

GLOBALLY HARMONIZED SYSTEM OF CLASSIFICATION AND LABELING OF CHEMICALS (GHS)



Introduction: Globally Harmonized System of Classification and Labeling of Chemicals (GHS)

The GHS, or Globally Harmonized System of Classification and Labeling of Chemicals, grew out of a 1992 United Nations environmental conference and was formalized in 2003. The GHS aims to harmonize the way nations classify and label their hazardous chemicals across the globe.

In the United States, the GHS's goals are in the process of being incorporated into the Occupational Safety and Health Administration's (OSHA) Hazard Communication Standard (HCS; CFR 1910.1200). The HCS covers more than 945,000 hazardous chemicals in 7 million U.S. work sites; the revisions will have a sweeping effect, most specifically on the Material Safety Data Sheets (MSDS) and warning labels that come with the purchase and use of most chemicals. These MSDS, to be referred to as SDS's in the future, and labels give workers the "right to know" about chemical hazards they are exposed to, along with instructions for care in handling and for post-accident responses.

The GHS calls for standardized (new) formats and information requirements for the data sheets and for the employment of more universal pictograms to convey important messages in multilingual environments. These revisions most directly affect the manufacturers and distributors of chemical products, but they also place new requirements on employers for effective workplace policies and retraining of personnel to learn the new standards.

What is the GHS?

The GHS is a system for standardizing and harmonizing the classification and labeling of chemicals. It is a logical and comprehensive approach to:

- Defining health, physical and environmental hazards of chemicals;
- Creating classification processes that use available data on chemicals for comparison with the defined hazard criteria; and
- Communicating hazard information, as well as protective measures, on labels and Safety Data Sheets (SDS).

The GHS itself is not a regulation or standard. The United Nation's GHS Document (referred to as "The Purple Book") establishes agreed-hazard classification and communication provisions with explanatory information on how to apply the system. The elements in the GHS supply a mechanism to meet the basic requirement of any hazard communication system, which is to decide if the chemical product produced and/or supplied is hazardous and to prepare a label and/or Safety Data Sheet as appropriate.

Regulatory authorities, such as OSHA, in countries adopting the GHS thus have the ability to take the agreed criteria and provisions and implement them through their own regulatory process and procedures, rather than simply incorporating the text of the GHS into their national requirements.

Why is the GHS needed?

The production and use of chemicals is fundamental to all economies. The global chemical business is more than a \$1.7 trillion per year enterprise. In the U.S., chemicals are more than a \$450 billion business and exports are greater than \$80 billion per year.

The sound management of chemicals should include systems through which chemical hazards are identified and communicated to all who are potentially exposed. These groups include workers, consumers, emergency responders and the public. It is important to know what chemicals are present and/or used, their hazards to human health and the environment, and the means to control them.

Before GHS, many countries already had regulatory systems in place for these types of requirements. These systems may have been similar in content and approach, but their differences were significant enough to require multiple classifications, labels and safety data sheets for the same product when marketed in different countries, or even in the same country when parts of the life cycle are covered by different regulatory authorities. This led to inconsistent protection for those potentially exposed to the chemicals and created extensive regulatory burdens on companies producing chemicals.

The International Mandate

The single most important force that drove the creation of the GHS was the international mandate adopted by the 1992 United Nations Conference on Environment and Development (UNCED), often called the “Earth Summit.” The harmonization of classification and labeling of chemicals was one of six program areas that were endorsed by the United Nations General Assembly to strengthen international efforts concerning the environmentally sound management of chemicals.

Benefits of the GHS

There are significant benefits associated with the implementation of a globally harmonized approach to hazard communication. Countries, international organizations, chemical producers and users of chemicals will all benefit.

First and foremost, implementation of the GHS enhances protection of people and the natural environment where potential exposure to chemicals exists. While some countries already have the benefits of protection under existing systems, the majority of countries do not have such comprehensive approaches. Thus, implementation of the GHS provides these countries with the important protections that result from dissemination of information about chemical hazards and protective measures.

In the U.S., the adoption of the GHS improves and builds on protections OSHA already has with its Hazard Communication Standard. Refinement of the information provided will help to improve comprehensibility and thus make it more likely that the information results in workplace changes to protect employees. As has already been noted, the majority of affected employers and employees will benefit from incorporation of the primary GHS elements. They’ll receive better, more standardized, and consistent information about chemicals in their workplaces.

Secondly, the GHS facilitates international trade in chemicals. It reduces the burdens of having to comply with differing requirements for the same product, and it gives companies more opportunity for international trade. This is particularly important for small producers who may have previously avoided international trade because they did not have the compliance resources required to address the extensive regulatory requirements for classification and labeling of chemicals.

Third, one of the initial reasons this system was pursued internationally involved concerns about animal welfare and the proliferation of requirements for animal testing and evaluation. Where existing systems have different definitions of hazards, it often results in duplicative testing to produce data related to the varying levels of toxicity or cut-offs used to define the hazards in the different systems. The GHS reduces this duplicative testing. (It should be noted that OSHA has no testing requirements. The HCS is based on collecting and evaluating the best available evidence on the hazards of each chemical.)

