HAZARD LABELS OF CHEMICALS

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INTRODUCTION

- **Label** means the written, printed or graphical information elements concerning a **hazardous chemical** that is affixed to, printed on or attached to the container of a **hazardous chemical**.
- It is necessary to label a hazardous chemical with a proper symbol which can decrease the risk of that particular chemical on use.

INTRODUCTION CONTINUED…

- The combination of label elements required on the label of a hazardous chemical is directly linked to its hazard classification. Label elements apply to classification endpoints or hazard categories and must be determined as specified in the GHS.

GHS

- The GHS is an acronym for *The Globally Harmonized System of Classification and Labeling of Chemicals*. The GHS is a system for standardizing and harmonizing the classification and labeling of chemicals. It is a logical and comprehensive approach to:

- Defining health, physical and environmental hazards of chemicals;
- Creating classification processes that use available data on chemicals for comparison with the defined hazard criteria; and
- Communicating hazard information, as well as protective measures, on labels and Safety Data Sheets (SDS).

SAMPLE LABEL

CODE _____
Product Name_____

Product Identifier

Company Name_____
Street Address_____
City_____ State_____
Postal Code_____Country_____
Emergency Phone Number_____

Supplier Identification

Hazard Pictograms

Signal Word

Danger

Keep container tightly closed. Store in a cool, well-ventilated place that is locked.
Keep away from heat/sparks/open flame. No smoking.
Only use non-sparking tools.
Use explosion-proof electrical equipment.
Take precautionary measures against static discharge.
Ground and bond container and receiving equipment.
Do not breathe vapors.
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 (CO_2) fire extinguisher to extinguish.

First Aid
If exposed call Poison Center.
If on skin (or hair): Take off immediately any contaminated clothing. Rinse skin with water.

Precautionary Statements

Highly flammable liquid and vapor.
May cause liver and kidney damage.

