Hazard Communication

Lesson 6 Study Guide

LESSON PURPOSE:

The purpose of this lesson is to identify how hazard communication provides a common approach to ensure that workers understand the types of chemicals in their workplace and how to properly handle them.

LESSON OBJECTIVES:

By the end of this lesson, you will be able to:

- Identify the Hazard Communication Standard (HCS)
- Describe the classifications and categories of chemical hazards
- List ways that the Hazard Communication Standard (HCS) protects employees in the workplace
- Explain employer responsibilities for providing a Hazard Communication Program

Hazard communication is critical to preventing serious injuries on the job.

According to OSHA, approximately 32 million workers work with and are potentially exposed to hazardous chemicals in the workplace. These chemicals can cause health problems, ranging from minor skin irritations to serious injuries or diseases like cancer.

The Hazard Communication Standard (HCS) is an OSHA standard that provides information about hazards and identities of chemicals in the workplace.

Various protective measures should be taken to ensure safety for both employers and employees in the work environment. Examples include the following:

- Identifying and listing hazardous chemicals found in the workplace
- Obtaining safety data sheets (SDS) and labels for each hazardous chemical
- Developing a written Hazard Communication program

Hazardous Chemical Classifications

Health hazards caused by chemical exposure	*Physical hazards caused by chemical exposure*	*Other chemical classifications*
• Acute Toxicity • Skin Corrosion/ Irritation • Serious Eye Damage/Eye Irritation • Respiratory or Skin Sensitization • Germ Cell Mutagenicity • Carcinogenicity • Reproductive Toxicity • Specific Target Organ Toxicity • Aspiration Hazard These effects can range from acute (short-term) to chronic (long-term).	• Explosives • Flammable chemicals • Oxidizers • Gases Under Pressure • Self-Reactive Chemicals • Pyrophoric Chemicals • Self-Heating Chemicals • Chemicals which emit flammable gases while in contact with water • Organic Peroxides • Metal corrosives	Simple asphyxiants displace oxygen in the ambient atmosphere which can cause oxygen deprivation to anyone exposed. Combustible dusts are solids that become a fire hazard when suspended in air or another oxidizing medium. Pyrophoric gas is a gas that will spontaneously ignite in air at a temperature at or below 130 F. Hazards not otherwise classified (HNOC) describe negative physical or health effects based on evidence that does not meet OSHA's criteria for an existing physical or health hazard class.

Classifying and Categorizing Chemical Hazards

While working on the job, you'll be exposed to a variety of health, physical, and chemical hazards.

The Globally Harmonized System of Classification and Labeling of Chemicals (GHS) is an international approach to Hazard Communication that provides a universally agreed upon criteria for classification of chemical hazards and a standardized approach to label elements and SDSs.

The HCS was modified to adopt the GHS to improve worker safety and health through more effective communication about chemical hazards. The GHS allows workers in all countries where the system is used to effectively use hazard information on chemicals that they may encounter from different regions.

To ensure chemical safety in the workplace, information about the identities and hazards of the chemicals must be made available and understandable to workers.

Chemical manufacturers and importers required to:

- Evaluate hazards of chemicals to verify proper classification
- Prepare labels and SDSs

Hazard classification incorporates the following three steps:

1. The **identification** of relevant data regarding the hazards of a chemical
2. A **subsequent review** of that data to ascertain the hazards associated with the chemical
3. A **determination** of whether the chemical will be classified as hazardous, and the degree of that hazard

Health hazard classes	*Effect details*
Acute Toxicity	Causes adverse effects when the chemical is ingested, transferred through the skin, or inhaled
Skin Corrosion	Irreversible damage to the skin; Reactions include ulcers, bleeding, bloody scabs, discoloration, areas of alopecia (no body hair), and scars
Skin Irritation	Reversible damage to the skin, such as lesions or a rash
Serious Eye Damage	Damage to eye tissue/serious physical decay of vision
Eye Irritation	Reversible damage such as burning or temporary loss of sight
Respiratory Sensitization	Hypersensitivity of airways when inhaled
Skin Sensitization	Allergic response from skin contact
Germ Cell Mutagenicity	Cause a permanent change in the amount or structure of the genetic material in human cells (mutations)
Carcinogenicity	Cause or increase likelihood of developing cancer
Reproductive Toxicity	Cause adverse effects on sexual function and fertility in adults and development of offspring
Specific Target Organ Toxicity	Single exposure class: Cause specific, non-lethal damage to organ after single exposure; May be reversible or irreversible Repeated/Prolonged Exposure Class: Cause specific, non-lethal damage to organ after single exposure; May be reversible or irreversible
Aspiration Hazard	Cause severe effects when ingested through oral or nasal cavity; Effects include chemical pneumonia, pulmonary injury, or death

Classifying and Categorizing Chemical Hazards

While working on the job, you'll be exposed to a variety of health, physical, and chemical hazards.

