



GHS

The
Globally Harmonized System
of Classification and Labeling of Chemicals

Globally Harmonized System of Classification and Labelling of Chemicals (GHS)

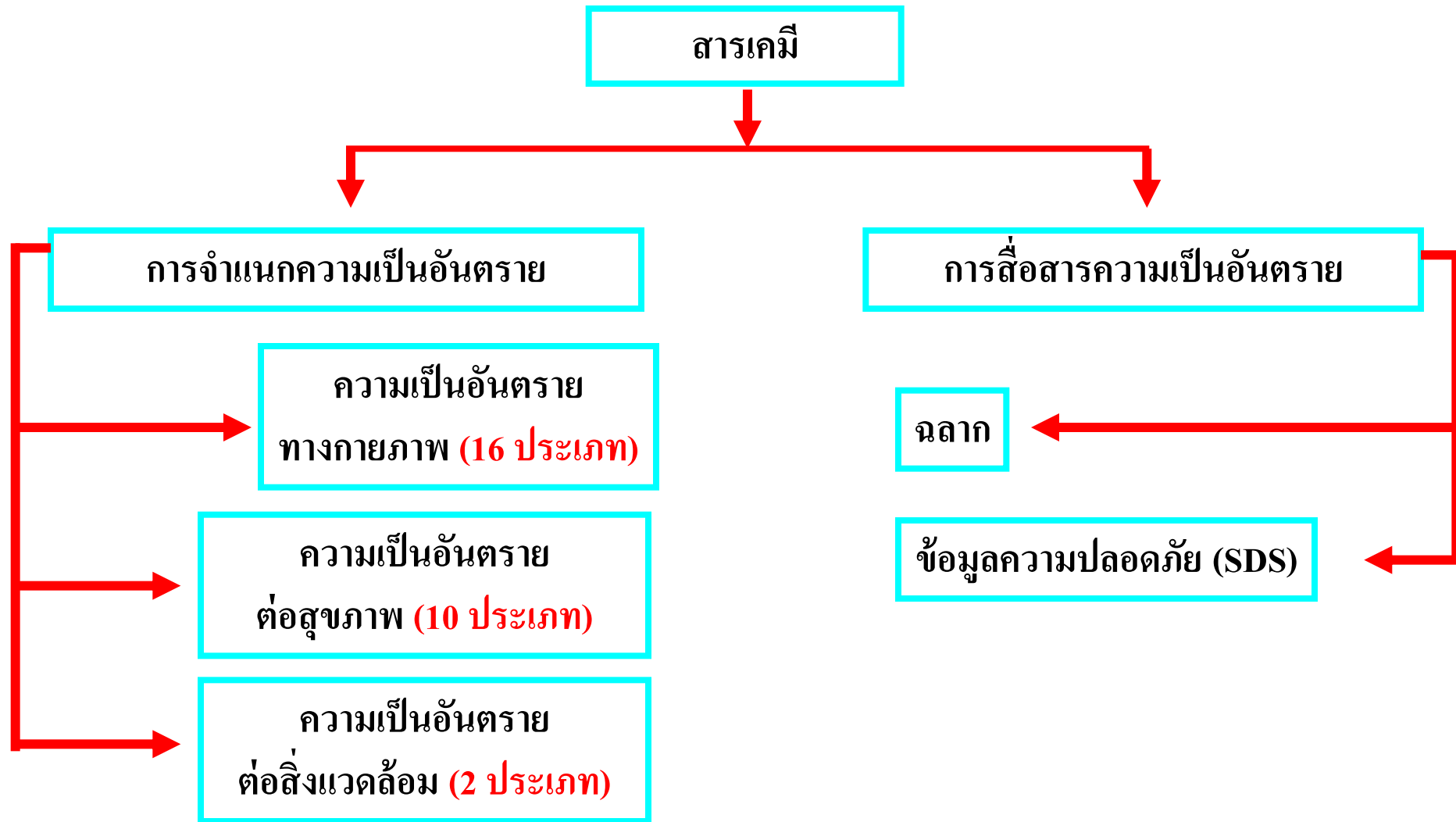
เป็นระบบ /วิธีการ (Approach) สำหรับ

- การจำแนกความเป็นอันตรายของสารเคมี (Chemical Hazard Classification)
- การสื่อสารความเป็นอันตรายของสารเคมี (Chemical Hazard Communication)





