

Hazard Communication Program



OSHAcademy™ Course 705 Study Guide

Hazard Communication Program

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This study guide is designed to be reviewed off-line as a tool for preparation to successfully complete OSHAcademy™ Online Course 705.

Read each module, answer the quiz questions, and return online to submit the quiz. Print the quiz response screen which will contain the correct answers to the questions.

The final exam will contain questions taken from each module quiz. I hope you enjoy the course and if you have any questions, feel free to email or call:

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Course Introduction

The numbers

More than 30 million workers are potentially exposed to one or more chemical hazards. There are an estimated 650,000 existing hazardous chemical products, and hundreds of new ones are being introduced annually. This poses a serious problem for exposed workers and their employers.

The OSHA Hazard Communication Standard (HCS) - 29 CFR 1910.1200 provides workers exposed to hazardous chemicals with the **right-to-know** the identities and hazards of those materials, as well as appropriate protective measures. When workers have such information, they are able to take steps to protect themselves from experiencing adverse effects from exposure.

It's important that you be familiar with OSHA's hazard communication standards to help save lives and avoid OSHA citations. Take a look at OSHA's top 10 most cited violations for 2009 and you will see that hazard communication ranks as the third most commonly cited violation!

1. Scaffolding, General - 9,093 violations
2. Fall Protection - 6,771 violations
- 3. Hazard Communication - 6,378 violations**
4. Respiratory Protection - 3,803 violations
5. Lockout/Tagout - 3,321 violations
6. Electrical, Wiring - 3,079 violations
7. Ladders - 3,072 violations
8. Powered Industrial Trucks - 2,993 violations
9. Electrical, General - 2,556 violations
10. Machine Guarding - 2,364 violations

Protection under the Hazard Communication Standard (HCS) includes all workers exposed to hazardous chemicals in all industrial sectors. This standard is based on a simple concept - that employees have both a need and a right to know the hazards and the identities of the chemicals they are exposed to when working. They also need to know what protective measures are available to prevent adverse effects from occurring.

Benefits

The HCS covers both physical hazards (such as flammability or the potential for explosions), and health hazards (including both acute and chronic effects). By making information available to employers and employees about these hazards, and recommended precautions for safe use, proper implementation of the HCS will result in a reduction of illnesses and injuries caused by chemicals. Employers will have the

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information they need to design an appropriate protective program. Employees will be better able to participate in these programs effectively when they understand the hazards involved, and take steps to protect themselves. Together, these employer and employee actions will prevent the occurrence of adverse effects caused by the use of chemicals in the workplace.

Requirements

The HCS established uniform requirements to make sure the hazards of all chemicals imported into, produced, or used in U.S. workplaces are evaluated and that this hazard information is transmitted to affected employers and exposed employees.

This program ensures that all employers receive the information they need to inform and train their employees properly and to design and put in place employee protection programs. It also provides necessary hazard information to employees so they can participate in, and support, the protective measures in place at their workplaces.

All workplaces where employees are exposed to hazardous chemicals must have a written plan which describes how the standard will be implemented in that facility. The only work operations which do not have to comply with the written plan requirements are laboratories and work operations where employees only handle chemicals in sealed containers.

The written program must reflect what employees are doing in a particular workplace. For example, the written plan must list the chemicals present at the site, indicate who is responsible for the various aspects of the program in that facility and where written materials will be made available to employees.

The written program must describe how the requirements for labels and other forms of warning, material safety data sheets, and employee information and training are going to be met in the facility.

Course Objectives

This course will focus on the responsibilities of the employer in establishing and implementing an effective hazard communication program. By the end of this course you should be able to:

1. List the primary Hazard Communications Standard responsibilities for manufacturers, distributors, importers, and employers.
2. Describe the four basic elements of the Hazard Communications Program.
3. Discuss the nature of chemical hazards and the types of exposures they present.
4. List the information required on each of the four types of hazardous chemical containers.
5. Describe each of the 12 required sections of a Material Safety Data Sheet.
6. Identify the basic requirements of the hazard communication training program.

MODULE ONE: GENERAL RESPONSIBILITIES

Introduction

In order to ensure chemical safety in the workplace, information must be available about the identities and hazards of the chemicals. OSHA's Hazard Communication Standard (HCS) requires the development and dissemination of the information below.

- Chemical manufacturers and importers are required to evaluate the hazards of the chemicals they produce or import.
- Chemical manufacturers and importers are required to prepare labels and material safety data sheets (MSDSs) to convey the hazard information to their downstream customers.
- All employers with hazardous chemicals in their workplaces must have labels and MSDSs for their exposed workers, and train them to handle the chemicals appropriately.

Purpose of the Standard

OSHA's Hazard Communication Standard, 29 CFR 1910.1200, was first promulgated by OSHA in 1983. The purpose of the standard is to ensure that the hazards of all chemicals produced or imported are evaluated, and that information concerning their hazards is transmitted to employers and employees. The transmittal of information is to be accomplished by means of comprehensive hazard communication programs, which are to include container labeling and other forms of warning, material safety data sheets and employee training

Scope of the Standard

The hazard communication standard requires chemical manufacturers, distributors or importers to assess the hazards of chemicals which they produce, distribute, or import.

The hazard communication standard is based on the premise that chemicals have inherent characteristics that pose potential hazards, and workers have the right to know what those potential hazards are. All **employers** must provide information to their employees about the hazardous chemicals to which they are exposed. They do this by means of a hazard communication program, labels and other forms of warning, material safety data sheets, and information and training.

Only chemical manufacturers and importers are required to perform hazard determinations on all chemicals they produce or import, although distributors and employers may also choose to do so. Hazard determination procedures must be in writing and made available, upon request, to employees, the National Institute for

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Occupational Safety and Health (NIOSH), and OSHA. Appendix C in the standard is provided as a guide for use when assessing appropriate hazard evaluation procedures.

Application



The hazard communication rule applies to any chemical which is known to be present in the workplace in such a manner that employees may be exposed under normal conditions of use or in a foreseeable emergency.

The phrase "**known to be present**" is essential to the scope of the standard. If a hazardous chemical is known to be present by the chemical manufacturer or the employer, it is covered by the standard. This includes chemicals to which employees may be exposed during normal operations or in a foreseeable emergency. This means that even though an employer was not responsible for the manufacture of the hazardous chemical, the employer has the responsibility for conveying hazards to his/her employees.

For example, the standard applies in the following situations: if employees are exposed to chemicals brought onto a multi-employer worksite by other employer(s) or if service personnel are exposed to natural gas during furnace repair. An employer whose employees are exposed to chemicals "known to be present" must include in their hazard communication program information concerning the hazards of those chemicals.

Employee. - Employees, such as office workers or bank tellers who encounter hazardous chemicals only in non-routine, isolated instances are not covered. For example, an office worker who occasionally changes the toner in a copying machine would not be covered by the standard. However, an employee who operates a copying machine as part of her/his work duties would be covered by the provisions of the HCS.

The standard applies to:

- Any chemical that employees may be exposed to under normal conditions in the workplace or in a foreseeable emergency.

The terminology "exposed under normal conditions of use or in a foreseeable emergency" excludes substances for which the hazardous chemical is inextricably bound or is not readily available, and, therefore, presents no potential for exposure. Foreseeable emergency does not include employee exposures in the event of an accidental fire, but does include equipment failure, rupture of containers, or failure of control equipment which could result in an uncontrolled release.

