



Compliance – Resource Bulletin

GHS – Hazardous Chemicals Signs

Overview:

The Globally Harmonized System of Classification and Labeling of Chemicals (GHS) is an international system for standardizing the classification and labeling of hazardous chemicals. It was developed by the United Nations Economic Commission for Europe (UNECE). A number of countries, including the United States, have contributed to and adopted the GHS guidelines published in what is known as the UN “Purple Book.” The GHS itself is not a regulation but provides countries with the building blocks to develop or modify existing national regulations that address the classification and communication of chemical hazards. Its goal is a global chemical safety standard for a global economy to ensure that employers, employees and the public are provided with adequate, practical, reliable, and comprehensible information on the hazards of chemicals, so that they can take effective, preventative, and protective measures for their health and safety. ^{[1][2]}

With the adoption of the GHS standard by the U.S., the Occupational Safety & Health Administration (OSHA) is the regulatory agency responsible for implementing the required changes in chemical classification and labeling for chemical manufacturers and workplaces that utilize these chemicals in their daily operations. The application of the GHS will enhance the protection of human health and the environment by providing an internationally comprehensible system. These regulations appear in OSHA’s revised Hazard Communication Standard (HCS 2012).

The Department of Transportation (DOT) is responsible for implementing the GHS standards for the transport of hazardous chemicals in the United States via aircraft, rail car, marine vessels, and motor vehicles. These regulations are stipulated in the DOT’s Hazardous Materials Regulations (HMR). The HMR applies to all persons involved in the packaging, loading, and transport of hazardous materials.

For simplification purposes within this document, both the HCS 2012 and HMR will be referred to as “GHS” when discussing the design of signs and labels. Also, note that because the GHS is being implemented in the U.S. by both OSHA and DOT, the terms “materials” and “chemicals” have the same meaning when pertaining to these regulations.

Resources:

OSHA HCS 2012: (Free)

http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=standards&p_id=10099

OSHA Final Rule: (Free)

<http://www.osha.gov/dsg/hazcom/GHSfinal-rule.pdf>

OSHA Hazard Communication: (Free)

<http://www.osha.gov/dsg/hazcom/index.html>

OSHA HCS 1994 vs HCS 2012: (Free)

<http://www.osha.gov/dsg/hazcom/side-by-side.html>

DOT Hazardous Materials Regulations: (Free)

http://www.ecfr.gov/cgi-bin/text-idx?tpl=/ecfrbrowse/Title49/49cfrv2_02.tpl

The UN “Purple Book”: (\$\$\$)

<http://www.unece.org/?id=5917>

MSDS vs. SDS: (Free)

<http://www.msds-online.com/blog/compliance-education/2012/08/20/from-msds-to-sds>

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ComplianceSigns.com strongly recommends the purchase of the UN “Purple Book” from the link above

Design of GHS Hazardous Chemicals Signs:

- The implementation of the GHS began on 3/19/2012 with OSHA’s announcement of its final rule on the GHS. As a result, new chemical labeling requirements must be adopted by businesses involved in the manufacture, import, distribution, and shipping, of listed chemicals as well as workplaces in which these chemicals are used or stored. (HCS1910.1200.b.1)
- Labeling requirements vary, and fall into one of three categories:
 - Labels affixed to chemical containers required of the manufacturer and importer.
 - Signs and labels posted in workplaces that use or store chemicals in their operations.
 - Placards and labels affixed to packages and to the outside of motor vehicles, freight containers, rail cars, intermodal containers and other bulk packages containing chemicals that are being shipped.
- MANUFACTURER LABELS:** Labels affixed to containers containing hazardous chemicals must contain the following elements in order of appearance from top to bottom on the label: (1910.1200.f.1)
 - PRODUCT NAME OR IDENTIFIER:** Identifies the specific chemical.
 - PICTOGRAM:** GHS pictograms consist of a symbol in black within an on point square with a white field and red border. There are nine pictograms, each representing a particular hazard. Chemicals are classified as to which hazard(s) they may present in the GHS “Purple Book.” These pictograms must replace the triangle pictograms formerly used on OSHA and ANSI chemical labels.