สาระสำคัญของระบบ GHS





Physical Hazard

- | | |
|------------------------------------|---|
| 1. Explosives | 9. Pyrophoric Liquids |
| 2. Flammable Gases | 10. Pyrophoric Solids |
| 3. Flammable Aerosols | 11. Self-Heating Substances |
| 4. Oxidizing Gases | 12. Substances which, in contact with water emit flammable gases |
| 5. Gases Under Pressure | 13. Oxidizing Liquids |
| 6. Flammable Liquids | 14. Oxidizing Solids |
| 7. Flammable Solids | 15. Organic Peroxides |
| 8. Self-Reactive Substances | 16. Corrosive to Metals |

1. Explosives

| <i>Division</i> | <i>Characteristics</i> |
|------------------------|---|
| 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 |

2. Flammable Gases

Flammable gas means a gas having a flammable range in air at 20°C and a standard pressure of 101.3 kPa.

3. Flammable Aerosols

Concentration of flammable components;

Chemical heat of combustion (mainly for transport/storage);

Results from the foam test (foam aerosols) (mainly for worker/consumer);

Ignition distance test (spray aerosols) (mainly for worker/consumer);

Enclosed space test (spray aerosols) (mainly for worker/consumer).

4. Oxidizing 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.

5. Gases under Pressure

| <i>Group</i> | <i>Criteria</i> |
|-----------------------------------|--|
| Compressed gas | Entirely gaseous at -50°C |
| Liquefied gas | Partially liquid at temperatures > -50°C |
| Refrigerated liquefied gas | Partially liquid because of its low temperature |
| Dissolved gas | Dissolved in a liquid phase solvent |

6. Flammable Liquids

| <i>Category</i> | <i>Criteria</i> |
|-----------------|--|
| 1 | Flash point < 23°C and initial boiling point ≤ 35°C (95°F) |
| 2 | Flash point < 23°C and initial boiling point > 35°C (95°F) |
| 3 | Flash point ≥ 23°C and ≤ 60°C (140°F) |
| 4 | Flash point ≥ 60°C (140°F) and ≤ 93°C (200°F) |

7. Flammable Solids

| <i>Category</i> | <i>Criteria</i> |
|-----------------|--|
| 1 | <p>Metal Powders: burning time ≤ 5 minutes</p> <p>Others: wetted zone does not stop fire & burning time < 45 seconds or burning > 2.2 mm/second</p> |
| 2 | <p>Metal Powders: burning time > 5 and ≤ 10 minutes</p> <p>Others: wetted zone stop fire for at least 4 minutes & burning time < 45 seconds or burning rat > 2.2mm/second</p> |

8. Self-Reactive Substances

| <i>Type</i> | <i>Criteria</i> |
|-------------|---|
| A | Can detonate or deflagrate rapidly, as packaged. |
| B | Possess explosive properties and which, as packaged, neither detonates nor deflagrates, but is liable to undergo a thermal explosion in that package. |
| C | Possess explosive properties when the substance or mixture as package cannot detonate or deflagrate rapidly or undergo a thermal explosion. |
| 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. |
| E | Neither detonates nor deflagrates at all and shows low or no effect when heated under confinement. |
| 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. |
| G | Neither detonates in the cavitated state nor deflagrates at all and shows non 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. |

9. 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.

10. 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.

11. 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.

