



CHEMICAL HYGIENE PLAN

MiraCosta College
Chemical Hygiene Plan
2 F W R E H U

I. Purpose

The California Occupational Safety and Health Administration (Cal/OSHA) under Title 8 California Code of Regulations (CCR) General Industry Safety Orders (GISO) §5191 has promulgated a standard entitled, Occupational Exposure to Hazardous Chemicals in Laboratories, which applies to all laboratories that use hazardous chemicals. This section defines a Chemical Hygiene Plan (CHP) as a written program developed and implemented by an employer 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 work place and meets the requirements of subsection §5191(e). It specifies that a written chemical hygiene plan must be developed and implemented that includes the necessary work practices, procedures, and policies to ensure that employees are protected from hazardous laboratory chemicals. As required by Cal/OSHA, [CCR §5191](#). Occupational Exposure to Hazardous Chemicals in Laboratories, this Chemical Hygiene Plan (CHP) has been prepared for use by all employees em. poliem. pol

III. Responsibility

D. Chemical Hygiene Officer

The Chemical Hygiene Officer (CHO) is in charge of reviewing the CHP annually to determine whether or not the content is still effective and valid and shall give recommendations for updating the CHP. The CHO shall provide technical guidance to employees at all levels of responsibility on matters pertaining to laboratory safety.

Responsibilities include, but are not limited to:

- 1) Perform hazard assessment of overall operations to determine the appropriate safety control requirements which include laboratory practices, Personal Protective Equipment (PPE), engineering controls, and training.
- 2) Review industrial hygiene monitoring data and reports for evidence of employee exposure and/or equipment contamination.
- 3) Review and approve Standard Operating Procedures (SOP).
- 4) Review chemical inventories from departments and facilities that house hazardous substances. Assist as needed with the MSDS Online SDS system.
- 5) Determine medical surveillance requirements of employees, such as pulmonaryeviem.to(h i)2

- 8) Access to the CHP online and in written form available in the workplace.
- 9) Maintain records of health and safety training of laboratory employees, annual general laboratory inspections, visually inspecting fire extinguishers monthly, annual fume hood surveys, and annual biological safety cabinet (BSC) certification. Maintain copies of training records. Records must be kept for a minimum of 5 years.
- 10) General laboratory safety / housekeeping inspections shall be performed annually.
- 11) Personal Protection Equipment (PPE) shall be inspected on a regular basis for adequate use and condition.
- 12) Dangerous activities, unsafe conditions, unsafe behavior, and any accidents should be reported immediately to the District Risk Management Officer, in emergency situations College Police at

- a. Contact Facilities immediately at X6875 for assistance and guidance with waste water cleanup after the event.

F. Custodial & Maintenance Staff

District Custodial and Maintenance Staff assigned to buildings with laboratory activities involving hazardous substances are responsible for, but are not limited to:

- 1) Attend Hazard Communication training, which familiarizes those individuals with potential hazards of performing normal work tasks in a laboratory setting.
- 2) Actively participate in trainings and assessments presented by the District.
- 3) Report unsafe conditions to immediate supervisor.

IV. Laboratory Safety Inspections

The District has implemented the following inspections based on regulatory requirements. The CHO, or designee, shall confirm these inspections are completed as outlined. The use of the Laboratory Safety Checklist (see Appendix A page 33) is encouraged.

- 1) Emergency eyewash stations and deluge showers testing shall be performed and documented monthly to ensure proper operation.
- 2) Fume hood ventilation rate surveys shall be conducted annually by an external fume hood service provider. Ventilation rate surveys shall also be conducted after any changes have been made to the ventilation system and/or other engineering controls that affect airflow.
- 3) General laboratory safety / housekeeping inspections shall be performed annually.
- 4) PPE shall be inspected on a regular basis for adequate use and condition.

V. Recordkeeping

Records must be kept for a minimum of five (5) years by the District. Copies of employee trainings and safety inspections/testing should be available to the District Risk Management Officer.