Physical/Chemical hazard classes	*More information*
Explosives	Solid or liquid chemicals that are capable, by chemical reaction, of producing gas at such a temperature and pressure that they rapidly damage the surrounding environment.
Flammable Gases	They work with air that is 68°F (20°C), and have a standard pressure of 14.7 psi.
Flammable Aerosols	Stored non-refillable receptacles that contain a flammable gas compressed, liquefied, or dissolved under pressure; Fitted with release device allowing contents to be ejected
Oxidizing Gases	May cause or contribute to combustion of other material
Gas under Pressure	Contained in a receptacle at a pressure of 29 psi or more, or which are liquefied, or liquefied and refrigerated
Flammable Liquids	Liquids having a flash point of not more than 199.4°F (93°C). Flash point refers to the minimum temperature at which a liquid gives off vapor in sufficient concentration to form an ignitable mixture with air near the surface of the liquid. There are four categories of flammable liquids, with Category 1 liquids having a lower flashpoint than Category 4 liquids.
Flammable Solids	Solids which are readily combustible, or which may cause or contribute to fire through friction
Self-Reactive Chemicals	Thermally unstable liquid or solid chemicals liable to undergo a strongly exothermic decomposition even without participation of oxygen (air)
Pyrophoric Liquids or Solids	Both liable to ignite within 5 minutes after coming into contact with air
Self-Heating Chemicals	Solid or liquid chemicals, other than pyrophoric ones, which, by reaction with the air and without energy supply, are likely to self-heat.
Chemicals with Water Contact Emit Flammable Gases	Assigned to solid or liquid chemicals that, by interaction with water, are likely to become spontaneously flammable or to give off flammable gases in dangerous quantities
Oxidizing Liquids/ Solids	May cause or contribute to combustion of other material when exposed to oxygen
Organic Peroxides	Liquid or solid chemicals that are considered a derivative of hydrogen peroxide, thermally unstable, may be liable to fire and explosion, and can react dangerously with other substances
Corrosive Metals	Chemicals which, by chemical action, will materially damage or destroy metals

How Hazard Communication Can Protect You

Learn how to protect yourself and others from health hazards.

Hazard communication can protect you from becoming ill or injured by properly communicating, through labels and other forms of warning, the dangers associated with chemicals found in the workplace.

Labels

Per OSHA and GHS standards, a label is defined as

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

The chemical manufacturer, importer, or distributor must ensure that the information provided for each hazard class and associated hazard category for the hazardous chemical is prominently displayed together on the label, tag, or marked in English.

SAMPLE LABEL

PRODUCT IDENTIFIER

CODE
Product Name

SUPPLIER IDENTIFICATION

Company Name
Street Address
City State
Postal Code Country
Emergency Phone Number

PRECAUTIONARY STATEMENTS

Keep container tightly closed. Store in cool, well ventilated place that is locked.
Keep away from heat/sparks/open flame. No smoking.
Only use non-sparking tools.
Use explosion-proof electrical equipment.
Take precautionary measure against static discharge.
Ground and bond container and receiving equipment.
Do not breathe vapors.
Wear Protective gloves.

HAZARD PICTOGRAMS

SIGNAL WORD
Danger

HAZARD STATEMENT

Highly flammable liquid and vapor.
May cause liver and kidney damage.