12. Substances which on Contact with Water Emit Flammable Gases

| <i>Category</i> | <i>Criteria</i> |
|-----------------|--|
| 1 | ≥ 10 L/kg/1 minute |
| 2 | ≥ 20 L/kg/ 1 hour + < 10 L/kg/1 min |
| 3 | ≥ 1 L/kg/1 hour + < 20 L/kg/1 hour |
| Not classified | < 1 L/kg/1 hour |

13. Oxidizing 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.

14. Oxidizing 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.

15. Organic Peroxides

| <i>Type</i> | <i>Criteria</i> |
|-------------|--|
| A | Can detonate or deflagrate rapidly, as packaged. |
| B | Possess explosive properties and which, as packaged, neither detonates nor deflagrates rapidly, but is liable to undergo a thermal explosion in that package. |
| C | Possess explosive properties when the substance or mixture as packaged cannot detonate or deflagrate rapidly or undergo a thermal explosion. |
| 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. |
| E | Neither detonates nor deflagrates at all and shows low or no effect when heated under confinement. |
| F | Neither detonates in the caviated bubble state nor deflagrates at all and shows only a low or no effect when heated under confinements as well as low or non explosive power. |
| G | Neither detonates in the caviated 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. |

16. Substances Corrosive to Metal

A substance or a mixture that by chemical action will materially damage, or even destroy, metals is termed 'corrosive to metal'.

Health Hazard




- 1. Acute Toxicity**
- 2. Skin Corrosion/Irritation**
- 3. Serious Eye Damage/Eye Irritation**
- 4. Respiratory or Skin Sensitization**
- 5. Germ Cell Mutagenicity**
- 6. Carcinogenicity**
- 7. Reproductive Toxicology**
- 8. Target Organ Systemic Toxicity - Single Exposure**
- 9. Target Organ Systemic Toxicity - Repeated Exposure**
- 10. Aspiration Toxicity**

Environmental Hazard

: Hazardous to the Aquatic Environment

- 1. Acute aquatic toxicity**
- 2. Chronic aquatic toxicity**
 - 2.1 Bioaccumulation potential**
 - 2.2 Rapid degradability**

ตัวอย่างการจำแนกความเป็นอันตราย (Flammable Liquids)

| | Category 1 | Category 2 | Category 3 | Category 4 |
|--------------------|---|---|---|-----------------------------------|
| Symbol |  |  |  | No symbol |
| Signal Word | Danger | Danger | Warning | Warning |
| Criteria | Flash point <23°C and initial boiling point ≤35°C | Flash point <23°C and initial boiling point >35°C | Flash point ≥23°C and ≤60°C | Flash point >60°C and ≤93°C |

การสื่อสารความเป็นอันตราย

GHS Pictograms



- Explosives
- Self-reactive substances (Type A, B)
- Organic peroxides (Type A,B)



- Flammable substances
- Self-reactive substances (Type B, C&D, E&F)
- Pyrophoric substances
- Self-heating substances
- Organic peroxides



- Oxidizing gases
- Oxidizing liquids
- Oxidizing solids



- Gases under pressure



- Corrosive to metal
- Skin corrosion
- Serious eye damage



- Sensitization (Respiratory)
- Mutagenicity
- Carcinogenicity
- Reproductive toxicity
- Target organ toxicity
- Aspiration hazard



- Acute toxicity (Severe)