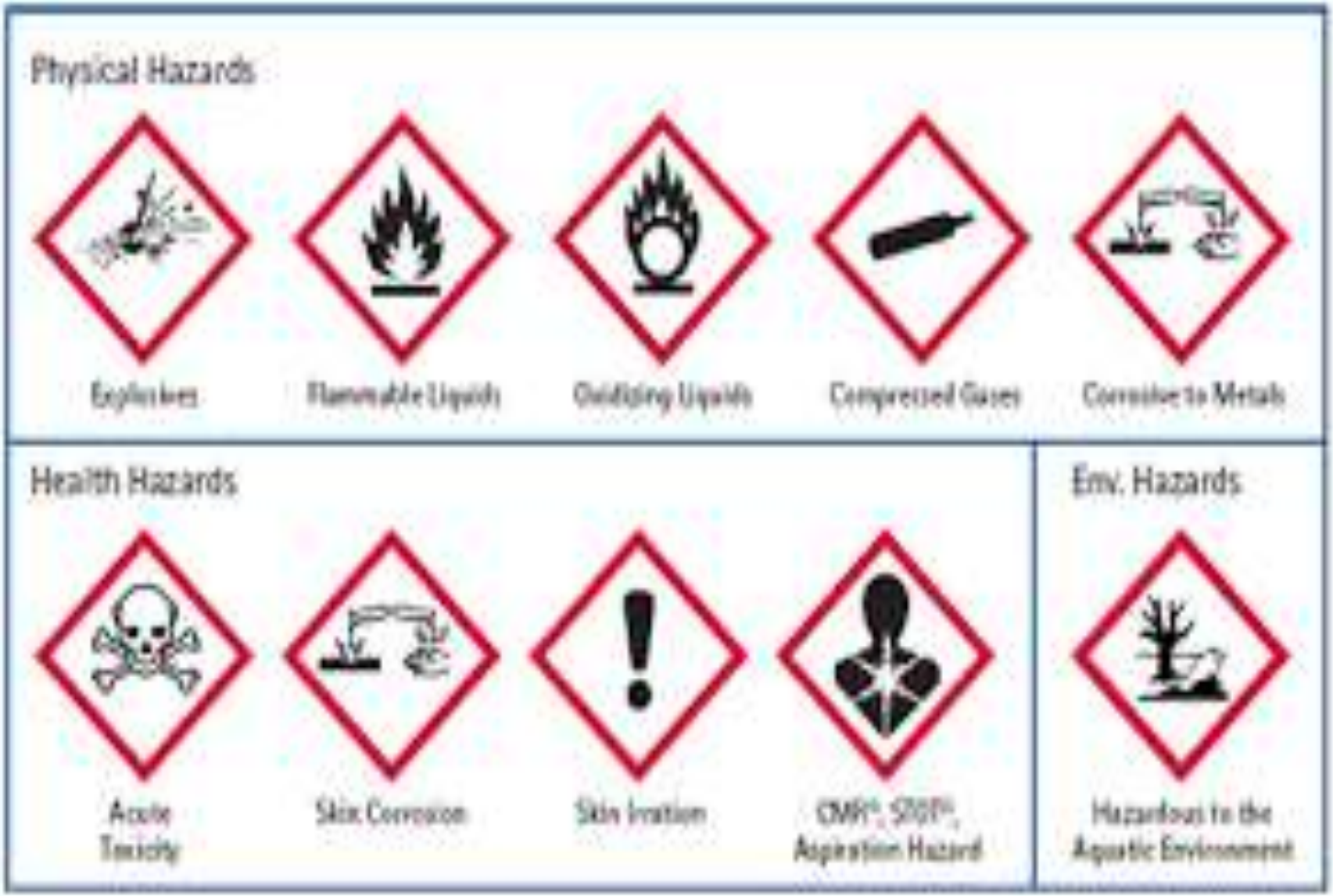
Hazard Statements

Supplemental Information

Directions for Use

_____
_____
_____

Fill weight:_____ Lot Number:_____
Gross weight:_____ Fill Date:_____
Expiration Date:_____


Physical Hazards
Explosives
Flammable Liquids
Oxidizing Liquids
Compressed Gases
Corrosive to Metals
Health Hazards
Acute Toxicity
Skin Corrosion
Skin Irritation
Aspiration Hazard
Env. Hazards
Hazardous to the Aquatic Environment

EXPLOSIVES

SYMBOL - EXPLODING BOMB

An explosive substance (or mixture) is a solid or liquid which is in itself capable by chemical reaction of producing gas at such a temperature and pressure and at such a speed as to cause damage to the surroundings

Substances, mixtures and articles are assigned to one of six divisions, 1.1 to 1.6,

DIVISION	CHARACTERISTIC
1.1	Mass explosion hazard
1.2	Projection hazard
1.3	Fire hazard or minor projection hazard
1.4	No significant hazard
1.5	Very insensitive substances with mass explosion hazard
1.6	Extremely insensitive articles with no mass explosion hazard

TABLE 1

FLAMMABLE AEROSOLS

Aerosols are any gas compressed, liquefied or dissolved under pressure within a non-refillable container made of metal, glass or plastic, with or without a liquid, paste or powder. The container is fitted with a release device allowing the contents to be ejected as solid or liquid particles in suspension in a gas, as a foam, paste or powder or in a liquid or gaseous state.

Aerosols are considered:

- Nonflammable, if the concentration of the flammable components ≤ 1% and the heat of combustion is < 20 kJ/g.
- Extremely flammable, if the concentration of the flammable components >85% and the heat of combustion is ≥ 30 kJ/g to avoid excessive testing.

SYMBOL - FLAME

Hazard statement

1 Extremely flammable aerosol

2 Flammable aerosol

OXIDISING GASES

Oxidizing gas means any gas which may, generally by providing oxygen, cause or contribute to the combustion of other material more than air does. Substances and mixtures of this hazard class are assigned to a single hazard category on the basis that, generally by providing oxygen, they cause or contribute to the combustion of other material more than air does.

SYMBOL – FLAME OVER CIRCLE

GASES UNDER PRESSURE

Gases under pressure are gases that are contained in a receptacle at a pressure not less than 280 Pa at 20°C or as a refrigerated liquid.

- **The Gas Cylinder pictogram alerts the physical hazards in the use and storage of compressed gas.**
- Liquefied gases can become liquids at STP when inside cylinders under pressure like anhydrous ammonia, chlorine, propane, nitrous oxide and carbon dioxide
- Non-Liquefied gases do not become liquid when compressed. Common examples are oxygen, nitrogen, helium and argon
- Acetylene is the only common dissolved gas.

SYMBOL - GAS CYLINDER

HAZARD CATEGORY	CRITERIA	SIGNAL WORD	HAZARD STATEMENT
COMPRESSED GAS	Entirely gaseous at - 50°C	Warning	Contains gas under pressure; may explode if heated
LIQUIFIED GAS	Partially liquid at temperatures > - 50°C	Warning	Contains gas under pressure; may explode if heated
DISSOLVED GAS	Dissolved in a liquid phase solvent	Warning	Contains gas under pressure; may explode if heated

TABLE 2

FLAMMABLE LIQUIDS

SYMBOL - FLAME

Flammable liquid means a liquid having a flash point of not more than 93°C.

