



WORKPLACE HEALTH AND SAFETY

THE GLOBALLY HARMONIZED SYSTEM OF CLASSIFICATION AND LABELING OF CHEMICALS

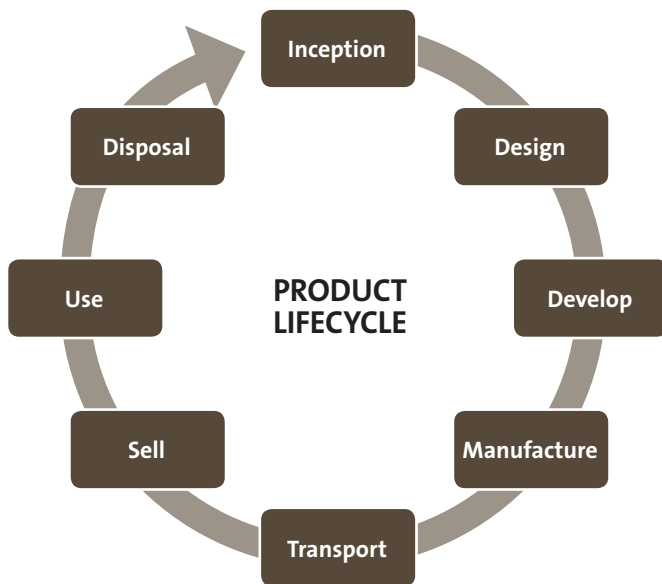




The Globally Harmonized System of Classification and Labeling of Chemicals

The United Nations' Globally Harmonized System of Classification and Labeling of Chemicals (GHS) is widely acknowledged to be one of the most significant regulatory changes to affect worldwide workplace health and safety practices in many years.^{1,2}

The GHS promotes a universal approach to classifying and communicating information about chemical hazards, regardless of where chemicals are produced or how the nature of a hazard is determined. The system helps ensure safe production, transport and use of chemicals as they move through the product life cycle.



Regulatory authorities in countries that voluntarily adopt the GHS will implement agreed upon criteria and provisions through their own regulatory processes and procedures. The UN's GHS document provides countries with regulatory building blocks

to develop or modify national programs that address hazard classification, transmittal of information about hazards and associated protective measures. In the United States, the federal Occupational Safety and Health Administration (OSHA) is in the process of incorporating the GHS into its Hazard Communication Standard (HazCom). The system is being phased in and will be enforceable under the HazCom Standard by June 1, 2015. During the transition period, chemical manufacturers, importers, distributors and employers operating in the U.S. may comply with either 29 Code of Federal Regulations 1910.1200 (the new revised standard, 2012), the current standard or both. The revised standard was published in the *Federal Register* on March 26, 2012.³ The final rule became effective May 25, 2012.

Reasons for Global Harmonization

Many countries have varying requirements for hazard definitions, labeling and safety data sheets (SDS), and in the U.S., regulatory practices are not necessarily consistent across all enforcement agencies. For example, a product may be considered flammable or toxic by one country or agency, but not by others.

While existing laws and regulations are similar in some respects, in many cases differences require the use of multiple labels for the same product, as well as multiple SDS for the same product in international trade. The GHS creates a standardized system to help minimize these complexities and promote compliance. By reducing incongruities in chemical hazard handling practices, the GHS is expected to significantly enhance employee and environmental protections. In the U.S. and in other countries,



manufacturers, plant workers and product consumers will be on the same page with respect to labels and symbols, safety data sheets and hazardous chemical classifications.

According to OSHA, there are many benefits associated with incorporating the GHS in the HazCom Standard, which applies to more than 43 million workers who produce or handle hazardous chemicals in more than 5 million workplaces. They include:

- improved comprehension of hazards, especially among limited-literacy workers
- training that will result in safer handling and use of chemicals
- quicker and easier access to information on labels and SDS
- millions of dollars in estimated savings as a result of productivity enhancements, simplified SDS and labels, and updated training
- lowering of trade, language and cultural barriers by harmonizing with systems around the world

Background

An international global harmonization mandate was adopted in 1992 at the United Nations Conference on Environment and Development, an event known as the Earth Summit. The

harmonization of classification and labeling of chemicals was one of six program areas endorsed by the United Nations General Assembly to strengthen international efforts concerning environmentally sound chemicals management. It was recognized that an internationally harmonized approach to classification and labeling would provide the foundation for all countries to develop comprehensive national programs to ensure the safe use of chemicals.

