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Hazard Communication Standard

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HAZARD COMMUNICATION STANDARD

The current rate of technological advances has brought with it an overwhelming increase in the usage of chemicals in the workplace and in the home. Coupled to this increase has been a heightened awareness in the potential for acute and chronic injuries attributable to chemical insults. The Hazard Communication Standard has been introduced with the desired goal of reducing workplace exposures to hazardous substances and thereby achieving a corresponding reduction in adverse health effects. It was created and proclaimed by the U.S. Department of Labor and regulated by the Occupational Safety and Health Administration.

REGULATORY BACKGROUND

On November 25, 1983, the Occupational Safety and Health Administration (OSHA) issued its Hazard Communication Standard (HCS). Standards pertaining to the Occupational Safety and Health Act are contained in the Code of the Federal Register, Title 29 Part 1910. This standard (1910.1200) established guidelines for training and communicating information to employees about chemical-related hazards in the workplace.

The Federal Register provides the uniform system for making available to the public regulations and legal notices issued by federal agencies.

Laboratory environments within the workplace are unique due to such factors as the professional competence of employees, the variety and often limited quantities of chemicals, and the engineering controls that may be present. Accordingly, special considerations have been established to fulfill the unique needs of laboratory environments.

Employees working in other than chemical laboratories must also be introduced to chemical hazard information. Due to the mobility and intense interaction within our population, all employees can benefit from this information.

Ten program elements are recommended for inclusion in a basic hazard communication program:

- Prepare a written hazard communication plan.
- Identify and evaluate the chemical hazards in the workplace.
- Prepare a hazardous substance inventory.
- Develop a file of Material Safety Data Sheets.
- Provide employees with access to Material Safety Data Sheets.
- Ensure that incoming products have proper labels.
- Develop a system for within-facility labeling where necessary.
- Develop a training program.

- Identify and train employees who are potentially exposed to hazardous chemicals.
- Evaluate the program and improve and update it where necessary.

The informational areas that are mandated for laboratories under the Hazard Communication Standard are as follows:

1. Labeling
2. Material Safety Data Sheets (MSDS)
3. Employee Information and Training

The Hazard Communication Standard requires chemical manufacturers and importers, to make a comprehensive hazard determination for the chemical products they sell. Information about the health and physical hazards is required to be furnished by manufacturers, importers, and distributors to manufacturing sector companies buying and using these products. Substances that pose physical hazards are those that react in some dangerous way, e.g. they burn or explode easily. Substances that pose health hazards include those that may be irritating corrosive; sensitizing; or toxic to skin, eyes, mucous membranes, lungs, or other body organs; or have been shown to cause cancer in humans or lab animals; or are otherwise dangerous to a person's health. The information concerning the hazards is supplied in the form of warning labels which are to be affixed to the containers and material safety data sheets (MSDS).

The Hazard Communication Standard, 1910.1200, is the first OSHA performance-based standard. A performance-based standard describes the goal a regulatory agency seeks to accomplish but leaves a certain amount of freedom as to how these goals are to be achieved. A specification standard, which is the opposite of a performance standard, is one where the government tells you what you have to do and how you have to do it.

What OSHA seeks to accomplish with the promulgation of this standard is to reduce the incidence of chemically-related occupational illnesses and injuries in employees.

It was originally limited to the manufacturing industries - 1986. It now applies to workers exposed to hazardous materials not only in manufacturing, but also in the nonmanufacturing sector (e.g., agriculture, construction, commercial industries and research and development laboratories) - 1988.

OSHA felt that increased availability of hazard information would assist employees in devising appropriate protective measures, and would give employees the information they need to take steps to protect themselves.

WRITTEN HAZARD COMMUNICATION PROGRAM - 1910.1200(e)

The OSHA standard requires covered employers to "develop and implement a written hazard communication program for their workplaces..." While this plan does not have to be lengthy, the standard requires that the program:

- be written;
- describe how the facility will comply with the standard;
- deal with plans for labeling and other forms of warning;
- describe how MSDS's will be obtained for each hazardous chemical used in the work area;
- describe how MSDS's will be made available in the workplace;
- describe how information and training will be provided to employees;
- include an inventory of all toxic chemicals known to be present in the workplace, cross-referenced to the MSDS file;
- explain how workers will be informed of hazards connected with nonroutine jobs, such as dealing with accidental spills and leaks;
- explain how workers will be informed of hazards associated with chemicals contained in unlabeled pipes; and,
- contain information on how contract employers will be informed about hazards their employees may encounter while working in the facility.

