

Understanding OSHA's Hazard Communication Standard and the GHS

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PROGRAM SYNOPSIS:

Hazardous chemicals are essential to a wide variety of industries, impacting everything from manufacturing and agriculture to consumer goods and energy. Because of the dangers presented by hazardous chemicals, OSHA developed the Hazard Communication Standard, 29 CFR 1910.1200, also known as the HCS. The HCS works hand in hand with the GHS, the Globally Harmonized System of Classification and Labeling of Chemicals.

In 2012, the HCS was significantly updated to bring the regulation more in line with the international standards of the GHS. Recently, there have been additional changes. OSHA published a Final Rule on May 20, 2024, to revise the HCS, aligning it primarily with the 7th Revised Edition of the GHS. This program is designed to help employees understand the three key elements of the GHS: hazard classification, container labeling, and Safety Data Sheets.

PROGRAM OBJECTIVES:

After watching the program, the viewer will be able to explain the following:

- What the written hazard communication plan and the Globally Harmonized System are;
- What is involved in hazard classification;
- What information can be found on GHS chemical container labels;
- The importance of pictograms, signal words, and hazard and precautionary statements;
- What information is contained in the 16 sections of a Safety Data Sheet.

PROGRAM OUTLINE:

BACKGROUND

- Hazardous chemicals are essential to a wide variety of industries, impacting everything from manufacturing and agriculture to consumer goods and energy. The Occupational Safety and Health Administration, "OSHA," estimates that about 32 million workers in more than 3.5 million workplaces are regularly exposed to hazardous chemicals.
- While these substances are essential, they can also be very dangerous due to their physical or chemical properties.
- Because of the dangers presented by hazardous chemicals, OSHA developed the Hazard Communication Standard, 29 CFR 1910.1200, also known as the HCS. The HCS works hand in hand with the GHS, the Globally Harmonized System of Classification and Labeling of Chemicals.
- In 2012, the HCS was significantly updated to bring the regulation more in line with the international standards of the GHS. Recently, there have been additional changes. OSHA published a Final Rule on May 20, 2024, to revise the HCS, aligning it primarily with the 7th Revised Edition of the GHS. The Final Rule is effective July 19, 2024.
- Whether you're a seasoned professional or just starting out, understanding how to handle these chemical substances safely is essential for maintaining a secure work environment.
- In this program, we will provide an overview of the key components of your organization's Hazard Communication Program and the GHS so you will be better prepared to work safely with and around chemicals in your workplace.

THE WRITTEN PLAN

- OSHA's HCS regulation requires companies to develop a Hazard Communication Program to ensure that employees understand the hazards associated with chemicals in their workplace and take appropriate precautions.
- The program must include a written plan. This written plan discusses items such as container labeling, the collection, storage, and availability of Safety Data Sheets, and a listing of all hazardous chemicals on site as well as their location.
- The written plan will also detail specific guidelines for the training of employees. For example, employees will receive specific training based on the hazardous chemicals to which they may be exposed and learn how to recognize warning signs of leaks or spills.
- The physical and health risks of the chemicals used in the work area and how to use safe work practices and personal protective equipment to avoid exposure are also covered in the training. Additionally, details will be provided on how to

read important information on chemical labels and Safety Data Sheets (SDS), as well as where to find these documents and the Written Plan on site.

- The written plan is an important document which all employees have a right to review upon request

THE GLOBALLY HARMONIZED SYSTEM

- OSHA's Hazard Communication Standard was first enacted in 1983. However, recent changes have brought the regulation more in line with the international standards found in the Globally Harmonized System, or GHS for short. These changes are all about improving how we classify and communicate hazards associated with chemicals, making safety information clearer and more consistent globally.
- Created by the international community and adopted by the United Nations, the Globally Harmonized System provides a single set of harmonized criteria for classifying chemicals and mixtures according to their health, physical, and environmental hazards.
- The GHS enhances hazard communication by defining key elements like signal words, pictograms, and precautionary statements, which are displayed on container labels and Safety Data Sheets.
- A reference guide to the GHS, which includes a detailed explanation of this information, has been published by the United Nations. It is titled, "The Globally Harmonized System of Classification and Labeling of Chemicals". However, it is commonly called "The Purple Book".
- While chemical workers don't need to fully grasp the entire Globally Harmonized System, they must understand the specific elements used to communicate the hazards of the chemicals in their workplace.
- We will now discuss the three major components of the Globally Harmonized System: hazard classification, container labeling, and Safety Data Sheets.

