DG and GHS Classification System

UN Globally Harmonised System of Classification and Labelling of Chemicals (GHS)
DG and GHS Classification System

Pictograms

FLAMMABLE GAS

TOXIC

CORROSIVE

ECO TOXIC

!
DG and GHS Classification System
Why Chemical Safety?

All chemicals are hazardous: EXPOSURE KILLS!
DG and GHS Classification System

Why Chemical Safety?

- People:
  Prevent death and serious injury.

- Facilities:
  Prevent destruction and unhealthy workplace environment.

- Environment:
  Contamination.
DG and GHS Classification System

Challenges in Chemical Safety

- Lack of understanding of chemical hazard.
- Upskilling workers handling and using chemicals.
- Preventing incidents involving chemicals.
- Safely managing chemical emergencies.
- Focus on small and medium sized enterprises (SMEs).
100 – 150,000 substances and chemical products.

7,000 classified.
Focus on:

- Providing comprehensive information about chemical products.
  - Identify the hazard.
  - Manage the risk.

- Product Stewardship initiatives.

- Focus on SMEs.
DG and GHS Classification System

Chain of Responsibility

- Manufacturer
- Packer
- Consignor or Shipper
- Freight Forwarder
- Driver
- Consignee
- Shipping Company
• 90 million 20-foot ISO Containers are shipped out of China each year.

• 20% contain Dangerous Goods.

• Ships’ crew have no responsibility once containers are landed.
DG and GHS Classification System
DG and GHS Classification System
DG and GHS Classification System

Prevent Harm to:

- People
- Environment
- Reputation
Dangerous Goods, Hazardous Materials, Hazardous Substances Vs Chemicals

Requires comprehensive information:

- Safety Data Sheets.
- Product Labels.
- Occupational Health and Safety (WES).
- Consumer protection.

Onus on manufacturer to classify and provide information.
DG and GHS Classification System

- Standardise assessments and information.
- Harmonise transport and workplace risk management.
- Training.
- Facilitate international trade.
- Progressively address society’s concerns.
### Classification of DG and GHS

#### HAZARD CLASSIFICATIONS FOR CLASSES 1-9 SUBSTANCES


<table>
<thead>
<tr>
<th>Explosiveness</th>
<th>Subclass</th>
<th>Hazard Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Mass Explosion</td>
<td>1.1 A B C D E F G J L</td>
<td></td>
</tr>
<tr>
<td>1 Projection</td>
<td>1.2 A B C D E F G H J K L</td>
<td></td>
</tr>
<tr>
<td>1 Fire and Minor Blast</td>
<td>1.3 A B C D E F G J K</td>
<td></td>
</tr>
<tr>
<td>1 No Significant Hazard</td>
<td>1.4 A B C D E F G S</td>
<td></td>
</tr>
<tr>
<td>1 Very Insensitive</td>
<td>1.5 D</td>
<td></td>
</tr>
<tr>
<td>1 Extremely Insensitive</td>
<td>1.6 N</td>
<td></td>
</tr>
</tbody>
</table>

#### Flammability

<table>
<thead>
<tr>
<th>Class</th>
<th>Subclass</th>
<th>Hazard Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 Gases</td>
<td>2.1.1 A B</td>
<td></td>
</tr>
<tr>
<td>2 Aerosols</td>
<td>2.1.2 A</td>
<td></td>
</tr>
<tr>
<td>3 Liquids</td>
<td>3.1 A B C D</td>
<td></td>
</tr>
<tr>
<td>3 Liquid Desensitised Explosive</td>
<td>3.2 A B C</td>
<td></td>
</tr>
<tr>
<td>4 Readily Combustible</td>
<td>4.1.1 A B</td>
<td></td>
</tr>
<tr>
<td>4 Self Reactive</td>
<td>4.1.2 A B C D E F G</td>
<td></td>
</tr>
<tr>
<td>4 Solid Desensitised Explosive</td>
<td>4.1.3 A B C</td>
<td></td>
</tr>
<tr>
<td>4 Spontaneously Combustible</td>
<td>4.2 A B C</td>
<td></td>
</tr>
<tr>
<td>4 Dangerous When Wet</td>
<td>4.3 A B C</td>
<td></td>
</tr>
</tbody>
</table>

#### Gases Under Pressure

<table>
<thead>
<tr>
<th>Class</th>
<th>Subclass</th>
<th>Hazard Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 Non-Flammable, Non-Toxic Gases</td>
<td>2.2</td>
<td></td>
</tr>
<tr>
<td>2 Toxic Gases</td>
<td>2.3</td>
<td></td>
</tr>
</tbody>
</table>

