



Hazard Communication Standard for Chemical Labels and Safety Data Sheets In GHS Format

This fact sheet —intended for employees, employers and suppliers— provides an overview of the required contents of Safety Data Sheets (SDSs) and chemical hazard labels, and includes tips on how employers and workers can use these materials to better protect health and the environment by providing enhanced and consistent information on chemical hazards. Always review SDSs and hazard labels before using a new product—the information it contains can guide you in selecting which products to use in the workplace.

What is an SDS?

An SDS is an important document that explains the hazards, precautions, and response actions for a particular chemical-containing product. An SDS also explains proper medical or first aid treatment, should overexposure occur. SDSs are developed by the manufacturer and provided by the product supplier. Many suppliers post their SDSs on their websites.

What should employers do with SDSs?

As an employee, you have a right to know about the identity and hazards of chemicals at work. This information is found in product labels, SDSs, technical data sheets and product application guides. Federal law, the [Occupational Safety and Health Administration \(OSHA\) Hazard Communication standard](#), requires that employers provide employees with access to SDSs while they are in their work areas. An SDS binder of paper copies is usually used, although electronic access is okay. Employers must keep an accurate list of hazardous chemical-containing products used in the workplace, and ensure an SDS is available for all products in the inventory.

Is training required?

Employers must ensure employees are trained to understand the hazard and precautionary information found on chemical container labels and SDSs, and how to work safely with chemicals. The training must include information on the hazards of chemicals; protection measures, including work practices, emergency procedures and personal protective equipment such as gloves and safety glasses; and ways to detect a spill or release of chemical.

Are there other sources of product information?

In addition to SDSs, product manufacturers often provide supplementary guidance for their products. These resources— commonly referred to as technical data sheets and application guides—provide important recommendations on product characteristics, performance and necessary safety equipment, as well as conditions for application and usage.

What is the GHS?

The United Nations Globally Harmonized System (GHS) for Classification and Labeling of Chemicals defines a standard way of classifying and describing the hazards of chemical-containing products that are found on SDSs.

A given product often fits in more than one hazard class and a typical solvent may fit in at least three classes—flammable liquid, skin irritant, and narcotic effects (causing drowsiness or dizziness). Most hazard classes are divided into categories based on the severity of the hazard; for example, a particular toxic material may be classified as either fatal if inhaled, toxic if inhaled, or simply, harmful if inhaled.

OSHA revised its hazard communication regulation to adopt the GHS (rev. 3), to provide greater consistency, and to improve the quality and readability of labels and SDSs.

Formerly referred to as material safety data sheets (or MSDSs), SDSs are developed by the manufacturer or importer and provided by the product supplier. Starting June 1, 2015, suppliers must provide SDSs in the new, standardized GHS format.



Label Overview

Standard label elements are assigned for each GHS hazard classification and category. These include the signal words, pictograms, standardized hazard statements and standardized precautionary statements, as well as the product identifier, product name, and contact information for the responsible party.

The use of signal words—like danger or warning— indicates the severity of the hazard. Signal words are not used for lower hazard materials. Hazard statements describe the type and severity of the hazard.

Precautionary statements provide four types of guidance for working safely with a material:

- Prevention
- Response
- Storage
- Disposal

Pictograms tell the type of hazard—for example, a skull and crossbones pictogram is displayed for poisons that may cause serious health effects after brief exposure, while a flame pictogram is used for materials that catch fire easily. Shown below are the three pictograms used for health hazards, and the one used for environmental hazards. Five others (not shown) are used for physical hazards such as fire and explosion. In the US, the use of the environment pictogram is considered optional, although some label and SDS preparers choose to include it when recommended by the international GHS guidelines.



The “star man” is used mainly for chronic hazards that could occur with long-term exposure to low levels of a chemical, such as cancer, asthma, harmful effects on organs such as the liver, kidneys, brain, or reproductive health.



The “skull and crossbones” is used for poisons that can cause toxic effects after brief exposures to small amounts.



The exclamation point pictogram is used for less severe health hazards such as irritants, chemicals that could cause dizziness or drowsiness if inhaled, chemicals that could cause allergic skin reactions, and chemicals that are ozone-depleting substances.



The environment pictogram is used for chemicals that could cause toxicity to fish and other aquatic life.

Sample Solvent Label

Contact and Product Information

Includes product identifier and name

Includes name, address and phone number of responsible party.

Danger



Hazard Statements

Highly flammable liquid and vapor.

Causes mild skin irritation.

Causes serious eye irritation.

May cause drowsiness or dizziness

Precautionary Statements

Keep container tightly closed. Store in cool, well ventilated place that is locked.

Keep away from heat/sparks/open flame. No smoking.

Use only non-sparking tools.

Use explosion-proof electrical equipment.

Take precautionary measures against static discharge.

Ground and bond container and receiving equipment.

Avoid breathing vapors. Use only outdoors or in a well-ventilated area.

Wear protective gloves. Do not eat, drink or smoke when using this product. Wash hands thoroughly after handling.

Dispose of in accordance with local, regional, national, international regulations as specified.

In Case of Fire: use dry chemical (BC) or carbon dioxide (CO₂) fire extinguisher to extinguish.

If in eyes: rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

If inhaled, remove person to fresh air and keep comfortable for breathing. Call a poison center / doctor if you feel unwell.

If on skin (on hair): Take off immediately any contaminated clothing. Rinse skin with water/shower.

