Hazard Communication Program

“Right to Know”

Lamar Institute of Technology

LAMAR INSTITUTE OF TECHNOLOGY
June 2025
Office of Campus Safety
Howard TC Bldg Office 114 / (409) 257-0073

Contents

Policy

This Hazard Communication Plan is intended to meet the requirements of the RMTSA Guidelines, Volume III, Section Two, Chapter 7.12: Texas Health and Safety Code, Chapter 502, Texas Hazard Communication Act; OSHA, 29 CFR 1910.1200 (e) (1).

The Texas Hazard Communication Act (THCA), codified as Chapter 502 of the Texas Health and Safety Code, requires all public employers in Texas to provide their employees with information regarding hazardous chemicals to which employees may be exposed in their workplace. In order to comply with THCA Section 502.009(b) and Section 295.7(a) of the THCA Rules (Title 25 of the Texas Administrative Code (TAC)), Section 295.1 – 295.13), the following written Hazard Communication Program (hereafter known as the HCP) has been established for the college.

Purpose

OSHA 1910.1200(a)(1) sets forth "*to ensure that the hazards of chemicals produced or imported by chemical manufacturers or importers are evaluated, and that information concerning their hazards is transmitted to affected employers and employees. The transmittal of information is to be accomplished by means of comprehensive HCPs, which are to include container labeling and other forms of warning, safety data sheets (SDS) and personnel training.*"

This program, as well as the regulation, is otherwise referred to as the "*Right to Know Law*", which in effect is designed to provide knowledge, warning, protection and training to employees who may be exposed to hazardous chemicals and materials.

Definitions

Chemical Name is the scientific designation of a chemical in accordance with the nomenclature system developed by the International Union of Pure and Applied Chemistry (IUPAC) or the Chemical Abstracts Service (CAS) rules of nomenclature, or a name that will clearly identify the chemical for the purpose of conducting a hazard classification.

Classification Identifies the relevant data regarding the hazards of a chemical; reviews that data to ascertain the hazards associated with the chemical; and decides if the chemical will be classified as hazardous according to the definition of hazardous chemical in this section. In addition, classification for health and physical hazards includes the determination of the degree of hazard, where appropriate, by comparing the data with the criteria for health and physical hazards.

Combustible Dust is finely divided solid particulates of a substance or mixture that pose a flash-fire hazard or explosion hazard when dispersed in air or other oxidizing media.

Common Name is any designation of identification, such as a code name, code number, trade name, brand name, or generic name, used to identify a chemical other than by its chemical name.

Container is any bag, barrel, bottle, box, can, cylinder, drum, reaction vessel, storage tank, or the like that contains a hazardous chemical. For purposes of this section, pipes or piping systems, and engines, fuel tanks, or other operating systems in a vehicle, **are not** considered to be containers.

Exposure or ***Exposed*** means that an employee is subjected to a hazardous chemical in the course of employment through any route of entry, including inhalation, ingestion, skin contact, or absorption. The term includes potential, possible, or accidental exposure under normal conditions of use or in a reasonably foreseeable emergency.

Hazard Category is the division of criteria within each hazard class, e.g., oral acute toxicity and flammable liquids and include four hazard categories. These categories compare hazard severity within a hazard class and should not be taken as a comparison of hazard categories more generally.

Hazardous Chemical is any chemical which is classified as a physical hazard or a health hazard, a simple asphyxiant, combustible dust, or hazard not otherwise classified.

Hazard Class is the nature of the physical or health hazards, e.g., flammable solid, carcinogen, oral acute toxicity.

Hazard *N*ot *O*therwise *C*lassified (HNOC) is an adverse physical or health effect identified through evaluation of scientific evidence during the classification process that does not meet the specified criteria for the physical and health hazard classes addressed in this section. This does not extend coverage to adverse physical and health effects for which there is a hazard class addressed in this section, but the effect either falls below the cut-off value/concentration limit of the hazard class or is under a GHS hazard category that has not been adopted by OSHA (e.g., acute toxicity Category 5).

Hazard Statement is 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.

Hazardous Substance in this plan is any hazardous chemical or mixture of hazardous chemicals that has not been declared as waste (and thus regulated under 42 U.S.C. Section 6901 et seq as a hazardous waste).

Hazardous Waste is the waste form of a *hazardous substance* that is, a substance that will, or may, result in adverse effects on the health or safety of employees; a solid waste, or combination of solid wastes, which because of its quantity, concentration, or physical, chemical, or infectious characteristics may:

(a) cause, or significantly contribute to an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness; or
(b) pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of, or otherwise managed.

Health Hazard has the meaning given that term by the OSHA standard (29 CFR 1910.1200(c)(iii); a chemical which is classified as posing one of the following hazardous effects: acute toxicity (any route of exposure); skin corrosion or irritation; serious eye damage or eye irritation; respiratory or skin sensitization; germ cell mutagenicity; carcinogenicity; reproductive toxicity; specific target organ toxicity (single or repeated exposure); or aspiration hazard. The criteria for determining whether a chemical is classified as a health hazard are detailed in Appendix A to § 1910.1200—Health Hazard Criteria.

Generator is any person who produces a hazardous waste as listed or characterized in part 261 of title 40 of the Code of Federal Regulations (CFR). The EPA has established three categories of generators based on the volume of hazardous waste each generator produces in a calendar month:

(a) Large Quantity Generators (LQG): Unlimited quantities
(b) Small Quantity Generators (SQG): 100 to 1000 kilos/month
(c) Conditionally Exempt Small Quantity Generators (CESQG): Less than 100 kilos/month *(This is the status held by the College.)*

Label an appropriate group of written, printed or graphic information elements concerning a hazardous chemical that is affixed to, printed on, or attached to the immediate container of a hazardous chemical, or to the outside packaging.

Mixture a combination or a solution composed of two or more substances in which they do not react.

Personal Protective Equipment is equipment worn to minimize exposure to hazards that cause serious workplace injuries and illnesses. These injuries and illnesses may result from contact with chemical, radiological, physical, electrical, mechanical, or other workplace hazards. Personal protective equipment may include items such as gloves, safety glasses and shoes, earplugs or muffs, hard hats, respirators, or coveralls, vests, and full body suits.

Physical Hazard is a chemical that is classified as posing one of the following hazardous effects: explosive; flammable (gases, liquids, or solids); aerosols; oxidizer (gases, liquids, or solids); self-reactive; pyrophoric (liquid or solid); self-heating; organic peroxide; corrosive to metal; gas under pressure; in contact with water emits flammable gas; or desensitized explosive. The criteria for determining whether a chemical is classified as a physical hazard are detailed in OSHA 1910.1200 Appendix B.

Pictogram is a composition that may include a symbol plus other graphic elements, such as a border, background pattern, or color, which is intended to convey specific information about the hazards of a chemical. Eight pictograms are designated under this standard for application to a hazard category.

Precautionary Statement is 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.

Product Identifier is the name or number used for a hazardous chemical on a label or in the SDS. It provides a unique means by which the user can identify the chemical. The product identifier used shall permit cross-references to be made among the list of hazardous chemicals required in the written hazard communication program, the label and the SDS.

Responsible Party is someone who can provide additional information on the hazardous chemical and appropriate emergency procedures, if necessary.

Safety Data Sheet (SDS) is a document containing chemical hazard and safe handling information that is prepared in accordance with the requirements of OSHA 1910.1200(g).

Signal Word is a word used to indicate the relative level of severity of hazard and alert the reader to a potential hazard on the label. The signal words used in this section are "danger" and "warning." "Danger" is used for the more severe hazards, while "warning" is used for the less severe.

Specific Chemical Identify is the chemical name, Chemical Abstracts Service (CAS) Registry Number, or any other information that reveals the precise chemical designation of the substance.

Substance is a chemical element and their compounds in the natural state or obtained by any production process, including any additive necessary to preserve the stability of the product and any impurities deriving from the process used, but excluding any solvent which may be separated without affecting the stability of the substance or changing its composition.

Trade Secret is any confidential formula, pattern, process, device, information, or compilation of information that is used in an employer's business, and that gives the employer an opportunity to obtain an advantage over competitors who do not know or use it. Appendix E to § 1910.1200—Definition of Trade Secret, sets out the criteria to be used in evaluating trade secrets.

Work Area is a room, a defined space, a utility structure, or an emergency response site in a workplace where hazardous chemicals are present, produced, or used and where employees are present.

Workplace is an establishment, job site, or project, at one geographical location containing one or more work areas, with or without buildings, which is staffed 20 or more hours a week.

Responsibility

To facilitate administration of and compliance with the HCP, the following levels of responsibility have been established:

A. A Hazard Communication Program Administrator (HCPA) shall be designated and will have the responsibility for the HCP.

   1. HCPA will be responsible for the initiation of the program.
   2. HCPA will be responsible for the annual update of the program.