~~Records shall include (a) 82 (b) 61 (c) 5063351310579 (a) (3-1) 8090 ad 12(0)281705 and Annual~~

- 2) Unauthorized persons should not be allowed in the laboratory.
- 3) Report unsafe conditions to the CHO immediately.
- 4)

C. Housekeeping

- 1) Work areas should be kept clean and uncluttered.
- 2) Equipment and supplies should be returned to their appropriate area after the lab session/class has finished.
- 3) Dry any wet floors to prevent slips and falls.
- 4) Keep aisles, walking areas, pathways to emergency equipment clear of any obstacles.
- 5) Do not clutter work area with unnecessary supplies/materials.

D. Laboratory Equipment

- 1) Equipment should only be used for its intended purpose.
- 2) All Faculty and Staff shall receive training and learn how to use the equipment prior to the first date of use.

SDSs are structured documents that follow the American National Standards Institute (ANSI) standardized SDS format and include the following 16 sections:

Section 1 gives details on what the chemical or substance is, Chemical Abstracts Service (CAS) number, synonyms, the name of the company issuing the data sheet, and often an emergency contact number.

Section 2 identifies the OSHA hazardous ingredients and

Section 15 outlines the regulatory information for the chemical. The hazard codes for the chemical are given along with principle hazards associated with the chemical. A variety of country and/or state specific details may be given.

Section 16 provides additional information such as the label warnings, preparation and revision dates, name of the person or firm that prepared the SDS, disclaimers, and references used to prepare the SDS.

B. Chemical Labeling

All chemicals and reagents must be labeled in accordance with the Globally Harmonized System of Classification and Labeling of Chemicals (GHS). No employee will use, store, or allow any other person to use or store any hazardous substance in a laboratory if the container (including bags, barrels, bottles, boxes,

All secondary containers shall be labeled with the following identifiers:

- x Chemical name (as it appears on the SDS)
- x Name of chemical manufacturer or person who prepared the solution
- x Necessary handling and hazard information
- x Concentration or purity
- x Date prepared
- x Expiration or "use by" date
- x National Fire Protection Association (NFPA) code (not required)
- x Common name (not required).

Any chemicals that are prepared or produced in the laboratory require special consideration:

- x If the chemical substance is produced exclusively for the laboratory's own use, the CHO, in conjunction with the Department Chair and Faculty, will determine if it is hazardous. The SDS should always be the guiding source for chemical substances.
- x If the chemical substance is produced as a byproduct whose composition is not known, it shall be assumed to be hazardous.

3) Containers in Immediate Use

Chemicals and reagents to be used within a 2-week period should be labeled as follows:

- x Chemical name (as it appears on the SDS)
- x Necessary handling and hazard information

4) Waste Containers

All containers used for chemical waste should be labeled in accordance with the District Waste Management Program.

C. Chemical Storage

Chemicals should be stored in designated facilities with ample routes of access, plenty of space for storage, and have chemicals segregated based on their compatibilities.

[CCR §5164. Storage of Hazardous Substances.](#)

In general, Safety Data Sheets (SDSs) are the best source for proper storage guidance and chemical incompatibility. (See Section VII. A.) The following are general guidelines.

1) Compressed Gases

- x Store away from external heat sources and away from falling objects that may cause damage
- x Store upright and secured to a wall or post with valve protection caps
- x Oxygen cylinders will be segregated from flammable gas cylinders by at least 20 feet by a non-combustible wall 5 feet high
- x Oxygen storage areas will be clearly marked "Oxidizer"

- x Flammable gas cylinder storage areas will be clearly marked “Flammable Gas” and “No Smoking or Open Flame”
- x Gas cylinders will be marked with “Full” or “Empty”
- x Gas cylinders will be clearly marked with the chemical or trade name
- x Empty cylinders shall not be refilled except by suppliers
- x All connecting hoses, couplings, and regulators shall be regularly inspected
- x Check valves/traps shall be installed in the discharge line to prevent back flow into the cylinder
- x Do not store aerosols in areas where temperatures may exceed 120° F

2) Cryogenics

- x Store cryogenic chemicals (e.g. liquid nitrogen) per manufacturer recommendations
- x Use appropriate PPE when dispensing, such as a face shield with goggles, cryogenic apron, and cryogenic protective gloves
- x If accidental exposure, immediately rinse the skin with warm water for 15 minutes and then seek medical attention