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Products Exempt from Coverage by the Rule

- Any hazardous waste as defined by the Solid Waste Disposal Act.
- Any hazardous substance defined by the Comprehensive Environmental Response, Compensation and Liability ACT (CERCLA) when the hazardous substance is the focus of remedial or removal action being conducted under CERCLA.
- Tobacco or tobacco products.
- Wood or wood products, including lumber which will not be processed, where the chemical manufacturer or importer can establish that the only hazard they pose to employees is the potential for flammability or combustibility (wood or wood products which have been treated with a hazardous chemical covered by this standard, and wood which may be subsequently sawed or cut, generating dust, are not exempted).
- Articles. By definition, a manufactured item is exempted as an article if "under normal conditions of use it does not release more than very small quantities, e.g., minute or trace amounts of a hazardous chemical...and does not pose a physical hazard or health risk to employees".
- Food or alcoholic beverages which are sold, used, or prepared in a retail establishment (such as a grocery store, restaurant, or drinking place), and foods intended for personal consumption by employees while in the workplace.
- Any drug, as that term is defined in the Federal Food, Drug, and Cosmetic Act, when it is in solid, final form for direct administration to the patient (e.g., tablets or pills); drugs which are packaged by the chemical manufacturer for sale to consumers in a retail establishment (e.g., over-the-counter drugs); and drugs intended for personal consumption by employees while in the workplace (e.g., first aid supplies).
- Cosmetics which are packaged for sale to consumers in a retail establishment, and cosmetics intended for personal consumption by employees while in the workplace.
- Any consumer product or hazardous substance, as those terms are defined in the Consumer Product Safety Act and Federal Hazardous Substances Act respectively, where the employer can show that it is used in the workplace for the purpose intended by the chemical manufacturer or importer of the product, and the use results in a duration and frequency of exposure which is not greater than the range of exposures that could reasonably be experienced by consumers when used for the purpose intended.
- Nuisance particulates where the chemical manufacturer or importer can establish that they do not pose any physical or health hazard covered under this section.
- Ionizing and non-ionizing radiation.
- Biological hazards.

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Responsibilities

Requirements for chemical manufacturers, distributors, and importers are different than those for employers who only use manufactured chemicals.

Chemical manufacturers and importers must evaluate chemicals produced in their workplaces or imported by them to determine if they are hazardous. Employers are not required to evaluate chemicals unless they choose not to rely on the evaluation performed by the chemical manufacturer or importer for the chemical.

Employer responsibilities include:

- assessing the hazards of chemicals;
- container labeling;
- material safety data sheet development, maintenance and use;
- information and training; and
- development of a written hazard communication plan.

Throughout the rest of the course, pay special attention to those areas you've listed as inadequate. You may gain some good ideas about how to improve those areas.

Assessing the Hazards

The quality of a hazard communication program is largely dependent upon the ability of the manufacturer to adequately and accurately determine the hazards posed by the chemicals they manufacture. Although manufacturers, importers, and employers evaluating chemicals are not required to follow any specific methods for determining hazards, they must be able to demonstrate that they have adequately ascertained the hazards of the chemicals they produce according to the following criteria:

- **Carcinogenicity:** Evidence that a chemical is carcinogenic is established by the [National Toxicology Program](#), the [International Agency for Research on Cancer](#), OSHA Standards, and all available scientific data.
- **Human data:** Where available, epidemiological studies and case reports of adverse health effects must be considered in the evaluation of the chemical.
- **Animal data:** Since human evidence of health effects in exposed populations is generally not available for most chemicals produced or used in the workplace, toxicological testing in animal populations is usually required to predict health effects.
- **Adequacy of data:** To establish sufficient basis for findings which determine hazards, they must be from studies designed and conducted according to established scientific principles, and which report statistically significant conclusions regarding health effects. In vitro (in an artificial environment

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outside the living organism) studies alone generally do not form the basis for a definitive finding of hazard.

- **Reporting data:** Chemical manufacturers, importers, or employers may report the results of other scientifically valid studies which tend to refute the findings of hazard.

Additional requirements for determining the hazards chemical mixtures used in the workplace are further outlined in 29 CFR 1910.1200 (d)(5).

Material Safety Data Sheets (MSDS)

Chemical manufacturers and importers must obtain and develop a material safety data sheet for each hazardous chemical they produce or import.

Employers must maintain and use a material safety data sheet in the workplace for each hazardous chemical they use. We will cover the MSDS in depth later in the course. If you are familiar with the MSDS, you'll agree that they are not exactly everyone's favorite reading, but they are extremely important for a number of reasons.

The Material Data Safety Sheet contains a wealth of information to protect employees in the workplace. For instance, you are given information about the nature of the chemical. You are also told what personal protective equipment (PPE) to wear when working with a hazardous chemical. You'll receive procedures to use if an unexpected spill occurs or if there is some kind of emergency as a result of exposure to a hazardous chemical. The MSDS may also serve as an excellent "course outline" when training specific HAZCOM procedures. Be sure you don't minimize the importance of the information given on the MSDS -- it may save your life some day!

Warning Labels

The containers used by manufacturers for hazardous chemicals are called **primary containers**. Chemical manufacturers must develop appropriate labels that provide hazard warning information, and they, as well as distributors and importers must make sure each primary container of hazardous chemicals leaving the workplace is properly labeled, tagged or marked with the:

- name of the manufacturer;
- name of the hazardous chemical; and
- appropriate warning hazard

When the employer transfers a hazardous chemical from the manufacturer's primary container to another container, they create a **secondary container**. The secondary container might be a coffee can, glass jar, or other container. The employer must make sure their secondary container labels indicate the:

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- Common name of the hazardous chemical; and
- Appropriate warning hazard

Information and Training

Education is the beginning of safety, and that certainly applies to hazard communication. It's critically important that employers educate their employees on the:

- physical and health hazards of chemicals used in their work area,
- hazard communication rule requirements,
- availability and location of the written program, and
- the importance of the training subjects below.

Employees should be thoroughly trained on how to:

- reference the chemical list of hazards,
- use material data safety sheets,
- use protective practices including PPE,
- recognize a release of chemicals
- detect overexposure to chemicals, and
- write secondary container labels

It's important to remember that the least effective method for training the safe use of hazardous chemicals in your workplace is to just lecture to your employees. As you can see from the above list, there's a lot that your employees must know and be able to do when working with chemicals, so an active hands-on approach is not only the best method for training your HAZCOM Program, it's required by OSHA.

Remember, anytime OSHA states that the employee must "demonstrate" something, it means the employee must be able to "prove" they know how to do it by actually doing it! The employee must show you they know how to use PPE, respond to a spill, clean up, recognize symptoms of overexposure, and safely use the chemical.

If it's a "how-to" make it "hands-on"!

Written Plan

Employers must develop, implement, and maintain a written hazard communication plan that contains a list of the hazardous chemicals being used in the workplace, assigns responsibilities, and describes procedures for:

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- labeling containers;
- maintaining and using material safety data sheets;
- information and training;
- pipe labeling;
- non-routine task procedures; and
- contractor procedures.

Well, I think you've got a good idea of the scope, application and responsibilities of the hazard communication program. It's time to take your first module quiz.

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MODULE 1 QUIZ

1. The purpose of the hazard communication program is to ensure that the hazards of _____ chemicals are assessed and that information is transmitted to employers and employees.
 - a. hazardous
 - b. dangerous
 - c. all
 - d. workplace
2. Which of the following is not a primary method in the hazard communication program to inform employees of the hazards in the workplace?
 - a. container labeling
 - b. Material Safety Data Sheets
 - c. medical exams
 - d. information and training
3. Employees are required to be educated about all of the following hazard communication program subjects, except: _____.
 - a. physical and health hazards
 - b. hazard communications rule requirements
 - c. availability of the written program
 - d. how to write an MSDS
4. Employers are responsible for conducting research and producing MSDSs?
 - a. true
 - b. false
5. In the hazard communication program, employees should be trained in which of the following?
 - a. use of the Material Data Safety Sheets (MSDS)
 - b. how to use personal protective equipment (PPE)
 - c. how to label secondary containers
 - d. all of the above

■ MODULE TWO: ANALYZING THE WORKPLACE

Initial Assessment

Now that you have reviewed the scope of the Hazard Communication Rule and employer responsibilities, It's time to get down to business. The first task is to determine what chemicals you have in your workplace. It's important for the person conducting the initial assessment to be familiar with the definition and characteristics of "hazardous chemicals," so let's take a look.