B. Departmental Hazard Communication Coordinators (DHCC) will be appointed and report information regarding the HCP in their respective departments to the HCPA. DHCCs will be responsible for the following:

   1. To provide an initial inventory list of chemicals classified as hazardous and to update that list as needed when new chemicals are purchased.
   2. To provide electronic copies of SDSs of hazardous chemicals on the list to the HCPA.
   3. To update the SDS binders when new chemicals are purchased and provide an electronic copy of the SDSs to the HCPA.
   4. To make sure all chemicals are labeled in compliance with the standards outlined in the Labels section of this HCP.
   5. To notify the HCPA throughout the year of any changes to the inventory list and provide an updated inventory list as changes are made.
   6. To disseminate and maintain the SDS binders in their work areas.
   7. To collect and provide the HCPA with a list or packet of the lab experiments that each course will perform during the academic year. This includes the experiments themselves, the chemicals and materials that will be used in the experiment, and the safety protocols in place for the experiment for both the instructor and the students.

C. All personnel will fully participate in the program as it may apply to their work area and work responsibility.

D. The written HCP for each department with its associated inventory list, records, materials, etc., will be maintained, located and readily accessible in the HCP binder in the department.

E. The DHCC shall ensure that all labs on campus – regardless of type – shall have signage posted on their doors with the name and contact information for the instructor, lab manager(s), and lab assistant(s).

Safety Data Sheets (SDS)

Each department shall maintain a legible copy of a current SDS for each hazardous chemical purchased, stored, or used in their work area. If the department does not have a current SDS for a hazardous chemical when the chemical is received at the workplace, the department shall request an SDS in writing from the manufacturer or distributor in a timely manner or, shall otherwise obtain a current SDS.

SDS will be verified as the most up-to-date version annually by the DHCC.

SDS binders shall be readily available and easily accessible for review and use by employees, students or designated representatives at each work area or storage area where hazardous chemicals are present. They shall be clearly labeled on their spine and front cover.

In general, SDSs are located much more quickly on the web because of the ease of searching various synonyms and common names.

However, read literally, both the OSHA Hazard Communication Standard and the Texas Hazard Communication Act seemingly require a paper copy be on hand.

For this reason and various others, **SDSs shall be printed out and maintained up to date primarily in SDS binders for all hazardous chemicals on campus, regardless of quantity**.

Labels

Primary Container Labels

College faculty and staff will not use, store, or allow any other person to use or store any hazardous substance on campus if the primary container (including bags, barrels, bottles, boxes, cans, cylinders, drums, and reaction vessels) does not meet the following labeling requirements in OSHA's Hazard Communication Standard [29 CFR 1910.1200(f)(1)]:

A. Product Identifier – Same as product identifier on SDS
B. Signal Word – Either 'Danger' or 'Warning' as determined by severity
C. Hazard Statement(s) – Describes the nature and/or degree of the hazard(s)
D. Pictograms – Black hazard symbol on white background with red diamond border
E. Precautionary Statement(s) – Prevention, response, storage, and spill measures
F. Supplier information – Name, U.S. address, and U.S. telephone number of the chemical manufacturer, importer, or other responsible party

Any primary containers found to be lacking a label that follows these requirements shall be reported to the HCPA upon discovery.

Replacement Container Labels

The primary label on a container entering the workplace from a supplier must not be removed, altered, or defaced unless it is illegible, inaccurate, or does not conform to the OSHA standard or other applicable labeling requirement. If the label on a chemical's primary container must be replaced, the new label must contain the same information as the original. Only use labels, ink, and marking that are not soluble in the liquid content of the container.

Exemptions to labeling requirements include food, drugs, pesticides, cosmetics, distilled spirits and consumer products labeled in accordance with the Consumer Product Safety Act.

Secondary Container Labels

Often, laboratory operations require transferring chemicals from the primary container into a secondary container (e.g., beaker, flask, or bottle). Secondary containers require a secondary label if any of the following occur:

A. The material is not used within the work shift of the individual who makes the transfer.

B. The worker who made the transfer leaves the work area – even for a short period of time.

C. The container is moved to another work area and is no longer in the possession of the worker who filled the container.

A blank secondary container label template is provided in the appendix of the HCP. This label requests the following information:

A. the name, CAS number, and percentage of the chemical(s) in the container

B. the owner's name, phone number, and department

C. the building and room where the chemical(s) are located

D. the date prepared and the expiration date of the chemical(s)

E. the hazards present indicated by circling the Signal Word(s) and checking the boxes next to the pictogram(s) that apply

F. any other hazards or information that should be known about the chemical(s) in the "Other" space.

The following rules apply to secondary container labels:

A. No abbreviations or chemical formulas may be used.

B. CAS number and percentage is required on each individual chemical. If there is no CAS number, specify the substance identifier(s) clearly.

C. All information requested on the label MUST be filled out.

D. All GHS pictogram boxes that apply must be checked.

E. All signal words that apply must be circled.

F. If the label is too large for the container, it may be folded at the dotted line.

G. Place the right side of the label on the container first.

H. Fold the label back onto itself at the dotted line.

Secondary Container Labels - continued

I. The label provided can be printed on Avery label sheets and applied in this manner or can be printed on regular paper and taped to the secondary container. Whichever method is used, the label must be affixed in such a manner that ensures it will not come off the container and will remain legible.

Hazardous Waste Labels

Containers holding hazardous waste will follow the same guidelines as the secondary container labels.

The labels must state “HazWaste” in red ink in the top right-hand corner of the label or have a red “HazWaste” sticker affixed just off the upper right corner of the label. Do not obscure any information on the existing label with the placement of the HazWaste sticker or writing.

Labels must be in English; other languages are permitted but only in addition to English.

The DHCC is responsible for ensuring all primary, secondary, and hazardous waste containers are properly labeled.

Chemical Inventory List

Chemical Inventory List for In Use, Storage, and Waste Disposal

The Hazard Communication Act requires the compilation and maintenance of a chemical inventory list that contains the following information for each hazardous chemical in use, in storage, or to be disposed of as waste:

A. the chemical's location (campus, building, room number, and address)

B. the name, phone number, and email for the responsible party

C. the CAS number

D. the chemical name used on the SDS and container label

E. the chemical's supplier name

F. the amount of the chemical (grams, pounds, pints, gallons, etc.)

G. the storage or work area in which the hazardous chemical is normally present or stored

H. the storage code

The DHCC will update the chemical inventory list as necessary and submit it to the HCPA as it is updated.

The chemical inventory list will normally be prepared for each work area or temporary workplace and made readily available to employees and students and their representatives in that area. All employees and students shall be made aware of the chemical inventory list before working with or in a work area containing hazardous chemicals.

The College is required to maintain a chemical inventory list for at least 30 years in accordance with the THCA Sect. 502.005(d).

Chemical Storage Guidelines

General Storage Guidelines

Follow these guidelines for safe chemical storage:

A. Read chemical labels and the SDS for specific storage instructions.

B. Store chemicals in a well-ventilated area; however, do not store chemicals in a fume hood.

C. Date all chemicals when they are received and again when they are opened, with a fine tipped permanent marker or sharpie somewhere it is legible.

D. Maintain an up-to-date inventory of all chemicals in storage.

E. Return chemical containers to their proper storage location after use.

F. Store glass chemical containers so that they are unlikely to be broken. Glass containers should never be stored directly on the floor or on a non-locking wheeled shelf or cart.

G. Store all hazardous chemicals below eye level of the shortest person working in the laboratory.

H. Never store hazardous chemicals in a public area or corridor. Hazardous chemicals must be kept in a secure area.

I. Rolling carts and shelf wheels must be locked any time it is not in motion. Hazardous chemicals should never be stored on a rolling cart or shelf that does not have locking wheels.

Separating and Storing Hazardous Chemicals

In addition to the guidelines above, there are storage requirements for separating hazardous chemicals. Follow these guidelines to ensure that hazardous chemicals are stored safely:

A. Group chemicals according to their hazard category (i.e., corrosives, flammables, acids, toxins, etc.), and keep them separated by some sort of physical barrier (appropriate cabinets, space, etc.).