In addition, the written plan must be given to representatives of OSHA or NIOSH, employees, and employee representative upon request.

There are several steps in conducting a hazard assessment. The first step involves the definition of hazardous chemicals. As defined in the HCS, "hazardous chemical" means any chemical which is a physical hazard or a health hazard. They do not include hazardous wastes regulated by EPA, tobacco products, wood products, articles as defined in the HCS, and food, drugs, and cosmetics used or consumed by employees at the workplace. Many of these items are excluded because they are subject to other specific Federal regulations that address proper labeling and hazard notification.

The OSHA HCS identifies a floor of about 600 chemicals that have been established as hazardous and therefore must be included in any hazard communication program if employees have potential exposure to them. These "hazardous" chemicals are derived from the following sources identified in the OSHA standard:

1. Any chemical regulated by OSHA in 29 CFR Part 1910, Subpart Z;
2. Threshold Limit Values for Chemical Substances and Physical Agents in the Work Environment, American Conference of Governmental Industrial Hygienists (ACGIH), latest edition;
3. National Toxicology Program (NTP), Annual Report on Carcinogens, latest edition;
4. International Agency for Research on Cancer (IARC) Monographs, latest edition.

However, the fact that a chemical is not listed does not mean it is not hazardous. Any chemical that poses a potential health or physical hazard, as defined in the HCS, must be included in the hazard assessment. In general, if there is any question regarding a particular chemical, it is prudent to include that chemical in the hazard communication program.

A facility or workplace may contain common consumer products such as household detergents and cleansers, soap, typing correction fluid (e.g., White-Out), etc. These items may be excluded from the hazard assessment provided they are used in the same manner and approximate quantities as would be expected in their typical consumer applications. If, for example, a commercial sodium hypochlorite solution (e.g., Clorox) is used to regularly disinfect work surfaces for microbial contamination, it should be included in the program.

The second step is to consider only those chemical agents known to be present at the workplace. However, consider any information already available that indicates the presence of a hazardous agent. The hazard assessment must consider all agents in work environments, including field locations.

The third step is to determine which employees have a potential for exposure to the chemical. The term potential exposure describes the ability of an employee to come into contact with a material by inhalation, ingestion, or direct contact with the skin. Exposures during normal work activities, nonroutine work tasks, and foreseeable emergencies (e.g., accidental spills) must also be considered. In many cases, the determination that a chemical is present in an employee's work area will be enough to where it is reasonable to conclude that exposure will not occur, such as exposure to gasoline during the operation of motor vehicles.

General Principles for Recognizing Health Hazards

When conducting a hazard assessment at a facility, there are several questions which can be asked to help organize the effort and to ensure that nothing important is overlooked. For example:

What chemicals are being used or produced and in what quantities? Are there warning labels on drums or containers that identify the chemical or caution against breathing vapors or against allowing skin contact? Obtain MSDS's and hazard information for these chemicals.

Are there procedures for responding to emergencies such as chemical spills, leaks, explosions, and fires?

Preparing a Hazardous Substance Inventory - 1910.1200(e)(1)(i)

One of the products of a hazard assessment is a complete inventory of chemical agents. This inventory should be periodically updated. Over time, several new hazardous agents may be introduced and older ones phased out. Also, activities may be redirected resulting in potential exposure to different chemicals.

The hazardous chemical inventory must contain the identity of the chemicals identified during the hazard assessment. The name used on the inventory to identify a chemical does not have to be its scientific chemical name (i.e., common, trade, or product names may be used). However, the name used on the inventory must also reference its corresponding MSDS. There should be a master inventory list for the entire facility. Additional lists can be developed for individual locations within the facility.

