

SECTION 10

Hazard Communication and Chemical Safety

SECTION 10: HAZARD COMMUNICATION AND CHEMICAL SAFETY

Overview

This section provides you with information about the proper identification, use, storage, and disposal of chemicals.

Chemical Use

Before working with any chemical, you must be aware of the hazards associated with it, how to use and handle it with appropriate safety controls, and the proper storage and disposal of it. This can be accomplished through attending training and reviewing references such as **Safety Data Sheets (SDS)** and written procedures. Always ask questions if you are unsure of how to handle a chemical.



Know About the Chemicals that You Use

Individuals working with chemicals should take Hazard Communication training provided by EH&S. You may contact the EH&S Office to get more details on the availability of the training. The HazCom training equips you with the tools to understand the manufacturer's hazard labeling information and the SDS.

All shops that contain chemicals must have an SDS binder in their work area or have the ability to access SDS information electronically and in a timely manner. The first section should include a chemical inventory (preferred format located in [Appendix D](#)), and the SDSs should follow. If you do not have a SDS for a chemical, you can get it from the manufacturer, EH&S, or look for it online. Review the SDS before chemical use and cleanup.

Knowing some basic information about the chemicals that you use and the type of PPE that is required is essential to using chemicals safely.

Contact EH&S for a hazard evaluation if you have additional concerns or questions after taking the HazCom online training and reviewing the manufacturer's SDS or hazard warnings on the label.

How do I find information on a SDS?

The following information will be listed on the SDS (in this order) for every chemical that you use:

- **Section 1, Identification** includes product identifier; manufacturer or distributor name, address, phone number; emergency phone number; recommended use; restrictions on use.
- **Section 2, Hazard(s) identification** includes all hazards regarding the chemical; required label elements.
- **Section 3, Composition/information on ingredients** includes information on chemical ingredients; trade secret claims.
- **Section 4, First-aid measures** includes important symptoms/effects, acute, delayed; required treatment.
- **Section 5, Fire-fighting measures** lists suitable extinguishing techniques, equipment; chemical hazards from fire.
- **Section 6, Accidental release measures** lists emergency procedures; protective equipment; proper methods of containment and cleanup.

- **Section 7, Handling and storage** lists precautions for safe handling and storage, including incompatibilities.
- **Section 8, Exposure controls/personal protection** lists OSHA's Permissible Exposure Limits (PELs); ACGIH Threshold Limit Values (TLVs); and any other exposure limit used or recommended by the chemical manufacturer, importer, or employer preparing the SDS where available as well as appropriate engineering controls; personal protective equipment (PPE).
- **Section 9, Physical and chemical properties** lists the chemical's characteristics.
- **Section 10, Stability and reactivity** lists chemical stability and possibility of hazardous reactions.
- **Section 11, Toxicological information** includes routes of exposure; related symptoms, acute and chronic effects; numerical measures of toxicity.
- **Section 12, Ecological information** lists ecotoxicity persistence and degradability; bioaccumulative potential, mobility in the soil.
- **Section 13, Disposal considerations***
- **Section 14, Transport information** lists UN number, UN proper shipping name, transport hazard class(es), packing group, if applicable, environmental hazards.
- **Section 15, Regulatory information** includes safety, health and environmental regulations specific for the product in question.
- **Section 16, Other information**, includes the date of preparation or last revision.

Handling Chemicals Safely

Be aware of your surroundings and keep the following items in mind:

General Safe Handling Practices

- If you are using flammable chemicals, make sure any ignition sources have been extinguished and heat is kept away.
- If you are using more than one chemical, make sure they will not react dangerously with one another.
- If you notice any fumes, vapors, bubbling, or unusual odors, stop what you are doing, vacate the area and request assistance.

Minimize Your Exposure

Proper chemical handling includes selecting the right kind of personal protective equipment (PPE) for the specific chemical hazard. In particular, you must select a glove that provides adequate protection against the individual chemical you are using (check the SDS for details), if necessary. When pouring or handling liquid chemicals, make sure you don't get proper splash protection (including gloves, aprons, and goggles).