What are Hazardous Substances and Chemicals?

OSHA has defined the term "**hazardous substance**" as any chemical which poses a physical or a health hazard. For the purposes of the hazard communication standard, a **hazardous chemical** may be defined as "any chemical which is a physical or health hazard".

Physical hazards - are chemical reactions that could result in a fire, explosion, and/or toxic gas release which cause physical trauma if chemicals are handled or stored improperly.

Health hazards - are health effects (illness or disease) caused directly by the chemicals themselves, not an injury resulting from a reaction. Health hazards, as defined in the HCS means chemicals for which there is statistically significant evidence based on at least one study conducted in accordance with scientific principles, that acute or chronic health effects may occur in exposed employees. Health hazards include chemicals that are carcinogens, toxic or highly toxic agents, reproductive toxins, irritants, corrosives, sensitizers, hepatotoxins, nephrotoxins, neurotoxins, agents which act on the hematopoietic system, and agents which damage the lungs, skin, eyes or mucous membranes. All chemical materials can cause health problems under the wrong conditions.

Forms of Hazardous Chemicals

You might think that the chemicals which apply to the rule are those in liquid, gas or particulate form. But, the standard's definition of "chemical" is much broader than that commonly used. According to the HCS, chemicals that apply may exist in any one of the forms below.

Dusts - are finely divided particles (i.e., wood dust).

Fumes - are even smaller particles usually formed when solid metal is heated and vaporized, and then condense as tiny particles.

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Fibers - are similar to dusts but are of an elongated shape (i.e., asbestos and fiberglass).

Mists - are liquid droplets that have been sprayed into the atmosphere.

Vapors - are gases formed when liquid evaporates.

Gases - are substances that are normally airborne at room temperature. A vapor is the gaseous phase of a substance which is normally a liquid or solid at room temperature.

Solids - such as metal, treated wood, plastic.

Liquids - the most common form in the workplace.

Chemical Effects

The effects chemicals have on the various organs of the human body depend on several important factors:

1. The **form** of the chemical: is the chemical a solid, liquid, or gas?
2. How the chemical **contacts** the body: is the chemical ingested, inhaled, absorbed, or injected?
3. The **amount**, or dose, the body receives: how much chemical makes its way into the body?
4. How **toxic** the chemical is: how poisonous is the chemical?

Routes of Entry

Another important task when assessing the workplace for chemical hazards is to determine the route(s) of entry the chemicals may take. If we know the route(s) of entry, we can then determine appropriate engineering, administrative, and PPE controls to eliminate or reduce the exposure. Below are the four common routes of entry.

1. **Ingestion**- Do we eat or drink it?
2. **Inhalation**- Do we breathe it in?
3. **Absorption**- Does it pass through the skin, eyes or other membranes?
4. **Injection**- Does it enter through a puncture or cut?

We'll be talking more about the physical characteristics, routes of entry, and toxicity of hazardous chemicals later in the MSDS module.

Assessing and Analyzing the Workplace for Chemical Hazards

There's a simple two step process for assessing and analyzing the workplace for chemical hazards.

1. Assess the workplace to see which hazardous chemicals are currently being used. Do this by conducting a walk-around inspection and checking records. Use the results of your assessment to

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create a list of hazardous chemicals. With chemical list in hand, obtain a MSDS for each chemical in preparation for the next step.

2. With each MSDS analyze the hazards presented by each chemical in the workplace. The MSDS is your primary tool to determine the physical and health hazards, routes of entry, toxicity, and other information about each chemical in your workplace.

Once you identify and know the nature of the hazards of each chemical, it becomes important to control those hazards by eliminating or reducing those hazards using a systematic approach.

Chemical Hazard Control Strategies

Hazardous materials can be used safely in workplaces if adequate control strategies are used to prevent exposure to those chemicals. A control strategy includes any device, procedure, piece of equipment, system, etc., that is used to keep hazardous chemicals from contacting workers at harmful levels. To eliminate or reduce exposure to hazardous chemicals, an effective protocol called the "Hierarchy of Controls" has been developed. When you determine during a workplace assessment that exposure to harmful levels of hazardous chemicals is present, try to eliminate or reduce that exposure using the following strategies in the order below.

The first three strategies focus on doing something with the hazard.

1. **Elimination.** The best solution is to totally eliminate hazardous substances. A personal story here: My daughter came down with leukemia back in 1998 and we had to get rid of all potentially hazardous chemicals in the house because her immune system would be compromised. I unloaded six shopping bags full of cleaners, soap, and other chemicals and replaced them all with one biodegradable, totally non-toxic, all-purpose "green" cleaner called "Planet Solutions." I don't think they make it anymore, but I could not believe the quantity of hazardous chemicals we had in the house! Go green!!! (P.S. My daughter came through with flying colors... a survivor 12 years out now!)

2. **Substitution.** Substitution is the next-best solution: replacing a toxic substance with a less-toxic substance. If you can't get rid of the toxic substances, you may be able to replace them with substances that are at least less toxic. The goal is to reduce the toxicity of the hazards to levels that do not require the use of administrative controls or personal protective equipment.

3. **Engineering Controls.** Redesign processes that use toxic chemicals to eliminate or reduce exposure to the chemical hazard itself. Engineering controls are most effective when this strategy seeks to control the hazard at the source by using such methods as total enclosure or substitution of a safer chemical. It also attempts to control the hazardous chemicals along the path by using such measures as ventilation.

The last two strategies focus on doing something with behaviors to reduce exposure to the

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hazard.

4. **Administrative Controls.** Change work procedures to reduce the duration, frequency, and severity of exposure to the chemical hazard. The chemical hazard, itself, is not eliminated or reduced using this strategy, only exposure to the chemical hazard. The primary focus is to incorporate safer work practices through written safety policies, rules, supervision and training. And that's a problem because you may have to regularly supervise employees as they perform a task. These controls work only so long as employees "behave" properly.

5. **Personal Protective Equipment (PPE).** The use of PPE is probably the most common strategy, and in many cases is a mandatory requirement when working with hazardous chemicals. The worker uses protective equipment to set up a barrier between worker and hazard. Once again, the chemical hazard is neither eliminated nor reduced, and a high reliance is placed on appropriate use of PPE for this strategy to be successful.

Remember, the first question you want to ask is, "How can I eliminate, reduce, or engineer out the hazard?" Hopefully you'll be able to eliminate the hazard or reduce it to the point where safe behaviors or PPE won't be necessary.

That's a lot of information to absorb. But there's light at the end of the tunnel... it's time to take the module quiz.

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MODULE 2 QUIZ

1. OSHA has defined the term "hazardous substance" as any chemical which poses a physical or a health hazard.
 - a. true
 - b. false
2. The primary tool to analyze the workplace for chemical hazards is the: _____.
 - a. job hazard analysis
 - b. the walk-around inspection
 - c. material safety data sheet
 - d. employee survey
3. Which of the following is not one of the four "routes of entry" of hazardous chemicals?
 - a. ingestion
 - b. inspiration
 - c. absorption
 - d. inhalation
4. Under the hazard communication rule, solids are not considered potentially hazardous chemicals.
 - a. true
 - b. false
5. Which of the following is the first strategy to consider to control hazardous chemicals?
 - a. elimination
 - b. administrative controls
 - c. personal protective equipment
 - d. engineering controls

MODULE THREE: CONTAINER LABELING

Types of Containers

Container labeling can be a very effective method to communicate the physical and health hazards of chemicals used in the workplace. The information on a container label will vary depending on what type of container it is and how it is used. We'll discuss the various labeling requirements in this module.