PICTOGRAMS AND HAZARDS

<p>HEALTH HAZARD</p> 	<p>FLAME</p> 	<p>EXCLAMATION MARK</p> 
<ul style="list-style-type: none"> • Carcinogen • Mutagenicity • Reproductive Toxicity • Respiratory Sensitizer • Target Organ Toxicity • Aspiration Toxicity 	<ul style="list-style-type: none"> • Flammables • Pyrophorics • Self-Heating • Emits Flammable Gas • Self-Reactives • Organic Peroxides 	<ul style="list-style-type: none"> • Irritant (Skin and Eye) • Skin Sensitizer • Acute Toxicity (Harmful) • Narcotic Effects • Respiratory Tract Irritant • Hazardous To Ozone Layer (Non Mandatory)
<p>GAS CYLINDER</p> 	<p>CORROSION</p> 	<p>EXPLODING BOMB</p> 
<ul style="list-style-type: none"> • Gas Under Pressure 	<ul style="list-style-type: none"> • Skin Corrosion/Burns • Eye Damage • Corrosive To Metals 	<ul style="list-style-type: none"> • Explosives • Self-Reactives • Organic Peroxides
<p>FLAME OVER CIRCLE</p> 	<p>ENVIRONMENT <small>(NON-MANDATORY)</small></p> 	<p>SKULL AND CROSSBONES</p> 
<ul style="list-style-type: none"> • Oxidizers 	<ul style="list-style-type: none"> • Aquatic Toxicity 	<ul style="list-style-type: none"> • Acute Toxicity (Fatal Or Toxic)

(GHS Hazardous Chemicals Signs Continued)

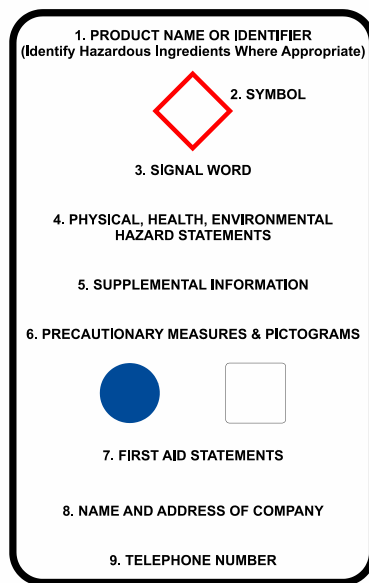
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- **SIGNAL WORD:** A signal word designates the severity of the hazard. GHS uses only two signal words in order of severity: “Warning” & “Danger.” Some lower level GHS hazard categories do not use signal words. A third signal word formerly used by OSHA and ANSI, “Caution” is not to appear on GHS labels.
- **HAZARD STATEMENT:** This is a standard phrase assigned to a hazard class and category that describes the nature of the hazard. The UN “Purple Book” publishes these standardized statements that should not be edited. Formerly, OSHA had no specific requirements for text.
- **PRECAUTIONARY STATEMENT:** This is a phrase(s) describing precautionary measures to be taken to avoid adverse effects from exposure to the chemical. Possible phrases are published in the GHS “Purple Book.” Precautionary statements may be accompanied by pictograms.
- **CONTACT INFORMATION:** The name, address and telephone number of the manufacturer or importer of the chemical.

GHS LABEL ELEMENTS



Reference The Below From GHS Document or “Purple Book”

- ← 1. 1.4.10.5.2(d)
- ← 2. 1.4.10.5.2© and Annexes 1 & 2
- ← 3. 1.4.10.5.2(a)
- ← 4. 1.4.10.5.2(b) and Annexes 1 & 2
- ← 5. 1.4.10.5.4.2
- ← 6. 1.4.10.5.2(c) and Annex 3
- ← 7. 1.4.10.5.2(c) and Annex 3
- ← 8. 1.4.10.5.2(e)
- ← 9. 1.4.10.5.2(e)

- **WORKPLACE LABELS & SIGNS:** In workplaces where hazardous chemicals are used or stored, employers must communicate the inherent hazards of these chemicals to their employees. This communication can be in the form of: (1910.1200.f.5-6)
 - The Manufacturer’s container label conveys the name, address, and telephone number of the chemical manufacturer, importer, or responsible party.
 - An alternative label or sign as long as it conveys the name of the chemical and the appropriate hazard warnings through words, pictures, symbols or a combination thereof, resulting in general information regarding the hazard of the chemical. There are currently seven GHS Standard Labeling requirements, including: *Product Identifier, Signal Word, Hazard Statements, Precautionary Statements, Pictograms, Supplier Information, and Supplemental Information.*