A functional workplace ventilation system can prevent unnecessary inhalation exposures and reduce or eliminate the need for respiratory protection. Proper ventilation can also reduce the potential for fire hazards. Examples of workplace ventilation systems include:

- Dust collection systems on woodworking equipment.
- Using spray hoods when painting.
- Snorkel vents over chemical and welding operations.

Contact EH&S for a hazard evaluation if you are unsure if the chemical you are handling requires special PPE, ventilation, or respiratory protection.

Housekeeping and Personal Hygiene

- Do not use or store chemicals in non-work areas such as eating areas or in locker rooms. Eating and drinking is prohibited in work areas and must be assigned to a specific area or room.
- Always wash your hands after working with chemicals. Prolonged exposure to certain chemicals may have delayed effects.
- Always clean up equipment and work surfaces if they come into contact with chemicals and avoid placing chemical containers on the floor or at the end of a bench or table to prevent a spill.
- Keep containers closed when not in use.

Know What To Do in Case Of A Spill

Personal safety is the highest priority when a spill occurs. Depending on the scope of the spill and your training in spill clean-up procedures, you may be able to clean up a spill yourself or with the help of coworkers who are also trained in spill clean-up. EH&S is available to clean up spills if you are not trained in these procedures or if the spill is large.

In case of a small spill that does not present a significant hazard:

- Cordon off the affected area.
- Don the proper PPE for the chemical that has spilled (according to the SDS).
- Surround the spill using paper towels or the absorbent material from your spill kit.
- Proceed to clean up the spill using the same materials.
- Dispose of all clean-up materials as hazardous waste.

In the case of a large spill, call police dispatch at 911.

Chemical Storage

Chemicals must be physically segregated according to hazard class to prevent adverse chemical reactions. The segregation rules apply to all chemicals, regardless of their physical state (solid, liquid, or gas). If space is limited, incompatible chemicals can be placed in separate secondary containments in the same cabinet. Proper chemical segregation can be accomplished by designating storage cabinets, tubs, bins, or specific areas for a specific hazard class. Hazardous classes include:

- **Flammable:** fuel, welding gases, solvents, paint thinner, acetone, spray aerosols
- **Combustible:** flux, paint, wood dust, stain, cutting fluid, some adhesives, oil
- **Oxidizers:** oxygen, hydrogen peroxide, bleach, certain cleaners
- **Toxics:** mercury, lead, alloys containing cadmium or beryllium, chlorinated solvents or degreasers, solders, pesticides
- **Acids:** etching solutions, battery acid
- **Bases:** caustic or alkaline materials, ammonia based cleaners and some chemical strippers
- **Reactives:** polymer kits, epoxy resin

Chemicals must be stored in secondary containment, such as plastic tubs, and should not be scattered around the shop. Ensure that these materials are properly restrained when they are stored in cabinets or on shelving. Avoid storing chemicals near sources of heat or combustion.

Chemical containers must be compatible with the chemicals they are holding. For example, corrosive chemicals, such as strong acids and bases, will corrode metal containers.

All chemical containers must also be clearly labeled with the manufacturer's original label. If you transfer any chemicals to another container, you are required to provide your own label. Containers must be clearly labeled with the product identifier (from the SDS), and general information about the hazards of the chemical.

No more than 10 gallons of flammable chemicals may be stored outside of a flammable storage cabinet at any time. Keep oily rags in a separate, flash proof metal container.

When chemicals are not in use, they must be tightly sealed. If containers are damaged, leaking, or corroded, the contents must be transferred to a new properly labeled container or disposed of as hazardous waste. Refer to the EH&S Safety Website for details on chemical hygiene and segregation.

