

Product Stewardship - Hazards

(Updated: November 2025)

An Introduction to Chemical Hazards

Chemicals play a significant role in our daily lives and are present in **commercial products*** such as soap, medicines, clothing, and food. They are also essential in various industrial processes that create the products we rely on for convenience, safety, and comfort. These chemicals are sourced and shipped from all over the world, and differences in language and labeling can pose serious risks. Throughout their lifecycle—from production to handling, transportation, and use—chemicals can pose dangers to human health and the environment. People of all ages, including children and the elderly, as well as those who speak different languages or who are illiterate, are frequently exposed to hazardous substances like chemicals and pesticides. To address these risks and acknowledge the reality of global chemical trade, it's essential to develop national programs that ensure the safe use, transport, and disposal of chemicals. An internationally harmonized approach to classification and labeling can provide the foundation for these initiatives. Once countries have access to consistent and relevant information about the chemicals they import or produce, they can establish comprehensive infrastructures to control chemical exposure and protect both people and the environment. Global regulations apply to all industrial sectors and mandate that manufacturers, importers, and users of hazardous substances or mixtures properly classify, label, and package these chemicals before they are sold. One of the primary goals of these regulations (example: Globally Harmonised System of Classification and Labelling of Chemicals (GHS) - provides an internationally recognised standard for hazard classification and communication) is to identify whether a substance or mixture has properties that warrant a hazardous classification. In this regard, classification serves as the starting point for effective hazard communication.

* Commercial product Definition

Commercial product is any item, component or system available stock or regular production that is sold in substantial quantities to the general public at established catalog or market prices

(41 CFR § 101-29.213)

Hazard Assessment

Hazard assessment is an essential part of the risk assessment process. Hazard assessment is also referred to as characterization of effects or hazard characterization. It is the identification of adverse effects that a stressor has an inherent capacity to cause to human individuals or populations, or environmental populations or ecosystems, or natural resources.

1/ Hazard Groups

The GHS (Globally Harmonized System) separates hazards into three groups: physical, health, and environmental.

- Physical hazards are determined by the physical and chemical properties of a substance and/or mixture and include flammability, metal corrosivity, and pyrophoricity.
- Health hazards are determined by their potential to cause an adverse health effect to humans, such as skin irritation, respiratory sensitisation, and carcinogenicity.
- Environmental hazards are determined by their potential to cause an adverse effect on biomes or ecosystems. Environmental hazards are distinguished as acute or chronic, acute being for a short period of time and chronic being for a longer period of 20 days or greater.

2/ Hazard Classification

Classification is the starting point for hazard communication. There are pre-set criteria based on relevant information (toxicological data, ecotoxicological data, component data, etc.) for substances or mixtures to be classified within a hazard class. Further to the hazard classes, there are hazard categories that reflect the severity of the hazard; a lower category indicates a more severe hazard and vice versa.

3/ Hazard Communication

The GHS hazard communication system includes labelling, safety data sheets (SDS), and easily recognisable symbols.

The SDS and labels assure that manufacturers and importers communicate the necessary information along the entire supply chain, which in turn, ensures that substances and mixtures are used safely.

3.1. Labelling

The compulsory label elements are as follows:

- **Signal words:** indicate the relative level of severity of a hazard. In the GHS, the signal words '**Warning**' and '**Danger**' are adopted. 'Danger' is mostly used for the more severe hazard categories, while 'Warning' is used for the less severe ones.
- **Pictogram:** graphical representations that convey hazard information, as shown in the image below. The pictograms required depend on the hazard classification and precedence rules that dictate if certain pictograms are present, then others should not appear.

GHS HAZARD PICTOGRAMS



- **Hazard statements (H phrases):** phrases assigned to hazard classes and categories that describe the nature and degree of severity of a hazard.
- **Precautionary statements (P phrases):** phrases that describe the recommended measures that should be taken to minimise or prevent adverse effects resulting from exposure to, improper storage, or handling of a hazardous product.

Each hazard and precautionary statement has an accompanying code, which is a unique identifier. The code is composed of the letter 'H' or 'P' (for 'hazard statement' or 'precautionary statement'), a number indicating the hazard group (2 for physical, 3 for health, and 4 for environmental), and two numbers corresponding to the sequential numbering of hazards.

- **Product identifiers:** for substances, the chemical identity must be disclosed on the label. For mixtures, the chemical identities of the components that contribute to the hazard of the mixture must be disclosed on the label. In certain cases, chemical identities may be classed as confidential business information and, therefore, certain identifiers may be concealed.
- **Supplier identification:** must include the name, address, and telephone number of the manufacturer or supplier of the substance or mixture.

3.2. Safety Data Sheets (SDS)

The SDS should provide comprehensive information about a substance or mixture so that those responsible for handling and storage are able to take the necessary safety precautions to prevent adverse effects to humans and the environment.

The SDS is divided into 16 sections, of which Section 2 is dedicated to hazard(s) identification. This section must include the following information:

- Hazard classification of the substance or mixture.
- The label elements.
- Any other hazards which do not result in classification (e.g., 'dust explosion hazard').

The SDS format follows the Annex II of REACH and its content should be clear, understandable, be accessible to the user, be accurate, be updated and in the official language of the country where the product is placed on the market.

- According to the **REACH** legislation an SDS is **mandatory** (Article 31(1)) at least when:
 - A substance or mixture fulfils the classification criteria as a dangerous product according to the **CLP Regulation**, or;
 - A substance is persistent, bio-accumulative and toxic, or very persistent and very bio-accumulative, according to the criteria in Annex XIII REACH, or;
 - A substance is included in the list of substances that are candidates for Authorisation (SVHC) which could possibly be subjected to Authorisation in the future according to Article 59(1) REACH.

For more information see the SDS Section by Section

Contact

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