conducting annual chemical hygiene program evaluations to ensure continuing effectiveness and regulatory compliance.
REFERENCE: Refer to OSHA Standard CCR Title 8, Section 5191. Occupational Exposure to Hazardous Chemicals in Laboratories, for details concerning the requirements of the standard.

ORGANIZATION:	LOCATION:
LABORATORY:	DATE OF AUDIT:
LAB MANAGER:	CHEMICAL HYGIENE OFFICER:

ITEM	CCR Title 8, Section 5191 REQUIREMENT	REF. NO.	YES	NO	COMMENTS
APPLICATION					
1	Laboratory engaged in the use of hazardous chemicals as defined by	(a)(1)			
2	Work performed on laboratory scale.	(b)			
OCCUPATIONAL EXPOSURE					
3	Employee exposure to Cal/OSHA regulated substance do not exceed the permissible exposure limits specific in CCR Title 8, Group 16, Sec.5139 et seq.	(c)			
EXPOSURE MONITORING					
4	Initial monitoring performed for employees 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 exposure limit).	(d)(1)			
5	Exposure monitoring provisions of relevant standards complied with for employee exposures over the action level (or in the absence of an action level, the	(d)(2)			
6	Employee monitoring terminated in accordance with relevant standard.	(d)(3)			
EMPLOYEE NOTIFICATION					
7	Employees notified of monitoring results within 15 days of receipt.	(d)(4)			
CHEMICAL HYGIENE PLAN					
8	A written Chemical Hygiene Plan is developed and implemented for hazardous chemical use as defined in the standard.	(e)(1)			
9	The Chemical Hygiene Plan is capable of protecting employees from health hazards associated with the chemicals in the	(e)(1)(A)			
10	The Chemical Hygiene Plan is capable of maintaining employee exposures below the permissible exposure limits specified in CCR Title 8, Section 5191 (c)	(e)(1)(B)			

11	The Chemical Hygiene Plan is readily available to employees, employee representatives and, upon request to the	(e)(2)			
12	The Chemical Hygiene Plan indicates specific measures to ensure laboratory employee protection and includes each of the following elements:	(e)(3)			
13	Standard operating procedures relevant to safety and health to be utilized when using hazardous chemicals	(e)(3)(A)			
14	Criteria for the implementation of control measures including engineering controls, personal protective equipment and hygiene	(e)(3)(B)			
15	Measures to ensure adequate performance and proper usage of engineering controls	(e)(3)(C)			
16	Circumstances that require prior approval prior to implementation.	(e)(3)(E)			
17	Provisions for medical consultation and examination in accordance with the standard.	(e)(3)(F)			
18	Designation of responsible personnel and responsibilities.	(e)(3)(G)			
19	Identification of, and provisions for work with, particularly hazardous substances, including: Establishment of designated areas Use of containment devices Removal of waste Decontamination procedures.	(e)(3)(H) (e)(3)(H)(1) (e)(3)(H)(2) (e)(3)(H)(3) (e)(3)(H)(4)			

PLAN REVIEW					
20	The Chemical Hygiene Plan is reviewed and updated at least annually	(e)(4)			
EMPLOYEE INFORMATION AND TRAINING					
21	Employees receive information and training to ensure that they are apprised of the hazards of chemicals present in their work area.	(f)(1)			
22	Information and training provided at the time of initial assignment and prior to assignments involving new exposure	(f)(2)			
23	Employees are informed of: Contents of the standard Location of Chemical Hygiene Plan Exposure limits for Cal/OSHA regulated substances or recommended exposure limits for other hazardous chemicals were there is no applicable Cal/OSHA regulation; Signs and symptoms associated with exposures to hazardous chemicals in the laboratory. Location and availability of known reference material.	(f)(3)(A) (f)(3)(B) (f)(3)(C) (f)(3)(D) (f)(3)(E)			