We'll take a look at the labeling requirements for each of the four types of containers referred to in the hazard communication standard.

- Primary containers
- Secondary containers
- Stationary containers
- Portable containers

Primary Container Labeling

The chemical manufacturer, importer, or distributor must ensure that each container of hazardous chemicals leaving the workplace is labeled, tagged or marked with the following three elements of information:

- **identity** of the hazardous chemical(s);
- appropriate **hazard warnings**, including target organ effects of the hazardous chemical; and
- **name and address** of the chemical manufacturer, importer, or other responsible party.

Most containers you receive directly from the manufacturer or purchase from a distributor are called primary containers. Labeling with the above information on these containers is usually adequate in communicating the hazards of the chemical.

The label is intended to be an immediate visual reminder of the hazards of a chemical. It is not necessary, however, that every hazard presented by a chemical be listed on the label. The Material Safety Data Sheet (MSDS) is used for this purpose. Manufacturers, importers, and distributors will have to assess the evidence regarding the product's hazards and must consider exposures under normal conditions of use or in foreseeable emergencies when evaluating what hazards are listed on the label. This is not to say that only acute hazards are to be listed on the label, or that well-substantiated hazards should be left off the label because they appear on the data sheet.

It's important to understand that the hazard warning must convey the particular physical and health hazards of the chemical, including target organ effects. Employees exposed to health hazards must be apprised of both changes in body functions and the signs and symptoms that may occur to signal those changes. Statements such as "Hazardous if Inhaled," "Caution," "Danger," are precautionary statements and are not

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to be considered appropriate hazard warnings. If, when inhaled, a chemical causes lung damage, then the appropriate warning is "lung damage," not inhalation.

A label may not be shipped separately, even prior to shipment of the hazardous chemical, since to do so defeats the purpose of providing an immediate hazard warning. Mailing labels directly to purchasers by-passes employees involved in transporting and handling the hazardous chemical.

Labeling Solid Materials

Remember, in an earlier module we said the hazardous chemicals under the HAZCOM program include solids. For solid metal (such as a steel beam or a metal casting), solid wood, or plastic items that are not exempted as articles due to their downstream use, or shipments of whole grain, the required label may be transmitted to the customer at the time of the initial shipment, and need not be included with subsequent shipments to the same employer unless the information on the label changes;

The label may be transmitted with the initial shipment itself, or with the material safety data sheet that is to be provided prior to or at the time of the first shipment. This exception to requiring labels on every container of hazardous chemicals is only for the solid material itself, and does not apply to hazardous chemicals used in conjunction with, or known to be present with, the material and to which employees handling the items in transit may be exposed (for example, cutting fluids or pesticides in grains). For example, treated lumber is covered since the lumber is not completely cured at the time of shipment and the hazardous chemical will, to a varying degree, offgas during shipment and be available for exposure to employees.

If the hazardous chemical is regulated by OSHA in a substance-specific health standard, the chemical manufacturer, importer, distributor or employer must ensure that the labels or other forms of warning used are in accordance with the requirements of that standard.

Secondary Container Labeling

Most employers use the primary containers they purchase to store and use chemicals. However, they may also use their own containers such as coffee cans, drums, plastic jugs, spray bottles, etc. to store and use smaller quantities of chemicals they purchase. These are called secondary containers.



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Generally, your employer must make sure that each secondary container of hazardous chemicals in the workplace is labeled, tagged or marked with at least the following information:

- identity of the hazardous chemical(s) contained therein; and
- appropriate hazard warnings, or words, pictures, and/or symbols which provide at least general information regarding the hazards of the chemicals, and which, in conjunction with the other information (an MSDS) will provide employees with the specific information regarding the physical and health hazards of the hazardous chemical.



Alternative Labeling Methods

Here are two examples of alternative labeling systems. The hazard communication standard recognizes the use of alternative in-plant labeling systems such as the HMIS (Hazardous Materials Information System), NFPA (National Fire Protection Association), and others which may be used in industry. These alternative systems use color, numbers and other information to convey the hazards of the chemical.



These systems rely on numerical and/or alphabetic codes to convey hazards and are generally non-specific. OSHA has permitted these types of in-plant labeling systems to be used when an employer's overall HCS program is proven to be effective despite the potential absence of target organ information on container labels. Under these circumstances, the employer should assure - through more intensified training - that its employees are fully aware of the hazards of the chemicals used. Additionally, employers must ensure that their training program instructs employees on how to use and understand the alternative labeling systems so that employees are aware of the effects (including target organ effects) of the hazardous chemicals to which

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they are potentially exposed. If you use alternative labeling systems, OSHA inspectors will determine whether workers can recognize what hazards correspond to what code ratings/symbols. This can be achieved through employee interviews.

Employers using alternative labeling systems must ensure that their employees are aware of *all* information required to be conveyed under the HCS. OSHA will make a plant-specific determination of the effectiveness of the complete program when an inspection is conducted. Any employer who relies on one of these types of alternative labeling systems, instead of using labels containing complete health effects information will - in any enforcement action alleging the inadequacy of the labeling system - bear the burden of establishing that it has achieved a level of employee awareness which equals or exceeds that which would have been achieved if the employer had used labels containing complete health effects information (59 F.R. 6156).

The key to evaluating the effectiveness of any alternative labeling method is to determine whether employees can correlate the visual warning on the in-plant container with the applicable chemical and its appropriate hazard warnings. The alternative labeling system must also be readily accessible to all employees in their work area throughout each work shift. For purposes of this provision, the term "other such written materials" does not include material safety data sheets used in lieu of labels.

Stationary Process Container Labeling



Stationary process containers are... well... stationary! Storage tanks are good examples. The employer may use signs, placards, process sheets, batch tickets, operating procedures, or other written materials in lieu of affixing labels to individual stationary process containers, as long as the alternative method identifies the containers to which it is applicable and conveys the information required on secondary containers. The written materials must be readily accessible to the employees in their work area throughout each work shift.

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Portable Container Labeling

Portable containers are used to transfer hazardous chemicals from labeled containers, and are intended only for the immediate use of the employee who performs the transfer. The employer is not required to label portable containers. For purposes of this section, drugs which are dispensed by a pharmacy to a health care provider for direct administration to a patient are exempted from labeling.

Figure this out...

It's important to know that portable containers must be under the positive control of the employee using it. Let's say an employee is cleaning some parts with solvent he has placed in a coffee can. As long as he is using it for immediate use and can prevent another employee from exposure, labeling is not required. However, if he walks away from the workstation to go on a break (or for any reason), losing control of the chemical, the status of the container changes.

Other Important Labeling Requirements

Labels are useless unless they accurately communicate the hazards of their associated chemicals. It's important to keep labels in good condition at all times. The employer must not remove or deface existing labels on incoming containers of hazardous chemicals, unless the container is immediately marked with the required information.

The employer must ensure that labels or other forms of warning are:

- legible;
- printed in English;
- prominently displayed on the container; or
- readily available in the work area throughout each work shift.

Employers having employees who speak other languages may add the information in their language to the material presented, as long as the information is presented in English as well.

Well, there you have it...well most of it. Be sure to review the standard for more information on all the labeling requirements. Now it's time to take the module quiz. If you can't answer a question, just scroll back up and review the related material.