B. Separate acids from bases and inorganic acids or bases from organic acids or bases. Store these chemicals near floor level. (Storage Color Code White)

C. Isolate perchloric acid from all other chemicals and from organic materials. **Do not store perchloric acid on a wooden shelf or spill paper.**

D. Separate highly toxic chemicals and carcinogens from all other chemicals. **This storage location should have a warning label and should be locked.** (Storage Color Code Blue or Black)

E. Time-sensitive chemicals, such as those that form peroxides, should not be kept longer than twelve months from purchase or six months after opening. **If stratification of liquids, precipitate formation, and/or change in color or texture is noted, contact EHS immediately.**

F. Picric acid must be stored under a layer of liquid, as picric crystals are highly explosive. **If picric acid dries out (forming yellow crystals), do not touch the container! Contact EHS immediately!**

G. Chemicals may be stored in the cabinets underneath a chemical fume hood provided the cabinetry is designed for that use:

1. Cabinetry designed for flammable storage vents into the fume hood exhaust duct.
2. Cabinetry designed for corrosives storage vents directly into the fume hood. **Flammable chemicals should never be stored in corrosive cabinets!**
3. Some cabinetry is only designed for general storage or with a drying rack. **These cabinets are not meant to be used for hazardous chemical storage.**

H. **Flammables should be stored in an approved flammable storage cabinet regardless of whether they are in-use, storage, or waste.** Contact EHS for more information on allowable storage of flammable liquids per NFPA Fire Code. (Storage Color Code Red)

The following table provides examples of incompatible chemicals:

CHEMICAL	INCOMPATIBLE WITH . . .
Acetic acid	Chromic acid, nitric acid, hydroxyl compounds, ethylene glycol, perchloric acid, peroxides, permanganates
Acetylene	Chlorine, bromine, copper, fluorine, silver, mercury
Acetone	Concentrated nitric and sulfuric acid mixtures
Alkali metals	Water, carbon tetrachloride or other chlorinated hydrocarbons, carbon dioxide, halogens

CHEMICAL	INCOMPATIBLE WITH . . .
Ammonia	Mercury, chlorine, calcium hypochlorite, iodine, bromine, hydrofluoric acid
Chlorates	Ammonium salts, acids, powdered metals, sulfur, finely divided organic or combustible materials
Chlorine	Ammonia, acetylene, butadiene, butane, methane, propane (or other petroleum gases), hydrogen, sodium carbide, benzene, finely divided metals, turpentine
Cyanide	Acids
Fluorine	Most other chemicals
Nitrates	Sulfuric acid
Oxygen	Oils, grease, hydrogen, flammable liquids, solids, or gases
Perchloric acid	Acetic anhydride, bismuth and its alloys, alcohol, paper, wood, grease, oils,
Sodium	Carbon tetrachloride, carbon dioxide, water
Sulfides	Acids

Color Coding for Chemical Storage

J. **Red**: Flammable or fire hazard chemicals, such as paints, inks, and other combustible liquids. Store in a segregated area.

K. **Blue**: Health hazard chemicals, such as toxic or poisonous substances that can be absorbed through the skin, ingested, or inhaled. Store in a secure area.

L. **Yellow**: Reactive or oxidizing hazard chemicals, such as those that can react violently with air, water, or other substances. Store away from flammable and combustible materials.

M. **White**: Contact hazard or corrosive chemicals, such as acids or bases that can harm the eyes, skin, or mucous membranes. Store away from red-, yellow-, and blue-coded reagents.

N. **Green Gray or Orange**: Chemicals that present a moderate or slight hazard, such as general chemicals that can be stored on higher shelves.

For more information, see the Color Codes for Chemical Storage in the Appendix.

Compressed Gas Cylinder Storage

Handling compressed gases is more hazardous than handling liquid and solid materials because of:

A. high pressure;

B. how easily and widely the gas can spread (ease of diffusion);

C. how easily flammable gases can burn or explode (low ignition points);

D. low boiling points; and

E. inability to see or smell some of the hazardous gases.

There are three major types of compressed gases: liquified gases, non-liquified gases, and dissolved gases.

Liquified gases are liquid at normal temperatures when they are inside cylinders under pressure. Common liquified gases include ammonia, chloride, propane, and nitrous oxide.

Non-liquified gases are also known as compressed, pressurized, or permanent gases. Oxygen, nitrogen, helium, and argon are all examples of non-liquefied gases.

Dissolved gases are very unstable chemically. Acetylene is the only common dissolved gas.

Compressed gas cylinders come in different shapes and designs, which are mostly based on the pressure of the gas they contain. In general, they are grouped as high-pressure cylinders, low pressure cylinders, and cryogenic containers.

High-pressure cylinders are typically tall and narrow, thick-walled, heavy when empty, generally made of steel or aluminum, and can withstand up to 10,000 psi. Common examples are nitrogen, helium, hydrogen, oxygen, and carbon dioxide cylinders.

Low-pressure cylinders are typically fatter and lighter than high-pressure cylinders. They have thin-walled, welded seams, and can withstand up to 500 psi. Common examples are liquefied petroleum gases (LPG) such as propane and refrigerant gases.

Cryogenic containers operate at a pressure of 20 – 500 psi. They have relief valves to help vent pressure as the temperature increases. Cryogenic containers are used to store natural gases such as oxygen, argon, nitrogen, helium, and other materials at the correct temperature and pressure for transportation.

The use, storage, and handling of compressed gas cylinders present two types of hazards: *chemical* and *physical*.

Chemical hazards result because compressed gases can be:

A. toxic, creating poison atmospheres;

B. flammable, resulting in fire and exploding cylinders;

C. oxidizing, reacting rapidly and violently with combustible materials;

D. corrosive, causing chemical burns and destroying skin tissue; or

E. inert, capable of quickly displacing oxygen in a large area causing suffocation.

Physical hazards of compressed gas include:

A. sudden, uncontrolled release of cylinder contents – damaged cylinders can rocket or spin out of control causing severe injury and damage (often caused by knocking over an uncapped cylinder and breaking the cylinder valve) and,

B. frostbite – gases escaping from a cylinder may be very cold, which can lead to serious, permanent skin damage.

General Safety Statements:

A. Compressed gas cylinders, in service or in storage, shall be adequately secured to a heavy, static object to prevent falling or being knocked over. Ropes, cords, tape of any kind, rubber and other combustible materials are not approved for this purpose. Chains and nylon rachet straps are permitted only if they are installed properly.

B. Compressed gas cylinders shall have their caps in place except when they are in use or are being serviced or filled.

Safety Guidelines for Compressed Gas Cylinders

To use, handle, and store cylinders, it is important to know and follow these safety steps:

A. read the cylinder label to identify the contents (the color of the cylinder is not always an identifying factor);

B. read the Safety Data Sheet (SDS) and know the safety and first-aid requirements;

C. identify the hazards associated with the contents and take the precautions listed on the label and the SDS;

D. report unlabeled cylinders to a supervisor so the supplier can be contacted to either provide the correct information or pick up the cylinder;

E. never expose a cylinder to anything that can produce a spark, cigarettes, open flames, or sources of radiant heat;

F. secure cylinders at all times with chain, plastic coated wire cable, or commercial cylinder straps;

G. never attempt to make repairs to cylinders or valves;

H. do not use cylinders as rollers;

I. do not drop cylinders or allow them to bump violently against each other;

J. do not permit cylinders to become part of an electrical circuit;

K. never accept cylinders if they have an expired hydrostatic pressure test date;

L. do not use grease or oil on oxygen cylinders;

M. do not use greasy or oily gloves on oxygen cylinders;

N. do not use cylinders that are dented, cracked, or have other visible damage;

O. always move cylinders with a suitable hand truck or cylinder cart;

P. always store cylinders in an upright, secured position, and in an adequately ventilated area;

Q. secure cylinder caps in a straight, hand-tightened manner, whether the cylinder is full or empty;

R. never store a cylinder near an open flame, potential ignition, or heat sources;

S. never store a cylinder in an area exposed to weather extremes;

T. never store cylinders where heavy objects may fall on them; and

Safety Guidelines for Compressed Gas Cylinders - continued

U. never store oxygen cylinders within 20 feet of fuel gas cylinders or highly combustible materials.

Empty cylinders should be:

A. labeled as empty;

B. stored with the valve closed and cylinder cap secured;

C. stored separately from full cylinders; and

D. returned with all original accessories.

For more information on the safe handling of compressed gas cylinders, review OSHA 29 CFR 1910.101 Compressed Gases (General Requirements). For regulatory citations and standards on specific gases, review:

A. 1910.102 – Acetylene

B. 1910.103 – Hydrogen

C. 1910.104 – Oxygen

D. 1910.105 – Nitrous oxide

Personal Protective Equipment (PPE)

PPE Regulations

In compliance with THCA 295.2(3), appropriate Personal Protective Equipment (PPE) is provided by the College to the employees that affords an adequate level of protection from chemicals to which the employees may be exposed. This PPE includes but is not limited to:

A. Gloves

B. Safety / Splash Proof Goggles

C. Respirators / Masks

D. Lab Coats

THCA 502 requires employers to ensure appropriate selection, fit testing, and functionality of personal protective equipment issued to employees and to provide training on the maintenance and storage of PPE. The protection given by using PPE should be adequate to ensure employee health and safety based on current industry standards.

In selecting PPE, the employer shall consider all possible routes of entry, permeability of PPE materials, duties being performed by the employee, hazardous chemicals present, and other factors that may affect equipment performance. The employer must ensure that the equipment properly fits the individual employee and is functional for its intended use as described by the manufacturer's specifications.

THCA 295.12(g) guarantees the rights of employees to receive appropriate PPE from their employer. Employers shall provide appropriate PPE to employees who may be exposed to hazardous chemicals in their workplace. The employer shall also provide additional training to employees regarding appropriate maintenance and storage of PPE to ensure that contamination does not occur.