HAZARD CLASSIFICATION

- The first component of the Globally Harmonized System we will discuss is hazard classification.
- Classification is the process of assigning a chemical or mixture to a hazard or danger category based on its health and physical hazards. Physical hazards are the properties of a gas, liquid, or solid that could adversely affect you or the workplace in a physical way, such as a fire or explosion.
- Health hazards are determined by the properties of a substance or mixture that can cause illness or injury to the skin, eyes, lungs, or other organs and body parts.
- In Appendix A of 29 CFR 1910.1200, the HCS updated the health hazards section regarding corrosion and irritation for the skin and eyes. It also adds information on non-animal testing methods to promote the use of alternative means.
- In Appendix B, the HCS updated the physical hazards section regarding flammable gases and aerosol hazard classes. It also added the hazard class "desensitized explosives".
- The revisions to OSHA's HCS will require manufacturers and importers to reclassify aerosols, desensitized explosives, and flammable gases in accordance with the new classification criteria and make corresponding revisions to SDSs and labels.
- Because there is such a large variety of hazardous chemicals, there is also a large variety of physical and health hazards presented by these chemicals. To better communicate the specific information needed by chemical workers, the GHS has created multiple classes of hazards. There are 17 classes of physical hazards and 10 classes of health hazards.

PHYSICAL AND HEALTH HAZARDS

- The 17 classes of physical hazards include explosives, flammable gases, aerosols and chemicals under pressure, oxidizing gases, gases under pressure, flammable liquids, flammable solids, and self-reactive chemicals.
- Other health hazard classes include carcinogenicity, reproductive toxicology, specific target organ toxicity from a single exposure, specific target organ toxicity from repeated exposures, and aspiration hazard.
- Other physical hazard classes include pyrophoric liquids, pyrophoric solids, self-heating chemicals, chemicals emitting flammable gases when contacting water, oxidizing liquids, oxidizing solids, organic peroxides, and chemicals corrosive to metal.
- The hazard class "desensitized explosives" has been added to describe solid or liquid explosive chemicals that have an agent added to them in order to stabilize the chemical. For example, solid desensitized explosives are explosive substances or mixtures which are wetted with water or alcohols or are diluted with other substances to form a solid mixture to suppress their explosive properties.

- Even though “desensitized explosives” is a new hazard classification, the explosion hazards were and are well known and should have been included in prior hazard training. For example, should the water or other wetting solution dry out, an explosion could occur.
- The 10 classes of health hazards include acute toxicity, skin corrosion and irritation, serious eye damage or eye irritation, respiratory or skin sensitization, and germ cell mutagenicity. Other health hazard classes include carcinogenicity, reproductive toxicology, specific target organ toxicity from a single exposure, specific target organ toxicity from repeated or prolonged exposures, and aspiration hazards.
- Of course, you may not be familiar with many of these terms, and you may never work with or handle chemicals in many of these hazard classes. However, it’s important for you to understand that the existence of the various GHS hazard classes makes it easier for you to receive the specific training and important information you need to work safely with the chemicals located in your workplace.