Hazardous Chemical MSDS File - 1910.1200(g)

All facilities are required to have an MSDS for each hazardous chemical that is used in the facility. Incoming MSDS's should be reviewed for accuracy and completeness and to ensure that the latest MSDS is on file. A comparison of new and old MSDS's is useful because it may identify those situations where a "new" hazard associated with an existing chemical has been identified, or a new ingredient is included in a currently used product. In those cases, additional training of employees may be required. If new and significant information becomes available concerning a product, the chemical manufacturer, importer, or distributor must add it to the MSDS within 3 months.

OSHA has not prescribed the format for the MSDS, but the standard specifies the information that MSDS's are required to contain. OSHA has issued a nonmandatory MSDS form (OSHA Form 174) that meets the HCS requirements and can be used as is or modified as needed. The information on the MSDS must be in the English language.

Information on the MSDS can be used to help you select the safest product to do a particular job. It can help you deal with emergency spills and leaks. However, given the complexity of the OSHA standard and the large number of MSDS's in use, it may take some time before all MSDS's are fully in compliance with the standard. Facility managers may find it necessary to consult other information sources to verify the accuracy and completeness of MSDS's.

An MSDS must be maintained for each hazardous chemical on the inventory. The facility's purchasing, receiving, inventory control, and safety and health departments should coordinate activities to make sure that all incoming initial shipments of hazardous substances arrive with an MSDS. While MSDS's are not required to be physically attached to a shipment, they must accompany or precede the shipment. In cases where your facility makes repetitive procurements of the same chemical from the same supplier, the MSDS may already be on file in your facility. Although subsequent shipments of the same item may have an MSDS attached, it is the initial shipment that must have one.

Chemical Identity

- If the chemical is a single substance, it should have the chemical, trade, and common name(s).
- The chemical identity on the MSDS should be cross-referenced to an identifier found on the label.

Hazardous Ingredients

- If the hazardous chemical is a mixture which has been tested as a whole to determine its hazards, the chemical and common names of the ingredients that are associated with the hazards, and the common name of the mixture itself must be listed.
- If the chemical is a mixture which has not been tested as a whole (most probable since very few mixtures are tested), all ingredients that are not carcinogens, but are health or physical hazards and comprise 1 percent or more of the mixture, must be listed.
- Carcinogens (e.g., OSHA list, IARC Monographs, NTP list) must be listed if they are present in the mixture at levels of 0.1 percent or greater.
- All components of a mixture that have been determined to present a physical hazard must be listed.

Physical and Chemical Characteristics

- The physical and chemical characteristics of the hazardous substance reflect the properties of the compound. These include such items as boiling and freezing point, density, vapor pressure, specific gravity, solubility, volatility, and the product's general appearance and odor.

Physical Hazards

- The compound's potential for fire and explosion must be described. This section explains the fire hazards of the product and the conditions under which the product could ignite or explode. Most MSDS's also provide information on recommended extinguishing agents and fire fighting methods.
- This section also presents information about other chemicals and substances with which the chemical is incompatible, or with which it reacts. Information on decomposition products, such as carbon monoxide, is included.

Health Hazards

- The health hazards of the chemical, together with signs and symptoms of exposure must be listed. In addition, any medical conditions which are generally associated with exposure to the compound, or which exposure to the compound can aggravate, must be included. The specific types of health hazards defined in the standard include: carcinogenicity, corrosives, toxicity, irritants, sensitizers, mutagenicity, teratogenicity, and target organ effects, such as, liver, kidney, nervous system, blood, lung, mucous membranes, reproductive, skin, and eye effects.
- The route of entry section describes the primary pathway by which the chemical enters the body. There are three principal routes of entry: inhalation, skin, and ingestion.
- This section of the MSDS supplies the OSHA Permissible Exposure Level (PEL), the ACGIH Threshold Limit Value (TLV), as well as other exposure levels used or recommended by the chemical manufacturer.
- If the compound is listed as a carcinogen by OSHA, NTP or IARC, it must be so indicated on the MSDS.