In general, employees should:

A. Properly wear PPE,

B. Attend training sessions on PPE,

C. Care for, clean, and maintain PPE, and

D. Inform a supervisor or EHS of the need to repair or replace PPE.

Personal Protective Equipment Defined

Personal Protective Equipment (PPE) includes all clothing and work accessories designed to protect employees from workplace hazards.

Engineering controls are physical changes to a work area or process that reduce or prevent hazards from coming into contact with workers.

Administrative controls are changes to work practices that reduce the likelihood of exposure to hazards in the workplace.

Procedural controls are a set of guidelines, instructions, and procedures that are used to manage risks and ensure compliance in a variety of settings.

PPE should not replace engineering, administrative, or procedural controls for safety. It should be used in conjunction with these controls. Employees must wear PPE as required and when instructed by a supervisor.

IMPORTANT: *PPE that is used to prevent exposure or contamination should always be removed before coming in contact with other individuals or going in or near elevators, break rooms, classrooms, bathrooms, etc.*

Do not launder personal protective equipment at home.

Arm and Hand Protection

Arms and hands are vulnerable to cuts, abrasions, temperature extremes, burns, bruises, electrical shock, chemical spills, and amputation. The following forms of hand protection are available for employees:

A. Disposable exam gloves

B. Rubber gloves

C. Nitrile gloves

D. Neoprene gloves

E. Leather gloves

F. Non-asbestos heat-resistant gloves

G. Metal-mesh gloves for meat cutters

H. Cotton gloves

I. Kevlar or Dynema gloves for cut resistance

Always wear the appropriate hand and arm protection. For arm protection, wear a long-sleeved shirt, a lab coat, chemical-resistant sleeves, or gauntlet-length gloves.

Follow these guidelines to ensure arm and hand safety:

A. Inspect and test new gloves for defects.

B. Always wash your hands before and after using gloves. Wash chemical-protective gloves with soap and water before removing them. Avoid skin contact with the outer area of chemical-protective gloves while removing them.

C. Do not wear loose fitting gloves near moving machinery; the gloves may become caught.

D. Do not wear gloves with metal parts near electrical equipment.

E. Prior to using a new chemical, make certain the chosen gloves provide sufficient protection by consulting the SDS of the chemical or a glove resistance chart.

F. Immediately remove and replace disposable gloves that are put in contact with hazardous chemicals. Even well-chosen gloves can eventually be permeated.

IMPORTANT: *Gloves are easily contaminated. Avoid touching surfaces that others are likely to touch, such as telephones, doorknobs, etc. when wearing gloves.*

Proper Glove Selection

The OSHA PPE Standard (29 CFR §§ 1910.132-1910.138) requires completion of a hazard assessment for each work area, including an evaluation of the hazards involved and selection of appropriate hand protection. Wear gloves whenever handling hazardous chemicals, sharp-edged objects, very hot or very cold materials, toxic chemicals, and substances of unknown toxicity.

Remember: No single glove material provides effective protection for all uses.

Before starting, carefully evaluate the type of protection required in order to select the appropriate glove. The discussion presented here is geared toward gloves that protect against chemical exposure.

According to the National Ag Safety Database, a program supported by NIOSH and the CDC, materials that are used in the manufacture of gloves designed to provide chemical resistance include the following:

A. Butyl is a synthetic rubber with good resistance to weathering and a wide variety of chemicals.

B. Natural rubber latex is a highly flexible and conforming material made from a liquid tapped from rubber plants. It is a known allergen.

C. Neoprene is a synthetic rubber having chemical and wear-resistance properties superior to those of natural rubber.

D. Nitrile is a copolymer available in a wide range of acrylonitrile content; chemical resistance and stiffness increase with higher acrylonitrile content.

E. Polyethylene is a fairly chemical-resistant material used as a freestanding film or a fabric coating.

F. Poly (vinyl alcohol) is a water-soluble polymer that exhibits exceptional resistance to many organic solvents that rapidly permeate most rubbers.

G. Poly (vinyl chloride) is a stiff polymer that is made softer and more suitable for protective clothing applications by the addition of plasticizers.

H. Polyurethane is an abrasion-resistant rubber that is either coated into fabrics or formed into gloves or boots.

I. 4H® or Silvershield® is a registered trademark of North Hand Protection; it is highly chemical-resistant to many different classes of chemicals.

J. Viton®, a registered trademark of DuPont, is a highly chemical-resistant but expensive synthetic elastomer.

When choosing an appropriate glove, consider the required thickness and length of the gloves as well as the material. Consult the glove manufacturer for chemical-specific glove recommendations and information about degradation and permeation times. Certain disposable gloves should not be reused. (For more information, see OSHA PPE Standard, 29 CFR § 1910.138, regarding hand protection.)

The following general guidelines apply to the selection and use of protective gloves:

A. Do not use a glove beyond its expiration date. Gloves degrade over time, even in an unopened box.

B. When not in use, store gloves in the laboratory but not close to volatile materials or heat sources.

C. To prevent chemical contamination of nonlaboratory areas by people coming to retrieve them, gloves must not be stored in offices, break rooms or lunchrooms.

D. Inspect gloves for small holes, tears, and signs of degradation before use.

E. Replace reusable gloves periodically because they degrade with use, depending on the frequency of use and their permeation and degradation

characteristics relative to the substances handled. Regular inspection of their serviceability is important. If they cannot be cleaned, dispose of contaminated gloves according to institutional procedures.

F. Replace gloves immediately if they become contaminated or torn.

G. Decontaminate or wash gloves appropriately before removing them.

   1. ***Note***: Some gloves, e.g., leather and poly (vinyl alcohol), are water permeable. Unless coated with a protective layer, poly (vinyl alcohol) gloves will degrade in the presence of water.

H. Do not wear gloves outside the laboratory, to avoid contamination of surfaces used by unprotected individuals.

I. Gloves on a glovebox should be inspected with the same care as any other gloves used in the laboratory. Disposable gloves appropriate for the materials being handled within the glovebox should be used in addition to the gloves attached to the box. Protect glovebox gloves by removing all jewelry prior to use.

General Rules and Guidelines for Glove Usage

Hands should be washed with soap and water immediately after working with any laboratory chemicals, even if gloves have been worn.

Never wear gloves or laboratory coats outside the laboratory or into areas where food is stored and consumed and always wash laboratory apparel separately from personal clothing.

Body Protection

Hazards that threaten the torso tend to threaten the entire body. A variety of protective clothing, including laboratory coats, long pants, rubber aprons, coveralls, and disposable body suits are available for specific work conditions.

A. Rubber, neoprene, and plastic clothing protect employees from most acids and chemical splashes.

B. Laboratory coats and coveralls protect employees and everyday clothing from contamination.

C. Welding aprons provide protection from sparks.

D. Do not launder contaminated chemically, biologically, or radiologically protective clothing at home or in any facilities outside of the College.

Ear and Hearing Protection

If you work in a high noise area, wear hearing protection. Most hearing protection devices have an assigned rating that indicates the amount of protection provided. Depending on your level of exposure, you may choose from the following devices:

A. Disposable earplugs

B. Reusable earplugs

C. Headband plugs

D. Sealed earmuffs

Earplugs may be better in hot, humid, or confined work areas. They may also be better for employees who wear other PPE, such as safety glasses or hats. Earmuffs, on the other hand, may be better for employees who move in and out of noisy areas, because the muffs are easier to remove. Before resorting to hearing protection, attempt to control noise levels through engineering or operational changes.

To avoid contamination, follow these guidelines when using earplugs:

A. Wash your hands before inserting earplugs.

B. Replace disposable earplugs after each use.

C. Clean reusable earplugs after each use.

Contact the EHS Specialist if you have any questions or for more information.

Eye and Face Protection

Employees must wear protection if hazards exist that could cause eye or face injury. Eye and face protection should be used in conjunction with equipment guards, engineering controls, and safe practices.

NOTE: *Safety glasses are required in laboratories. Chemical goggles should be worn when handling chemical materials that may splash.*

Always wear adequate eye and face protection when performing tasks such as grinding, buffing, welding, chipping, cutting, or pouring chemicals. Safety glasses with side shields provide protection against impact, but sealed, unvented chemical safety goggles provide protection against impact, splashes, and hazardous atmospheres.

Follow the below information regarding eye protection:

A. If you wear prescription glasses, wear goggles or other safety protection over the glasses.

B. Safety glasses with side-shields provide primary protection to eyes and are four times as resistant as prescription glasses to impact injuries.

C. Wear chemical splash goggles, not just safety glasses, when working with chemicals. Goggles protect against impacts, sparks, dust, and irritating mist.

D. A welding helmet protects from flash burn due to welding, soldering, or brazing, but does not provide primary eye protection; safety glasses or goggles should be worn with the helmet.

E. A face shield should be worn with goggles or safety glasses. It is designed to protect the face from some splashes or projectiles but does not eliminate exposure to vapors.

F. To reduce eyestrain from glare and outdoor sun exposure use safety glasses with UV protection to minimize ultraviolet light exposure.