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MODULE 3 QUIZ

1. Hazcom container label categories include all of the following except?

- a. Primary label
- b. Secondary label
- c. Chemical label
- d. Stationary process label
- e. Portable label

2. Look at the picture the left. What are the colors of the Primary, Secondary and Portable containers?



Primary Container

Secondary Container

Portable Container

blue

blue

blue

yellow

yellow

yellow

white

white

white

3. A _____ container does not require a label.

- a. Primary
- b. Secondary
- c. Stationary process
- d. Portable

4. Which label must include the name and address of the chemical manufacturer?

- a. Primary container label
- b. Secondary container label
- c. Stationary process container label
- d. Portable container label

5. All of the below hazard warnings may be appropriate except?

- a. may cause eye injury
- b. carcinogenic
- c. danger
- d. may cause skin rash

■ MODULE FOUR: MATERIAL SAFETY DATA SHEET (MSDS) MANAGEMENT

What's a Material Safety Data Sheet (MSDS)?

The Material Safety Data Sheet (MSDS) is used to communicate chemical hazard information from the manufacturer to the employee. This is the information needed to inform and train employees on the safe use of hazardous chemicals. The employer is required to have an MSDS for each hazardous chemical product they use. This module will examine the MSDS and the requirements for maintaining an effective MSDS system. So, let's get going.

Who Must Have Them?

- Chemical manufacturers and importers must obtain or develop a material safety data sheet for each hazardous chemical they **produce** or **import**. Employers that mix chemicals that result in an interaction may be considered to be manufacturers and required to develop a MSDS for the new chemical. If the chemicals in the mixture do not interact, the employer may be able to use the existing MSDS's for each chemical in the mixture. Check with OSHA if you have questions about mixing chemicals in your workplace.
- Employers must have a material safety data sheet in the workplace for each hazardous chemical which they **use**.

The MSDS Form

Let's take a look at the MSDS form, itself. Some of the terms in each section link to additional information. You can check out the [glossary](#) for general information on terms you may not be familiar with. I'll detail important points related to each MSDS section and then show you an example that illustrates those points. So, let's start the review.

Each material safety data sheet must be in English (although the employer may maintain copies in other languages as well), and must contain at least the following information:

- The name, address and telephone number of the chemical manufacturer, importer, employer or other responsible party preparing or distributing the material safety data sheet, who can provide additional information on the hazardous chemical and appropriate emergency procedures, if necessary.

The English language requirement was included to prevent importers of chemicals from supplying MSDSs in a foreign language. This requirement, however, does not prevent a chemical

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manufacturer/employer from translating MSDSs from English into foreign languages, in order to assist non-English speaking employees with training comprehension and hazard recognition.

MATERIAL SAFETY DATA SHEET

FISHER SCIENTIFIC
CHEMICAL DIVISION
1 REAGENT LANE
FAIR LAWN NJ 07410
(201) 796-7100

EMERGENCY NUMBER: (201) 796-7100
CHEMTREC ASSISTANCE: (800) 424-9300

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- The identity used on the label.
- If the hazardous chemical is a single substance, its chemical and common name(s).
- If the hazardous chemical is a mixture which has been tested as a whole to determine its hazards, the chemical and common name(s) of the ingredients which contribute to these known hazards, and the common name(s) of the mixture itself.
- Or, if the hazardous chemical is a mixture which has not been tested as a whole, the chemical and common name(s) of all ingredients which have been determined to be health hazards, and which comprise 1% or greater of the composition (0.1% for carcinogens).

SUBSTANCE IDENTIFICATION

CAS-NUMBER 65-85-0

SUBSTANCE: **BENZOIC ACID**

TRADE NAMES/SYNONYMS: BENZENECARBOXYLIC ACID; CARBOXYBENZENE; DRACYLIC ACID; PHENYL CARBOXYLIC ACID; PHENYLFORMIC ACID; RETARDER BA; TENN-PLAS; RETARDEX; SOLVO POWDER; SALVO LIQUID; PHENYLCARBOXYLIC ACID; BENZOATE; BENZENEMETHANOIC ACID; BENZENEFORMIC ACID; STCC 4966340; A-63; A-65; A-68; BP344; C7H6O2; ACC02720

CHEMICAL FAMILY: Carboxylic acid, aromatic

MOLECULAR FORMULA: C6-H5-C-O2-H

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MOLECULAR WEIGHT: 122.12

CERCLA RATINGS (SCALE 0-3): HEALTH=3 FIRE=1 REACTIVITY=0 PERSISTENCE=2

NFPA RATINGS (SCALE 0-4): HEALTH=2 FIRE=1 REACTIVITY=U

COMPONENTS AND CONTAMINANTS

COMPONENT: BENZOIC ACID PERCENT: 100 CAS# 65-85-0

EXPOSURE LIMITS: No occupational exposure limits established by OSHA, ACGIH, or NIOSH.

5000 pounds CERCLA Section 103 Reportable Quantity

- Physical and chemical characteristics of the hazardous chemical (such as vapor pressure, flash point).

PHYSICAL/CHEMICAL CHARACTERISTICS

DESCRIPTION: White powder or crystals with an odor of benzoin or benzaldehyde.

BOILING POINT: 480 F (249 C)

MELTING POINT: 252 F (122 C)

SPECIFIC GRAVITY: 1.2659 @ 15 C

VAPOR PRESSURE: 1 mmHg @ 205 F

PH: 2.8 (satd solution)

SOLUBILITY IN WATER: 2.9% @ 20 C

VAPOR DENSITY: 4.2

SOLVENT SOLUBILITY: Soluble in alcohol, ether, benzene, chloroform, acetone, carbon disulfide, oil of turpentine, carbon tetrachloride, fixed and volatile oils; slightly soluble in petroleum ether, hexane.

- The physical hazards of the hazardous chemical, including the potential for fire, explosion, and reactivity.

FIRE AND EXPLOSION HAZARD DATA

FIRE AND EXPLOSION HAZARD: Slight fire hazard when exposed to heat or flame. Dust/air mixtures may be explosive above the flash point. Vapor from molten benzoic acid may form explosive mixture with air.

FLASH POINT: 250 F (121 C) UPPER EXPLOSIVE LIMIT: 35 g/ft³ (optimum)

LOWER EXPLOSIVE LIMIT: 3 g/ft³

AUTOIGNITION TEMPERATURE: 1060 F (571 C)

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FIREFIGHTING MEDIA: Dry chemical, carbon dioxide, water spray or regular foam (1990 Emergency Response Guidebook, DOT P 5800.5). For larger fires, use water spray, fog or regular foam (1990 Emergency Response Guidebook, DOT P 5800.5).

FIREFIGHTING: Move container from fire area if you can do it without risk. Do not scatter spilled material with high-pressure water streams. Dike fire-control water for later disposal (1990 Emergency Response Guidebook, DOT P 5800.5, Guide Page 31). Use water in flooding quantities as a fog; solid streams of water may be ineffective. Cool affected containers with flooding quantities of water applying water from as far a distance as possible. Avoid breathing vapors or dusts.

REACTIVITY

REACTIVITY: Stable under normal temperatures and pressures.

INCOMPATIBILITIES: OXIDIZERS (STRONG): Vigorous exothermic reaction.

DECOMPOSITION: Thermal decomposition products may include toxic oxides of carbon.

POLYMERIZATION: Hazardous polymerization has not been reported to occur under normal temperatures and pressures.

- The health hazards of the hazardous chemical, including signs and symptoms of exposure, and any medical conditions which are generally recognized as being aggravated by exposure to the chemical;
- The primary route(s) of entry.
- Emergency and first aid procedures.
- The OSHA permissible exposure limit, ACGIH Threshold Limit Value, and any other exposure limit used or recommended by the chemical manufacturer, importer, or employer preparing the material safety data sheet, where available.
- Whether the hazardous chemical is listed in the National Toxicology Program (NTP) Annual Report on Carcinogens (latest edition) or has been found to be a potential carcinogen in the International Agency for Research on Cancer (IARC) Monographs (latest editions), or by OSHA.