CONTAINER LABELS

- The second component of the Globally Harmonized System is container labels.
- Container labels will provide information on the relevant hazard classifications of the chemical. Labels and Safety Data Sheets (SDSs) are often the first indication to a worker that they are handling a hazardous chemical, so it is imperative that labels and SDSs be as accurate and complete as possible.
- After classifying the hazardous chemical, the manufacturer, importer, or distributor will consult Appendix C of 29 CFR 1910.1200 to determine the appropriate information to include on the label. This appendix has been updated to include the new and revised hazard classes and categories.
- Labels for a hazardous chemical must contain the name, address, and telephone number of the chemical manufacturer, importer, or other responsible party, the product identifier, a signal word, hazard statements, precautionary statements, and applicable pictograms.
- The HCS has been updated to include changes to labels for small containers in 1910.1200(f)(12). For a container less than or equal to 100 ml capacity, the chemical manufacturer, importer, or distributor must include, at a minimum, the following information on the label of the container: the product identifier, a pictogram, a signal word, the chemical manufacturer’s name and phone number, and a statement that the full label information for the hazardous chemical is provided on the immediate outer package.
- For a container less than or equal to 3 milliliters capacity, where the chemical manufacturer, importer, or distributor can demonstrate that any label interferes with the normal use of the container, no label is required, but the container must bear, at a minimum, the product identifier.
- For all small containers covered by this section of the HCS, the immediate outer package must include the full label information for each hazardous chemical. The label must not be removed or defaced. A statement that the small container inside must be stored in the immediate outer package bearing the complete label when not in use must also be included.
- 1910.1200(f) also lists updated labeling requirements for packaged containers that have been released for shipment or that constitute bulk shipping and for allowing the withholding of concentration ranges of substances for reasons related to trade secrets.

PICTOGRAMS

- Container labels include additional information in the form of pictograms, signal words, and hazard and precautionary statements.
- Pictograms are standardized graphics, sometimes called harmonized hazard symbols, which are assigned to a specific hazard class or category. Pictograms on a GHS label may convey health, physical, or environmental hazard information.
- However, keep in mind that there is not a unique pictogram for each individual hazard within each class. In other words, one pictogram may be used to represent several hazards within a class.
- There are nine pictograms that can be displayed on GHS labels to represent the hazards of a chemical.
- The health hazard pictogram, sometimes called the chronic health hazard pictogram, denotes respiratory sensitization, germ cell mutagenicity, carcinogenicity, reproductive toxicity, or an aspiration hazard. It is also used when a substance can cause specific target organ toxicity following a single or repeated exposures.
- The flame pictogram is used for flammables, pyrophorics, self-heating substances, a substance or mixture that emits flammable gas, self-reactive substances, organic peroxides, and desensitized explosives.

- The exclamation mark pictogram is used for the health hazards of acute toxicity, skin irritation, eye irritation, skin sensitization, and specific target organ toxicity following a single exposure in the form of narcotics effects or a respiratory tract infection.
- The gas cylinder pictogram is exhibited when a substance is compressed, liquefied, refrigerated liquefied, or dissolved gas.
- The corrosion pictogram indicates that a material is corrosive to metal. The corrosion pictogram is also used to denote the health hazards of skin corrosion and serious eye damage.
- The exploding bomb pictogram is used to signify a material as explosive, unstable explosive, organic peroxide, or a self-reactive substance or mixture.
- The flame over circle pictogram appears on a label when a chemical is an oxidizing gas, liquid, or solid.
- The environment pictogram is used when a substance poses acute or chronic hazards to the aquatic environment.
- The skull and crossbones pictogram is used when a chemical is acutely toxic to the skin, lungs, or digestive system.
- Pictograms are also used when chemicals are being transported. However, the pictograms used during transport are different from those found on labels.
- Transportation pictograms still feature the harmonized hazard symbols. However, the background, border, and colors used on the transport pictogram come from the United Nations Recommendations on the Transport of Dangerous Goods.
- Your specific chemical training as well as your company's written plan will include an explanation of the pictograms associated with the chemicals in your work environment. This knowledge helps workers quickly identify a chemical's hazards and is the first step to taking proper precautions to work safely.

SIGNAL WORDS

- There are two signal words that can appear on GHS container labels.
- The words "Danger" or "Warning" are used to emphasize hazards and indicate the relative level of severity of the hazard. The signal word "Danger" represents a more severe hazard than the signal word "Warning".
- Only one signal word, corresponding to the class of the most severe hazard, should be used on a chemical label.