3) Corrosive Liquids

- x Store corrosives in a dedicated cabinet within a well-ventilated area
- x Small quantities of corrosives can be stored on polyethylene shelves or ceramic trays that can contain spills/leaks
- x Create spill containment barriers for storing bulk corrosives
- x Acids will be segregated from substances they are reactive with (metals, oxides, cyanates, fluorides, hydroxides, amines, carbonates, and sulfides)
- x Oxidizing acids will be segregated from organic acids and flammable substances
- x Nitric acid will be segregated from other acids and bases
- x Always wear splash proof goggles and the appropriate gloves when handling corrosives
- x Areas that contain large quantities of corrosives shall be equipped with eyewash stations and deluge showers
- x Corrosives should not be stored at or above eye level

4) Flammable Liquids

- x Store in a well-ventilated area away from oxidizers and other sources of heat and ignition
- x Store in covered, flammable storage cabinets with self-closing doors
- x Never use air pressure to remove liquids from a drum or tank
- x Provide spill containment equipment and material near storage areas
- x All flammable liquid storing areas should be identified with signs and symbols
- x Flammable liquids should not be dispensed from containers greater than 4 liters
- x Use only approved safety cans or media bottles to dispense flammable liquids
- x Fire extinguishers (Class A, B, C) should be readily accessible to employees without subjecting the employees to possible injury and so that the travel distance from the Class B hazard area to any extinguisher is 50 feet or less. [CCR §6151. Portable Fire Extinguishers](#)
- x Flammable storage areas should be clearly marked “No Smoking or Open Flame”

5) Oxidizers

- x Store in a well-ventilated area
- x Keep away from combustibles, organic matter, reducing agents, and sources of heat or ignition
- x Keep oxygen canisters free of oil, grease, dirt, or other contaminants

6) Peroxides

- x Peroxides and peroxide forms must be clearly labeled with pertinent information including the date opened
- x Peroxide quantities should be limited to the minimum required
- x Unused peroxides should not be returned to the container
- x Spills should be cleaned up immediately
- x Do not use metal utensils to handle peroxides
- x Smoking, open flames, friction, or other heat sources and impact sources should be avoided while using peroxides
- x Store at the lowest possible and appropriate storage temperature
- x Peroxides must be diluted before disposal

7) Reactive Substances

- x Store in a cool, dry, and well-ventilated area
- x Reactive substances should be kept away from sources of heat and ignition
- x Water reactive material should not be stored in a room with an automatic water sprinkler system unless it is certain the material will remain dry
- x Pyrophoric materials such as metals should be segregated from halogenated hydrocarbons, oxidizers, and moisture

8) Solvents

- x Store and use in a cool,

D. Waste Disposal

Disposing hazardous waste appropriately is critical toward protecting Faculty and Staff, waste handlers, and the environment. Hazardous waste is defined as a substance or material that poses a hazard to human health or the environment when handled improperly. Types of hazardous waste include abandoned chemicals, unused chemicals, chemicals stored in deteriorating/shoddy containers, unlabeled chemicals, and containers with different types of labels.

- 1) Use labeled hazardous waste containers and follow the established procedures for waste control/reduction. Refer to [UPENN Laboratory Chemical Waste Management Guidelines](#) for more details.

VIII. Employee Training

Laboratory Faculty, Staff, student workers, and volunteers shall be trained, as appropriate for their discipline and role, to ensure that they are aware and knowledgeable of the chemical hazards with which they work. General trainings on lab safety, chemical handling, chemical spills, PPE, and more are available through the District Risk Management Officer. Laboratory specific training is the responsibility of the department under direction from the CHO, who may delegate the actual training to third-party providers. The CHO should contact the

There are three different classes of BSCs which are not directly related to the Biological Safety Levels (BSLs) required for the microbiological agent being used. Generally, Class I and Class II cabinets can be used for work at BSLs 1 to 3. Class III cabinets are usually reserved for work at BSL4, although a Class II cabinet can be used at this level if the appropriate PPE is used.