24	Employee training includes: Methods to detect the presence of a hazardous chemical Physical and health hazards of chemicals in the work area Measures employees van take to protect themselves from hazards Details of the Chemical Hygiene Plan.	(f)(4)(A)(1) (f)(4)(A)(2) (f)(4)(A)(3)			
MEDICAL CONSULTATIONS					
25	Employees are provided an opportunity to receive medical attention under the circumstances defined in the standard.	(g)(1)			
26	Medical consultations are performed by or under the direct supervision of a licensed	(g)(2)			
27	Medical consultations are performed without cost to the employee, without loss of pay and at a reasonable time and place.	(g)(2)			
28	Information on chemical identity, exposure conditions and exposure symptoms is provided to the physician performing medical	(g)(3)(A)-(C)			
29	A written opinion is obtained from the examining physician that includes results, recommendations and any medical condition resulting in increased employee risk as a result of exposure to a hazardous chemical in the	(g)(4)(A)(1)-(4)			
30	The written opinion does not address diagnoses unrelated to occupational	(g)(4)(B)			
HAZARD IDENTIFICATION					
31	Labels on incoming containers of hazardous chemicals are not removed or defaced.	(h)(1)(A)			
32	All received safety data sheets are maintained and readily available to laboratory employees	(h)(1)(B)			
33	Training is provided for all hazardous chemicals produced in the laboratory are assumed hazardous and covered in the	(h)(2)(A)			
34	Chemical byproducts of unknown composition produced in the laboratory are assumed hazardous and covered in the Chemical Hygiene	(h)(2)(B)			
35	Chemical production for a user outside of the laboratory comply with the Hazard Communication CCR Title 8, Section	(h)(2)(C)			
RESPIRATORY PROTECTION					
36	Where respirators are used to maintain employee exposure below permissible exposure limits: Respirators are provided at no cost to the employee	(i) (i)			
RECORDKEEPING					
37	A recordkeeping system is established to maintain for each employee, accurate records of measurements taken to monitor employee exposure and any medical consultations and examinations.	(j)(1)			

38	Records are kept, transferred, and made available in accordance with CCR Title 8, Section 3204	(j)(2)			

Notes: (Use additional Sheets as necessary)

Conducted by: Title(s) Date:

Reviewed by: Title (s) Date:

OSHA EXAMPLES

Hazard Communication Standard Pictogram

As of June 1, 2015, the Hazard Communication Standard (HCS) will require pictograms on labels to alert users of the chemical hazards to which they may be exposed. Each pictogram consists of a symbol on a white background framed within a red border and represents a distinct hazard(s). The pictogram on the label is determined by the chemical hazard classification.

HCS Pictograms and Hazards

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 ▪ Narcotic Effects ▪ Respiratory Tract Irritant ▪ Hazardous to Ozone Layer (Non-Mandatory)
Gas Cylinder  ▪ Gases Under Pressure	**Corrosion**  ▪ Skin Corrosion/Burns ▪ 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 toxic)

For more information:

OSHA® Occupational Safety and Health Administration
U.S. Department of Labor
www.osha.gov (800) 321-OSHA (6742)

Hazard Communication Standard Labels

OSHA has updated the requirements for labeliing of hazardous chemicals under its Hazard Communication Standard (HCS). As of June 1, 2015, all labels will be required to have pictograms, a signal word, hazard and precautionary statements, the product identifier, and supplier identification. A sample revised HCS label, identifying the required label elements, is shown on the right. Supplemental information can also be provided on the label as needed.

For more information: www.osha.gov

OSHA (800) 321-OSHA (6742)

SAMPLE LABEL

PRODUCT IDENTIFIER

CODE _____
Product Name _____

SUPPLIER IDENTIFICATION

Company Name_____
Street Address _____
City _____ State _____
Postal Code _____ Country _____
Emergency Phone Number _____

PRECAUTIONARY STATEMENTS

Keep container tightly closed. Store in cool, well ventilated place that is locked.
Keep away from heat/sparks/open flame. No smoking.
Only use non-sparking tools.
Use explosion-proof electrical equipment.
Take precautionary measure against static discharge.
Ground and bond container and receiving equipment.
Do not breathe vapors.
Wear Protective gloves.
Do not eat, drink or smoke when using this product.
Wash hands thoroughly after handling.
Dispose of in accordance with local, regional, national, international regulations as specified.