Substances and mixtures Of this hazard class are assigned to one of four hazard

categories on the basis of the

flash point and boiling point.

CATEGORY	CRITERIA	SIGNAL WORD	HAZARD STATEMENT
1	Flash point < 23°C (73°F) and initial boiling point ≤ 35°C (95°F)	Danger	Extremely flammable liquid and vapor
2	Flash point < 23 °C (73°F) and initial boiling point > 35°C (95°F	Danger	Highly flammable liquid and vapor
3	Flash point ≥ 23 °C (73°F) and ≤ 60 °C (140°F)	Warning	Flammable liquid and vapor
4	4 Flash point > 60 °C (140°F) and ≤ 93 °C (200°F	Warning	Combustible liquid

TABLE 3

FLAMMABLE SOLIDS

Flammable solids are solids that are readily combustible, or may cause or contribute to fire through friction. Readily combustible solids are powdered, granular, or pasty substances which are dangerous if they can be easily ignited by brief contact with an ignition source, such as a burning match, and if the flame spreads rapidly.

Substances and mixtures of this hazard class are assigned to one of two hazard categories

SYMBOL - FLAME

HAZARD CATEGORY	CRITERIA	SIGNAL WORD	HAZARD STATEMENT
1	Metal Powders: burning time ≤ 5 minutes Others: wetted zone does not stop fire & burning time < 45 seconds or burning > 2.2 mm/second	Danger	Flammable solids
2	Metal Powders: burning time > 5 and ≤ 10 minutes Others: wetted zone stop fire for at least 4 minutes & burning time < 45 seconds or burning rate > 2.2 mm/second	Warning	Flammable solids

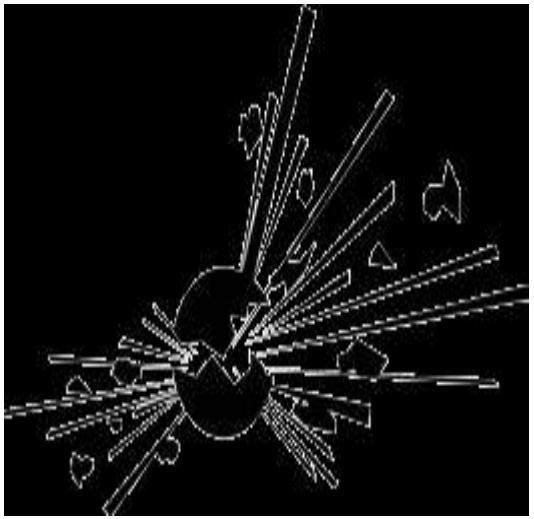
TABLE 4

SELF REACTING SUBSTANCES

Self-reactive substances are thermally unstable liquids or solids liable to undergo a strongly exothermic thermal decomposition even without participation of oxygen (air),

The substances are assigned into 6 categories from 1 to G.

SYMBOL – EXPLODING BOMB



HAZARD CATEGORY	CRITERIA	SIGNAL WORD	HAZARD STATEMENT
A	Can detonate or deflagrate rapidly, as packaged.	Danger	Heating may cause an explosion
B	Possess explosive properties and which, as packaged, neither detonates nor deflagrates rapidly, but is liable to undergo a thermal explosion in that package	Danger	Heating may cause an explosion
C	Possess explosive properties when the substance or mixture as packaged cannot detonate or deflagrate rapidly or undergo a thermal explosion.	Danger	Heating may cause a fire
D	• Detonates partially, does not deflagrate rapidly and shows no violent effect when heated under confinement; or • Does not detonate at all, deflagrates slowly and shows no violent effect when heated under confinement; or • Does not detonate or deflagrate at all and shows a medium effect when heated under confinement.	Danger	Heating may cause a fire

TABLE 5

E	Neither detonates nor deflagrates at all and shows low or no effect when heated under confinement.	Warning	Heating may cause a fire
F	Neither detonates in the cavitated bubble state nor deflagrates at all and shows only a low or no effect when heated under confinement as well as low or no explosive power	Warning	Heating may cause a fire
G	Neither detonates in the cavitated state nor deflagrates at all and shows no effect when heated under confinement nor any explosive power, provided that it is thermally stable (self-accelerating decomposition temperature is 60°C to 75°C for a 50 kg package), and, for liquid mixtures, a diluent having a boiling point not less than 150°C is used for desensitization	no label elements allocated to this hazard category	

TABLE 5

PYROPHORIC LIQUIDS

A pyrophoric liquid is a liquid which, even in small quantities, is liable to ignite within five minutes after coming into contact with air. Substances and mixtures of this hazard class are assigned to a single hazard category.