OSHA published the original Hazard Communication Standard in November 1983. The standard required chemical manufacturers and importers to include hazard information on labels and material safety data sheets (MSDS). However, it did not establish standardized formats. Following years of subsequent review, debate and analysis, the agency revised the standard, incorporating the UN's GHS recommendations.

HazCom 2012 Highlights

Section 1910.1200(a)(1) mandates that hazards associated with chemicals that are produced domestically or imported are classified using a consistent system, and that information concerning the classified hazard is transmitted to employers and employees. This section mirrors provisions of the UN's GHS, Revision 3, which calls for the use of comprehensive hazard communication and training programs.

Section 1910.1200(a)(2) addresses the classification of potential hazards, communication of information concerning hazards and appropriate protective measures that may include:

- developing and maintaining a written hazard communication program for the workplace, including lists of hazardous chemicals present
- labeling of containers of chemicals in the workplace, as well as containers of chemicals being shipped to other workplaces
- preparation and distribution of SDS to employees and downstream employers
- development and implementation of employee training programs regarding chemical hazards and protective measures

Labeling Requirements

Consistent labeling is a critical aspect of the GHS. Under the revised HazCom Standard, all labels will be required to have:

- standardized pictograms
- a signal word – either warning or danger
- hazard and precautionary statements
- product identifier
- supplier identification

Hazard pictograms, signal word and hazard statements are required to be located together on the label. The actual format or label layout is not specified in the standard. Alternative labeling systems such as the National Fire Protection Association 704 Hazard Rating and the Hazardous Information System are permitted for workplace containers. The information supplied on these labels must be consistent with the revised HazCom Standard. Employers may label workplace containers either with the same label that would be on shipped containers or with label alternatives that meet requirements.

Workforce training on the standard must provide instruction on effective use of labels, for example, to ensure proper storage or facilitate a rapid response in the event of an exposure, and explain how label elements may overlap, such as multiple hazards identified via pictograms.

Pictograms

The HazCom Standard calls for the use of eight of nine GHS pictograms; the exception is an environmental pictogram. OSHA's required pictograms must be in the shape of a square set at a point and include a black hazard symbol on a white background with a red frame sufficiently wide enough to be clearly visible. A black border may be used in some circumstances if restricted to a specific workplace.

Signal word

One of two signal words will be used to indicate the relative level of hazard severity: danger or warning. Within a specific hazard class, danger is used for the more severe hazards and warning is used for the less severe hazards. Only one signal word corresponding to the class of the most severe hazard should be used.

Hazard statement(s)

Statements specific to hazard classification categories are used to describe the nature and degree of the hazard(s) of a chemical, for example, "causes damage to kidneys through prolonged or repeated exposure when absorbed through the skin."

Precautionary statement(s)

These statements are descriptive phrases on recommended measures to minimize or prevent adverse effects resulting from exposure to a hazardous chemical or from improper storage or handling. There are four types of precautionary statements:

- prevention (to minimize exposure)
- response (in case of accidental spillage, emergency response or first aid)
- storage
- disposal

Product identifier

Information on labels includes product identifiers such as the chemical name, code number or batch number. The manufacturer, importer or distributor selects the appropriate product identifier, which also must be on the label and listed in Section 1 of the SDS under identification.

Supplier identification

Labels must include the name, address and phone number of the chemical manufacturer, distributor or importer.



WARNING



DANGER

Supplemental information

Supplemental Information is non-harmonized information on the container of a hazardous product that is not required or specified under the GHS. In some cases this information may be required by another authority, or it may be information provided at the discretion of the manufacturer/distributor. The GHS provides guidance on the use of supplemental information to ensure it provides further detail but does not contradict or cast doubt on the validity of standardized hazard information. It also may be used to provide information about hazards not yet incorporated into the GHS.

Safety Data Sheets

Another one of the significant changes being introduced as part of the revised HazCom Standard is replacement of the current MSDS reporting format with standardized safety data sheets that are in use globally. A table comparing MSDS to SDS is provided in Appendix A of OSHA's GHS guidance document (www.osha.gov/hazcom/ghs).



The SDS format is product-related and provides comprehensive information for use in workplace chemical management. To be compliant, the SDS should contain 16 headings and provide a description of the data used to identify hazards.