In all countries, there is a need to acquire sufficient information to properly handle the chemical when it is imported from other countries. Thus having a coordinated and harmonized approach to the development and dissemination of information about chemicals is mutually beneficial to both importing and exporting countries.

The GHS benefits for U.S. producers

In the U.S., the four primary regulatory agencies (OSHA, EPA, CPSC, and DOT) that are responsible for GHS implementation are not domestically harmonized in terms of definitions of hazards and other requirements related to classification and labeling of chemicals. Since most chemicals are produced in a workplace and shipped elsewhere, every manufacturer deals with at least two of the U.S. systems. As such, every producer is likely to experience some benefits from domestic harmonization of GHS, in addition to the benefits that will accrue to producers involved in international trade.

OSHA believes that adoption of the GHS also addresses some of the issues that have been discussed in the U.S. regarding the HCS and its implementation, such as improving labels and SDS comprehensibility through implementation of a standardized approach. Having the information provided in the same words and pictograms on labels, as well as having a standardized order of information on SDSs, helps all users identify the critical information necessary to protect employees.

Scope of the GHS

The GHS covers chemicals in various stages of their life cycle, from production to disposal. It is based primarily on the hazards of chemicals. The GHS is designed to allow regulatory authorities to choose provisions that are appropriate to their particular scope of regulation. This is referred to as the “building block approach.” The GHS includes all of the building blocks or possible regulatory components that might be needed for classification and labeling requirements in the workplace as well as for regulation of classification and labeling of pesticides, chemicals in transport, and consumer products.

The building block approach may also be applied in other ways when deciding which parts of the system to adopt. For example, the GHS includes classification criteria, labels, and SDSs. While workplace authorities like OSHA adopt all of these elements, it is expected that consumer product authorities will not have SDS requirements, nor will transport authorities.

The building block approach may also be applied to the criteria for defining hazards. For example, the acute toxicity criteria are much broader than those in the original HCS for workplace exposures. This is to provide consumer product authorities the tools they need to address the protection of children who might accidentally be exposed. Conversely, OSHA may not need to adopt all of the categories of acute toxicity in order to protect employees from the types of exposures they have.

In addition to the building block approach, the GHS also contains a number of areas that are left to the competent authority to determine how to apply the provision. Where OSHA is the competent authority, i.e., in terms of workplace protections in the U.S., the agency expects to maintain its current approaches in terms of interpretations and accommodations regarding application.

Overall, the scope of the GHS with regard to chemicals covered, as well as types of chemicals and workplaces that are covered, is very similar to the HCS. The HCS has a very broad scope of coverage, ensuring that information is provided on all potential hazards in American workplaces. Adoption of the GHS maintains this broad coverage of hazards and chemicals. It should be noted that the GHS, like the HCS, does not require any new testing of chemicals. Evaluations of chemical hazards are to be based on the best available evidence.

The Biggest Difference Between HCS and GHS

The original HCS requirements for labels simply indicated the minimal information required to be on them. At the time the standard was published, OSHA reviewed the current industry consensus standards for labels, and focused on requiring information that was not generally present on most labels in use by the industry. The additional information included an identity that could be traced to more detailed information, and specific information about both the health and physical hazards. Other types of information such as precautionary statements were not included in the requirements.

This performance-oriented approach was strongly supported by the chemical industry at the time the standard was adopted. It allowed existing labels to continue to be used in many situations, thus minimizing the impact on a number of producers.

However, an ultimate outcome has been that various supplier / organizational labels are not consistent and may not communicate adequately to users. While some producers follow voluntary industry consensus standards, others do not. Many large companies have developed their own libraries of phrases to be used on labels and safety data sheets, and undertaken translation of them into multiple languages. This is a considerable burden for a company to develop and maintain.

Other major existing systems considered in the harmonization process included specific label phrases to convey hazards and other information. Symbols and pictograms were also part of these systems. For purposes of developing an agreed upon harmonized approach, it was necessary to consider including such elements in the GHS.

For each class and category of hazard under the GHS, there is a harmonized hazard statement, a signal word, and a pictogram specified. This is referred to as the core information for a chemical. Thus, once an employer classifies a chemical, the GHS provides for the specific core information to convey to users on that chemical. There are provisions to allow supplementary information as well so the chemical manufacturer is not limited to the specified core information. This addresses product liability concerns for U.S. employers and ensures they can include other information they consider to be necessary for that purpose.

Precautionary statements are also provided as examples in the GHS, but they have not yet been agreed upon and harmonized. This is expected to occur in the future as work on the system continues. These and several similar labeling provisions or exceptions will likely be the biggest difference between the updated HCS and the GHS.

There are a number of benefits to this standardized approach. First, employers and employees are given the same information on a chemical regardless of the supplier. This consistency improves communication of the hazards. It also improves communication for those who are not functionally literate, or who are not literate in the language written on the label. Literacy of both types is a significant concern in American workplaces.