HAZARD & PRECAUTIONARY STATEMENTS

- Other standardized communication elements found on GHS container labels are Hazard Statements and Precautionary Statements.
- Hazard Statements are standard phrases assigned to a hazard class and category that concisely describe the nature of the hazard. For products which pose more than one risk, an appropriate hazard statement for each GHS hazard will be included on the chemical label.
- Chemical labels will also contain Precautionary Statements. Precautionary Statements are standardized explanations of the measures to be taken to minimize or prevent adverse effects.
- Some examples of "Prevention" precautionary statements include: "Do not allow contact with water" and "Wear protective gloves".
- Some examples of "Response" precautionary statements include: "If on skin wash with plenty of water" and "If inhaled remove person to fresh air".
- Some examples of "Storage" precautionary statements include: "Store in well-ventilated place" and "Protect from sunlight."
- "Disposal" precautionary statements typically state to: "Dispose in accordance with local regulations". Disposal precautions are an area the United Nations plans to further develop in the future.
- Appendix C to 1910.1200 includes information regarding updating select hazard and precautionary statements for clearer and more precise hazard information. It also outlines guidance on desensitized explosives.

SAFETY DATA SHEETS

- Let's now turn our attention to the third primary source of information on chemical hazards and how to protect yourself from exposures: Safety Data Sheets.
- All Safety Data Sheets will have the following 16 sections, in specific order, so workers will always know which section will provide which data no matter what chemical you are referencing.

- Section 1: Identification. This section provides the product's identifier; the manufacturer or distributor's name, U.S. address, and phone number; an emergency phone number; the recommended use of the chemical; and the restrictions on its use.
- Section 2: Hazards Identification. Health, environmental and physical hazards are listed in this section. The chemical's intrinsic properties including a change in the chemical's physical form and chemical reaction products associated with known or reasonably anticipated uses or applications must be included in this section. Also shown are the GHS standard and transport pictograms as well as the hazard and precautionary statements found on the container label.
- Section 3: Composition/Information on Ingredients. This section gives the components of the substance and their concentration as well as their Chemical Abstract Service numbers, European Commission numbers, and European Chemical Agency numbers. With this revised standard, OSHA finalized the use of prescribed concentration ranges when an ingredient's concentration is withheld as a trade secret.
- Section 4: First Aid Measures. This section discusses treating chemical exposures, such as contact with the eyes and skin, during a first aid situation. Inhalation and ingestion are also covered.
- Section 5: Firefighting Measures. This section lists the appropriate and inappropriate fire extinguisher agents to be used in the event of a fire and the personal protection to be worn by firefighters.
- Section 6: Accidental Release Measures. Personal precautions, environmental precautions, and methods for cleanup in the event of a spill are explained in this section.
- Section 7: Handling and Storage. This section provides the procedures for safe handling and storage of the chemical.
- Section 8: Precautions to Control Exposure/Personal Protection. Exposure limits and the controls and monitoring required to prevent exposure above these limits are listed in this section. Also, the necessary personal protection needed to prevent exposure is included.
- Section 9: Physical and Chemical Properties. This section contains the various properties of the substance, such as appearance, odor, flash point, specific gravity, flammability limits, and vapor density. Particle size is also included.
- Section 10: Stability and Reactivity. Such issues as chemical stability, hazardous decomposition products, conditions to avoid, and incompatible materials are discussed in this section.
- Section 11: Toxicological Information. This section explains the routes of entry to the human body as well as the symptoms and effects of exposure to the chemical. Numerical measures of toxicity and interactive effects are included in this section.
- Section 12: Ecological Information. Provided in this section is information on the product's effect on plants or animals and its ultimate environmental disposition.
- Section 13: Disposal Considerations. This section discusses how to safely dispose of the chemical.
- Section 14: Transport Information. The proper shipping name, hazard class, UN Identification Number, Transport Label required, and other information required for transporting the product are listed in this section.
- Section 15: Regulatory Information. This section documents the chemical's classification under federal regulations such as the Toxic Substances Control Act, the Clean Water Act, and the Superfund Amendments and Reauthorization Act, among others. It may also include applicable state and international regulations as well as European Union classification and EU risk and safety phrases.
- Section 16: Other Information. The final section allows chemical manufacturers to provide information not found in the first 15 sections. This may include such things as the manufacturer's email address, the intended use of product, what agency issued the data sheet, date of issue, or a full explanation of risk and safety phrases, just to name a few.
- OSHA estimates that almost every SDS will need to be revised due to the provisions in the latest update. It's important that SDSs contain the most up-to-date required information for the safety of everyone who will interact with the chemical.
- Your facility maintains a Safety Data Sheet for each chemical in the workplace as part of its Hazard Communication Program. You should review the SDS before working with any chemical or any time you have concerns about safety issues. Always ask your supervisor if you have any questions about a chemical label or Safety Data Sheet.
- And of course, always wear the proper protective equipment specified by the container label or Safety Data Sheet. This often includes wearing gloves, protective clothing, and goggles with a face shield. Respiratory protection may also be required to avoid breathing in hazardous fumes. If you are unsure about the required PPE for any chemical, stop and ask your supervisor