Foot Protection

To protect feet and legs from falling objects, moving machinery, sharp objects, hot materials, chemicals, or slippery surfaces, employees should wear closed-toed shoes, boots, foot-guards, leggings, or safety shoes as appropriate. Safety shoes are designed to protect people from the most common causes of foot injuries — impact, compression, and puncture. Special foot protection is also available for protection against static electricity, sparks, live electricity, corrosive materials, and slipping.

IMPORTANT: *Do not wear sandals, crocs, or open-toed shoes in laboratories, shops, food prep, food serving, or other potentially hazardous areas.*

Head Protection

Accidents that cause head injuries are difficult to anticipate or control. If hazards exist that could cause head injury, employees should try to eliminate the hazards, but they should also wear head protection.

Hardhats protect the head from impact, penetration, and reduce electrical shock. Head protection is necessary if you work where there is a risk of injury from moving, falling, or flying objects or if you work near high-voltage equipment.

Hard hats should be water resistant, flame resistant, and adjustable. Wear one of the following hard hats as appropriate for your work situation:

A. Class G - General service, limited voltage (2,200 Volts) protection

B. Class E - Utility service, high-voltage (20,000 Volts) protection

C. Class C - Special service, no voltage protection

Follow these guidelines for head safety:

A. Check the shell and suspension of your headwear for damage before each use. Look for cracks, dents, gouges, chalky appearance, and torn or broken suspension threads. Discard damaged hats or replace broken parts with replacements from the original manufacturer.

B. Discard any hat that has been struck or dropped from a great height, even if there is no apparent damage.

C. Do not wear a hard hat backwards, unless this is necessary to accommodate other protective equipment (e.g., welders face shield).

D. Do not paint the plastic shell of a hard hat or alter it in any way.

Respiratory Protection Program

The College uses engineering, administrative, and procedural controls to protect people from dangerous atmospheres, including harmful mists, smoke, vapors, and oxygen-deficient atmospheres. When these controls cannot provide adequate protection against harmful atmospheres, respiratory protection is necessary.

Usage Requirements

People who use respiratory protection must be physically capable of using and wearing the equipment. In some cases, a physician must determine if an employee is healthy enough to use a respirator via pulmonary testing. In addition, all people required to wear respirators must be formally trained and instructed in proper equipment usage. This training should include instruction on common respiratory hazards and symptoms of exposure, as well as the hazards and symptoms to consider in the context of their particular work.

Before wearing a respirator, employees must be fit tested to ensure their respirator protection equipment is the proper size and fits appropriately. Fit testing must be done annually or more frequently based on substantial weight gain/loss or facial surgery.

Selecting a Respirator

When selecting a respirator, consider the following factors:

A. Type of hazards

B. Identity and concentration of the contaminant

C. Time constraints

D. Activity of the person wearing the respirator

E. Degree of protection provided by each type of respirator

IMPORTANT: *Respirators are available in varied sizes. Always fit test a respirator to select the correct size.*

Using Respirators Safely

Your respirator is necessary to prevent the inhalation of particulates, gases, vapors, aerosols, or other contaminants. Be sure you have notified EHS of all hazardous chemicals or materials you will be working with to ensure you have been provided the best possible respiratory protection.

It is important to remember the following:

A. Only use the respirator you were approved to wear and that has been properly fit tested on you.

B. Be familiar with the respirator, its use, and limitations, and how to properly maintain and care for your respirator.

C. Facial hair that interferes with the seal of a tight-fitting respirator is prohibited. If you were fit tested without facial hair or with a minimal amount of facial hair, you must not wear your respirator with additional hair growth.

D. Contact EHS to be fit tested again if you have facial or dental surgery, significant weight gain or loss, facial scarring, or anything else that might affect the fit and seal of your respirator.

E. You should be fit tested annually.

Respirator Safety Tips:

A. Inspect respirator before and after each use to ensure that all parts are present or attached and are functioning properly.

B. Rubber and plastic parts should be checked for signs of wear and tear (cracking, stiffness, etc.). If you identify any worn or weak parts, do not use the respirator.

C. Perform a positive pressure and negative pressure seal check every time you put on the respirator:

Positive Pressure Check: Cover the exhalation valve of the respirator with the palm of your hand. Exhale gently for about 10 seconds to build up a slight pressure. If air leaks out, the respirator is not sealing properly and should be repositioned before entering the hazardous area.

Negative Pressure Check: Cover the filter or cartridge openings of the respirator with the palms of your hands. Inhale gently and hold your breath for about 10 seconds. You should notice a slight suction. If the face piece does not collapse inward or you feel an air leak, the respirator is not sealing properly and should be repositioned before entering the hazardous area.

Leave the respiratory protection area if any of the following occur:

A. If your respirator is damaged.

B. If your breathing becomes difficult.

C. If you become dizzy.

D. If you detect a respirator failure (smell something you did not notice before, eyes begin to water, etc.).

E. If you feel your seal has been broken (air getting in or out around your face piece).

DO NOT REMOVE OR REPOSITION YOUR MASK UNTIL YOU HAVE LEFT THE AREA.

Storage, Cleaning, and Care:

A. Store respirator in a clean, cool area (away from dust, sunlight, extreme temperatures, moisture, and chemicals).

B. Do not hang respirator by headband.

C. Clean the respirator after each use. Disinfect the respirator after each use if it is shared. All parts should air dry or be wiped dry with a lint-free cloth.

D. Respirator cartridges eventually expire upon exposure to atmosphere. Follow manufacturer recommendations regarding replacement.

Hazardous Chemical Waste Procedure

Since Federal and State regulations govern hazardous chemical waste disposal at the College, failure to comply with any hazardous chemical waste regulation may result in substantial fines and penalties for the College. Individual generators (e.g., principal investigators, employees) causing the violation may also be personally liable. Violations may range from failure to properly label a container of hazardous waste to intentionally disposing of hazardous chemical waste into the air, down the drain, or in the garbage. Penalties range from fines of no less than $5,000 and up to $25,000 or more and, prison terms of no less than 1 year and up to 10 years.

The Resource Conservation and Recovery Act (RCRA) is administered by the U.S. Environmental Protection Agency (EPA). Under this Act, the EPA has the responsibility for regulating hazardous chemical wastes. RCRA established a "cradle to grave" hazardous chemical waste management requirement to protect public health and the environment from improper disposal of hazardous chemical waste. “Cradle-to-grave” considers impacts at each stage of a chemical or material’s life-cycle, from the time natural resources are extracted from the ground and processed through each subsequent stage of manufacturing, transportation, product use, and ultimately, disposal. The Texas Commission on Environmental Quality (TCEQ) administers an equivalent to RCRA for the State of Texas under Industrial Solid Waste and Municipal Hazardous Waste Regulations (Title 30, Part 1, Chapter 335).

Hazardous Chemical Waste Disposal Program

Generators are responsible for following the College disposal procedures, for assuring that their employees are trained in proper disposal procedures, and for properly identifying the hazardous chemical waste generated. The following procedures are intended to assure compliance with applicable Federal and State regulations for the proper management of hazardous chemical waste and to reduce adverse effects to human health and the environment.

Hazardous Chemical Waste Training

The law requires that employees of hazardous waste generators who manage or handle hazardous waste be trained. It also requires those employees to have annual refresher training. EHS will provide this training that shall include:

A. Overview of both federal and state regulations;

B. Generator responsibilities;

C. Hazardous waste determination;

D. Waste classification, labeling, segregation, and storage;

E. Spill cleanup procedures; and

F. Disposal procedures.

Hazardous Chemical Waste Determination

A material becomes *waste* when the individual generator determines that it is no longer useful and should be discarded.

A material is *non-hazardous chemical waste* if it does not meet the definition of "hazardous chemical waste".

A material is *hazardous chemical waste* if it meets one or more of the following:

A. It is a mixture or solution containing a chemical and a non-hazardous chemical.

B. It meets the definition of one of the following:

1. Ignitability (flashpoint <60° C (140° F) or supports combustion)
2. Reactivity (e.g., responds violently to air or water, cyanides, explosives, unstable chemicals)
3. Corrosivity (pH <4 or >10)
4. EP toxicity (e.g., pesticides, heavy metals, poisons)

C. It is a Universal Waste per 30 TAC 335.261; or

D. Material is excluded from the regulations.

General Information

A. Non-hazardous waste may be disposed of by using the sanitary sewer or regular trash. Additional information about non-hazardous waste disposal can be obtained from EHS.

B. Hazardous chemicals can be treated to reduce the hazard or the quantity of waste in the laboratory if the treatment procedure is included as part of the written experimental protocol.

C. Gas cylinders should be returned to the manufacturer or distributor whenever possible. Non-returnable cylinders should be tagged as chemical waste.

D. Empty chemical containers shall not be disposed of in the regular trash. They must be included with hazardous waste.

E. Chemical containers cannot be re-used for any other purposes.

Classification and Segregation of Hazardous Chemical Waste

Hazardous chemical waste is categorized into the following hazard classes:

A. Halogenated solvents
B. Non-halogenated solvents
C. Acids (inorganic or organic)
D. Bases (inorganic or organic)
E. Heavy metals (silver, cadmium, lead, mercury, etc.)
F. Poisons (inorganic or organic)
G. Reactives (cyanides, sulfides, water reactive chemicals, peroxides, etc.)