In Case of Fire: use dry chemical (BC) or Carbon dioxide (CO_2) fire extinguisher to extinguish.

First Aid
If exposed call Poison Center.
If on skin (on hair): Take off immediately any contaminated clothing. Rinse skin with water.

HAZARD PICTOGRAMS

SIGNAL WORD

Danger

HAZARD STATEMENT

Highly flammable liquid and vapor.
May cause liver and kidney damage.

SUPPLEMENTAL INFORMATION

Directions for use

_____
_____
_____

Fill weight: _____ Lot Number _____
Gross weight: _____ Fill Date: _____
Expiration Date: _____

Hazard Communication Safety Data Sheets

The Hazard Communication Standard (HCS) requires chemical manufacturers, distributors, or importers to provide Safety Data Sheets (SDSs) (formerly known as Material Safety Data Sheets or MSDSs) to communicate the hazards of hazardous chemical products. As of June 1, 2015, the HCS will require new SDSs to be in a uniform format, and include the section numbers, the headings, and associated information under the headings below:

Section 1, Identification includes product identifier; manufacturer or distributor name, address, phone number; emergency phone number; recommended use; restrictions on use.

Section 2, Hazard(s) identification includes all hazards regarding the chemical; required label elements.

Section 3, Composition/information on ingredients includes information on chemical ingredients; trade secret claims.

Section 4, First-aid measures includes important symptoms/ effects, acute, delayed; required treatment.

Section 5, Fire-fighting measures lists suitable extinguishing techniques, equipment; chemical hazards from fire.

Section 6, Accidental release measures lists emergency procedures; protective equipment; proper methods of containment and cleanup.

Section 7, Handling and storage lists precautions for safe handling and storage, including incompatibilities.

Section 8, Exposure controls/personal protection lists OSHA's Permissible Exposure Limits (PELs); Threshold Limit Values (TLVs); appropriate engineering controls; personal protective equipment (PPE).

Section 9, Physical and chemical properties lists the chemical's characteristics.

Section 10, Stability and reactivity lists chemical stability and possibility of hazardous reactions.

Section 11, Toxicological information includes routes of exposure; related symptoms, acute and chronic effects; numerical measures of toxicity.

Section 12, Ecological information*

Section 13, Disposal considerations*

Section 14, Transport information*

Section 15, Regulatory information*

Section 16, Other information, includes the date of preparation or last revision.

*Note: Since other Agencies regulate this information, OSHA will not be enforcing Sections 12 through 15(29 CFR 1910.1200(g)(2)).

Employers must ensure that SDSs are readily accessible to employees.
See Appendix D of 1910.1200 for a detailed description of SDS contents.

For more information: www.osha.gov

OSHA

(800) 321-OSHA (6742)

U.S. Department of Labor

Hazard Communication Standard GHS TERMS

Hazard statement(s):

Describes the nature of the hazard(s) of a chemical, including, where appropriate, the degree of hazard. For example: "Causes damage to kidneys through prolonged or repeated exposure when absorbed through the skin." All of the applicable hazard statements must appear on the label. Hazard statements may be combined where appropriate to reduce redundancies and improve readability. The hazard statements are specific to the hazard classification categories, and chemical users should always see the same statement for the same hazards, no matter what the chemical is or who produces it.

Signal word:

Used to indicate the relative level of severity of hazard and alert the reader to a potential hazard on the label. There are only two signal words, **"Danger"** and **"Warning."** Within a specific hazard class, **"Danger"** is used for the more severe hazards and **"Warning"** is used for the less severe hazards. There will only be one signal word on the label no matter how many hazards a chemical may have. If one of the hazards warrants a **"Danger"** signal word and another warrants the signal word **"Warning,"** then only **"Danger"** should appear on the label.

Product identifier:

How the hazardous chemical is identified. This can be (but is not limited to) the chemical name, code number or batch number. The manufacturer, importer or distributor can decide the appropriate product identifier. The same product identifier must be both on the label and in Section 1 of the SDS (Identification).

Precautionary Statement(s):

Means a phrase that describes recommended measures that should be taken to minimize or prevent adverse effects resulting from exposure to a hazardous chemical or improper storage or handling.