A Guide to GHS Labeling of Chemicals
# A Guide to GHS Labeling of Chemicals

## Table of Contents

- **The GHS** ........................................................................................................ 1  
  - History ........................................................................................................ 1
- **What Has Changed?** ...................................................................................... 1
- **Elements of the GHS Label** ......................................................................... 2  
  - Standardized Label Elements Included In The GHS .................................. 2
- **Additional Elements for the GSH Label** ..................................................... 3  
  - Symbol or Pictogram? ................................................................................ 4
- **Pictograms** .................................................................................................. 4
- **Labeling Solutions From ID Technology** ....................................................... 5
- **Get Ready for GHS** ...................................................................................... 7  
  - BS5609 Label Certification ......................................................................... 7
- **Implementation by Other US Agencies** ......................................................... 8
- **Interagency Coordination** ........................................................................... 8
The GHS

The GHS is an acronym for The Globally Harmonized System of Classification and Labeling of Chemicals, an international standard that replaces the various classification and labeling standards used in different countries.

The GHS provides a logical and comprehensive approach to:

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

OSHA's Hazard Communication Standard for hazardous labeling now includes the standardized approach defined by GHS. OSHA has modified the Hazard Communication Standard (HCS) to adopt the GHS and improve safety and health of workers through more effective communications on chemical hazards. For full details about HCS, visit the OSHA Hazard Communication page.

What Has Changed?

The three major areas of change are in Hazard Classification, Labels, and Safety Data Sheets.

*Hazard classification* - The definitions of hazard have been changed to provide specific criteria for classification of health and physical hazards, as well as classification of mixtures.

These specific criteria will help to ensure that evaluations of hazardous effects are consistent across manufacturers, and that labels and safety data sheets are more accurate as a result.

*Labels* - Chemical manufacturers and importers will be required to provide a label that includes a harmonized signal word, pictogram, and hazard statement for each.

*Safety Data Sheets* - Previously known as Material Safety Data Sheets, the SDS now have a standardized 16-section format. For more specifics on SDS content and formatting, read OSHA's SDS Brief.

History

The Globally Harmonized System of Classification and Labeling of Chemicals (GHS) began with the premise that existing systems should be harmonized in order to develop a single, globally harmonized system to address classification of chemicals, labels, and safety data sheets.

Harmonization of classification and labeling was already largely in place for physical hazards and acute toxicity in the transport sector, based on the work of the United Nations Economic and Social Council’s Committee of Experts on the Transport of Dangerous Goods (UNCEDTG).

UNSCEGHS (United Nations Sub-Committee of Experts on the Globally Harmonized System) was to make the GHS available for worldwide use and application.

To review the complete guide, read [A Guide to the Globally Harmonized System of Classification and Labeling of Chemicals](https://www.idtechnology.com).
Elements of the GHS Label

The GHS specifies for each hazard, and for each class within the hazard, what signal word, pictogram, and hazard statement should be used on the label. The GHS hazard pictograms, signal words and hazard statements should be located together on the label.

The actual label format or layout is not specified in the GHS; the label design is left to you. However, labels will require the following elements:

1. **Pictogram**: The GHS symbols have been incorporated into pictograms for use on the GHS label. The pictogram includes the harmonized hazard symbol plus other graphic elements, such as a border, background pattern, or color that is intended to convey specific information about the hazards of a chemical. Each pictogram consists of a different symbol on a white background within a red square frame set on a point (i.e. a red diamond). There are nine pictograms under the GHS. However, only eight pictograms are required under the GHS - the environmental pictogram is not within OSHA’s jurisdiction.

For transport, pictograms will have the background, symbol and colors currently used in the UN Recommendations on the Transport of Dangerous Goods, Model Regulations. For other sectors, pictograms will have a black symbol on a white background with a red diamond frame. A black frame may be used for shipments within one country. Where a transport pictogram appears, the GHS pictogram for the same hazard should not appear.

2. **Signal words** - A single word used to indicate the relative level of severity of hazard and alert the reader to a potential hazard on the label. The signal words used are “danger” and “warning.” “Danger” is used for the more severe hazards, while “warning” is used for less severe hazards.

3. **Hazard Statement** - 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.

4. **Precautionary Statement** - A phrase that describes recommended measures to be taken to minimize or prevent adverse effects resulting from exposure to a hazardous chemical, or improper storage or handling of a hazardous chemical.

5. **Product Identifier** - Names or numbers used on a hazardous product label or in a safety data sheet. They provide a unique way for the user to identify the chemical substance or mixture. Under the GHS, labels for substances should include the chemical identity of the substance. Labels for mixtures should include the identities of the ingredients that are responsible for certain hazards on the label.