Different classes of hazardous chemical waste must not to be commingled in the same waste container.

Do not combine inorganic heavy metal compounds and organic waste solvents.

Do not combine non-hazardous waste with hazardous chemical waste.

Dry materials (paper, rags, towels, gloves, pig pads, or Kim Wipes, etc.) contaminated with flammable or extremely toxic chemicals must be double bagged in heavy-duty plastic bags and must be treated as hazardous chemical waste.

Do not use biohazard bags.

Hazardous chemical waste is still bound by the storage code(s) of the chemical(s) and must follow those guidelines.

Containment and Storage of Hazardous Chemical Waste

Individual hazardous waste generators (lab instructors through the DHCC) shall:

A. Maintain custody and control of their container storage areas within their hazardous waste storage areas.
B. Accumulate their waste in safe, transportable containers that are properly labeled, sealed, and stored to prevent human exposure to or environmental release of the waste materials.
C. Provide their own waste containers that are compatible with the chemical contents (e.g., do not use metal containers for corrosive waste or plastic containers for organic solvent).

D. Use containers that are in good condition and do not leak. All containers must have suitable screw caps or other means of secure closure. When large waste containers (i.e. 5 gallons or more total volume) are required, contact EHS for assistance on selection and placement of appropriate container type and size.

Further Guidelines

A. Never overfill hazardous waste containers. Expansion and excess weight can lead to spills, explosions, and extensive environmental exposure.

B. Containers of solids must not be filled beyond their weight and volume capacity.

C. Jugs and bottles should not be filled above the shoulder of the container.

D. Closed head cans (5 gallons or less) should have at least two inches of headspace between the liquid level and the head of the container.

E. Closed head drums (larger than 5 gallons) should have at least four inches of headspace.

F. Containers must be closed or sealed to prevent leakage. All waste collection containers must be kept closed except when adding or removing material.

Hazardous Chemical Waste Generation Reduction

Hazardous waste regulations have evolved from an emphasis on *reduction* to the **prevention** of environmental pollution. The Pollution Prevention Act of 1990 made the prevention of pollution and reduction of waste generation a national priority. The Texas Waste Reduction Policy Act required some generators to prepare and implement Source Reduction and Waste Minimization Plans. The key to these plans is "front-end minimization".

Front-end minimization means reducing hazardous waste by reducing the quantities of hazardous chemicals used and by substituting less hazardous materials. Teaching laboratories and other working groups that generate hazardous waste should review their purchasing practices and systems, chemical usage patterns, and workplace activities to identify potential points of their operations where source reduction and waste minimization can be implemented.

All departments shall attempt to reduce the amount of waste they generate by implementing front-end minimization efforts.

Some examples of front-end minimization efforts include:

A. Follow the 3 R's Rule: reduce, reuse, and recycle. Reducing, reusing, and recycling waste helps save landfill space by keeping useful materials out.

B. Ordering enough chemical for the experiments to be done in a semester but no more.

C. Use microscale or scaled down procedures in experiments.

D. When it is safe to do so and does not violate safety SOPs, reuse chemicals and materials in experiments.

E. Minimize the use of toxic or hazardous chemicals and materials by replacing them with greener alternatives.

F. Keep chemicals in their original containers as often as possible to reduce the amount secondary containers.

G. Stay up to date with the latest green alternatives and solutions. Some resources can be found at the following links:

    1. http://www.zerowastenetwork.org/index.cfm#section_page-9
    2. https://www.mygreenlab.org/ambassador-program.html
    3. https://www.tceq.texas.gov/agency/qa/env_lab_accreditation.html

Reporting Spills, Incidents, and Injuries

Accidental Hazardous Chemical Spills

Hazardous materials come in the form of explosives, flammable and combustible substances, poisons, and radioactive materials. Hazardous materials in various forms can cause death, serious injury, long-lasting health effects, and damage to buildings, homes and other property.

Spills Inside a Building

If there is a hazardous chemical spill inside a building:

A. Isolate and secure the spill area.

B. Warn others in the immediate area to stay clear of the spill area.

C. Contact EHS via the Campus Safety direct line at 409.257.0073 and follow the instructions given by the EHS Specialist.

D. Attempt cleanup only if:

1. you are instructed to do so by the EHS Specialist,
2. you are trained to do so,
3. you have appropriate PPE and,
4. you have a spill kit suitable for the chemical(s) spilled.
5. Do not wash spilled material into a floor drain or sink.

E. If emergency medical assistance is needed, call 911, give the location of the spill and the type of material spilled.

F. Evacuate the building if required (use of the public address system preferred or use of building fire alarm system).

G. Meet with and assist EHS and emergency response personnel.

Spills Outside a Building

If there is a hazardous chemical spill outside the building:

A. Isolate and secure the spill area.

B. Warn others in the immediate area to stay clear of the spill area.

C. Contact EHS via the Campus Safety direct line at 409.257.0073 and follow the instructions given by the EHS Specialist.

D. Attempt cleanup only if:
    1. you are instructed to do so by the EHS Specialist,
    2. you are trained to do so,
    3. you have appropriate PPE and,
    4. you have a spill kit suitable for the chemical(s) spilled.
E. Meet with and assist EHS and emergency response personnel.

Personnel Injuries

If there is a personnel injury involving chemical contamination:

A. Assist with emergency eyewash/shower use, as appropriate.
B. Provide first aid immediately for serious injuries.
C. If emergency medical assistance is needed, call 911 and give the location and type of material involved.
D. Notify EHS at 409.257.0073 and follow instructions given by the EHS Specialist.
E. If it is possible to remove contaminated clothing without harming the victim, do so, but use proper PPE to protect yourself. If proper PPE is not available, do not contaminate yourself.
F. Obtain an SDS for the material involved. The SDS binder should be close by and readily accessible.

LIT 409.257.0073

Lab Shut Down Procedure

The following is a checklist of items for shutting down a laboratory prior to leaving for an extended period of time (longer than a weekend). This includes holidays and impending weather event campus closures.

The DHCC shall ensure that all instructors, lab managers and lab assistants (where applicable) review the full list below and consider how best to adapt it to the specific needs of their individual laboratory.

All labs should implement the following:

- ✓ Back up and shut down computers, electronic notebooks, and tablets.
- ✓ Check Lab Safety Plans (and lab signage) to make sure emergency contacts are up-to-date and posted.
- ✓ Review the full shutdown checklist for additional actions to consider starting now.
- ✓ If certain tasks or equipment use can be deferred, consider implementing this process now, particularly if the shutdown process requires preparation and time.

General

- ✓ Deliveries canceled where possible.
- ✓ Arrangements made for deliveries that couldn't be canceled.
- ✓ All glassware is cleaned and stored properly.
- ✓ Gas is turned off at the master valve.
- ✓ All cabinets and doors needing to be locked are secured.
- ✓ Lights are turned off.

Biologicals

- ✓ All biological samples are labeled and stored at their appropriate temperature and in their appropriate locations. (For cultures that cannot be frozen down, ensure you have approval from supervisors to continue work, and enough supplies and personnel to maintain cultures.)
- ✓ All biological material waste has been disposed of appropriately. (Waste that cannot be disposed of then should be stored and labeled properly until disposal can take place.)
- ✓ Biosafety Cabinets are turned off, sash is closed, and unit unplugged where possible.
- ✓ All biohazard waste bag containers are empty and disinfected.
- ✓ UV lights are turned off and unplugged where possible.
- ✓ All primary and secondary containers are properly labeled and sealed with secondary containment in place where required.

Chemicals

- ✓ Sashes on chemical fume hoods closed.
- ✓ Compressed gas cylinders are secured with their valve caps in place and chained.
- ✓ All hazardous materials and chemicals are stored properly.
    - ✓ Flammables in flammable cabinets with SDS sheets nearby and easily accessible.
    - ✓ Acids in acid cabinets with SDS sheets nearby and easily accessible.
    - ✓ Incompatible chemicals not stored with each other.
    - ✓ All primary and secondary containers are properly labeled and sealed with secondary spill measures in place where required.

Radiation

- ✓ Radioactive vials are closed and secured (refrigerator with lock or lockbox).
- ✓ Geiger counter turned off so that batteries do not run down.
- ✓ Radiation waste stored appropriately, labeled with isotope, amount, and date for I-25 and P32 items undergoing decay.

Equipment

- ✓ Proper shut down procedures for electrical equipment have been reviewed and followed, and equipment has been shut down and unplugged where possible to prevent surges.
- ✓ All lasers are turned off and key removed from the power source.
- ✓ Microscopes, hot plates, sterilizers, water baths, and all other equipment that is not being used is properly shut down and unplugged from energy source where possible.
- ✓ Water sources to cooling columns, water purifiers, etc. are shut down and unplugged where possible.
- ✓ Heat producing machines are shut down and unplugged where possible.
- ✓ Procedures and arrangements for equipment and other processes that will remain in use have been reviewed, followed, and confirmed with all parties involved.