- SIGNAL WORD - DANGER
- HAZARD STATEMENT - Catches fire spontaneously if exposed to air

SYMBOL - FLAME

PYROPHORIC SOLIDS

A pyrophoric solid is a solid which, even in small quantities, is liable to ignite within five minutes after coming into contact with air. Substances and mixtures of this hazard class are assigned to a single hazard category

- SIGNAL WORD - DANGER
- HAZARD STATEMENT - Catches fire spontaneously if exposed to air

SYMBOL - FLAME

SELF HEATING SUBSTANCES

A self-heating substance is a solid or liquid, other than a pyrophoric substance, which, by reaction with air and without energy supply, is liable to self-heat. This endpoint differs from a pyrophoric substance in that it will ignite only when in large amounts (kilograms) and after long periods of time (hours or days). These are assigned into 2 categories

SYMBOL - FLAME

HAZARD CATEGORY	SIGNAL WORD	HAZARD STATEMENT
1	Danger	Self-heating; may catch fire
2	Warning	Self-heating in large quantities; may catch fire

TABLE 6

SUBSTANCES AND MIXTURES WHICH, IN CONTACT WITH WATER, EMIT FLAMMABLE GASES

Substances that, in contact with water, emit flammable gases are solids or liquids which, by interaction with water, are liable to become spontaneously flammable or to give off flammable gases in dangerous quantities.

Substances and mixtures of this hazard class are assigned to one of three hazard categories

SYMBOL - FLAME

HAZARD CATEGORY	SIGNAL WORD	HAZARD STATEMENT
1	Danger	In contact with water releases flammable gases, which may ignite spontaneously
2	Danger	In contact with water releases flammable gases
3	Warning	In contact with water releases flammable gases

TABLE 7

OXIDISING LIQUIDS

An oxidizing liquid is a liquid which, while in itself not necessarily combustible, may, generally by yielding oxygen, cause or contribute to the combustion of other material. Substances and mixtures of this hazard class are assigned to one of three hazard categories

SYMBOL – FLAME OVER CIRCLE

HAZARD CATEGORY	SIGNAL WORD	HAZARD STATEMENT
1	Danger	May cause fire or explosion; strong oxidiser
2	Danger	May intensify fire; oxidiser
3	Warning	May intensify fire; oxidiser

TABLE 8

OXIDISING SOLIDS

An oxidizing solid is a solid which, while in itself not necessarily combustible, may, generally by yielding oxygen, cause or contribute to the combustion of other material. Substances and mixtures of this hazard class are assigned to one of three hazard categories

SYMBOL – FLAME OVER CIRCLE

HAZARD CATEGORY	SIGNAL WORD	HAZARD STATEMENT
1	Danger	May cause fire or explosion; strong oxidiser
2	Danger	May intensify fire; oxidiser
3	Warning	May intensify fire; oxidiser

TABLE 9

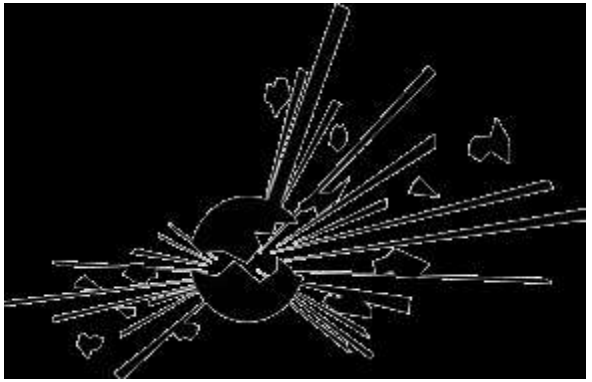
ORGANIC PEROXIDES

An organic peroxide is an organic liquid or solid which contains the bivalent -0-0- structure and may be considered a derivative of hydrogen peroxide, where one or both of the hydrogen atoms have been replaced by organic radicals. The term also includes organic peroxide formulations (mixtures). Such substances and mixtures may:

- be liable to explosive decomposition;
- burn rapidly;
- be sensitive to impact or friction;
- react dangerously with other substances.

Substances and mixtures of this hazard class are assigned to one of seven 'Types', A to G.