Hazardous Chemical Waste

When a chemical product is discarded or is no longer useable, it typically becomes a hazardous waste, which requires special disposal procedures. Old or expired chemicals that cannot or will not ever be used should be disposed of as hazardous waste. Remember that waste can be decreased by purchasing only the amount of a chemical that you need or by substituting non-hazardous products for hazardous chemicals.

What is hazardous waste?

A waste meets the definition of hazardous waste if it has one or more of the following hazardous characteristic(s): it is flammable, corrosive, reactive, or toxic. These are referred to as characteristic wastes. Hazardous wastes that could be generated in the shops include oil, oily rags, used solvent, paint, aerosol cans, etc.

What do I do with hazardous waste?

1. Identify and Label with a Hazardous Waste Tag.

A Hazardous Waste Tag must be placed on each hazardous waste container upon start of accumulation and must be kept on the container at all times. The EH&S Office can assist the shop in creating hazardous waste tags and using available software to support the proper labeling and pick-up of hazardous waste.

See Figure 10.1 for an example of a completed tag.

Figure 10.1 – Sample Hazardous Waste Tag



The image shows a sample hazardous waste tag form. It includes a tracking number (2177757), accumulation start date (2017-02-02), and a date when it must be given to EH&S (2017-05-03). The form lists contents: lead foil (90%) and sodium chloride (10%). It has checkboxes for various hazard categories: Flammable, Corrosive Acid (pH < 2), Corrosive Base (pH > 12.5), Toxic, Reactive, Oxidizer, Extremely Hazardous, Solid, and Bag. A barcode is present with the number 2177757. The form is from the University of California, Los Angeles (UCLA) and includes fields for Generator Account Name, Your Name, Phone #, Location, and Comments.

2. Follow the container requirements.

- Liquid container requirements:
 - Containers must be free of exterior contamination.
 - Containers must be chemically compatible and the size should be suitable for the material stored.
 - Containers must be in good condition with screw tops or sealed lids.
 - Containers must not be leaking, rusting, or have any other defects.
 - Containers must not be filled to the top (only fill 90% full, leaving 10% air space)

- Dry container requirements:
 - Dry waste must be double bagged in transparent, sturdy bags and cannot have sharp or protruding edges.

3. Store the waste safely in the shop:

- Collect and store hazardous waste in the same or adjacent room where it is generated before it is transported.
- Keep the containers closed and inspect them for signs of leaks, corrosion, or deterioration regularly.
- Report damaged containers to EH&S. EH&S will help with the transfer of contents to an appropriate container.
- Segregate chemical wastes to prevent incompatible mixtures. For example, do not mix acids with bases, acids with cyanide compounds, or oxidizers with organic materials.
- Label storage areas according to the types of chemicals kept there (e.g., “Corrosive”, “Flammable”, etc.).
- Storage of hazardous waste under the sink is prohibited.

Dispose of waste within 90 days from the first point of generation. Coordinate waste pick-up with the EH&S Office prior to reaching the 90 day limit.

What about special wastes?

Contact EH&S if you think you may have a special waste, such as an unknown chemical or a container that is damaged or corroded.

How can I decrease hazardous waste?

Some hazardous chemicals can be substituted with non-hazardous products, like using aqueous parts washers instead of solvent based ones. Other wastes can be decreased by not purchasing large quantities of chemicals when only a small quantity is necessary for a job. If a certain chemical has an expiration date, use the older containers first. If possible, use substances that can be neutralized or stabilized either physically or chemically. Use less hazardous substitutes when feasible.

What do I do with empty chemical containers?

Containers that held chemicals or hazardous waste are only considered empty when material cannot be poured or scraped from them. Most empty containers do not need to be managed as hazardous waste, but there are some exceptions. You will need to dispose of a container as hazardous waste if it contains waste residue or if its capacity is greater than five gallons.

What else do I need to know?

- Don't dispose of chemicals down the drain or in regular trash receptacles.
- Unknown chemicals may require special analysis. Contact the EH&S Office for further details on proper handling of unknown chemicals.