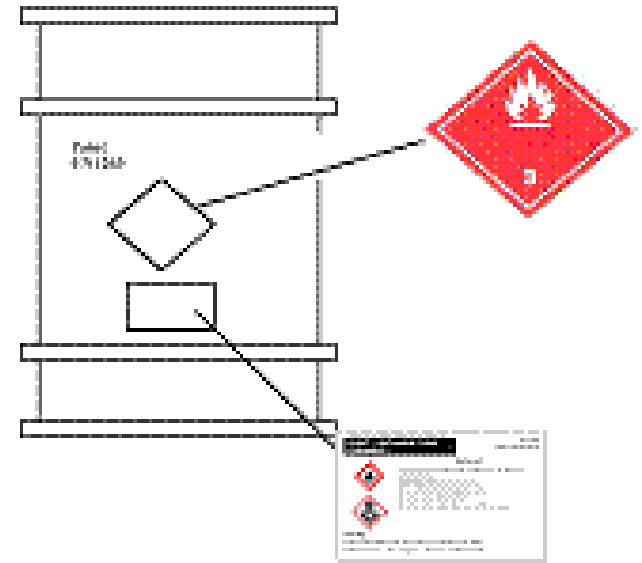
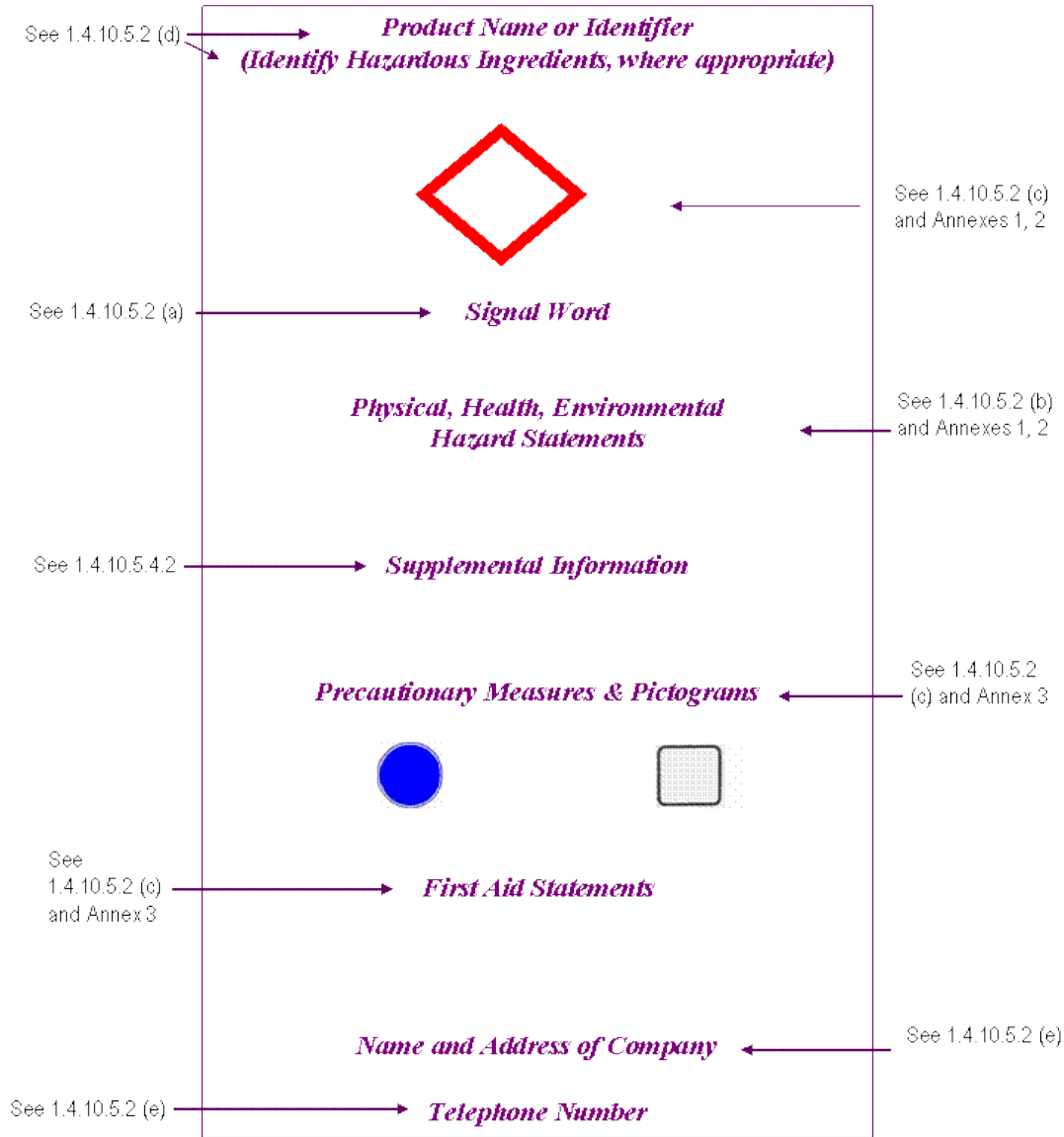
- Acute toxicity
- Skin irritation
- Eye irritation
- Sensitization (dermal)
- Target organ toxicity
- Ozone depleting substances



- Environmental toxicity

Figure 4.8

GHS Label Elements



การสื่อสารความเป็นอันตราย



ศูนย์บริการข้อมูลด้านสินค้าอันตราย,

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