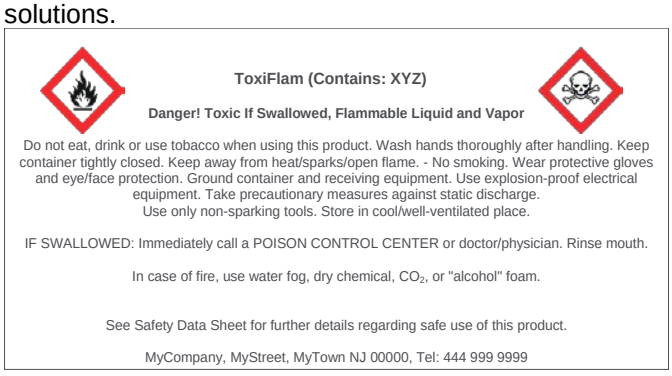
ANNUAL SAFETY TRAINING – 2014
Module # 2

CHEMICAL HYGIENE

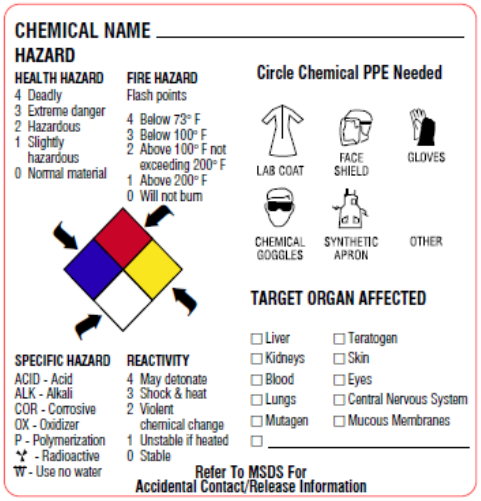
The purpose of the Chemical Hygiene Plan is to protect employees from exposures to hazardous laboratory chemicals. It provides guidance on safe handling, use and storage of chemicals in laboratory operations. This training is in compliance with 29 CFR 1910.1450, the OSHA Laboratory Standard (available at the link below). The training also covers other states regulatory requirements like the California CCR Title 8, 5191, for occupational exposure to hazardous chemicals in the laboratory. In addition, there may county or city standards. It is the responsibility of each employee to work safely with chemicals. The goal is to prevent unnecessary exposures to chemicals.
A hazardous chemical is any chemical, chemical compound, or mixture of compounds which presents a physical and / or health threat. A chemical is a **physical hazard** if there is scientific evidence or knowledge that it is: a flammable substance; a compressed gas; an explosive; an oxidizer; a pyrophoric; a water reactive material; or a self-reactive or self-heating substance. A chemical presents a **health hazard** if there is evidence or knowledge that it is acutely toxic, causes skin or eye irritation, causes respiratory or skin sensitization, is a germ cell mutagen, is a carcinogen, causes target organ systemic toxicity (after one or multiple exposures) or causes aspiration toxicity. The following engineering controls and safe work practices can prevent unnecessary exposures and potential injuries from working with chemicals:

- Do not work with chemicals unless you have had the appropriate training. You should be familiar with the hazardous properties of the chemical you handle.
- Know the location of each chemical's Safety Data Sheet, or SDS, (formerly Material Safety Data Sheets – or MSDS). They will alert you to the appropriate equipment, work practices, and Personal Protective Equipment (PPE) needed to handle the chemical safely. They may be stored as paper or electronic copies.
- When working with chemicals, utilize all available engineering controls, such as lab hoods, bottle carriers, and secondary containment for proper storage of chemicals and wastes. Ensure all engineering controls are in good working order and properly maintained. This includes air velocity checks and annual certifications for lab hoods, checks for leaking or damaged containers and secondary containment.
- Avoid direct contact with all hazardous chemicals. Wear the required PPE and avoid inhalation of vapors and fumes from hazardous chemicals.

- Never eat, chew gum, drink, smoke, apply cosmetics, and/or manipulate contact lenses or personal electronic devices in the laboratory (especially in the presence of hazardous chemicals).
- Confine long hair, loose clothing, and utilize appropriate footwear that fully covers the feet when working with hazardous chemicals.
- Know the location and proper use all emergency equipment; including fire extinguishers, eyewash and safety shower stations.
- Check and flush all plumbed eyewash stations weekly and shower stations monthly, as directed in the *Emergency Eyewash and Shower Policy*.
- Wash thoroughly with soap and water after handling chemicals, before leaving the laboratory, and before eating or drinking.
- Ensure all chemicals are properly labeled with the chemical name(s), symbols, signal words and the hazard statement. All containers, storage areas, and laboratory entryways should be labeled with the appropriate hazard warnings. Do not deface the label on incoming chemical and make labels for containers of working solutions.



- New OSHA regulations require chemical labels to have a standard format like the one on the left.
- The information more clearly indicates the type of physical and health risk the chemical presents.
- Manufactures will determine the hazards and provide the label.
- Secondary containers used in the lab may contain this information or may use an alternate method such as the NFPA symbol below.



- The symbol to the left includes one of the more commonly used symbols to identify chemical hazards, developed by The National Fire Protection Association (NFPA). The four-colored diamond represents a chemical's Flammability Rating (red); Health Hazard Rating (blue), Reactivity Rating (yellow), and other Special Hazards are at the bottom in white. Each quadrant contains a number (0-4) indicating the severity of the hazard, with 0 indicating no hazard and 4 indicating the most severe hazard. This label also provides space to indicate the proper PPE to wear and the target organs at risk when handling the chemical.

- Area or personal monitoring will be conducted for employees working with hazardous chemical that have regulatory exposure threshold limits. This will ensure our controls and work practices are minimizing the risk of exposure. Permissible Exposure Limits (PEL) and Short Term Exposure Limits (STEL) for some common lab chemical include:

Chemical	PEL (8 hour; ppm)	STEL (15 min; ppm)
Formalin	0.75	2.0
Xylene	100	150
Methylene chloride	25	125

- Signs and symptoms of chemical exposure vary by the chemical and route of exposure but may range from minor respiratory, eye or skin irritation to dizziness, headaches, confusion, nausea, weakness and loss of consciousness. Consult the SDS for additional details.
- There are several methods you can use to detect the presence or release of a hazardous chemical. These include: visible signs of a spill or leak, the detection of odor related to a chemical, an exposure monitoring result above the threshold limits, or experiencing signs or symptoms of overexposure.
- Segregate chemicals and stored separately based on compatibility (e.g. segregate flammables, acids and bases). This limits the likelihood of an unexpected chemical reaction. Flammable chemicals should be stored in flammable cabinets. When possible, use small "working" quantities of chemicals (such as a pint or one liter). Avoid the practice of placing large containers of chemicals at work stations, lab bench-tops, and inside fume hoods.
- All chemicals and hazardous materials must be maintained, stored, and transported in a secure manner.
- Additional information about chemicals can be found in the *Chemical Hygiene Plan* located on the EHS web page (http://questnet1.qdx.com/Business_Groups/hr/ehs/ehs_toc.htm). Contact your supervisor or manager for a list of the hazardous chemical present in your work area.

Reference: *OSHA 29 CFR 1910-1450 "Occupational Exposure to Hazardous Chemicals in Laboratories"* available here http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=10106