SUPPLEMENTAL INFORMATION

Directions for use

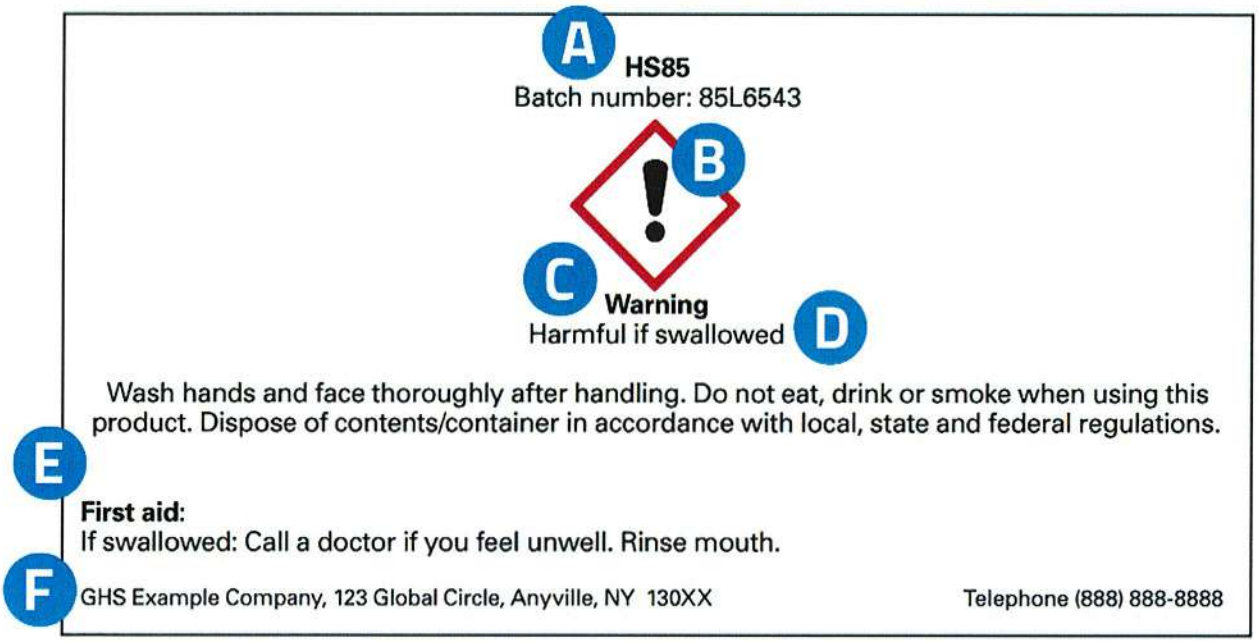
Fill weight: Lot Number
Gross weight: Fill Date:
Expiration Date:

Components of labels include the following:

- **Product identifier:** Name or number for a hazardous product
- **Supplier identifier:** Name, address, and telephone number of the chemical manufacturer, importer, or other responsible party
- **Precautionary statement(s):** A phrase that describes recommended measures that should be taken to minimize or prevent adverse effects resulting from exposure to a hazardous chemical or improper storage or handling
- **Pictogram(s):** A composition that may include a symbol in addition to other graphic elements, such as a border, background pattern, or color, that is intended to convey specific information about the hazards of a chemical.
- **Signal word:** Used to indicate the relative level of severity of hazard, and alert the reader to a potential hazard on the label.
- **Hazard statement(s):** A statement assigned to a hazard class and category that describes the nature of the hazard(s) of a chemical, including, where appropriate, the degree of hazard
- **Supplemental information:** Any additional information

Label Elements

Review this sample label to better understand its required elements.



A. Product Identifier

This is how the hazard is identified. Examples include the **chemical name**, **batch number**, or **code number**.

B. Signal Word

This indicates a hazard's severity. The only two words used as signal warnings are "**Danger**" and "**Warning**."

C. Hazard Statement(s)

These describe the **nature** and **degree** of the hazard.

D. Pictogram(s)

These graphic symbols communicate specific information about a chemical's hazard.

E. Precautionary Statement(s)

These describe the measures you should take to prevent or minimize hazardous effects.

F. Supplier Identifier

This is the chemical manufacturer, importer, or other responsible party's information.

Label Elements

Labels must include pictograms that alert workers to the chemical hazards they may be exposed to.

Pictograms And Their Associated Hazard Classes

Health Hazards

- Carcinogen
- Mutagenicity
- Reproductive Toxicity
- Respiratory Sensitizer
- Target Organ Toxicity
- Aspiration Toxicity

Exclamation Mark

- Irritant (Skin and Eye)
- Skin Sensitizer
- Acute Toxicity
- Narcotic Effects
- Respiratory Tract Irritant
- Hazardous to Ozone Layer (Non-Mandatory Warning)

Gas Cylinder

- Gas Under Pressure

Flame

- Flammables
- Pyrophoric
- Self-Heating
- Emits Flammable Gas
- Self-Reactive
- Organic Peroxides

Skull & Crossbones

- Acute Toxicity (Fatal or Toxic)

Corrosion

- Skin Corrosion or Burns
- Eye Damage
- Corrosive to Metals

Flame Over Circle

- Oxidizer

Environment

- Aquatic Toxicity

Exploding Bomb

- Explosive
- Self-Reactive
- Organic Peroxide

Safety Data Sheets

Safety data sheets (SDSs) communicate the hazards associated with chemicals.

Safety data sheets must be made **readily available** when designated representatives, the Assistant Secretary, and the Director request them.

