# Chemical Safety and Security

Fifth Lecture

First stage

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# Review of the warning signs for the hazards of chemicals and classification of hazardous material:

| Classification | | Labelling | | | |
|---|---|---|---|---|---|
| Hazard | | Pictogram, code* | Signal word | Hazard Statement | |
| Class | Category | | | Code* | Text |
| Explosives | Unstable explosive |  GHS01 | Danger | H200 | Unstable explosive |
| | Division 1.1 | | | H201 | Explosive; mass explosion hazard |
| | Division 1.2 | | | H202 | Explosive; severe projection hazard |
| | Division 1.3 | | | H203 | Explosive; fire, blast or projection hazard |
| | Division 1.4 | | Warning | H204 | Fire or projection hazard |
| | Division 1.5 | No GHS Pictogram (1) | Danger | H205 | May mass explode in fire |
| | Division 1.6 | No GHS Pictogram (1) | No Signal Word | N/A | No Hazard Statement |
| | (1)=Explosives of Divisions 1.5 and 1.6 need to be labelled with their respective Dangerous Goods class label in accordance with the Australian Explosives Code. | | | | |
| Flammable Gases | Category 1 |  GHS02 | Danger | H220 | Extremely flammable gas |
| Flammable Aerosols | Category 1 |  GHS02 | Danger | H222 | Extremely flammable aerosol |
| | Category 2 | | Warning | H223 | Flammable aerosol |
| Oxidising Gases | Category 1 |  GHS03 | Danger | H270 | May cause or intensify fire; oxidiser |
| Gases under Pressure (2) | Compressed gas |  GHS04 | Warning | H280 | Contains gas under pressure; may explode if heated |
| | Liquefied gas | | | | |
| | Dissolved gas | | | | |
| | Refrigerated liquefied gas | | | H281 | Contains refrigerated gas; may cause cryogenic burns or injury. |
| | (2) – The hazard class "Gases under Pressure" is subdivided into 'Groups' (not 'Categories'). | | | | |
| Flammable Liquids | Category 1 |  GHS02 | Danger | H224 | Extremely flammable liquid and vapour |
| | Category 2 | | | H225 | Highly flammable liquid and vapour |
| | Category 3 | | Warning | H226 | Flammable liquid and vapour |
| | Category 4 | No Pictogram | Warning | H227 | Combustible liquid |
| Flammable Solids | Category 1 |  | Danger | H228 | Flammable solid |

Globally Harmonised System of Classification and Labelling of Chemicals

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## Chemicals Classifying:

The Global Maritime System for Hazardous Substances (IMDGC) is one of the best ways to classify hazardous chemicals. This classification divides hazardous materials into nine levels of danger.



**A- Explosive chemicals (ranked 1)**

- Explosion massive.
- Explosion projection
- Fire hazard
- Explosive materials are completely insensitive to explosion, but when they explode, they have a great destructive effect.

## B- Gases under Pressure Hazards (ranked 2)

-Gases Flammable.

- Nonflammable and Nontoxic Gas

- Toxic Gases

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## C- Liquids Flammable (ranked 3)

The **flash point** of a material is the "lowest liquid temperature at which, under certain standardized conditions, a liquid gives off vapors in a quantity such as to be capable of forming an ignitable vapor/air mixture



**Point Flash Low**: liquids where the flash point is less than -18°C.

**Intermediate Flash:** Medium Flash Point Liquids These are liquids with a flash point from -18°C to 23°C.

**High Point Flash**: High flash point liquids are liquids with a flash point of 23°C to 61°C.

## D-Solids Flammable: (ranked 4)

-Solids Combustible Readily



-Substances Liable to Spontaneous Combustion

- Substances Emit Flammable Gases when they are In Contact with Water

## E- Organic Peroxide (ranked 5)

It includes chemicals that produce oxygen when it is decomposed or interacted, and it includes two types:

1- Substances Oxidizing Agents

2- Organic Peroxide



## F-Toxic and infectious Substances (ranked 6)

Substances that cause harm or death to humans when swallowed or inhaled

## G-Substances Infectious (ranked 7)

They are materials that contain real living organisms such as bacteria, viruses, parasites, and hybrid and genetically modified microorganisms that cause diseases to humans or animals.

## H- Corrosive substances (ranked 8)

They are the substances that are in this dangerous category because of their chemical activity, which causes severe damage when they come into contact with living tissues, or they become cloudy when they leak into the surrounding containers and other goods, and in many cases, this results in the escalation of gases, some of which are toxic and others that may cause a mixture with atmospheric air to explode and ignite.

## I-Miscellaneous Dangerous (Substances) (ranked 9)

Substances that constitute a danger during transportation or a danger to the environment, such as mineral acids such as sulfuric acid, alkalis such as sodium hydroxide, and salts such as mercury chloride or hydrocyanic salts.

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# Thank you