



Lewis & Clark
GLOBALY HARMONIZED SYSTEM
HAZARD COMMUNICATION
TRAINING

January 17, 2013

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GLOBALLY HARMONIZED SYSTEM HAZARD COMMUNICATION

Part 1

BACKGROUND

In May 2012 the U.S. adopted the United Nations universal hazard communication system into federal OSHA's Hazard Communication Standard. The purpose is to standardize the way that important safety information is communicated to workers around the world. The main elements:

- Six hazard classes
- Label components
- Nine standardized pictograms
- The 16-section Safety Data Sheet (replaces the Material Safety Data Sheet)

HAZARD CLASSIFICATION

1. **Physical Hazards:** any chemical or physical condition that has any of these characteristics
 1. Explosive
 2. Flammable
 3. Self-Reactive
 4. Pyrophoric

Examples: Heat, cold, noise, ionizing radiation, ultraviolet radiation, vibration

2. **Health Hazards:** any chemical that has any of these characteristics
 1. Acute adverse health effects
 2. Chemical burns
 3. Reproductive toxicity
 4. Specific organ toxicity
 5. Causes cancer
 6. Skin sensitization
 7. Respiratory sensitization

Examples: Sulfuric acid, benzene, methylene chloride

3. **Simple Asphyxiant Hazards:** any substance or mixture that has any of these characteristics
 1. Displaces atmospheric oxygen
 2. Absorbs atmospheric oxygen

3. Creates a dangerous oxygen deficient atmosphere

Examples: Nitrogen or carbon dioxide in a confined space

4. **Combustible dust:** any finely divided solid material that can catch fire or explode if ignited in air at or below 130 degrees Fahrenheit.

Examples: metal dusts, wood dusts, coal dusts, or grain dusts

5. **Pyrophoric hazard:** any gas that will spontaneously ignite in air at or below 130 degrees Fahrenheit.

Example: silane

6. **Hazards Not Otherwise Classified (HNOC):** any hazard that has adverse physical or health effects but does not meet the criteria of the hazard class and has not been adopted by OSHA (federal or state)