CONCLUSION

- In this program, we have discussed OSHA's Hazard Communication Standard and its requirement for employers to create a written "Hazard Communication Program."
- We also discussed OSHA's requirements related to hazard classification, container labels, safety data sheets, and employee training.
- In addition, we explained the hazard categories and classes of the Globally Harmonized System and discussed the communication elements of the GHS such as pictograms, signal words, hazard statements, and precautionary statements found on chemical labels.
- Perhaps most importantly, we have made it clear that all workers have a "Right-To-Know" about the chemical hazards in their workplace and that the Hazard Communication Program is designed to do just that.
- Working with hazardous chemicals involves understanding their risks, following stringent safety protocols, using appropriate PPE, and providing proper training. Adhering to regulations and best practices helps protect health and safety in environments where these chemicals are handled.

UNDERSTANDING OSHA'S HAZARD COMMUNICATION STANDARD AND THE GHS

ANSWERS TO THE REVIEW QUIZ

1. a
2. b
3. a
4. a
5. b
6. a
7. a
8. a
9. b
10. a

**UNDERSTANDING OSHA'S HAZARD COMMUNICATION STANDARD AND THE GHS
REVIEW QUIZ**

The following questions are provided to determine how well you understand the information presented in this program.

Name _____ Date _____

1. Because of the dangers presented by hazardous chemicals, OSHA developed the Hazard Communication Standard, 29 CFR 1910.1200, also known as the HCS.
 - a. True
 - b. False

2. The written Hazard Communication Plan is an important document which some employees have access to for review at certain times of the year.
 - a. True
 - b. False

3. The Globally Harmonized System provides a single set of harmonized criteria for classifying chemicals and mixtures according to their health, physical, and environmental hazards.
 - a. True
 - b. False

4. Health hazards are determined by the properties of a substance or mixture that can cause illness or injury to the skin, eyes, lungs, or other organs and body parts.
 - a. True
 - b. False

5. "Desensitized explosives" is a new hazard classification with previously unknown explosion hazards that were not included in prior hazard training.
 - a. True
 - b. False

6. Some of the things required on hazardous chemical container labels are the product identifier, a signal word, hazard statements, and applicable pictograms.
 - a. True
 - b. False

7. There are nine pictograms that can be displayed on GHS labels to represent the hazards of a chemical.
 - a. True
 - b. False

8. The signal word "Danger" represents a more severe hazard than the signal word "Warning".
 - a. True
 - b. False

9. Some examples of "Storage" precautionary statements include: "Do not allow contact with water" and "Wear protective gloves".
 - a. True
 - b. False

10. Safety Data Sheets should be reviewed before working with any chemical or any time you have concerns about safety issues.
 - a. True
 - b. False