TOXICITY

IRRITATION DATA: 22 mg/3 days intermittent skin-human moderate; 500 mg/24 hours skin-rabbit mild; 100 mg eye-rabbit severe.

TOXICITY DATA: 6 mg/kg skin-human TDLo; 500 mg/kg oral-man LDLo; 1700 mg/kg oral-rat LD50; 1940 mg/kg oral-mouse LD50; 2 gm/kg oral-guinea pig LDLo; 2000 mg/kg oral-dog LD50; 2000 mg/kg oral-cat LD50; 2000 mg/kg oral-rabbit LDLo; 2000 mg/kg subcutaneous-rabbit LDLo; 1400 mg/kg intraperitoneal-guinea pig LDLo; 1460 mg/kg intraperitoneal-mouse LD50; mutagenic data (RTECS).

CARCINOGEN STATUS: None.

LOCAL EFFECTS: Irritant- eye.

ACUTE TOXICITY LEVEL: Moderately toxic by ingestion.

TARGET EFFECTS: Poisoning may affect the respiratory and central nervous system.

HEALTH EFFECTS AND FIRST AID

INHALATION:

- **ACUTE EXPOSURE** - Dust may cause mild respiratory irritation with sore throat and coughing.
- **CHRONIC EXPOSURE** - No data available.
- **FIRST AID** - Remove from exposure area to fresh air immediately. If breathing has stopped, perform artificial respiration. Keep person warm and at rest. Treat symptomatically and supportively. Get medical attention immediately.

SKIN Contact:

- **ACUTE EXPOSURE** - Dust and liquid may cause mild irritation and redness. Concentrations up to 0.2%, may elicit an immediate skin reaction varying from erythema to a non-immunologic Contact urticaria in some persons.
- **CHRONIC EXPOSURE** - Repeated application to human skin produced moderate irritation.
- **FIRST AID** - Remove contaminated clothing and shoes immediately. Wash affected area with soap or mild detergent and large amounts of water until no evidence of chemical remains (approximately 15-20 minutes). Get medical attention immediately.

EYE Contact: IRRITANT.

- **ACUTE EXPOSURE**- Dust may cause strong irritation and redness.
- **CHRONIC EXPOSURE**- Repeated or prolonged Contact with irritants may cause conjunctivitis.

FIRST AID - Wash eyes immediately with large amounts of water or normal saline, occasionally lifting upper and lower lids, until no evidence of chemical remains (approximately 15-20 minutes). Get medical attention immediately.

INGESTION:

- **ACUTE EXPOSURE** - Large doses may cause sore throat, gastric pain, nausea, vomiting, and possible allergic reactions. A 67 kg man ingested 50 gm without ill effects.
- **CHRONIC EXPOSURE** - A daily intake of 4-6 grams produced no toxic effects outside of gastric irritation. Larger doses may have systemic effects similar to salicylates and may include disturbances in acid base balance, tremor and convulsions.
- **FIRST AID** - Treat symptomatically and supportively. Get medical attention immediately. If vomiting occurs,

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keep head lower than hips to prevent aspiration.

ANTIDOTE: No specific antidote. Treat symptomatically and supportively.

- Any generally applicable precautions for safe handling and use which are known to the chemical manufacturer, importer or employer preparing the material safety data sheet, including appropriate hygienic practices, protective measures during repair and maintenance of contaminated equipment, and procedures for clean-up of spills and leaks.

STORAGE AND DISPOSAL

Observe all federal, state and local regulations when storing or disposing of this substance. Store away from incompatible substances.

CONDITIONS TO AVOID

May burn but does not ignite readily. Avoid Contact with strong oxidizers, excessive heat, sparks, or open flame.

SPILL AND LEAK PROCEDURES

SOIL SPILL: Dig holding area such as lagoon, pond or pit for containment. Use protective cover such as a plastic sheet to prevent material from dissolving in fire extinguishing water or rain.

WATER SPILL: Use activated carbon to absorb spilled substance that is dissolved. Use mechanical dredges or lifts to extract immobilized masses of pollution and precipitates. Use suction hoses to remove trapped spill material.

OCCUPATIONAL SPILL: Sweep up and place in suitable clean, dry containers for reclamation or later disposal. Do not flush spilled material into sewer. Keep unnecessary people away.

Reportable Quantity (RQ): 5000 pounds

The Superfund Amendments and Reauthorization Act (SARA) Section 304 requires that a release equal to or greater than the reportable quantity for this substance be immediately reported to the local emergency planning committee and the state emergency response commission (40 CFR 355.40). If the release of this substance is reportable under CERCLA

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Section 103, the National Response Center must be notified immediately at (800) 424-8802 or (202) 426-2675 in the metropolitan Washington, D.C. area (40 CFR 302.6).

- Any generally applicable control measures which are known to the chemical manufacturer, importer or employer preparing the material safety data sheet, such as appropriate engineering controls, work practices, or personal protective equipment.

PROTECTIVE EQUIPMENT

VENTILATION: Provide local exhaust ventilation. Ventilation equipment should be explosion-proof if explosive concentrations of dust, vapor or fume are present.

RESPIRATOR: The following respirators are recommended based on information found in the physical data, toxicity and health effects sections. They are ranked in order from minimum to maximum respiratory protection. The specific respirator selected must be based on contamination levels found in the work place, must be based on the specific operation, must not exceed the working limits of the respirator and must be jointly approved by the National Institute for Occupational Safety and Health and the Mine Safety and Health Administration (NIOSH-MSHA).

- Any dust and mist respirator.
- Any air-purifying respirator with a high-efficiency particulate filter.
- Any powered air-purifying respirator with a dust and mist filter.
- Any powered air-purifying respirator with a high-efficiency particulate filter.
- Any type 'C' supplied-air respirator operated in the pressure-demand or other positive pressure or continuous-flow mode.
- Any self-contained breathing apparatus.

FOR FIREFIGHTING AND OTHER IMMEDIATELY DANGEROUS TO LIFE OR HEALTH CONDITIONS

- Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode.
- Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained breathing apparatus operated in pressure-demand

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or other positive-pressure mode.

CLOTHING: Employee must wear appropriate protective (impervious) clothing and equipment to prevent repeated or prolonged skin Contact with this substance.

GLOVES: Employee must wear appropriate protective gloves to prevent Contact with this substance.

EYE PROTECTION: Employee must wear splash-proof or dust-resistant safety goggles to prevent eye Contact with this substance.

- **Emergency eye wash:** Where there is any possibility that an employee's eyes may be exposed to this substance, the employer should provide an eye wash fountain within the immediate work area for emergency use.

- The date of preparation of the material safety data sheet or the last change to it.

PREPARATION DOCUMENTATION

AUTHORIZED - XYZ SCIENTIFIC GROUP, INC.

CREATION DATE: 11/02/84

REVISION DATE: 12/23/93

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If no relevant information is found for any given category on the material safety data sheet, the chemical manufacturer, importer or employer preparing the material safety data sheet must mark it to indicate that no applicable information was found.

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MSDS Management

Below are some more important requirements manufacturers, importers and distributors must meet.