The 16 sections are:

1. Identification of the supplier and substance/mixture
2. Hazard identification
3. Composition/information on ingredients
4. First aid measures
5. Firefighting measures
6. Accidental release measures
7. Handling and storage
8. Exposure controls / personal protection
9. Physical and chemical properties
10. Stability and reactivity
11. Toxicological information
12. Ecological information *
13. Disposal considerations*
14. Transport information *
15. Regulatory information*
16. Other information including instructions on preparation and revision of the SDS

**Note: The SDS must contain Sections 12-15 to be consistent with the GHS. Although the headings for Sections 12-15 are mandatory, OSHA will not enforce the content of these four sections because they are within other agencies' jurisdictions.⁵*



Hazard Classification

Chemical manufacturers and importers are required to determine the hazards of the chemicals they produce or import. Hazard classification under the updated HazCom Standard provides specific criteria to address health and physical hazards as well as classification of chemical mixtures. There are two hazard classes – 16 physical hazards and 10 health hazards.

Physical Hazards	
Explosives	Pyrophoric liquids
Flammable gases	Pyrophoric solids
Flammable aerosols	Self-heating substances
Oxidizing gases	Substances which in contact with water emit flammable gases
Gases under pressure	Oxidizing liquids
Flammable liquids	Oxidizing solids
Flammable solids	Organic peroxides
Self-reactive substances	Substances corrosive to metal

Health Hazards	
Acute toxicity	Germ cell mutagenicity
Skin corrosion	Carcinogenicity
Skin irritation	Reproductive toxicity
Eye effects	Target organ systemic toxicity: single and repeated exposure
Sensitization	Aspiration toxicity

Compliance Deadlines

OSHA has established deadlines for phasing in the GHS.

By December 1, 2013 – Training

By this date, employers to whom the standard applies must have trained their workers on labeling requirements and the 16-section SDS format.

By June 1, 2015 – Compliance

All affected parties must be in compliance with the final rule, with the exception of distributors who will be given until Dec. 1, 2015 to ensure all containers in their supply chain are labeled in accordance with the HazCom Standard. All hazardous chemicals shipped after June 1, 2015, must be labeled with specified elements including pictograms, signal words, and hazard and precautionary statements. Manufacturers, importers and distributors have the option of using the new labeling system before June 1, 2015.

By June 1, 2016 – Updates

Employers must complete updates of their workplace labeling and hazard communication training programs, as necessary, and provide additional employee training for any newly identified physical or health hazards.



How UL Workplace Health and Safety Can Assist

UL Workplace Health and Safety offers a number of courses to help employers comply with the HazCom Standard and the GHS requirements:

- Hazard Communication (with GHS integration)
- Hazard Communication for Construction
- Hazard Communication for Healthcare
- Hazard Communication for Construction Mini-Module
- GHS Mini-Modules:
 - Hazard Communication – Safety Data Sheets
 - Hazard Communication – Pictograms
 - Hazard Communication – Labels

UL offers a range of training and consulting services to assist organizations in meeting the requirements of the updated HazCom Standard. For additional information, contact Langdon Dement, EHS Advisor, at langdon.dement@ul.com.

1. *Globally Harmonized System of Classification and Labeling of Chemicals (GHS), United Nations Economic Commission for Europe. Web, http://www.unece.org/trans/danger/publi/ghs/ghs_rev00/00files_e.html*
2. *Hazard Communication Safety and Health, Occupational Health and Safety Administration guidance and resource materials. Web, <http://www.osha.gov/dsg/hazcom/index.html>.*
3. *Federal Register, daily journal of the U.S. Government, Hazard Communication, a rule by the Occupational Safety and Health Administration. Web, March 26, 2013, <https://www.federalregister.gov/articles/2012/03/26/2012-4826/hazard-communication>*
4. *A Guide to the Globally Harmonized System of Classification and Labeling of Chemicals, Appendix A: Comparison of MSDS/SDS Elements, Occupational Safety and Health Administration. Web, <https://www.osha.gov/dsg/hazcom/ghs.html>.*
5. *Modification of the Hazard Communication Standard to conform with the United Nations' (UN) Globally Harmonized System of Classification and Labeling of Chemicals, Occupational Safety and Health Administration: Questions and Answers. Web, <https://www.osha.gov/dsg/hazcom/hazcom-faq.html>.*

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