SDS Overview

The GHS defines a standardized format for the information included in an SDS. The first three sections of any SDS include:

- Critical information that identifies the chemical-containing product and its hazardous ingredients;
- Duplicates the text found on the container label that provides product users with important information about potential hazards and appropriate precautions; and
- Lists the hazardous ingredients contained in the product.

The later sections of any SDS include more technical information that can be useful in selecting “greener” products. Sections 12, 13, 14 and 15 are noted as optional since they do not relate directly to safety in the workplace and are outside of OSHA’s jurisdiction. However, many SDS preparers use these sections to include information regarding Federal or State transportation, disposal and Right to Know requirements that apply to their products.

1. Product Identifier/Contact Information

The first section of an SDS provides the product name used on the container label and any synonyms, such as catalog numbers. It also lists the recommended use and restrictions on use. The manufacturer’s name, address, phone number and emergency phone number are also provided.

2. Hazards Identification

The information found on the product label is repeated here, including the pictograms, signal words, hazard statements, and the four types of standard precautionary statements (prevention, response, storage and disposal).

Look here for hazard warnings and precautions related to the type and severity of hazards

This section lists the GHS hazard classifications, for example, flammable liquid, skin irritation, and/or reproductive toxicity. For each hazard class, it shows the category, which tells the severity. The number of categories varies between hazard classes, but category 1 is always the most serious hazard. A category 1 flammable would carry the hazard statement “extremely flammable,” while a category 3 would be labeled “flammable.”

3. Composition/Ingredients

Hazardous ingredients with approximate percentages or range of concentrations are listed here, along with Chemical Abstract Service (CAS) numbers. Some of this information may be withheld as proprietary.

4. First-Aid Measures

Look here for first-aid information about how to respond to accidental exposure by inhalation, skin/eye contact, or ingestion. Section 4 also provides the acute and delayed symptoms and effects of exposure and instructions for special medical treatment.

5. Fire-Fighting Measures

This section provides information for fighting a fire involving the product, such as appropriate extinguisher types, hazards such as combustion products and special precautions for firefighters.

6. Accidental Release Measures

Guidance for response to spills or emergencies, including precautions, personal protective equipment (PPE), and methods and materials for containment and clean-up is provided in this section.

7. Handling And Storage

This section describes precautions for safe handling and storage.

Look here for special storage requirements such as, keep away from heat, light, or incompatible chemicals.

8. Exposure Controls/Personal Protection

Exposure limits are provided here, when known. Types include OSHA Permissible Exposure Limits (PELs), American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values (TLVs) and others.

Exposure limits indicate a hazardous level of inhalation exposure for the hazardous ingredients.

Engineering controls such as ventilation would be specified in this section. Examples of PPE that may be recommended include gloves, goggles, protective clothing, or a respirator.

This section describes protective practices such as ventilation and PPE.

9. Physical And Chemical Properties

This section lists physical and chemical properties of the product or ingredients which can help in identifying potential hazards.

- Appearance (physical state, color)
- Odor
- Odor threshold
- pH
- Melting point/freezing point
- Initial boiling point, boiling range
- Flash point
- Evaporation rate
- Flammability (solid, gas)
- Upper/lower flammability or explosive limits
- Vapor pressure
- Vapor density
- Relative density
- Solubility(ies)
- Partition coefficient (n-octanol/water)
- Auto-ignition temperature
- Decomposition temperature
- Viscosity

Odor thresholds indicate the concentration at which a chemical can be smelled. If the odor threshold is higher than the exposure limit (listed in Section 8), workers can be over exposed without realizing it.

The pH measures how acidic or caustic the material is, which can help determine the hazard of skin or inhalation exposure, and how likely the chemical is to react with other materials. Products with a pH value less than 2 or greater than 12.5 are more hazardous.

Volatile liquids that evaporate readily at room temperature pose a greater risk of inhalation. A boiling point below 95°F or an evaporation rate greater than 3.0 are considered more volatile. The vapor pressure also indicates the volatility.

10. Stability And Reactivity

This section describes chemical stability, possibility of hazardous reactions, conditions to avoid (such as impact, vibration, or electrical sparks), and incompatible materials that should not be mixed with the product.

11. Toxicological Information

The health and toxicological effects information are listed here. This should include a description of the immediate effects, delayed effects of short-term exposure, and the effects of chronic (long-term, repeated) exposure.

This section explains whether breathing or skin/eye contact are a concern for exposure, and what symptoms workers may have if exposed to the product.

Look here to determine whether any ingredient is listed as a known or suspected cancer-causing agent (carcinogen).

12. Ecological Information (optional section)

Environmental toxicity and persistence information may be reported here.

13. Disposal Considerations (optional section)

Disposal requirements may be reported here, such as whether the chemical is listed as a hazardous waste under the Resource, Conservation and Recovery Act (RCRA).

14. Transport Information (optional section)

Department of Transportation (DOT) packaging requirements for shipping may be shown here.

15. Regulatory Information (optional section)

State Right to Know Law listings may be included here, as well as Threshold Planning Quantities defined under the Emergency Planning and Community Right to Know Act (EPCRA).

16. Other Information/Preparation Date

The date of preparation or most recent revision of the SDS must be stated here.

For More Information

- [OSHA Brief of Hazard Communication Standard: Labels and Pictograms](#)
- [OSHA Brief of Hazard Communication Standard: Safety Data Sheets](#)
- [OSHA's Hazard Communication safety and Health Topics Website](#)