Special Precautions, Spill, Leak, and Cleanup Procedures

- The standard requires the preparer to describe applicable precautions for safe handling and use which are known. These include recommended industrial hygiene practices, precautions to be taken during repair and maintenance of equipment, and procedures for cleaning up spills and leaks. Some companies also use this section to include useful information not specifically required by the standard, such as EPA waste disposal methods and State and local requirements.

Control Measures

- The standard requires the preparer of the MSDS to list any generally applicable control measures. These include engineering controls, safe handling procedures, and personal protective equipment. Information on the use of goggles, gloves, body suits, respirators, and face shields is often included.

Emergency and First Aid Procedures

- This part of the MSDS deals with the action that should be taken in the event of an accidental overexposure. Different procedures are usually given to deal with inhalation, ingestion, skin, or eye exposures.

Responsible Party

- The standard specifies that the MSDS preparation date or the date of the last change be provided. In addition, the name, address, and telephone number of the chemical manufacturer, importer, or other responsible party preparing or distributing the MSDS must be included.

Trade Secrets.

The HCS contains provisions which allow a chemical manufacturer, importer, or employer to withhold chemical identity information from an MSDS to protect a "bona fide" trade secret (29 CFR 1910.1200(i)). However, the MSDS still must disclose the properties and hazards of any chemical for which a trade secret claim is made. The HCS also prescribes procedures for disclosure of trade secret chemical identities to health professionals who provide occupational health services to exposed employees, employees, or designated representatives. Individuals to whom trade secret information is provided must be able to demonstrate a "need-to-know" the information and the means to maintain its confidentiality.

Employee Access to MSDS's - 1910.1200(g)(8)

Copies of MSDS's must be readily accessible to employees during each work shift when they are in their work areas. Employee representatives also have a right to access MSDS's. Under the standard, alternative formats to the MSDS may be used. For example, in facilities where computer terminals are readily available, MSDS information could be provided to employees through that mechanism.

There are no requirements in the HCS dealing with the retention of MSDS's for substances no longer used. However, the OSHA Access to Exposure and Medical Records rule (29 CFR 1910.20) requires retention of some historical record of the compounds that you have used in the past, as well as medical and environmental monitoring records of employee exposure.

Incoming Labels and Within Facility Labeling Systems

Container Labeling - 1910.1200(f)

In general, containers of chemicals must be labeled with the identity of the contents and appropriate hazard warnings. The hazard warning can be words, pictures, or symbols which provide an immediate understanding of the primary health and/or physical hazard(s) of the material. The name and address of the manufacturer or other responsible party must also be listed. It may not be necessary or appropriate to include on the labels every hazard found on the MSDS, since the MSDS addresses essentially every known hazard of the chemical. However, this does not mean that well documented hazards can be left off the label simply because they appear on the MSDS. Nor should the label include only the acute or immediate hazards. The selection of hazards to be highlighted on the label will involve some assessment of the evidence and significance of each of the hazards listed in the MSDS.

Labeling information may appear on the container surface (e.g., labels) or may be attached to the container (e.g., tags, tickets, process sheets). Containers include bags, barrels, bottles, boxes, cans, cylinders, drums, reaction vessels, etc. Pipes and piping systems for chemicals do not have to be labeled. However, employees must be provided information on the contents of any pipes used to convey hazardous chemicals.

In most cases, containers of chemicals will already be labeled by the manufacturer, supplier, or distributor to satisfy OSHA hazard communication requirements and Department of Transportation (DOT) requirements. Therefore, your major requirement under this provision would be to check the adequacy of existing labels.

The identifier that is listed on the label must allow cross-referencing to the MSDS and the inventory. Any designation can be used, such as chemical name, trade name, Chemical Abstract Service (CAS) number or Federal Stock number or code number. For example, a container of formaldehyde could be named in the following ways:

<u>Designation</u>	<u>Type</u>
Formaldehyde	chemical name
Methylene oxide	synonym
Formalin	synonym
50-00-0	CAS number
LP8925000	NIOSH RTEC Number
1198 or 2209	DOT Identification Number

Existing Labels - 1910.1200(f)(7)

An existing label on a container brought into the workplace can be removed or altered only if the container is immediately relabeled with the identity and hazard information. However, most chemical containers should be properly labeled by the manufacturer. The most efficient approach to labeling would be to leave these labels intact.