- Prepare one MSDS that applies to all similar mixtures where complex mixtures have similar hazards and contents (i.e., the chemical ingredients are essentially the same, but the specific composition varies from mixture to mixture).
- When preparing the material safety data sheet, ensure that the information recorded accurately reflects the scientific evidence used in making the hazard determination.
- When aware of any significant new information regarding the hazards of a chemical, or ways to protect against the hazards, the new information should be added to the material safety data sheet within three months.
- If the chemical is not currently being produced or imported, add any new information to the material safety data sheet before the chemical is introduced into the workplace again.
- Provide an appropriate material safety data sheet with the initial shipment, with the first shipment after a material safety data sheet is updated, and as requested by the employer or distributor.
- Provide material safety data sheets with the shipped containers or send them to the distributor or employer prior to or at the time of the shipment.

Distributors Must Meet the Requirements Below

- Ensure that material safety data sheets, and updated information, are provided to other distributors and employers with their initial shipment and with the first shipment after a material safety data sheet is updated.
- Either provide material safety data sheets with the shipped containers, or send them to the other distributor or employer prior to or at the time of the shipment.
- Retail distributor selling hazardous chemicals to employers having a commercial account -- provide a material safety data sheet to such employers upon request, and must post a sign or otherwise inform them that a material safety data sheet is available. If an employer without a commercial account purchases a hazardous chemical from a retail distributor not required to have material safety data sheets on file (i.e., the retail distributor does not have commercial accounts and does not use the materials), the retail distributor must provide the employer, upon request, with the name, address, and telephone number of the chemical manufacturer, importer, or distributor from which a material safety data sheet can be obtained. Chemical manufacturers, importers, and distributors need not provide material safety data sheets to retail distributors that have informed them that the retail distributor does not sell the product to commercial accounts or open the sealed container to use it in their own workplaces.
- Wholesale distributor selling hazardous chemicals to employers over-the-counter -- provide material safety data sheets upon the request of the employer at the time of the over-the-counter purchase, and post a sign or otherwise inform such employers that a material safety data sheet is available.

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- Distributors and employers who in good faith choose to rely upon the MSDSs provided to them by the chemical manufacturer/importer assume no responsibility for the content and accuracy of the MSDSs.

What about employer responsibilities?

Employers must obtain a MSDS from the chemical manufacturer or importer as soon as possible if the material safety data sheet is not provided with a shipment that has been labeled as a hazardous chemical.

Employers must maintain in the workplace copies of the required material safety data sheets for each hazardous chemical, and must ensure that they are readily accessible during each work shift to employees when they are in their work area(s). (Electronic access, microfiche, and other alternatives to maintaining paper copies of the material safety data sheets are permitted as long as no barriers to immediate employee access in each workplace are created by such options.)

Where employees must travel between workplaces during a work-shift, i.e., their work is carried out at more than one geographical location, **the material safety data sheets may be kept at the primary workplace facility**. In this situation, the employer must ensure that employees can immediately obtain the required information in an emergency.

Employees who work at more than one site during the work shift must be able to obtain MSDS information immediately **in an emergency**. MSDSs may be kept at the primary workplace facility, as long as the employer has a representative available at all times to ensure **ready access** to this information. This is the only situation in which an employer is allowed to transmit hazard information via voice communication. The employer must address in the written hazard communication program how MSDS information will be conveyed to remote worksites.

Material safety data sheets may be kept in any form, including operating procedures, and may be designed to cover groups of hazardous chemicals in a work area where it may be more appropriate to address the hazards of a process rather than individual hazardous chemicals. The Hazard Communication Standard provides little information regarding formatting of an MSDS, and OSHA does not require that all MSDSs be formatted into any number of sections, but it must contain all required information.

In fact, in 1993, the ANSI Z400.1, American National Standard for Hazardous Industrial Chemicals – Material Safety Data Sheets – Preparation, was developed to address the need for a MSDS format that was comprehensive, understandable and consistent. ANSI Z400.1-1993 introduced the standardized 16-section MSDS.

However, the employer must ensure that in all cases the required information is provided for each hazardous chemical, and is readily accessible during each work shift to employees when they are in their work area(s).

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Usually MSDSs will be kept at the "Right to Know" station in a **centralized location where most of the work is being accomplished**. Along with the MSDSs, there must be a list of chemicals with an effective reference system to help the employee quickly locate a specific MSDS.

Well, I hope you understand the MSDS and the various requirements related to its management. As usual, read the rules and ask an OSHA consultant if you have specific questions about MSDS management at your workplace. Now it's time for the quiz, so let's go.

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MODULE 4 QUIZ

1. The _____ must conduct valid research and assess the hazards of the chemicals they produce.
 - a. manufacturer
 - b. distributor
 - c. employer
 - d. employee

2. What is the basis for the English language requirement for the MSDS?
 - a. To make sure only domestic manufacturers produce the MSDS.
 - b. To prevent importers of chemicals from supplying MSDSs in a foreign language.
 - c. To prevent the proliferation of MSDS in multiple languages.
 - d. To make it easier to read for workers.

3. Distributors and employers who in good faith choose to rely upon the MSDSs provided to them by the chemical manufacturer/importer assume no responsibility for the content and accuracy of the MSDSs.
 - a. true
 - b. false

4. Where employees must travel between workplaces during a work shift, the material safety data sheets: _____.
 - a. may be kept anywhere
 - b. must be in the cab of the truck
 - c. may be kept at the primary workplace facility
 - d. must be filed in a computer

5. Material safety data sheets may be kept in any form, including operating procedures.
 - a. true
 - b. false

■ MODULE FIVE: INFORMATION AND TRAINING

Introduction

Education is the beginning point for developing and maintaining a world-class HAZCOM program. This module focuses on communicating information about hazards and training employees to work safely while being exposed to those hazards. This module discusses basic employer responsibilities for effectively communicating the HAZCOM to employees.

The "Prime Directive"

Employers must provide employees with effective information and training on hazardous chemicals in their work area at the time of their initial assignment, and **whenever a new physical or health hazard the employees have not previously been trained about is introduced into their work area**. Information and training may be designed to cover categories of hazards (e.g., flammability, carcinogenicity) or specific chemicals. Chemical-specific information must always be available through labels and material safety data sheets.

Information

Employees must be informed of:

- the **requirements** of the hazard communication standard (1910.1200);
- any **operations** in their work area where hazardous chemicals are present; and
- the **location and availability of the written hazard communication program**, including the required list(s) of hazardous chemicals, and material safety data sheets required by this section.

Training

Employee training must include at least:

- Methods and observations that may be used to **detect the presence or release of a hazardous chemical** in the work area (such as monitoring conducted by the employer, continuous monitoring devices, visual appearance or odor of hazardous chemicals when being released, etc.);
- The **physical and health hazards** of the chemicals in the work area;

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- training need not be conducted on each specific chemical found in the workplace, but may be conducted by categories of hazard (e.g., carcinogens, sensitizers, acutely toxic agents) that are or may be encountered by an employee during the course of his duties;
- the **measures employees can take to protect themselves** from these hazards, including specific procedures the employer has implemented to protect employees from exposure to hazardous chemicals, such as appropriate work practices, emergency procedures, and personal protective equipment to be used; and
- the **details of the hazard communication program** developed by the employer, including an explanation of the labeling system and the material safety data sheet, and how employees can obtain and use the appropriate hazard information.

According to the information above, an employer, has a responsibility to **evaluate** an employee's level of knowledge with regard to the hazards in the workplace, their familiarity with the requirements of the standard, and the employer's hazard communication program.

When do you train HAZCOM?

It's important to understand that employees must be trained at the time they are assigned to work with a hazardous chemical. The intent of this provision is to have information **prior** to exposure to prevent the occurrence of adverse health effects. Of course, this intent cannot be met if training is delayed until a later date.

Also, training requirements are not satisfied solely by giving employees the MSDS to read. An employer's training program is to be a forum for explaining the who, what, where, why and when (the education) to employees regarding the hazards of the chemicals in their work area. It is also to be a forum for explaining **how** (the training) to work safely using safe procedures as required by the hazard communication program. This can be accomplished in many ways, including:

- classroom instruction;
- interactive video; and
- hands-on demonstration.