#### Capacity to Oxidise

<table>
<thead>
<tr>
<th>Class</th>
<th>Subclass</th>
<th>Hazard Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 Liquids/Solids</td>
<td>5.1.1 A B C</td>
<td></td>
</tr>
<tr>
<td>5 Gases</td>
<td>5.1.2 A B</td>
<td></td>
</tr>
<tr>
<td>5 Organic Peroxides</td>
<td>5.2 A B C D E F G</td>
<td></td>
</tr>
</tbody>
</table>

#### Toxicity

<table>
<thead>
<tr>
<th>Class</th>
<th>Subclass</th>
<th>Hazard Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 Acutely Toxic</td>
<td>6.1 A B C D E</td>
<td></td>
</tr>
<tr>
<td>6 Infectious Substances</td>
<td>6.2</td>
<td></td>
</tr>
<tr>
<td>6 Skin Irritant</td>
<td>6.3 A B</td>
<td></td>
</tr>
<tr>
<td>6 Eye Irritant</td>
<td>6.4 A</td>
<td></td>
</tr>
<tr>
<td>6 Sensitive</td>
<td>6.5 A B</td>
<td></td>
</tr>
<tr>
<td>6 Mutagen</td>
<td>6.6 A B</td>
<td></td>
</tr>
<tr>
<td>6 Carcinogen</td>
<td>6.7 A B</td>
<td></td>
</tr>
<tr>
<td>6 Reproductive/Developmental</td>
<td>6.8 A B C</td>
<td></td>
</tr>
<tr>
<td>6 Target Organ/Systemic</td>
<td>6.9 A B</td>
<td></td>
</tr>
</tbody>
</table>

#### Radioactive

<table>
<thead>
<tr>
<th>Class</th>
<th>Subclass</th>
<th>Hazard Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>7 Radioactive Material</td>
<td>7</td>
<td></td>
</tr>
</tbody>
</table>

#### Corrosiveness

<table>
<thead>
<tr>
<th>Class</th>
<th>Subclass</th>
<th>Hazard Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>8 Metallic Corrosive</td>
<td>8.1 A</td>
<td></td>
</tr>
<tr>
<td>8 Skin Corrosive</td>
<td>8.2 A B C</td>
<td></td>
</tr>
<tr>
<td>8 Eye Corrosive</td>
<td>8.3 A</td>
<td></td>
</tr>
</tbody>
</table>

#### Miscellaneous Dangerous Substances and Articles, Including Environmentally Hazardous Substances

<table>
<thead>
<tr>
<th>Class</th>
<th>Subclass</th>
<th>Hazard Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>9 Miscellaneous Dangerous Substances</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>9 Environmentally Hazardous Substances - Aquatic</td>
<td>9.1 A B C D</td>
<td></td>
</tr>
<tr>
<td>9 Environmentally Hazardous Substances - Soil</td>
<td>9.2 A B C D</td>
<td></td>
</tr>
<tr>
<td>9 Environmentally Hazardous Substances - Terrestrial Vertebrate</td>
<td>9.3 A B C</td>
<td></td>
</tr>
<tr>
<td>9 Environmentally Hazardous Substances - Terrestrial Invertebrate</td>
<td>9.4 A B C</td>
<td></td>
</tr>
</tbody>
</table>

---

**Key:**
- Hazardous Substances and Dangerous Goods
- Dangerous Goods only
- Hazardous Substances only
- "1" HSNO criteria are UNRTDG 11th Revision
- "2" Oxidising Gases are HSNO 5.1.2A and DG 2.2
- "3" Toxic Gases are HSNO 6.1
- CHEMSAFE® HNSO compliance software
- PRINCE® site compliance assessment
- CHEMCALL® 24/7 emergency response service
- HNSO Approved codes of practice
- HNSO specialist training
DG and GHS Classification System

GHS Classification Process

• Identify composition of product.

• Identify hazards associated with product.

• Approve product.

• Assign appropriate classification and controls.
A substance or mixture is hazardous if it exceeds one or more of the following GHS properties:

- Explosives.
- Flammability.
- Ability to oxidise.
- Corrosiveness (metallic and biological).
- Toxicity (including chronic toxicity).
- Eco-toxicity.
Multiple Hazards

Single substance: Allyl Alcohol.

- Toxic (poison).
- Flammable.
DG and GHS Classification System

Safe Chemical Management in Workplaces

- Safety Data Sheets.
- Product Labels.
  - Safe storage.
  - Good housekeeping.
- Codes of Practice.
- Specialist training.
- Emergency preparedness.
- Codes of Practice.
International Standards for Safe Chemical Management

DG and GHS Classification System
DG and GHS Classification System

United Nations Transport Division

Sub Committee of Experts on the Transport of Dangerous Goods (DG)

‘Orange Book’

Sub Committee of Experts on the Globally Harmonised System of Classification and Labelling of Chemicals (GHS)

‘Purple Book’
DG and GHS Classification System

UN ‘Orange Book’: Transport of Dangerous Goods Model Regulations.


DG and GHS Classification System