UNIVERSITÀ
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OPERATING PROCEDURE NO. 8

INFORMATION SHEET ON THE PROPERTIES OF SUBSTANCES

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Curated by:

Environment and Safety Office

INFORMATION SHEET ON THE PROPERTIES OF SUBSTANCES

Purpose and scope of application

The Safety Data Sheet is the most comprehensive documentary tool related to a substance or product and contains information on the physical-chemical, toxicological, and environmental hazard properties of the considered substance. The primary purpose of the safety data sheet is to provide the necessary data to determine whether hazardous chemical agents/substances/preparations are present in a workplace, posing risks to the health and safety of workers handling them. The information provided in the safety data sheet allows us to assess: the characteristics, transportation, storage, and handling of hazardous products/substances, as well as to understand the main measures to be taken in case of decontamination, disposal, or fire emergency.
The safety data sheet is often confused with the product technical sheet; the latter is a document produced by the company for different purposes than the safety data sheet, mainly descriptive of the product and not in compliance with regulations on hazardous substances and preparations.

References

- Regulation (EC) No. 1272/2008
- Regulation (EU) No. 453/2010
- Regulation (EC) No. 1907/2006
- Directive No. 67/548/EEC
- Legislative Decree No. 152/2006
- Legislative Decree No. 81/2008

Terms and Definitions

Chemical agents: All chemical elements or compounds, whether alone or in mixtures, in their natural state or obtained, used, or disposed of, including disposal as waste, through any work activity, whether they are intentionally produced or not and whether they are placed on the market or not.
Hazardous chemical agents: Substances and mixtures that, based on their chemical, physicochemical, and toxicological properties, are classified into hazard categories according to Legislative Decree 52/97 and Legislative Decree 285/98.
They are divided into:

- **Hazardous substances** (chemical elements and their compounds in their natural state or obtained through industrial processes);
- **Hazardous mixtures** (solutions of one or more substances);

- **Chemical agents that, although not classified as hazardous,** may pose a risk to workers' safety and health due to their physicochemical, chemical, or toxicological properties and the way they are used or present in the workplace.

Hazard classes: Based on the physicochemical properties of substances, they indicate the nature of the physical, health, or environmental hazard.
The CLP regulation defines **28 hazard classes**, divided as follows:

- 16 physical hazard classes;
- 10 health hazard classes;
- 1 environmental hazard class;
- 1 additional class for substances hazardous to the ozone layer.

Hazard classes are represented by pictograms, which are graphic compositions including a symbol and other graphical elements designed to communicate specific hazard information.

Hazard statements codes: Represented by alphanumeric codes (H-statements and numbers), these describe the nature of a substance's or mixture's hazard. The **letter H** is followed by three numbers: the first number indicates the type of hazard, the last two numbers correspond to the sequential order of definition.
The hazards indicated by H-statements may refer to:

- Physical hazards;
- Health hazards;
- Environmental hazards.

Precautionary statements: Indicated by alphanumeric codes consisting of the **letter P** followed by three numbers: the first number indicates the type of precautionary advice, the last two numbers correspond to the sequential order of definition.

Warning: Indicates a potential hazard to the reader.

GHS (Globally Harmonized System): A worldwide system for the classification and communication of chemical hazards.

Description of the Safety Data Sheet

The safety data sheet consists of 16 headings, further divided into subsections, gathering essential information for handling, emergencies, and transportation.
The section titles are as follows:

1. Identification of the substance and the company;
2. Hazard identification;
3. Composition/information on ingredients;

4. First aid measures;
5. Firefighting measures;
6. Accidental release measures;
7. Handling and storage;
8. Exposure controls/personal protection;
9. Physical and chemical properties;
10. Stability and reactivity;
11. Toxicological information;
12. Ecological information;
13. Disposal considerations;
14. Transport information;
15. Regulatory information;
16. Other information.

Key points of interest:

- **Hazard identification** – Lists the most important risks, allowing identification of the H-statements of the substance, its hazard classification, and the corresponding pictogram;
- **First aid measures** – Specifies initial first aid interventions in case of an accident and whether medical consultation is required;
- **Accidental release measures** – Provides guidance on personal protective equipment and environmental precautions in case of spills or accidental release:
- **Handling and storage** – Outlines proper storage and safe handling practices for the product;
- **Exposure controls/personal protection** – Specifies the personal protective equipment (PPE) required and potential risks of improper use of the substance;
- **Physical and chemical properties** – Lists all relevant chemical and physical characteristics of the substance;
- **Stability and reactivity** – Details stability conditions and possible hazardous reactions when mixed or in contact with other chemicals. This section is crucial for assessing substance compatibility, particularly when disposing of waste;
- **Toxicological information** – Indicates the substance's potential toxic effects;
- **Disposal considerations** – Provides guidance on proper waste treatment methods.