Regardless of the training method, all employees should have an opportunity to ask questions to ensure that they understand the information presented to them. Furthermore, the training must be comprehensible. If employees receive job instructions in a language other than English, then the HAZCOM training and information will also need to be conducted in that foreign language.

And, here's a subtle, but important point to remember: additional training is to be done whenever a new physical or health hazard is introduced into the work area, not a new chemical. Below are a couple of examples that help will help you to understand this requirement.

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Example 1. If a new solvent is brought into the workplace, and it has hazards similar to existing chemicals for which training has already been conducted, then no new training is required. However, as with initial training, and in keeping with the intent of the standard, the employer must:

- make employees specifically aware which hazard category (i.e., corrosive, irritant, etc.) the solvent falls within;
- make the substance-specific data sheet available; and
- properly label the new product.

Example 2. If the newly introduced solvent is a suspected carcinogen, and there has never been a carcinogenic hazard in the workplace before, then new training for carcinogenic hazards must be conducted for employees in those work areas where employees will be exposed.

What about retraining new hires?

It is not necessary that the employer retrain each new hire if that employee has received prior training by a past employer, an employee union, or any other entity. The new employee should be able show proof that training on the hazardous substances to which they would be exposed to on the job has been conducted. General information, such as the rudiments of the HCS could be expected to remain with an employee from one position to another. The employer, however, **maintains the responsibility and is held accountable** to ensure that their employees are adequately trained and are equipped with the knowledge and information necessary to conduct their jobs safely.

Remember, it is likely that additional training will be needed since employees must know the specifics of their new employers' programs such as where the MSDSs are located, details of the employer's in-plant labeling system, and the hazards of new chemicals to which they will be exposed.

Training at Multi-Employer Worksites

The training requirements also apply if the employer becomes aware via the multi-employer worksite provision of exposures of his/her employees to hazards for which they have not been previously trained.

Training Temporary Employees

Training temporary employees is a responsibility that is shared between the temporary agency and the host employer.

- The host-employer holds the primary responsibility for training since the host employer uses or produces chemicals, creates and controls the hazards, and is, therefore, best suited to inform employees of the chemical hazards specific to the workplace environment.

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- The temporary agency, in turn, maintains a continuing relationship with its employees, and would be, at a minimum, expected to inform employees of the requirements of the standard.

Contracts between the temporary agency and the host-employer should be examined to determine if they clearly set out the training responsibilities of both parties, in order to ensure that the employers have complied with all requirements of the regulation.

How extensive should training be?

A frequently overlooked portion of the training provisions is that which is dealing with emergency procedures. Training is expected to be proportional to the hazards of the workplace. If a chemical is very hazardous, more information would be expected to be provided on the MSDS. Therefore, the training for emergency procedures, including information about the characteristics of the chemical and precautions to be taken, would need to be more extensive.



In situations where employees are expected to moderate or control the impact of the emergency in a manner similar to an emergency responder, training under 1910.120 would be required. Employers who fall under the scope of HAZWOPER must have either a written emergency response plan or an emergency action plan. If employers expect their own employees to respond to a potential emergency involving a hazardous substance, then the employer must create an emergency response plan and the employees must be trained to perform the duties expected.

What about uncontrollable releases of hazardous substances?

OSHA Standard 1910.120, Hazardous waste operations and emergency response (HAZWOPER) covers response to uncontrollable releases. Incidental spills that are controllable and do not have the potential for becoming an emergency are covered by the HAZCOM rule. Training for responding to such incidental spills would be covered under the HAZCOM standard and would include, at a minimum, leak and spill cleanup procedures and the use of appropriate PPE.

There you have it? Almost everything you need to know. Time to take the module review quiz, so let's go. Answer each question as best you can. Scroll up the page to review if you like.

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MODULE 5 QUIZ

1. All of the following are examples of acceptable HAZCOM training methods except?
 - a. interactive video
 - b. classroom training
 - c. reading a MSDS
 - d. hands-on demonstration

2. No matter what training method you use, make sure HAZCOM training includes: _____?
 - a. testing
 - b. hands-on practice
 - c. MSDS review
 - d. all of the above

3. Only the host employer is required to train temporary employees on HAZCOM procedures.
 - a. true
 - b. false

4. Hazardous Waste Operations (HAZWOPER) cover response to incidental spills that do not have the potential for becoming an emergency.
 - a. true
 - b. false

5. A new employee should be able to _____ that training on the hazardous substances _____ has been conducted.
 - a. remember, and personal protective equipment
 - b. state, categories found in all workplaces
 - c. show proof, to which they would be exposed on the job
 - d. confirm, labeling requirements

MODULE SIX: PROGRAM ANALYSIS EXERCISE (This module is optional)

Introduction

It's time to take what you've learned in the other modules and put it all together by analyzing the facts surrounding an actual accident that occurred in Oregon a few years ago (Names have been changed). In answering the questions, we'll get involved with uncovering management weaknesses in the employer's hazard communication program, and in problems with overall safety leadership. Read through the scenario below and answer the questions.

Findings: Severe Hydrofluoric Acid Burns at XYZ Power Wash

1. XYZ Power Wash uses dilute hydrofluoric acid (HF), a clear, colorless liquid with mild detergent odor, to wash industrial vehicles with a mobile pressurized cleaning system. The company has seven employees. In cleaning operations, the company mainly uses dilute HF (0.1%) at all their operations. However, a few contracts require the use of concentrated HF (4 - 10%) to provide better brightening of aluminum truck parts.
2. The victim, Mr. Jones, stated he had received severe chemical burns on his hands during a powerwash operation in the pit area at Jupiter Equipment Company while preparing to clean heavy equipment. Jupiter Transport did not want Mr. Jones to use the XYZ concentration, but rather their own concentration at 10% HF.
3. While filling a garden sprayer with the 10% HF Mr. Jones accidentally splashed it on his gloves and forearms. Mr. Jones stated that, since he did not feel any pain, or stinging, he did not worry about getting his hands wet.
4. According to Mr. Jones, later that evening, his hand and forearm began to ache. Eventually he hurt so much that he went to the local hospital emergency room where he received immediate treatment for HF burns. However, due to the delayed treatment, he suffered severe damage to the tissue and bones of his hand. (Flourosis of the bone: fluorine ions replace calcium in the bone.) As a result, part of his hand had to be amputated.
5. Mr. Smith, the employer, stated that Mr. Jones had received training on the safe handling of HF and was informed to wear gloves when working with the concentrated HF. However, he states that Mr. Jones was not wearing gloves when the accident occurred. No written documentation of training could be located.

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6. Mr. Smith provided a statement by Mr. Bill, of Jupiter Transport stating he observed the above incident and warned Mr. Jones to wear gloves while handling HF.

7. Mr. Jones stated that he had never been provided hazard communication training on this or any other chemical used by XYZ and denies speaking to Mr. Bill at the time of his accident.

8. Employee interviews substantiate Mr. Jones' claim that hazard communication training was not being accomplished. No MSDS was on hand at either XYZ or Jupiter. No eye wash or shower facilities were available in the vicinity of the area where employees handle 10% HF.

MODULE 6 QUIZ

Assignment 1: Discuss the surface causes (Hazardous conditions, unsafe behaviors, inappropriate supervisor actions) that caused this accident.

Assignment 2: Discuss the underlying root causes (inadequate design or implementation of safety policies, plans, programs, processes, procedures and practices) for the accident.

Assignment 3: Give at least two recommendations to eliminate or reduce the probability of this accident occurring again.