6. **Supplier Identification** - The name, address and telephone number of the manufacturer or supplier of the product should be provided on the label.

---

**Standardized Label Elements Included In The GHS**

**Symbols (hazard pictograms)**: Convey health, physical and environmental hazard information, assigned to a GHS hazard class and category.

**Signal Words**: “Danger” or “Warning” are used to emphasize hazards and indicate the relative level of severity of the hazard, assigned to a GHS hazard class and category.

**Hazard Statements**: Standard phrases assigned to a hazard class and category that describe the nature of the hazard.
Additional Elements for the GSH Label

Supplemental label 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 a Competent Authority or it may be additional information provided at the discretion of the manufacturer/distributor.

The GHS provides guidance to ensure that supplemental information does not lead to wide variation in information or undermine the GHS information. Supplemental information may be used to provide further detail that does not contradict or cast doubt on the validity of the standardized hazard information.

Some examples of additional elements for the GSH label can include:

First Aid Statement - A statement that describes steps to follow in case of exposure to the chemical.

Chemical Name - The name that clearly identifies the chemical to the user.

It also may be used to provide information about hazards not yet incorporated into the GHS. The labeler should have the option of providing supplementary information related to the hazard, such as physical state or route of exposure, with the hazard statement.
The GHS Pictograms are intended to quickly convey specific information about the hazards of a product. When chemicals meet classification criteria under any of the hazard classes identified by the GHS, the corresponding pictogram must be printed on the chemical label. The pictograms for product packaging are shown below:
Labeling Solutions From ID Technology

VP700 Color Printer
The VP700 is perfect for printing on-demand, high impact, color labels up to 8.5 inches wide. With print speed of 6 inches per second or 12 inches per second, this printer handles Just In Time (JIT) labeling requirements in manufacturing or logistic environments.

- User-friendly, easy to operate
- Rugged design for industrial use
- Fast, high-quality color printing

VP495 Color Printer
The VP495 printer was developed for color on demand GHS labels at a hardware cost that supports distributed printing throughout your organization.
This unit has been certified BS5609 compliant and can generate a highly durable label. No added costs are required for secondary processes, like coating or lamination.

- BS5609 certified label generation
- Beautiful labels that last up to twelve months outdoors
- Eliminate the need for post-print lamination

Zebra 220Xi4 Color Printer
The Zebra 220Xi4 thermal transfer printer is designed for fast printing of chemical drum and other wide-label applications. Load pre-printed color labels into your printer and add your black text or barcodes.

- Rugged, reliable in harsh environments
- Suitable for high-volume labeling
- Wide range of connectivity options

Two-Color Print and Apply System
LSI’s Series 22 print and apply labeler includes two thermal transfer print engines; one with a black ribbon and the second with a red ribbon for simultaneous printing of two colors. Meet the criteria for GHS labeling standards by printing the two-tone black and red precautionary symbols and apply your labels automatically. The applicator can corner wrap or tamp labels onto filled and sealed cases, depending upon your requirements.

- Print two colors at the same time
- Labeling rate of 6 products/min.
- Infeed Metering System creates the proper spacing of the cases
- Barcode Scanner verifies the printed barcode

www.IDTechnology.com
**Bartender® Software**

BarTender® provides intuitive, easy-to-use GHS label templates that help you meet GHS labeling requirements and produce consistent, compliant labeling throughout your enterprise. You can automatically populate hazard statements, precautionary statements, and GHS-mandated pictograms in the correct size for the application, with multiple formatting options, including linear- and diamond-shaped arrangements.

- Customizable GHS label templates
- Support for multiple languages, including official UN languages
- Built-in business rules

**NiceLabel® Software**

Overcome GHS labeling challenges in a simple way; without custom coding or endless amount of label template variations. With NiceLabel® you can wrap text around pictograms so that you can use all available space, and the auto-fit function dynamically adjusts the font size for optimal use of space.

- Support for different languages on the same label
- Easy long-term maintenance of label templates
- Align information on labels and safety data sheets
Get Ready for GHS

By December 1, 2015, distributors will not be permitted to ship containers labeled by the chemical manufacturer or importer unless the contained is labeled properly with a GHS label.

Do you have a GHS labeling plan?

**Pre-Printed Color Labels** - Start with color labels that comply with GHS and the BS5609 Chemical Drum labeling standard. Then add your own variable data using a thermal transfer printer. Another way to reduce inventory and label printing costs, is to have blank labels printed with the fixed graphics, such as logos and pictograms. You then add product specific information or variable information when you need to use the label.