- Class I BSC: A ventilated cabinet for Faculty and Staff and environmental protection with non-recirculated inward airflow away from the user. The cabinet exhaust air is HEPA filtered before it is discharged to the outside atmosphere. This cabinet resembles a chemical fume hood with a filtered exhaust and is suitable for work with low and moderate risk biological agents where no product protection is required.
- Class II BSC: A ventilated cabinet for Faculty and Staff, product and environmental protection having (1) an open front with inward airflow for user protection, (2) downward HEPA-filtered; laminar airflow for product protection, and (3) HEPA- filtered exhausted air for environmental protection. Class II cabinets are suitable for low- and moderate-risk biological agents. There are four recognized types of Class II biosafety cabinets that are widely used. These are Class II types: A, B1, B2, and B3. The nature

- 3) Corrosive Storage Cabinets are made of polyethylene, 18-gauge steel powder coated, HDPE, or wood laminate to prevent hazardous leakage of corrosive acids and/or bases.

D. Chemical Fume Hood

A fume hood is a local exhaust device whose primary purpose is to protect the operator from hazards of airborne chemical contaminants. The secondary purpose is to protect people and property against small fires and explosions. The fume hood must be used properly to allow it to function correctly and remove contaminants from the breathing area of the user.

Operators of the fume hood should check the area daily for visible blockage of airflow. Large items or numerous containers can impede the flow of air. Airflow monitor devices should be observed before each use to check that the hood is functioning. If the hood does not contain a monitor, place a tissue paper strip at the o

E. Electrical Extension Cords

The National Electric Code (NFPA 70) prohibits the use of extension cords as a substitute for permanent wiring. Multiple plug outlet adapters are also prohibited. If additional electrical outlets are needed in a work area, the department can request to have additional outlets installed by Facilities Department. However, power strips with covered outlets and a fuse are acceptable.

F. Emergency Eyewash and Deluge Shower

Eyewash stations and deluge showers are installed in or near laboratories, chemical preparation areas, or chemical storage areas in case of a chemical emergency as required under:

American National Standards Institute (ANSI) Standard Z358.1-2014 "Emergency Eyewash and Shower Equipment". (Also, Cal/OSHA General Industry Safety Orders §5162. Emergency Eyewash and Shower Equipment.)

Safety showers and eyewash stations are tested periodically (monthly) for use and effectiveness. Additionally, all laboratory Faculty and Staff are trained in the proper use of the shower and eyewash stations. Laboratory Faculty and Staff should

and accident SOPs may be created within the District and submitted for approval to the District Risk Management Officer.

A. Spill Plans and Spill Kits

The CHO should develop a spill plan appropriate for each department's chemical exposures. Start by reviewing the chemical inventory list to identify hazards of chemicals used and stored in their building or area. Purchase or assemble spill kit(s) appropriate for the chemicals used and stored in each area. Consider special needs for air and water reactive reagents, bases, corrosives, poisons, and toxic chemicals. Post emergency contact information or call lists at a central location(s) within the building. Post a hazardous materials spill guide at an easily accessible location in the work area. Train lab occupants on area spill procedures and exit routes. Review and update plan as needed.

Spill kit supplies may be purchased from district Procurement approved vendors. It is important

After calling in emergency, notify your direct supervisor. Emergencies may include ambulance, evacuation, explosion, fire, police, rescue, etc.

2) Major Spill: Call College Police emergency line at X6911 immediately.

A major spill is one that spreads rapidly, presents inhalation or fire hazards, has entered the environment, or exceeds the capability of the user to respond. Steps to follow in the event of a major spill, after College Police is called at X6911:

- x Attend to injured or contaminated individuals after donning the appropriate PPE and remove them from the exposure
- x Alert others to leave spill area and close doors to affected area(s)
- x Remove ignition sources, shut down equipment, close fume hood sash and open windows, as appropriate
- x Assemble at a safe distance and location from exposure
- x Provide necessary information and SDS documents to emergency Faculty and Staff and affected individuals
- x Call supervisor to report an incident
- x The CHO will complete the Environmental Release or Spill Incident Reporting Form (Appendix D) page 42

3) Minor Spill/Non-emergency situation:

Notify direct supervisor and follow spill procedures given above.