Training and Education Program

All personnel will be informed of the HCP and Right to Know Law annually or, at the time of initial employment and annually thereafter. The HCPA is responsible for ensuring that all persons handling and labeling the secondary containers are properly trained.

When attending training, personnel will sign a form or list indicating:

A. that they attended a general or specific training session,

B. that they received any written material,

C. that they understood the HCP,

D. that they received any technical or specific training related to hazardous chemicals or materials.

General program information and training will be accomplished by lecture, photo slides, movie, video, literature, or combination, and will cover the contents of this program to include a review of the following:

A. Department's policy statement.

B. The basic definition of the regulation(s).

C. Statements of responsibility, both program and personnel.

D. Information relating to labels and general warning signs used by the College.

E. Location and availability of the HCP.

F. SDS binder locations, chemical inventory listing, and comprehension of the SDS system.

G. Instruction and comprehension of the definitions of:

1. Hazardous chemicals
2. Health hazard
3. Physical hazard
4. Protective Gear Required (PPE)
5. GHS Pictograms and
6. NFPA 704 code and standard
7. Other pertinent definitions and information.

H. Steps that department personnel can take to lessen or prevent exposure to hazardous chemicals or materials, i.e., knowledge of chemicals, storage, posting, personal protective equipment, chemical loads, warnings, eye wash and safety showers, training, etc.

I. Methods and observation techniques used to determine the presence or release of hazardous chemicals or materials in a work area, i.e., flame or fire, smell or odor, fumes, etching, color, irritation, etc.

J. The emergency procedure to take in the event there is exposure to hazardous material or chemical.

K. The proper use of personal protective equipment (PPE) and first aid treatment to be used with respect to the hazardous substances to which the employees may be exposed

L. Notice of hazardous chemicals or materials in an individual's work area.

M. General safety instructions on the handling, cleanup procedures, appropriate spill kit use, and disposal of hazardous substances.

This training may be conducted by categories of chemicals. The department's DHCC must advise employees and students that information is available on the specific hazards of individual chemicals through the SDSs. Protective equipment and first aid treatment may be by categories of hazardous chemicals.

Additional instruction to employees and students must be provided when the potential for exposure to hazardous substances in the employee's work area increases significantly or when the employer receives new and significant information concerning the hazards of a substance in the employee's work area (like from an updated SDS, etc.). The addition of new chemicals alone does not necessarily require additional training. In lab classes where students are provided with generalized education and training at the beginning of the semester, specific training on the hazards of the specific hazardous substances to be used in a particular lab procedure must be provided at the beginning of the lab period.

Students and employees who are to use or be exposed to highly hazardous materials, including but not limited to pyrophoric organometallic chemicals such as alkyl lithium and aluminum alkyls and related compounds, flammable solids, water reactive metals such as sodium and potassium, or compounds that are labeled as poisonous by inhalation must perform an Experiment Hazard Analysis (EHA) prior to using these compounds. The HCPA should be notified if there is a need for a new EHA. Students must be directly supervised by a faculty member or other qualified supervisor until they are fully experienced in using such

compounds. Lab coats made of flame-retardant materials must be worn where appropriate.

All employees and students must receive refresher training at intervals not to exceed one year.

The department must provide training for a new or newly assigned employee or student before the employee works with or in a work area containing a hazardous substance. It is College policy that students whose lab work may involve exposure to hazardous substances during an organized (not individual instruction) course receive appropriate education and training at the beginning of the semester in which the course is taught, regardless of any previous education and training.

The DHCC shall keep an up-to-date written HCP and a record of each training session given to employees and students, including the date, a roster of the employees and students who attended, the subjects covered in the training session, and the names of the instructors. The DHCC will copy to, and update as needed, those records to the HCPA. Those records shall be maintained by both the DHCC and the HCPA for at least five years in accordance with the THCA Sect. 502.009(g).

Emergency Response

The College shall provide all Campus Safety Officers information on recognizing, evaluating, and controlling exposure to hazardous substances, as required by the THCA Sect. 502.009(h).

LIT 409.257.0073

Appendix

- Texas Right to Know Law
- Secondary Container Label Template
- Color Coding for Chemical Storage
- GHS Pictograms
- NFPA 704
- Understanding the Safety Data Sheets (SDS)
- Experiment Hazard Analysis Blank and Example
- HazWaste Disposal Inventory Workbook
- In-Use & Stored Chemicals & Materials Inventory Workbook
- Useful Links

Texas Department of Health and Humans Services Notice to Employees

NOTICE TO EMPLOYEES

The Texas Hazard Communication Act, codified as Chapter 502 of the Texas Health and Safety Code, requires public employers to provide employees with specific information on the hazards of chemicals to which employees may be exposed in the workplace. As required by law, your employer must provide you with certain information and training. A brief summary of the law follows.

HAZARDOUS CHEMICALS

Hazardous chemicals are any products or materials that present any physical or health hazards when used, unless they are exempted under the law. Some examples of more commonly used hazardous chemicals are fuels, cleaning products, solvents, many types of oils, compressed gases, many types of paints, pesticides, herbicides, refrigerants, laboratory chemicals, cement, welding rods, etc.

WORKPLACE CHEMICAL LIST

Employers must develop a list of hazardous chemicals used or stored in the workplace in excess of 55 gallons or 500 pounds. This list shall be updated by the employer as necessary, but at least annually, and be made readily available for employees and their representatives on request.

EMPLOYEE EDUCATION PROGRAM

Employers shall provide training to newly assigned employees before the employees work in a work area containing a hazardous chemical. Covered employees shall receive training from the employer on the hazards of the chemicals and on the measures they can take to protect themselves from those hazards. This training shall be repeated as needed, but at least whenever new hazards are introduced into the workplace or new information is received on the chemicals which are already present.

SAFETY DATA SHEETS

Employees who may be exposed to hazardous chemicals shall be informed of the exposure by the employer and shall have ready access to the most current Safety Data Sheets (SDSs) or Material Safety Data Sheets (MSDSs) if an SDS is not available yet, which detail physical and health hazards and other pertinent information on those chemicals.

LABELS

Employees shall not be required to work with hazardous chemicals from unlabeled containers except portable containers for immediate use, the contents of which are known to the user.

EMPLOYEE RIGHTS

Employees have rights to:

- access copies of SDSs (or an MSDS if an SDS is not available yet)
- information on their chemical exposures
- receive training on chemical hazards
- receive appropriate protective equipment
- file complaints, assist inspectors, or testify against their employer

Employees may not be discharged or discriminated against in any manner for the exercise of any rights provided by this Act. A waiver of employee rights is void; an employer's request for such a waiver is a violation of the Act. Employees may file complaints with the Texas Department of State Health Services at the telephone numbers provided below.

EMPLOYERS MAY BE SUBJECT TO ADMINISTRATIVE PENALTIES AND CIVIL OR CRIMINAL FINES RANGING FROM $50 TO $100,000 FOR EACH VIOLATION OF THIS ACT

Further information may be obtained from:

Texas Department of State Health Services
Consumer Protection Division
Environmental Operations Branch
PO Box 149347, MC 2835
Austin, TX 78714-9347

(512) 834-6787
(800) 293-0753 (toll-free)
Fax: (512) 483-3414
E-mail: TXHazComHelp@dshs.texas.gov
Website: www.dshs.texas.gov/hazcom

TEXAS Health and Human Services | Texas Department of State Health Services

Worker Right-To-Know Program
Publication # E23-14173
Revised May 2024

Secondary Container Label

Secondary Container Label Product/Material:			
Owner Name:	Secondary Container Chemical Contents:		% or
	Chemical Name:	CAS Number:	Msmt
Phone:			
Dept:			
Bldg/Rm#:			
Date Prepared:			
Exp Date:			
Signal Word: (circle one) Danger Warning None			

This is a blank secondary container label template. This label requests the following information:

A. the name, CAS number, and percentage of the chemical(s) in the container
B. the owner's name, phone number, and department
C. the building and room where the chemical(s) are located
D. the date prepared and the expiration date of the chemical(s)
E. the hazards present indicated by circling the Signal Word(s) and checking the boxes next to the pictogram(s) that apply
F. any other hazards or information that should be known about the chemical(s) in the "Other" space.

The following rules apply to secondary container labels:

A. No abbreviations or chemical formulas may be used.
B. CAS number and percentage is required on each individual chemical. If there is no CAS number, specify the substance identifier(s) clearly.
C. All information requested on the label MUST be filled out.
D. All GHS pictogram boxes that apply must be checked.
E. All signal words that apply must be circled.
F. If the label is too large for the container, it may be folded at the dotted line.
    1. Place the right side of the label on the container first.
    2. Fold the label back onto itself at the dotted line.
G. The label provided can be printed on Avery label sheets and applied in this manner or can be printed on regular paper and taped to the secondary container. Whichever method is used, the label must be affixed in such a manner that ensures it will not come off of the container and will remain legible.