SYMBOL – EXPLODING BOMB



HAZARD CATEGORY	CRITERIA	SIGNAL WORD	HAZARD STATEMENT
A	Can detonate or deflagrate rapidly, as packaged.	Danger	Heating may cause an explosion
B	Possess explosive properties and which, as packaged, neither detonates nor deflagrates rapidly, but is liable to undergo a thermal explosion in that package	Danger	Heating may cause an explosion
C	Possess explosive properties when the substance or mixture as packaged cannot detonate or deflagrate rapidly or undergo a thermal explosion.	Danger	Heating may cause a fire
D	• Detonates partially, does not deflagrate rapidly and shows no violent effect when heated under confinement; or • Does not detonate at all, deflagrates slowly and shows no violent effect when heated under confinement; or • Does not detonate or deflagrate at all and shows a medium effect when heated under confinement.	Danger	Heating may cause a fire

TABLE 10

E	Neither detonates nor deflagrates at all and shows low or no effect when heated under confinement.	Warning	Heating may cause a fire
F	Neither detonates in the cavitated bubble state nor deflagrates at all and shows only a low or no effect when heated under confinement as well as low or no explosive power	Warning	Heating may cause a fire
G	Neither detonates in the cavitated state nor deflagrates at all and shows no effect when heated under confinement nor any explosive power, provided that it is thermally stable (self-accelerating decomposition temperature is 60°C to 75°C for a 50 kg package), and, for liquid mixtures, a diluent having a boiling point not less than 150°C is used for desensitization	no label elements allocated to this hazard category	

TABLE 10

SUBSTANCES CORROSIVE TO METALS

A substance or a mixture that by chemical action will materially damage, or even destroy, metals is termed ‘corrosive to metal’. These substances or mixtures are classified in a single hazard category

- SIGNAL WORD – DANGER
- HAZARD STATEMENT - May be corrosive to metals

SYMBOL – EXPLODING BOMB

ACUTE TOXICITY

SYMBOL – SKULL AND BONES

SYMBOL – EXCLAMATION MARK

Five GHS categories have been included in the GHS Acute Toxicity scheme from which the appropriate elements relevant to transport, consumer, worker and environment protection can be selected. Substances are assigned to one of the 4 toxicity categories on the basis of LD50 (oral, dermal) or LC50 (inhalation)

ACUTE TOXICITY	**Category 1**	**Category 2**	**Category 3**	**Category 4**
ORAL (mg/kg)	≤ 5	> 5 ≤ 50 > 50	≤ 300 > 300	≤ 2000
DERMAL (mg/kg)	≤ 50	> 50 ≤ 200	> 200 ≤ 1000	> 1000 ≤ 2000
GASES (ppm)	≤ 100	> 100 ≤ 500	> 500 ≤ 2500	> 2500 ≤ 5000
VAPORS (mg/l)	≤ 0.5	> 0.5 ≤ 2.0	> 2.0 ≤ 10	> 10 ≤ 20
DUST AND MIST (mg/l)	≤ 0.05	> 0.05 ≤ 0.5	> 0.5 ≤ 1.0	> 1.0 ≤ 5

TABLE 11

SKIN CORROSION

Skin corrosion means the production of irreversible damage to the skin following the application of a test substance for up to 4 hours. Substances and mixtures in this hazard class are assigned to a single harmonized corrosion category

SYMBOL - CORROSION

- SIGNAL WORD - DANGER
- HAZARD STATEMENT - Causes severe skin burns and eye damage

SYMBOL – EXCLAMATION MARK

SENSITIZATION

Respiratory sensitizer means a substance that induces hypersensitivity of the airways following

inhalation of the substance. Substances and mixtures in this hazard class are assigned to one

hazard category.

Skin sensitizer means a substance that will induce an allergic response following skin contact.

The definition for “skin sensitizer” is equivalent to “contact sensitizer”. Substances and mixtures

in this hazard class are assigned to one hazard category

- SIGNAL WORD - DANGER
- HAZARD STATEMENT - May cause allergy or asthma symptoms or breathing difficulties if inhaled

SYMBOL – HEALTH HAZARD

GERM CELL MUTAGENICITY

Mutagen means an agent giving rise to an increased occurrence of mutations in populations of cells and/or organisms

SYMBOL – HEALTH HAZARD

CARCINOGENICITY

Carcinogen means a chemical substance or a mixture of chemical substances which induce cancer or increase its incidence.

REPRODUCTIVE TOXICITY

Reproductive toxicity includes adverse effects on sexual function and fertility in adult males and females, as well as developmental toxicity in offspring.

THANKS

For Further Detail/SUGGESTIONS Please Contact

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