Reading the safety data sheet allows us to identify the H-statements of the substances we use, ensuring correct classification for waste disposal.

Old Labeling System

The now obsolete Directive 67/548/EEC regulated:

- Classification;
- Packaging;
- Labeling.

of hazardous substances when they were placed on the market by EU Member States. It introduced pictograms with black symbols on an orange square with a black border. This directive was replaced by Regulation (EC) No. 1272/2008 (CLP), which introduced new classification criteria, making them mandatory for substances from December 1, 2010, and for mixtures by June 1, 2015.

New Labeling System

The purpose of the GHS (Globally Harmonized System) is to standardize the labeling and classification of chemical substances and mixtures worldwide, ensuring a clear hazard communication system to improve human health and environmental protection.
The GHS labeling includes:

- Product identifier;
- Warning statement;
- GHS pictograms;
- Hazard statements;
- Precautionary statements;
- Supplier information;
- Additional customer requirements.

The CLP regulation defines **9 pictograms:**

- 5 for physical hazards;
- 3 for health hazards;
- 1 for environmental hazards.

The pictograms are diamond-shaped (square on a point), featuring a black symbol on a white background with a red border. Each pictogram must cover at least 1/15th of the harmonized label's surface, with a minimum size of 1 cm^2.

Summary Table

OLD LABELING SYSTEM WITH PICTOGRAM	NEW LABELING SYSTEM WITH PICTOGRAM	CLASSIFICATION CRITERIA BASED ON CLP
 Explosive	 GHS01 - Explosive	A solid, liquid, or mixture of substances that, through a chemical reaction, can release gases at a temperature, pressure, and speed capable of causing damage to the surrounding area.

OLD LABELING SYSTEM WITH PICTOGRAM	NEW LABELING SYSTEM WITH PICTOGRAM	CLASSIFICATION CRITERIA BASED ON CLP
 Flammable  Extremely Flammable	 GHS02 - Flammable	A liquid with a flash point not exceeding 60°C. A flammable solid that can cause or promote a fire through friction.
 Oxidizing	 GHS03 - Oxidizing	Substances or mixtures, liquid/solid, that, although not necessarily combustible, can generally cause or promote the combustion of other materials by releasing oxygen.
No match	 GHS04 - Compressed Gas	Gases contained in a vessel with a relative pressure of 200 kPa or higher, or in the form of liquefied or refrigerated gases.
 Corrosive	 GHS05 - Corrosive	Substances or mixtures that, through chemical action, can attack or destroy living tissues, inert materials, or equipment.

OLD LABELING SYSTEM WITH PICTOGRAM	NEW LABELING SYSTEM WITH PICTOGRAM	CLASSIFICATION CRITERIA BASED ON CLP
 Toxic  Very Toxic	 GHS06 - Toxic	Substances or preparations that, through inhalation, ingestion, or skin penetration, can pose serious, acute, or chronic risks, including death.
 Irritant (Xi) Harmful (Xn)	 GHS07 - Irritant/harmful	These include substances or preparations that are not corrosive but, upon immediate, prolonged, or repeated contact with the skin or mucous membranes, can cause an irritating action or reversible damage (Irritant) Or substances or preparations that, through inhalation, ingestion, or skin absorption, can pose non-lethal health risks; or substances that, through inhalation or contact, may cause allergic reactions (Harmful).
 Toxic	 GHS08 - Serious Health hazard	Substances or preparations that, through inhalation, ingestion, or absorption through the skin, cause extremely severe, acute or chronic risks, and are likely to result in death.

OLD LABELING SYSTEM WITH PICTOGRAM	NEW LABELING SYSTEM WITH PICTOGRAM	CLASSIFICATION CRITERIA BASED ON CLP
 Very Toxic		
 Hazardous to the Environment	 GHS09 - Hazardous to the Environment	Substances that can cause damage to aquatic organisms to varying degrees depending on the exposure.

Usage

Laboratory waste is delivered to the **Temporary Storage Facility** accompanied by a **waste identification sheet** (see operational instructions No. 01 and 03).
When filling out the sheet, the **Laboratory Manager** must indicate the **hazard classes** of the substances present in the highest quantities. This information can be easily found in the **Safety Data Sheet (SDS)** of each substance under **"Section 2 – Hazard Identification."**
Section 2 includes:

- **Pictograms;**
- **H-statements;**
- **P-statements;**
- **Warning labels;**
- Any **other hazards** of the hazardous substances contained.

However, the **hazard characteristics of waste** are listed in **Annex I of Legislative Decree 152/06** and are also referred to as **H-statements**, but they **apply to waste as a whole**, not to individual substances or mixtures.
Since **June 1, 2015**, the **hazard characteristics of waste (H1 to H15)**, as defined in **Legislative Decree 152/06**, have been renamed **HP** (Hazardous Properties) in accordance with **Commission Regulation (EU) No. 1357/2014 of December 18, 2014**.

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