Color Coding for Chemical Storage

COLOR CODES FOR CHEMICAL STORAGE

Hazard	Color Code
Flammables	RED
Health Hazards & Toxins	BLUE
Reactives & Oxidizers	YELLOW
Contact Hazards & Corrosives	WHITE
General Storage	GREEN, GRAY, OR ORANGE

NOTICE

CHEMICAL STORAGE AREA

Store in Flammable Storage Cabinet or Flammable Storage Area. Separate Flammable Solids from Other Hazard Classes

When Necessary, Secure Poison Area or Separate from Other Chemical Storage.

Store Corrosives in This Group in Chemical Resistant Secondary Containers or in Corrosion Proof Cabinets.

Store Away from Organic Material, Flammables, or Other Incompatible Materials.

Store in Chemical Resistant Catch Trays or Corrosives Cabinet.

Store Acids Separate from Bases.

General Storage Can Be Stored on Higher Shelves.

Store According to the Nature of the Chemical.

PLEASE NOTE:
Chemicals with labels that are colored and striped may react with other chemicals in the same hazard class. See the Safety Data Sheet (SDS) for more information. Some chemical containers have labels already color coded for the hazard. Those that do not will have hazard information listed on the label. Read the label carefully and store accordingly. Look up information on the MSDS whenever necessary.

GHS Pictograms

GHS Pictograms

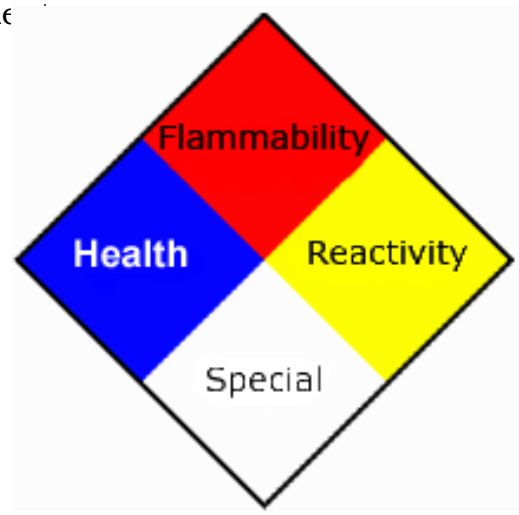
Health Hazard  • Carcinogen • Mutagenicity • Reproductive Toxicity • Respiratory Sensitizer • Target Organ Toxicity • Aspiration Toxicity	**Flame**  • Flammables • Pyrophorics • Self-Heating • Emits Flammable Gas • Self-Reactives • Organic Peroxides	**Exclamation Mark**  • Irritant (skin and eye) • Skin Sensitizer • Acute Toxicity (harmful) • Narcotic Effects • Respiratory Tract Irritant • Hazardous to Ozone Layer (Non-Mandatory)
Gas Cylinder  • Gases Under Pressure	**Corrosion**  • Skin Corrosion/ 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)

NFPA 704

The National Fire Protection Association (NFPA) 704 diamond in the illustration below is one method of identifying chemical hazards. NFPA uses a scale of 0 – 4 to rate each hazard with 0 indicating "no hazard" and 4 indicating the most extreme hazard.

The following is a detailed explanation of the NFPA hazard classification codes:

A. Health (Blue):
   4 - Can cause death or major injury despite medical treatment
   3 - Can cause serious injury despite medical treatment
   2 - Can cause injury. Requires prompt medical treatme
   1 - Can cause irritation if not treated
   0 - No hazard



B. Flammability (Red):

   4 - Very flammable gases or liquids
   3 - Can ignite at normal temperatures
   2 - Ignites with moderate heat
   1 - Ignites with considerable preheating
   0 - Will not burn

C. Reactivity (Yellow):

   4 - Readily detonates or explodes
   3 - May detonate or explode with strong initiating force or heat under confinement
   2 - Normally unstable, but will not detonate
   1 - Normally stable. Unstable at high temperature and pressure.
   0 - Normally stable and not reactive with water.

D. Specific Hazard (White):

   Oxidizer OX
   Acid - ACID
   Alkali - ALK
   Corrosive – COR
   Use No Water – W
   Radioactive - (see image at right)

Many chemicals fall under more than one hazard class. For example, 30% hydrogen peroxide in water has a health rating of 3, a flammability rating of 0, a reactivity rating of 1, and is noted to be an oxidizer. Extra care should be taken when handling or storing chemicals with multiple hazards.

Understanding the Safety Data Sheets (SDS)

A Safety Data Sheet (SDS) is a document prepared by chemical manufacturers for any chemical which presents a hazard to health and safety. The SDS includes information about each chemical, covering the physical and environmental hazards, precautions for safe handling, storage, and transportation of the chemical, and more.

There are 16 sections in an SDS:

- **Section 1** identifies the chemical on the SDS as well as its intended use. It also provides the essential contact information of the supplier.
- **Section 2** outlines the hazards of the chemical and appropriate warning information.
- **Section 3** identifies the ingredient(s) of the chemical product identified on the SDS, including impurities and stabilizing additives.
- **Section 4** of the safety data sheet describes the initial treatment protocol for untrained responders to incidents of chemical exposure.
- **Section 5** provides recommendations for fighting a fire caused by the chemical.
- **Section 6** details the appropriate response to chemical spills, leaks, or releases, including containment, and cleanup to prevent or minimize exposure to people, property, or the environment.
- **Section 7** of the safety data sheet provides guidance on the safe handling practices and conditions for safe storage of chemicals.
- **Section 8** lists chemical exposure limits, engineering controls, and personal protective measures that can be used to minimize worker exposure.
- **Section 9** identifies physical and chemical properties associated with the product.
- **Section 10** describes the reactivity hazards of the chemical and chemical stability information. This section is broken into three parts: reactivity, chemical stability, and other.
- **Section 11** identifies toxicological and health effects info, if applicable
- **Section 12** explains the environmental impact of a chemical(s) if released to the environment.
- **Section 13** covers proper disposal, recycling or reclamation of the chemical(s) or its container, and safe handling practices.
- **Section 14** explains classification information for shipping and transporting of hazardous chemical(s) by road, air, rail, or sea.
- **Section 15** of the safety data sheet identifies the safety, health, and environmental regulations specific to the product.
- **Section 16** tells you when the SDS was originally prepared or the last known revision date. This section of the SDS may also state where changes have been made to the previous version.

Depending on the complexity of the chemical or substances therein, each section may have multiple descriptive fields with additional detail, providing various levels of information.

Campus Safety
409.658.4491
Rev. 06.18.2025

Experiment Hazard Analysis (EHA)	
Date:	**Location:**
Department:	**Experiment Time & Date:**
Department Supervisor:	**Fire Watch:**
Instructor / Demonstrator:	**Nearest Fire Alarm Pull:**
Fire Suppression Assets:	
	Nearest Assembly Point:
Fire Suppression Asset's Numbers:	
	Weather Conditions:
Experiment Description & Purpose:	

Steps	Potential Hazards of Step & Mitigations for Hazards:	
Step 1		***Fire Watch***
		PPE/Tools
Step 2		***Fire Watch***
		PPE/Tools

Campus Safety
409.658.4491
Rev. 06.18.2025

Experiment Hazard Analysis (EHA)

Date:

Signatures of All Parties Involved:

Signature on this page certifies that all steps, hazards & mitigations have been reviewed thoroughly & agreed upon by all.

(If more steps are needed, reuse this page & change the numbers.)

Campus Safety
409.658.4491
Rev. 06.18.2025

Experiment Hazard Analysis (EHA)			
Steps	**Potential Hazards of Step & Mitigations for Hazards:**		
Step 3		***Fire Watch***	
		PPE/Tools	
Step 4		***Fire Watch***	
		PPE/Tools	
Step 5		***Fire Watch***	
		PPE/Tools	

The following links are to the Excel workbooks on the campus website:

HazWaste Disposal Inventory Workbook

In-Use & Stored Chemicals & Materials Inventory Workbook

Useful Links:

Prudent Practices in the Laboratory, full book, free pdf download – This book is referenced and used by almost all of the hazardous chemical and material governmental agencies and scientific research organizations. It has stood the test of time and gives an immense amount of laboratory safety information.

American Chemical Society (ACS) – Chemical & Laboratory Safety

The National Institute for Occupational Safety and Health (NIOSH) Pocket Guide to Chemical Hazards

ATSDR Toxic Substances Portal

ATSDR Toxicological Profiles – Toxicological Profiles (Tox Profiles) are a unique compilation of toxicological information on a given hazardous substance. Each peer-reviewed Tox Profile reflects a comprehensive and extensive evaluation, summary, and interpretation of available toxicological and epidemiological information on a substance.

PubChem

Carolina SDS Website

PubChem GHS Classification (Rev. 10, 2023) Summary

OSHA Occupational Chemical Database

Texas Department of Health & Human Services Right-To-Know Program