Secondly, having the core information developed already, translated into multiple languages, and readily available to whoever wishes to access it eliminates the burden of chemical manufacturers and importers developing and maintaining their own such systems. Thus, the specification approach should be beneficial both to the producers and the users of chemicals.

Specific Labeling Requirements

Under the HCS, the SDS (see samples above) is the detailed reference source on the chemical. While labels provide a quick snapshot to remind employers and employees of the hazards of the chemical, the SDS addresses all aspects of hazard information as well as methods for handling and use. The HCS specifies what information must be included on the SDS, but currently does not specify a format or order of information. Again, this approach was supported by producers to minimize the impact of the standard for those who already developed and disseminated (M)SDS's.

Safety data sheets under the current HCS regulation are required to include:

- Identification of the chemical or hazardous ingredients of a mixture
- Physical and chemical characteristics
- Health hazards, including signs, symptoms, and medical conditions that could be aggravated by exposure
- The primary routes of entry
- The OSHA permissible exposure limit, ACGIH (American Conference of Governmental Industrial Hygienists) Threshold Limit Value, and any other recommended exposure limits
- Whether the chemical is considered to be a carcinogen by OSHA, the International Agency for Research on Cancer, or the National Toxicology Program
- Precautions for safe handling and use
- Control measures
- Emergency and first aid procedures
- Date of preparation of the safety data sheet
- Contact information for the responsible party

Users of chemicals have always preferred a standardized approach. Many believe that having the information in the same place on every data sheet allows them to access it more effectively. OSHA published a request for information regarding ways to improve the information provided under the HCS (55 FR 20580; May 17, 1990), and received approximately 600 comments in response. The majority of the responses were in favor of a standardized format or order of information.

As a result of the users' expressed preferences, chemical manufacturers in the U.S. developed a voluntary industry consensus standard that included an order of information for safety data sheets (ANSI Z400.1). This approach was later adopted into international voluntary industry consensus standards as well.

The HCS allows any format to be used, so many producers have been following the consensus standard order of information for some years. In negotiating the GHS, it was decided that this format should be adopted there as well. One change was made, reversing the order of sections 2 and 3 so the hazard information appeared earlier in the sheet than information on chemical composition. Both the national and international industry consensus standards are being changed to be consistent with this approach.

The GHS data sheet is to include the following sixteen sections in this order:

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| • Identification | • Hazard identification |
| • Regulatory information | • First aid measures |
| • Firefighting measures | • Accidental release measures |
| • Handling and storage | • Exposure controls/personal protection |
| • Stability and reactivity | • Physical and chemical properties |
| • Toxicological information | • Ecological information |
| • Disposal considerations | • Transport information |
| • Composition/information on ingredients | • Other information |

Having a standardized order of information improves comprehensibility, which has been a continuing issue with regard to safety data sheets. It makes it easier for chemical producers to comply by providing them with a template to follow. Using the industry consensus standards also minimizes the burden of preparing new safety data sheets since many chemical producers already use the format specified. While the GHS safety data sheet does not address exposure limits in the titles of the sections, guidance on what should be included indicates that occupational exposure limits would be addressed under the “exposure controls” section. Countries may choose what to require in these sections in terms of occupational exposure limits.

Under the auspices of the International Program on Chemical Safety (IPCS), a series of more than 1,300 international chemical safety cards has been developed and translated into 14 languages. These cards are developed and peer reviewed by participating institutions in a number of countries, including the The National Institute for Occupational Safety and Health (NIOSH) in the U.S.. The cards are similar to SDSs in terms of the information provided, but they are in a concise format of two pages. The cards are going to be updated to reflect the GHS criteria and hazard information. These may be found on NIOSH’s Web page at: <http://www.cdc.gov/niosh/ipcs/nicstart.html>.

OSHA also has a link to them on its hazard communication page. These cards are an excellent resource for many of the most common chemicals found in the workplace.

As mentioned earlier, there is information required on a GHS SDS that is outside OSHA’s jurisdiction to regulate, specifically sections twelve through fifteen. This includes environmental and transport information. OSHA does not intend to propose requiring it on safety data sheets, but will provide information about the provisions so chemical producers can include it if they wish to be completely consistent with the GHS. OSHA does not preclude such information being on a safety data sheet, but will not review or enforce the provisions of these four sections.

What to Keep In Mind with GHS

This personal guide is intended to help you understand and meet your obligations under OSHA’s evolving Hazard Communications Standard (HCS), which going forward will be adapted to harmonize with the GHS.

This important information for your knowledge and understanding about GHS was researched and compiled from Occupational Safety and Health Administration rules and regulations and from source materials on the GHS itself.

Most important features of the GHS to remember when you are addressing Hazardous Communications requirements and best practices are:

- The origins of the GHS and what its purpose is
- The International Mandate that informs OSHA’s HCS
- What the HCS is and what benefits it offers
- SDS and labeling requirements under the GHS
- Differences between the GHS and the HCS
- Examples of GHS labels and pictograms

For More Information:

To learn more about Hazard Communication and the GHS standard, visit www.BradyID.com/ghs.

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