4) Environmental Release and OHS

6) Explosion and Fire

- x General Response Actions: Alert other Faculty and Staff in the lab or work area immediately and notify College Police. Quickly determine if means are available to extinguish fire. If none are available, then vacate the area and activate the nearest building fire alarm.
- x Small Fire Actions: Relatively small fires (no larger than an office waste basket), may be extinguished immediately using the nearest fire extinguisher appropriate for the type of fuel burning. Fire extinguishers should be used only by individuals trained in the extinguisher operation. When using a fire extinguisher, aim the nozzle at base of fire and apply agent on flame using a side-to-side sweeping motion. Always maintain accessible exit and avoid smoke or fumes. Ventilate the area after the fire has been extinguished. Call College Police and report incident to your direct supervisor.

The four classes of extinguishers are:

Class A: ordinary combustible solids such as paper, wood, coal, rubber, and textiles

Class B: petroleum hydrocarbons (e.g. diesel fuel, motor oil, and grease)

Class C: electrical equipment

Class D: combustible or reactive metals (e.g. sodium, potassium, metal hydrides, and organometallics)

- x Large Fire Actions: If a large fire erupts, activate the nearest fire alarm and alert people to evacuate. Close doors to confine fire. Evacuate the building immediately, then call College Police emergency line

x After a Power Outage:

- Throw away any food that has been exposed to temperatures above 40°F (4°C) for 2 hours or more or that has an unusual odor, color, or texture. When in doubt, throw it out.
- Restock your emergency kit with fresh batteries and other supplies

10) Radioactive Material:

Notify your supervisor, the CHO, and the District Risk Management Officer of all radioactive material spills and instances of personal contamination as soon as possible.

D. Spill Training & Spill Minimization

1) Spill training criteria. Spill training should include the following:

- x Recognition (sight, smell, alarms, etc.)
- x Fire aid for chemical injuries that may occur in your area
- x Handling emergencies (notification, action)
- x Prevention and containment (secondary containment, spill limitation)
- x Clean-up (PPE, use of equipment, preventing damages, etc.)

- x Supervisors shall immediately notify the District Risk Management Officer regarding any work-related accident/incident that results in injury/illness to an employee. This can be done in-person at Location T116, by phone call to Risk Management X6866 or

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m gas manifold)				Click or tap here to enter text.
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PROCEDURES	Y	N	N/A	COMMENTS
sted				Click or tap here to enter text.
Waste Management & other accessible to all lab Faculty				Click or tap here to enter text.

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29) A

50) Eyewashes & showers accessible within 10 seconds travel				Click or tap here to enter text.
51) Eyewashes & showers free of obstructions				Click or tap here to enter text.
52) Eyewashes routinely flushed & record kept				Click or tap here to enter text.
EMERGENCY KITS	Y	N	N/A	COMMENTS
53) Lab has access to chemical and/or biological spill kits				Click or tap here to enter text.
54) Lab staff have access to a fully stocked first-aid kit & training on first aid				Click or tap here to enter text.
EXIT ACCESS/CORRIDORS	Y	N	N/A	COMMENTS
55) Aisles and exits within the lab space are free of clutter and obstructions				Click or tap here to enter text.
56) Corridors and exits free of obstruction and hazardous materials				

70) Lab coats are regularly laundered				Click or tap here to enter text.
MACHINERY	Y	N	N/A	COMMENTS
71) All hazardous pieces of machinery are mounted or secured to prevent movement or tipping				Click or tap here to enter text.
72) All points of operation, rotating components, and other moving parts of machinery are properly guarded to prevent injury				Click or tap here to enter text.
73) Lab equipment with potential hazards are routinely inspected and maintained or services as recommended by manufacturer				Click or tap here to enter text.
PERSONAL PROTECTIVE EQUIPMENT	Y	N	N/A	COMMENTS

90) Safety training completed and documented for all lab staff, including chemical/biological spills overview				Click or tap here to enter text.
91) Lab specific training completed and documented				Click or tap here to enter text.
VENTILATION	Y	N	N/A	COMMENTS
92) Processes that emit vapors, gases, or fumes are adequately captured	0.48	0.7296	0.009	

APPENDIX B: SAMPLE CONTAINER LABEL

The illustration below identifies the components of a GHS label as described in Section VII of this plan. The GHS hazard pictograms, signal word and hazard statements should be located together on the label. Actual label design and layout may vary and

APPENDIX C: Cal/OSHA List of Acutely Hazardous Chemicals, Toxics and Reactives

The following contains a listing of toxic and reactive highly hazardous chemicals which present a potential for a catastrophic event at or above the threshold quantity (TQ).