Safety data sheets:

- May be kept in any form.
- May be designed to cover groups of hazardous chemicals in a work area.
- Must be readily accessible during each work shift to employees.
- Must contain 16 specific sections.*

For complex mixtures that have **similar hazards and contents**, the chemical manufacturer, importer, or employer may prepare **one safety data sheet** to apply to similar mixtures.

Responsibilities

Chemical Manufacturers or Importers – They must provide SDSs with the shipped containers. Or, they must send SDSs to the distributor or employer before or at the time of shipment.

Employers – They must make sure the required information is provided for each hazardous chemical.

**Inclusion of the 16 sections ensures consistency in how information is presented. For more information on the 16 sections of safety data sheets, visit the OSHA website.*

Safety data sheets must be readily available upon request.

If employers, chemical manufacturers, or importers have **significant new information** about a chemical's hazards (or ways to protect against hazards), they must add this information to the SDS within **three months**.

REMEMBER

"Safety data sheets" (SDSs) are formerly known as "material safety data sheets" (MSDSs). MSDSs may still be used during the transition period for compliance with updated Hazard Communication Standard (HCS) requirements.

Employer Responsibilities

Employers and employees must work together to reduce health hazards on the worksite.

Preventing Heat Hazards

Employers must prevent heat illness by doing the following:

- Provide cool, potable water.
- Provide frequent cool-down breaks.
- Schedule the heaviest work load during the coolest part of the day.
- Encourage workers to drink water and cool down.
- Look for signs and symptoms of heat stress.
- Provide training on heat stress including prevention, recognition, and first aid.
- Prohibit use of the common drinking cup.

Hazard Classification

- Train all employees in label elements.
- Train employees in the 16 sections of safety data sheets.
- Hazard classification under the GHS provides specific criteria to address health and physical hazards as well as classification of chemical mixtures.
- Chemical manufacturers and importers must provide a label that includes a signal word, pictogram, hazard statement, and precautionary statement for each hazard class and category.

Good recordkeeping is an important responsibility.

Employers must inform employees of the following:

- Employer requirements for chemical hazard training.
- Employer requirements for sharing of information with employees.
- Operations in employee work areas where hazardous chemicals are present.
- Locations and availability of the written hazard communication program.

REMEMBER

The written hazard communication program should include the required lists of hazardous chemicals and safety data sheets.

Employee Training

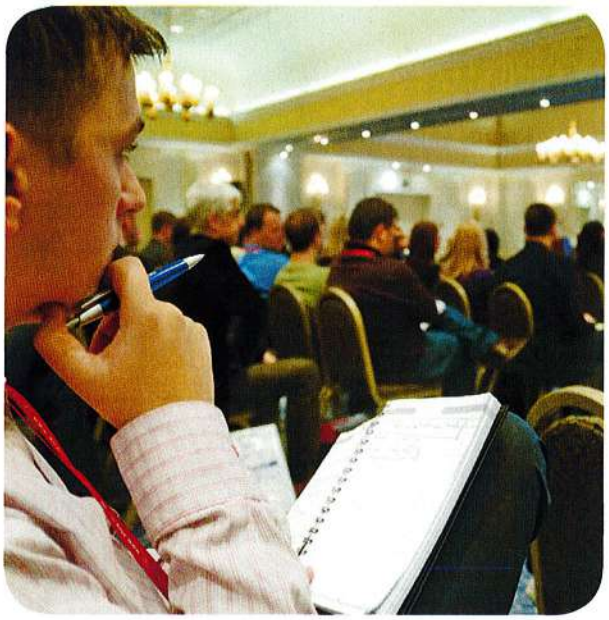
Employers are responsible for providing proper training to employees.

Employers must provide employees with effective information and training on hazardous chemicals in their work area.

- Provide training at the time of an employee's initial assignment.
- Provide additional training when a new chemical hazard is introduced.
- Training must include a statement of conditions.

Effective training programs are:

- Observable.
- Measurable.



Training of temporary workers is a joint responsibility of the employer and the temp agency.

REMEMBER

Training is meant to inform employees **prior** to exposure. Do not delay training until after the work has begun.

Training Requirements

Employer-provided training should cover the following:

- Measures employees can take to protect themselves from hazards.
- Work practices, emergency procedures, and other procedures that protect employees from exposure to hazardous chemicals.
- Details of the hazard communication program developed by the employer.
- Explanations of labels received on shipped containers.
- Explanations on the employer's workplace labeling system.
- Information of the safety data sheet, including the order of information.
- Information on how employees can obtain and use appropriate hazard information.

NOTES: