

Date Published: 7-1-2015

## Globally Harmonized System for Classifying Chemicals

Follow this and additional works at: <https://collections.uhsp.edu/environmentalhealthsafetypolicies>

---

### Recommended Citation

"Globally Harmonized System for Classifying Chemicals" (2015). *Environmental Health & Safety Policies*. 11.

<https://collections.uhsp.edu/environmentalhealthsafetypolicies/11>

This Policy is brought to you for free and open access by the Operations at UHSP Collections. It has been accepted for inclusion in Environmental Health & Safety Policies by an authorized administrator of UHSP Collections. For more information, please contact [jill.nissen@uhsp.edu](mailto:jill.nissen@uhsp.edu).

**Applies to:** (examples; Faculty, Staff, Students, etc)

Faculty , Staff , Students , Contractors\_Vendors

**Policy Overview:**

Issued: 07-01-2015

Next Review Date: 06-26-2024

Frequency of Review: Annually

The Globally Harmonized System (GHS) is a world-wide system adopted by OSHA for standardizing and harmonizing the classification and labeling of chemicals.

Policy applies to UHSP Faculty, Staff, and Students and any personnel who might potentially be exposed to hazardous materials.

**Definitions:**

<b>Term</b>	<b>Definition</b>
GHS	GHS stands for stands for the Globally Harmonized System of Classification and Labelling of Chemicals. GHS defines and classifies the hazards of chemical products, and communicates health and safety information on labels and safety data sheets).
SDS	Safety Data Sheet. SDS is the term used by GHS for Material safety data sheet (MSDS).
Class	Class is the term used to describe different types of hazards.
Category	Category is the name used to describe the sub-sections of classes.
Hazard Statement	For each category of a class, a standardized statement is used to describe the hazard.
Precautionary statement	These statements are standardized phrases that describe the recommended steps to be taken to minimize or prevent adverse effects from exposure to or resulting from improper handling or storage of a hazardous product.
Signal Word	There are two signal words used by the GHS – Danger and Warning. These signal words are used to communicate the level of hazard on both the label and the SDS.
Pictogram	Refers to the GHS symbol on the label and SDS. Not all categories have a symbol associated with them.

**Details:**

1. a. i. Objectives
  - i. The objectives of the GHS are to:
    - i. Define health, physical, and environmental hazards of chemicals;
    - ii. Create classification processes that use available data on chemicals for comparison with the defined hazard criteria (numerical hazard classification is based on a 1 – 5 scale, 1 being the most hazardous and 5 being the least hazardous); and
    - iii. Communicate hazard information, as well as protective measures, on labels and Safety Data Sheet (SDS), formerly known as Material Safety Data Sheets (MSDS).

iv. Figure I.a.iv. depicts GHS

## GHS Pictograms



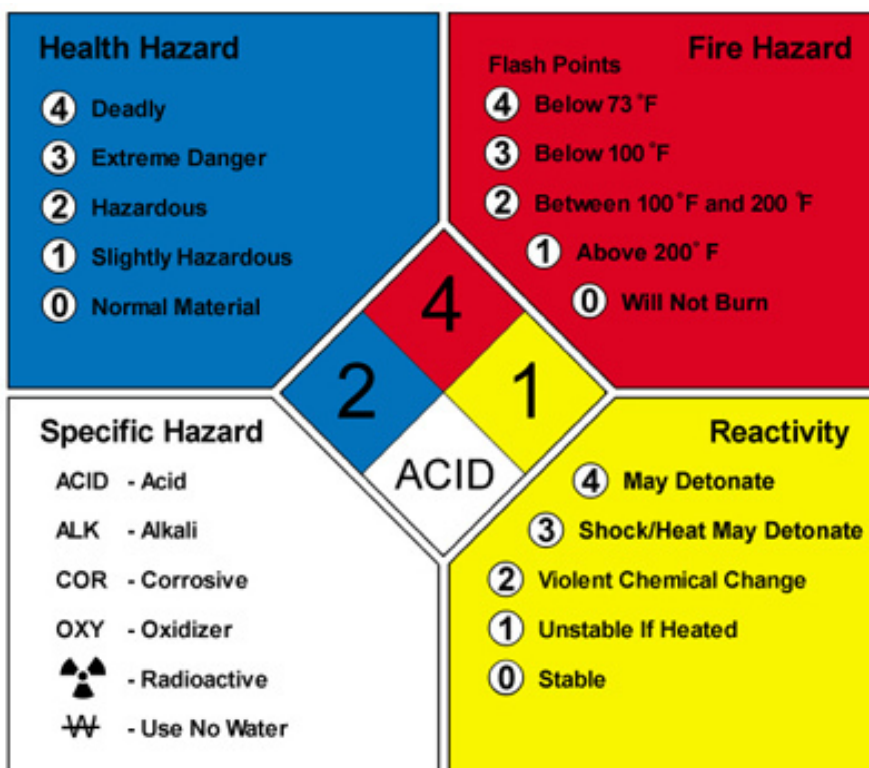
pictograms

### ii. Safety Data Sheets

- i. The SDS provides comprehensive information that is imperative for the safe handling of hazardous chemicals. Laboratory personnel should use the SDS as a resource to obtain information about hazards and safety precautions. SDSs cannot provide information for hazards in all circumstances. However, the SDS information enables the employer to develop an active program of worker protection measures such as training on hazard mitigation. Chemical manufacturers are required to use a standard format when developing SDSs. The SDS will contain 16 headings which are explained below.
  - i. Section 1—Identification: Product identifier, manufacturer or distributor name, address, phone number, emergency phone number, recommended use, and restrictions on use.
  - ii. Section 2—Hazard(s) identification: All hazards regarding the chemical and required label elements.
  - iii. Section 3—Composition/Information on ingredients: Information on chemical ingredients and trade secret claims.
  - iv. Section 4—First-aid measures: Required first aid treatment for exposure to a chemical and the symptoms (immediate or delayed) of exposure.
  - v. Section 5—Fire-fighting measures: The techniques and equipment recommended for extinguishing a fire involving the chemical and hazards that may be created during combustion.
  - vi. Section 6—Accidental release measures: Steps to take in the event of a spill or release involving the chemical. Includes: emergency procedures, protective equipment and proper methods of containment and cleanup.
  - vii. Section 7—Handling and storage: Precautions for safe handling and storage, including incompatibilities.
  - viii. Section 8—Exposure controls/Personal protection: OSHA's permissible exposure limits (PELs), threshold limit values (TLVs), appropriate engineering controls, and personal protective equipment (PPE).
  - ix. Section 9—Physical and chemical properties: The chemical's characteristics.
  - x. Section 10—Stability and reactivity: Chemical stability and possible hazardous reactions.
  - xi. Section 11—Toxicological information: Routes of exposure (inhalation, ingestion, or absorption contact), symptoms, acute and chronic effects, and numerical measures of toxicity.
  - xii. Section 12—Ecological information: How the chemical might affect the environment and the duration of the effect.
  - xiii. Section 13—Disposal considerations—describes safe handling of wastes and methods of disposal, including the disposal of any contaminated packaging.
  - xiv. Section 14—Transportation information—includes packing, marking, and labeling requirements for hazardous chemical shipments.
  - xv. Section 15—Regulatory information—indicates regulations that apply to chemical.
  - xvi. Section 16—Other information—includes date of preparation or last revision.

### iii. Scope

- i. GHS covers all hazardous chemicals and may be adopted to cover chemicals in the workplace, transport, consumer products, pesticides and pharmaceuticals. The target audiences for GHS include workers, transport workers, emergency responders and consumers.
- iv. Chemical Labeling
  - i. The GHS standardized label elements, which are not subject to variation and must appear on the chemical label, contain the following elements:
    - i. Symbols (hazard pictograms) are used to convey health, physical and environmental hazard information, assigned to a GHS hazard class and category;
    - ii. Signal Words such as "Danger" (for more severe hazards) or "Warning" (for less severe hazards), are used to emphasize hazards and indicate the relative level of severity of the hazard assigned to a GHS hazard class and category;
    - iii. Hazard statements (e.g., "Danger! Extremely Flammable Liquid and Vapor") are standard phrases assigned to a hazard class and category that describe the nature of the hazard; and
    - iv. Precautionary statements are recommended measures that should be taken to minimize or prevent adverse effects resulting from exposure to the hazardous chemical.
  - ii. GHS also standardizes the hazard pictograms that are to be used on all hazard labels and SDSs. There are 9 pictograms that represent several defined hazards, and include the harmonized hazard symbols which are intended to convey specific information about each hazard.
  - iii. GHS labeling requirements are only applicable to chemical manufacturers, distributors, and shippers of chemicals. GHS labeling requirements are not required for chemicals being stored in a laboratory. However, since most chemicals stored in the laboratory have been purchased from a chemical manufacturer, the GHS labeling and pictogram requirements are very relevant and must be understood by laboratory employees. Figure 2.4.3 illustrates the GHS label format showing the required elements.
  - iv. One of the objectives of GHS was to create a quantitative hazard classification system (numerical hazard classification is based on a 1 – 5 scale, 1 being the most hazardous and 5 being the least hazardous) based on physical characteristics such as flash point, boiling point, lethal dose of 50% of a population, reactivity, etc. Table 2.1 illustrates how the numerical hazard classification works for flammable liquids. More detailed information on GHS can be found on the OSHA website. (<https://www.osha.gov/dsg/hazcom/ghs.html>)
- v. National Fire Protection Association Rating System
  - i. The NFPA system uses a diamond-shaped diagram of symbols and numbers to indicate the degree of hazard associated with a particular chemical. This system was created to easily and quickly communicate hazards to first responders in the event of an emergency situation. These diamond-shaped symbols are placed on chemical containers to identify the degree of hazard associated with the specific chemical or chemical mixture. The NFPA system is a common way to identify chemical hazards and should be understood by laboratory employees. The NFPA 704 numerical rating system is based on a 0 – 4 system; 0 meaning no hazard and 4 meaning the most hazardous (note: this is in contrast to the GHS system where 1 is the most hazardous and 4 is the least hazardous). Figure V.a. illustrates the NFPA hazard rating system and identifies both the hazard categories and hazard rating



- system.
- vi. Department of Transportation Hazard Classes

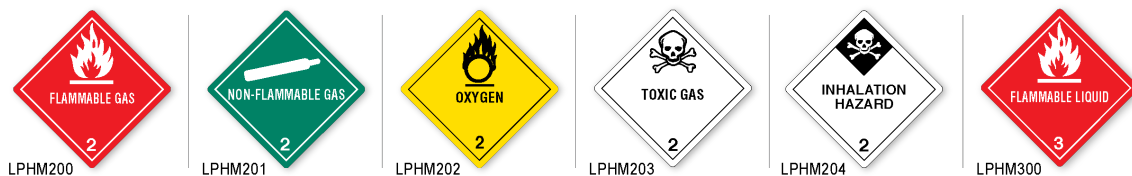
- i. The DOT regulates the transportation of all hazardous materials in the United States, and defines a hazardous material as any substance that has been determined to be capable of posing an unreasonable risk to health, safety, or property when transported in commerce. There are several methods that can be employed to determine whether a chemical is hazardous for transport, a few of which included:
  - i. Reviewing the DOT Hazardous Materials Table (49 CFR 172.101);
  - ii. Reviewing the SDS, specifically Section 2: Hazardous Identification and Section 14: Transport Considerations, for the chemical being shipped, as detailed in Section 2.3 of the CHP;
  - iii. Reviewing the chemical label and looking for hazard information detailed above;
  - iv. Understanding the chemical and physical properties of the chemical.
- ii. A sample SDS sheet can be found in the Resources section of this policy.
- iii. All hazardous chemicals must be properly labeled by the chemical manufacturer or distributor before transportation occurs. Chemical containers stored in laboratories are not required to be labeled per DOT standards; however the DOT 9 hazard classes are often seen on chemical containers and are discussed in Section 14 of GHS-formatted

### Class 1 EXPLOSIVES



### Class 2 GASES (NON-FLAMMABLE & FLAMMABLE, TOXIC / POISON)

### Class 3 FLAMM. LIQUID

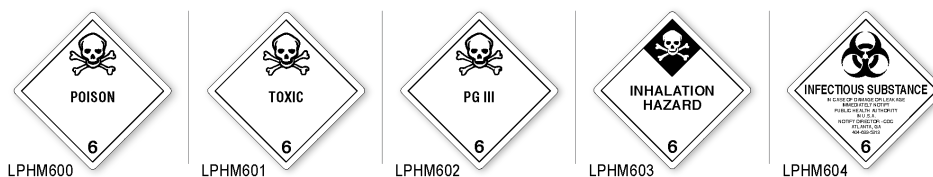


### Class 4 FLAMMABLE SOLIDS

### Class 5 OXIDIZER / ORGANIC PEROXIDE



### Class 6 TOXIC / POISONOUS & INFECTIOUS SUBSTANCES



### Class 7 RADIOACTIVE

### Class 8 CORROSIVE

### Class 9 MISCELLANEOUS DANGEROUS GOODS



1. Class 1 – Explosives
2. Class 2 – Gases
3. Class 3 – Flammable Liquids
4. Class 4 – Flammable Solids; Spontaneously Combustible Materials; Dangerous when Wet Materials
5. Class 5 – Oxidizers and Organic Peroxides

6. Class 6 – Toxic Materials and Infectious Substances
7. Class 7 – Radioactive Materials
8. Class 8 – Corrosive Materials
9. Class 9 – Miscellaneous Dangerous Goods

## Procedures:

1. Training Requirements
  - a. The following groups are required to complete the online Globally Harmonized System lesson and quiz on an annual basis:
    - i. Facilities personnel;
    - ii. Housekeeping personnel;
    - iii. Public Safety personnel;
    - iv. Laboratory managers, faculty, and teaching assistants;
    - v. Students enrolled in lab classes at the University;
    - vi. Individuals needing access to 6<sup>th</sup> floor ARB research area or Jones Hall research spaces;
  - b. The quiz must be completed following review of the lesson.
  - c. A minimum score of 90% is required to achieve a passing score.

## Responsibilities:

<u>Position/Office/Department</u>	<u>Responsibility</u>
Environmental Health & Safety	Updating training, maintaining course records, verifying completion of training from different groups.
Laboratory PI/lab coordinators	Notify EH&S of new laboratory employees who need access to research spaces for training assignments.

## Resources:

[UHSP Chemical Hygiene Plan](#)  
[Sample SDS Sheet](#)  
[Hazard Communication Program](#)

## Policy Contacts:

<u>Name</u>	<u>Contact Information</u>
Carlin Harp	<a href="mailto:Carlin.Harp@uhsp.edu">Carlin.Harp@uhsp.edu</a> ; 314-446-8133
Eric Knoll	<a href="mailto:Eric.Knoll@uhsp.edu">Eric.Knoll@uhsp.edu</a> ; 314-446-8375