There are situations where existing labels may need to be replaced or supplemented. If hazardous materials in bulk containers are repackaged or redistributed into containers used by more than one employee, then each "sublot" container must be labeled. Also, any existing labels that may not remain legible over the useful life of the container should be replaced. For example, weather-resistant labels or tags would be appropriate for containers subjected to outdoor conditions. Some chemicals when splashed or spilled may degrade the markings on the container label. Therefore, label inks and markings should be used that are not soluble in the liquid content of the container.

Probably the most widely used and recognized labels are the DOT shipping labels. While these labels do not meet the requirements of the HCS, they do identify the general class of material in the shipping container (e.g., poison, corrosive, flammable liquid, explosive, etc.). Because these labels are designed for hazard warning during transport, they are not, by themselves, sufficient warning of the hazards workers may encounter while using or handling the material. Nonetheless, these labels can provide some indication of the key hazards. All employees covered by the program should be trained to recognize the DOT labels, especially personnel receiving shipments and deliveries of hazardous materials.

Labeling Exemptions and Alternatives

There are four situations that are exempted from or allow alternatives to the labeling requirement; containers labeled under other Federal laws, portable containers, laboratories, and stationary containers.

Labels Required by Other Agencies - 1910.1200(b)(4)

Other Federal agencies require labeling on the articles they regulate to inform users of ingredients and hazards. These articles would be exempt from any additional labeling requirement under the hazard communication program. These Federal agencies and their areas of jurisdiction are listed in Table 1.

TABLE 1
SOME LABELS REQUIRED BY OTHER AGENCIES

Agency	Authority	Jurisdiction
Environmental Protection Agency	Federal Environmental	Insecticides
	Pesticide Control Act	Fungicides
	(formerly FIFRA)*	Rodenticides
Consumer Product Safety Commission	Federal Hazardous Substances Labeling Act	Hazardous and Toxic Household Products
Food and Drug Administration	Fair Packaging and Labeling Act	Packaging and Labeling of Food, Drugs, Cosmetics, & Medical Devices
Bureau of Alcohol, Tobacco, & Firearms	Federal Alcohol Administration Act	Distilled Beverages, Wine, and Malt Beverages

*Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) DOE, EPA and the U.S. Nuclear Regulatory Agency get involved with radioactive materials and their control.

These articles are exempt only from the labeling provisions of the standard; the other requirements of the OSHA standard still apply. Most pesticides should be included as part of the hazard communication program. Consumer products may or may not be included depending on how they are used in the workplace.

Portable Containers - 1910.1200(f)(6)

Portable containers into which hazardous chemicals are transferred from labeled containers and which are intended only for the immediate use of the employee performing the transfer, are exempt from the labeling requirements of the HCS. Hazardous chemicals left in portable containers beyond the employee's work shift must be labeled according to the standard. This labeling exemption is intended to prevent the ineffective use of labels for certain activities, such as the few ounces of a pesticide or fertilizer placed in a hand-held spray applicator. However, labels may be appropriate for any container where confusion may subsequently occur if it is not labeled.

Laboratories - 1910.1200(b)(3)

Laboratories also receive different treatment in terms of HCS labeling requirements. Labels on incoming containers of hazardous chemicals must not be removed or defaced. In laboratories only, containers, such as test tubes, flasks and beakers, need not be labeled with an identity and hazard warning.

Stationary Containers and Vessels - 1910.1200(f)(5)

Alternative methods of labeling, such as signs, placards, and other written forms of warning, are permitted in lieu of affixing labels to individual stationary process containers. Sometimes, stationary containers (e.g., reaction vessels, storage tanks) may be used for several different materials. It is not necessary to relabel the container each time its contents changes. Instead, signs, placards or batch/process sheets can be placed or posted in close proximity to the container. However, the alternative method of labeling must provide the same information as a label, that is, the substance identity and the principle hazard(s). In addition, employees must be informed, as part of their hazard communication training, of the alternative labeling methods used in their work areas.

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