<https://www.dir.ca.gov/title8/5189a.html>

CHEMICAL NAME	CAS*	TQ**
Acetaldehyde	75-07-0	2500
Acrolein (2		

Dichloro Acetylene	7572-29-4	250
Dichlorosilane	4109-96-0	2500
Diethylzinc	557-20-0	10000
Diisopropyl Peroxydicarbonate	105-64-6	7500
Dilaluroyl Peroxide	105-74-8	7500
Dimethyldichlorosilane	75-78-5	1000
Dimethylhydrazine, 1,1-	57-14-7	1000
Dimethylamine, Anhydrous	124-40-3	2500
2,4-Dinitroaniline	97-02-9	5000
Ethyl Methyl Ketone Peroxide (also Methyl Ethyl Ketone Peroxide; concentration >60%)	1338-23-4	5000
Ethyl Nitrite	109-95-5	5000
Ethylamine	75-04-7	7500

Nitric Acid (94.5% by weight or greater)	7697-37-2	500
Nitric Oxide	10102-43-9	250
Nitroaniline (para Nitroaniline)	100-01-6	5000
Nitromethane	75-52-5	2500
Nitrogen Dioxide	10102-44-0	250
Nitrogen Oxides (NO; NO ₂ ; N ₂ O ₄ ; N ₂ O ₃)	10102-44-0	250
Nitrogen Tetroxide (also called Nitrogen Peroxide)	10544-72-6	250
Nitrogen Trifluoride	7783-54-2	5000
Nitrogen Trioxide	10544-73-7	250
Oleum (65% to 80% by weight; also called Fuming Sulfuric Acid)	8014-95-7	1,000
Osmium Tetroxide	20816-12-0	100
Oxygen Difluoride (Fluorine Monoxide)	7783-41-7	100
Ozone	10028-15-6	100
Pentaborane	19624-22-7	100
Peracetic Acid (concentration >60% Acetic Acid; also called Peroxyacetic Acid)	79-21-0	1000
Perchloric Acid (concentration >60% by weight)	7601-90-3	5000
Perchloromethyl Mercaptan	594-42-3	150
Perchloryl Fluoride	7616-94-6	5000
Peroxyacetic Acid (concentration >60% Acetic Acid; also called Peracetic Acid)	79-21-0	1000
Phosgene (also called Carbonyl Chloride)	75-44-5	100
Phosphine (Hydrogen Phosphide)	7803-51-2	100
Phosphorus Oxychloride (also called Phosphoryl Chloride)	10025-87-3	1000
Phosphorus Trichloride	7719-12-2	1000
Phosphoryl Chloride (also called Phosphorus Oxychloride)	10025-87-3	1000
Propargyl Bromide	106-96-7	100
Propyl Nitrate	627-3-4	2500
Sarin	107-44-8	100
Selenium Hexafluoride	7783-79-1	1000
Stibine (Antimony Hydride)	7803-52-3	500
Sulfur Dioxide (liquid)	7446-09-5	1000
Sulfur Pentafluoride	5714-22-7	250
Sulfur Tetrafluoride	7783-60-0	250
Sulfur Trioxide (also called Sulfuric Anhydride)	7446-11-9	1000
Sulfuric Anhydride (also called Sulfur Trioxide)	7446-11-9	1000
Tellurium Hexafluoride	7783-80-4	250
Tetrafluoroethylene	116-14-3	5000
Tetrafluorohydrazine	10036-47-2	5000
Tetramethyl Lead	75-74-1	1000

APPENDIX D: ENVIRONMENTAL RELEASE OR SPILL INCIDENT REPORTING FORM

[San Diego County Spills and Release Reporting](#)