Part 2

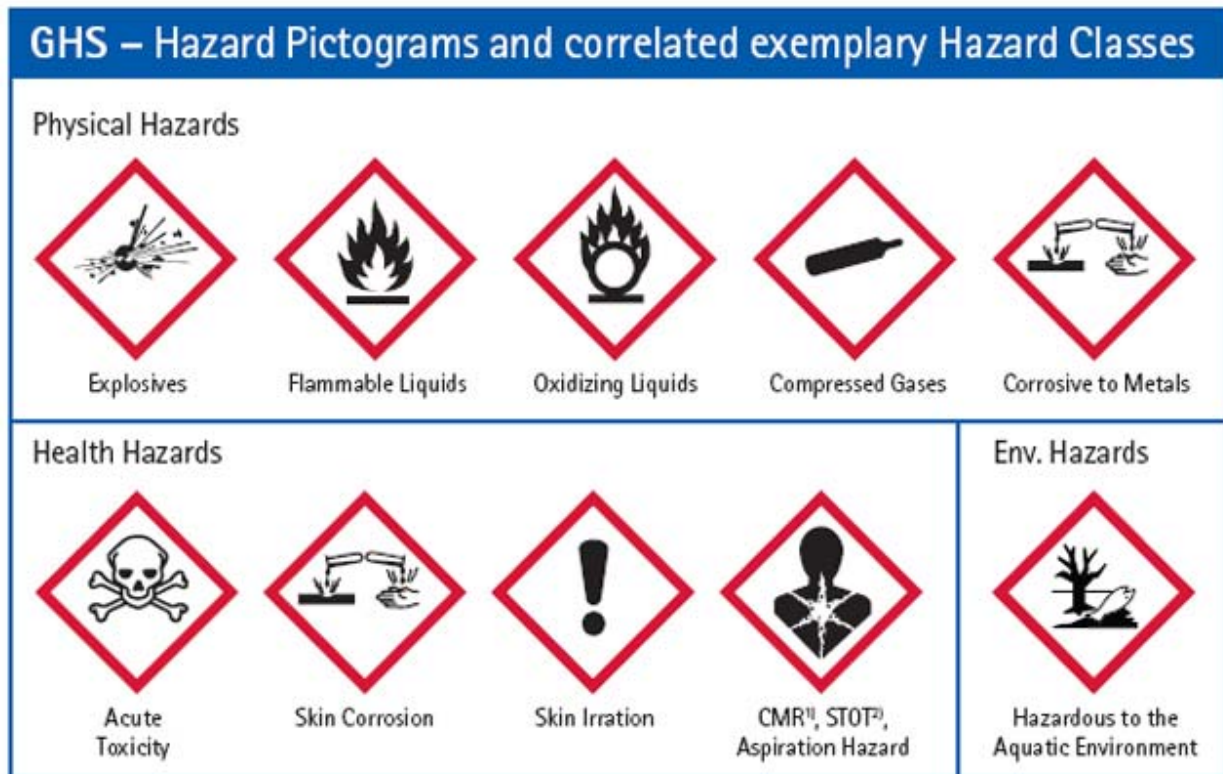
LABELS

Labels must contain the following identification information:

1. The chemical/substance identity
2. A signal word – Danger, Warning, or Caution
3. Hazard statements – such as “may be harmful or fatal if swallowed” or “highly flammable liquid
4. Pictograms – one or more of the ten standardized symbols indicating specific hazards (see below)
5. Precautionary statements – How to safely handle, store, and dispose of the substance
6. Name, address, and telephone number of a *responsible party*

PICTOGRAMS

All hazard classification pictograms will be composed of black symbols on a white background surrounded by a red diamond.



1) carcinogenic, germ cell mutagenic, toxic to reproduction / 2) specific target organ toxicity

1. **Explosives:** is represented by an exploding bomb with fragments moving outwards.
Appropriate for:
 - a. Explosives
 - b. Self-reactives
 - c. Organic peroxides

2. **Flammables:** are represented by a flame above a horizontal bar. Appropriate for:
 - a. Flammables
 - b. Pyrophorics
 - c. Self-heating substances
 - d. Substances that emit flammable gases
 - e. Self-reactives that burn
 - f. Organic peroxides

3. **Oxidizers:** are represented by an "O" above a horizontal bar with flames coming out of the top of the "O" and includes both compressed or liquefied oxygen itself or substances, that under the right conditions will release oxygen themselves (e.g. potassium permanganate).

4. **Compressed gases:** are represented by symbolic gas cylinder. It indicates the contents of a container are at greater than sea level atmospheric pressure.

5. **Corrosives:** are represented by two test tubes at downward angles; one dropping liquid onto a horizontal bar while the other is dripping onto a human hand. In both the point of contact is missing a piece. Appropriate for:
 - a. Acids or bases capable of damaging metal
 - b. Acids or bases capable of damaging the human body

6. **Acute Toxins:** are represented by skull and crossbones. Appropriate for: severely toxic substances capable of causing death or serious illness.

7. **Irritants and Sensitizers:** are represented by an exclamation mark. Appropriate for:
 - a. Skin and eye irritants
 - b. Skin sensitizers
 - c. Acute harmful effects
 - d. Narcotic effects
 - e. Respiratory tract irritants
 - f. Substances harmful to the ozone layer (non-mandatory)

8. **Health hazards:** are represented by human torso with a star burst in chest. Appropriate for:
 - a. Carcinogens
 - b. Mutagens
 - c. Teratogens (adverse reproductive effects)
 - d. Respiratory sensitizers
 - e. Specific target organ toxicity
 - f. Aspiration toxicity

9. **Environmental hazards:** are represented by a dead tree and a dead fish.

SHIPPING AND SECONDARY CONTAINERS

The labels placed on shipping containers by manufacturers must be kept in good, readable condition. The recipient/user is responsible for replacing damaged or torn labels. Secondary containers must have a duplicate of the original label. Alternatives to labels are acceptable as long as they convey the same information as the label. These might include:

1. Signs
2. Placards
3. Process sheets
4. Batch tickets
5. Operating procedures

Chemwatch is introducing a label making function for GHS compliant labels in June 2013.