**Print Durable Color Labels On Demand** - If you require a variety of labels for your product line, or require high volume labels, then it may make sense to print your own labels in color and on-demand. Our VP700 digital color laser printer from Memjet, prints high-resolution color labels at an affordable price. Print crisp text and barcodes and vibrant graphics for your GHS labels.

One thing to note is that while the print from the VP700 is durable, the resulting labels may not have the durability needed to meet the BS5609 standard or GHS standard. The VP495 printer will print color labels suitable for outdoor use, GHS labels, and labels that comply with the BS5609 standard for chemical drum labeling.

**Label Printing Service** - If you don’t have the label volume to justify a printer purchase, using our custom Label Printing Service can get you to compliance without an investment in equipment. You can get low volume, high quality label runs that are 100% compliant with GHS and BS5609.

---

**BS5609 Label Certification**

Chemical manufacturers who transport dangerous goods are subject to safety regulations and may require British Maritime Standards (BS5609) specifications for their labeling components.

BS5609 is a drum and barrel test to certify that a label will stay affixed to a drum for a least three months in sea water. The test involves lab adhesion and salt spray testing. The labels are tested on a rig in the English Channel for three months, during which they are immersed during high tide and exposed to the elements during low tide.

The label face and adhesive must be certified together - you can not mix components that do not meet the standard. Since the liner is not part of the drum label, liners are interchangeable for certification purposes.

BS5609 compliance means the label has met the most stringent tests for durability in the industry. We can put together a complete solution that consists of the compliant labels designed to meet your exact needs, printer, and labeling software – complete with custom label templates.
Implementation by Other US Agencies

In the U.S., EPA and three other key Federal agencies of government have regulations that would be affected by adoption of GHS. The other agencies are in various stages of planning for and implementing GHS.

The Department of Labor’s Occupational Safety and Health Administration (OSHA): OSHA has principal responsibility for regulating classification, labeling, and material safety data sheets required for chemicals in the workplace. On September 30, 2009, OSHA published a proposed rulemaking to align their Hazard Communication Standard (HCS) with the GHS. The public comment period ended on December 29, 2009 and informal public hearings were conducted in March and April 2010. More information can be found on the web site.

The Department of Transportation (DOT): DOT regulates chemicals in the transport sector. DOT has modified its regulations to incorporate most elements of the GHS that affect its programs, including physical hazards and the most severe categories of acute toxicity. DOT plans to implement changes related to environmentally hazardous substances (aquatic toxicity) in line with the adoption of such changes by the International Maritime Organization.

The Consumer Product Safety Commission (CPSC): CPSC has jurisdiction over more than 15,000 kinds of consumer products used in and around the home, in sports, recreation, and schools, including non-pesticide household chemicals. CPSC staff is completing a comparison of agency regulations and guidelines under the Federal Hazardous Substances Act to the GHS to determine which sections of the GHS might be considered for implementation, as well as whether statutory or regulatory changes would be necessary for eventual implementation.

The most important benefit of GHS is enhanced health and environmental protection through greater clarity and consistency in information provided to people who may be exposed to chemicals. GHS is designed to provide clear, consistent label messages to chemical handlers and users, emergency first responders, and the public.

Interagency Coordination

In the United States, each of the four key agencies that regulate chemical hazard classification and communication currently has its own system, with classification criteria and use of symbols, signal words, and hazard statements differing between the agencies.

For example, the signal word “caution” has a different meaning on non-pesticide consumer product labels than it has on pesticide labels, and products with the same hazards may bear different signal words. This can cause confusion and result in increased risk.

The four core agencies (EPA, OSHA, DOT and CPSC) formed an Interagency Working Group on Harmonization to coordinate U.S. government participation in GHS activities and negotiations. The State Department also participates in the working group whenever international issues are under consideration, and a larger group involving other U.S. agencies may also become involved when issues potentially relevant to their programs are addressed. In addition to developing common positions for international meetings, the interagency group also provides a forum for the agencies to share drafts of documents for comment, exchange information, and discuss areas of mutual interest and concern.

The standardization of these elements under GHS will promote better understanding, thereby increasing protection. Consistency of hazard communication on chemical labels will also help emergency first responders more easily and accurately identify what hazards are present in emergency situations.
ID Technology can help you implement GHS labeling with our full line of durable thermal transfer labels, barcode printers, GHS label templates, barcode scanners, and other products.

As a full-service supplier of product identification equipment and supplies, ID Technology has a solution for any challenging product labeling, identification, coupon labeling, case marking, bar coding, pallet labeling, date, lot or batch coding, and more.