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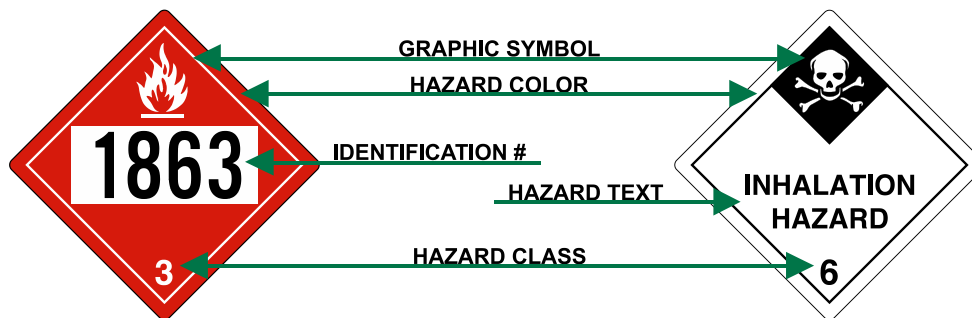
- Alternative labeling systems such as NFPA 704 or HMIS may continue to be used as long as they do not display hazard warnings or pictograms that conflict with the GHS. For example: signs with the OSHA/ANSI triangle pictogram or signal word “Caution” should not be used since GHS does not recognize “Caution” as a signal word. Current OSHA signs will remain with “Caution,” but future labels and/or signs should be referenced using “Warning” or “Danger.” (OSHA Hazard Communication)
- The previously named MSDS (Material Safety Data Sheet) has become the SDS (Safety Data Sheet). OSHA’s adoption of GHS via HazCom 2012, mandates the use of a single GHS format for safety data sheets. This format consists of 16 sections in a strict ordering. Because of this, hazard classification of a particular chemical might change because some GHS hazard definitions are different from what OSHA has been using from prior MSDS sheets. New SDS sheets will be created by manufacturers, and these will be used in classifying hazards for particular chemicals. It is also important to understand that the numbers used to show severity of chemicals will now be reversed. Whereas, a number four chemical was previously the most severe, now per GHS, a number one chemical would be the most severe.
- **TRANSPORT LABELS & PLACARDS:** DOT hazardous chemical signs may be package labels that are affixed to non-bulk packages, or placards that are affixed on the outside of motor vehicles, freight containers, rail cars, intermodal containers and other bulk packages. These signs use exactly the same symbols as manufacturer labels but other components of the sign are unique to the transport of these chemicals. In addition, the DOT has its own list of chemical classifications designated by the numbers 1-9. As a result, a chemical will display a manufacturer label on its container as well as a DOT transport label or placard on the package or transport vehicle in which it is shipped. (HMR 172.400) (172.504)
 - **BASIC SHAPE:** Both labels and placards are a square diamond on point, but each have specific material and size requirements. (172.407) (175.519). Some common exceptions are:
 - A “Consumer Commodity” label is a rectangle of specific size and color. (172.316)
 - A “Cargo Aircraft Only” label is a rectangle of specific size and color. (172.407.c.2)
 - A “Keep Away From Heat” label is a rectangle of specific size and color. (172.317)
 - **HAZARD CLASSIFICATION:** Each material in The Hazardous Material Table (HMT) is given a hazard class number with description. The nine classes are:
 1. Explosives
 2. Gas
 3. Flammable Liquids
 4. Other Flammable Substances
 5. Oxidizing Substances & Organic Peroxides
 6. Toxic(Poisonous) & Infectious Substances
 7. Radioactive Materials
 8. Corrosive Materials
 9. Miscellaneous Dangerous GoodsSome materials are so hazardous that they are not allowed to be transported. They are designated as “Forbidden” in the HMT. The HMT serves as the template document for the layout of every hazardous material label or placard (sign). All the information required on the sign: color, graphic symbol, text, class and identification numbers are specified for each material in the HMT. (172.101)

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- **SIGN ELEMENTS:** Each sign is composed of a number of elements that communicate all the hazard information required. (172.101) (172.411-450) (172.519-560)
 - **Hazard Color:** The color of the sign is stipulated by the hazard class as well as the specific hazard the material may cause. Example: All gases are in class 2 but a flammable gas sign is red while a toxic gas sign is white.
 - **Graphic Symbol:** Most signs display a graphic symbol of specific size, design, and color indicating the specific hazard. If required, these symbols appear at the 12 o'clock position on the sign.
 - **Hazard Text:** Signs may describe the hazard in specific text directly below the graphic symbol.
 - **Hazard Class:** The numeric hazard class (1 thru 9) is displayed on the sign at the 6 o'clock position. Some classes have subclass designations that result in the display of additional digits or letters. Example: 6.1 or 1.4G.
 - **Identification Numbers:** When required, identification numbers may be displayed in the center of the sign or on a separate rectangular sign of specific size with an orange background. (172.332)

DOT TRANSPORT SIGN ELEMENTS



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- With OSHA adopting the GHS standards for chemical labeling, the U.S. has now completed the compliance period. The compliance window was 12/1/2013 to 6/1/2016. Compliance had tiered completion dates for different facets of the compliance transition. It was acceptable to have both labeling systems in the workplace during this period. Note: The DOT adopted the GHS standard for the transport of chemicals in 2007, and is currently in full compliance.
 - **EMPLOYEE TRAINING:** 12/1/2013: Employers must have trained employees on new label elements and safety data sheet (SDS) format.
 - **MANUFACTURER & SHIPPING CHEMICAL LABELS:** 12/1/2015: All listed chemicals must have the new GHS formatted label on the container prior to being shipped from manufacturer.
 - The shipping package or container must have the appropriate GHS label or placard as defined by the DOT.
 - **WORKPLACE CHEMICAL LABELS/SIGNS:** 6/1/2016: Updated all labels and signs in the workplace that mark listed chemicals stored or used in the facility.

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[1] Understanding the GHS

[2] OSHA Hazard Communication