Part 3

SAFETY DATA SHEETS

The safety data sheet, or SDS, replaces the existing material safety data sheets (MSDS'). Where the MSDS could be any format that the manufacturer desired (as long it provided required information) the SDS will follow a standardized, uniform 16-section format. These will be as follows:

Section 1 – Identification

1. Product identifiers (brand/trade names, chemical names)
2. Manufacturer and/or distributor
 - a. Address
 - b. Telephone number
3. Recommended use(s)
4. Restricted use(s)

Section 2 – Hazard Identification

Contains all hazards and required label elements

Section 3 – Composition/Ingredients

Provides information on chemical ingredients and trade secret claims

Section 4 – First Aid Measures

1. First aid measures
2. Identifies symptoms and effects
3. When professional medical attention is needed

Section 5 – Fire Fighting Measures

1. Extinguishing media to use to put out a fire
2. Hazardous thermal decomposition products

Section 6 – Accidental Release Measures

1. Protective equipment needed
2. Emergency containment procedures
3. Cleanup procedures

4. What to do with the cleaned up materials

Section 7 – Handling and Storage

Safe storage and handling requirements

Section 8 – Exposure Controls and Personal Protection

Recommended engineering control and personal protective equipment (PPE) to avoid exposure to greater than PEL/TLV values

Section 9 – Physical and Chemical Properties

1. Physical appearance (color, odor, physical state)
2. Melting point
3. Freezing point
4. Boiling point
5. Flash point
6. Auto ignition temperature
7. Evaporation rate
8. Solubility
9. pH (if applicable)
10. Solubility
11. Flammable/explosive ranges with upper and lower range limits

Section 10 – Stability and Reactivity

1. Whether or not the material is chemically stable
2. Whether or not there is hazardous polymerization
3. Possible hazardous reactions to other materials
4. Possible hazardous reactions to physical conditions
5. Incompatible materials
6. Other appropriate stability/reactivity information

Section 11 – Toxicological Information

1. Symptoms of exposure
2. Methods of exposure
 - a. Inhalation
 - b. Ingestion
 - c. Skin absorption

Section 12 – (NON-MANDATORY) Ecological Information

This section will not be enforced by OSHA. At present (January 2013) it is unknown if EPA or Oregon DEQ will use the GHS formatted SDS to regulate for environmental issues. This section is present to allow for that future development.

Section 13 - (NON-MANDATORY) Disposal Considerations

This section will not be enforced by OSHA. At present (January 2013) it is unknown if EPA or Oregon DEQ will use the GHS formatted SDS to regulate for environmental issues. This section is present to allow for that future development.

Section 14 – (NON-MANADATORY) Transportation Information

This section will not be enforced by OSHA. At present (January 2013) it is unknown if U.S. DOT or ODOT will use the GHS formatted SDS to regulate the transportation of hazardous materials. This section is present to allow for that future development.

Section 15 – (NON-MANDATORY) Regulatory Information

This section will not be enforced by OSHA. It is present to give a broad overview of which regulations apply to a particular substance.

Section 16 – Other Information

Date of preparation and last revision date of the SDS

Part 4

LOCATING SDS' WITH CHEMWATCH

Lewis & Clark is a subscriber to the Chemwatch North America safety data sheet database. There are literally millions of SDS' on file. Lewis & Clark uses the Chemwatch Gold III SDS search engine. This can be accessed by any computer connected to the internet servers of the institution. It works for all three campuses.

To access Chemwatch

1. Go to the L&C Risk Management website at http://www.lclark.edu/offices/facilities/risk_management/
2. View the instruction video on using Chemwatch
3. Click on the link to Chemwatch
4. You will at the Chemwatch Gold III search engine

To initiate a SDS search

1. Type in the name of the substance in the name/CAS box (you can use brand names, chemical names, molecular formulas, or Chemical Abstract System numbers)
2. Click on the "GO" button
3. The longer the symbolic molecule symbol rotates the greater the number of hits in the database

Changing a MSDS to GHS formatted SDS

- a. After carrying out the preceding steps select from the search list the most appropriate MSDS.
- b. At the left list of menus, select the Chemwatch Gold Long form MSDS option
- c. On the MSDS, there will be a tool with "OPTIONS"
- d. Click on "OPTIONS"
- e. In the "Format" box, select "GHS"
- f. Scroll down until you see the "Save" button
- g. Click the "Save" button
- h. The MSDS will automatically convert to a GHS Formatted SDS