GHS Hazard Pictograms

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Hazard pictograms form part of the Globally Harmonized System of Classification and Labeling of Chemicals (GHS). Two sets of pictograms are included within the GHS: one for the labeling of containers and for workplace hazard warnings, and a second for use during the transport of dangerous goods. Either one or the other is chosen, depending on the target audience, but the two are not used together.[1] The two sets of pictograms use the same symbols for the same hazards, although certain symbols are not required for transport pictograms. Transport pictograms come in wider variety of colors and may contain additional information such as a subcategory number.

Hazard pictograms are one of the key elements for the labelling of containers under the GHS, along with:[2]

- an identification of the product;
- a signal word – either **Danger** or **Warning** – where necessary
- hazard statements, indicating the nature and degree of the risks posed by the product
- precautionary statements, indicating how the product should be handled to minimize risks to the user (as well as to other people and the general environment)
- the identity of the supplier (who might be a manufacturer or importer)

The GHS chemical hazard pictograms are intended to provide the basis for or to replace national systems of hazard pictograms. It has still be implemented by the European Union (CLP regulation) in 2009.

The GHS transport pictograms are the same as those recommended in the UN Recommendations on the Transport of Dangerous Goods, widely implemented in national regulations such as the U.S. Federal Hazardous Materials Transportation Act (49 U.S.C. 5101–5128) and D.O.T. regulations at 49 C.F.R. 100–185.

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Physical hazards pictograms

Usage

- Unstable explosives
- Explosives, divisions 1.1, 1.2, 1.3, 1.4
- Self-reactive substances and mixtures, types A, B
- Organic peroxides, types A, B

Further information: Explosive material

Explosive

Usage

- Flammable gases, category 1
- Flammable aerosols, categories 1, 2
- Flammable liquids, categories 1, 2, 3
- Flammable solids, categories 1, 2
- Self-reactive substances and mixtures, types B, C, D, E, F
- Pyrophoric liquids, category 1
- Pyrophoric solids, category 1
- Self-heating substances and mixtures, categories 1, 2
- Substances and mixtures, which in contact with water, emit flammable gases, categories 1, 2, 3
- Organic peroxides, types B, C, D, E, F

Further information: Flammability

Flammable

Usage

- Oxidizing gases, category 1
- Oxidizing liquids, categories 1, 2, 3
- Oxidizing solids, categories 1, 2, 3

Further information: Oxidizing agent

Oxidizing

Usage

- Compressed gases
- Liquefied gases
- Refrigerated liquefied gases
- Dissolved gases

Compressed Gas

Usage

- Corrosive to metals, category 1

Further information: Corrosive substance

Corrosive

no pictogram required

Usage

- Explosives, divisions 1.5, 1.6
- Flammable gases, category 2
- Self-reactive substances and mixtures, type G (see HAZMAT Class 4 Flammable solids)
- Organic peroxides, type G

Health hazards pictograms

Toxic

Usage

- Acute toxicity (oral, dermal, inhalation), categories 1, 2, 3

Corrosive

Usage

- Skin corrosion, categories 1A, 1B, 1C
- Serious eye damage, category 1

Irritant

Usage

- Acute toxicity (oral, dermal, inhalation), category 4
- Skin irritation, categories 2, 3
- Eye irritation, category 2A
- Skin sensitization, category 1
- Specific target organ toxicity following single exposure, category 3
  - Respiratory tract irritation
  - Narcotic effects

Not used[3]

- with the "skull and crossbones" pictogram
- for skin or eye irritation if:
  - the "corrosion" pictogram also appears
  - the "health hazard" pictogram is used to indicate respiratory sensitization

Health hazard

Usage

- Respiratory sensitization, category 1
- Germ cell mutagenicity, categories 1A, 1B, 2
- Carcinogenicity, categories 1A, 1B, 2
- Reproductive toxicity, categories 1A, 1B, 2
- Specific target organ toxicity following single exposure, categories 1, 2
- Specific target organ toxicity following repeated exposure, categories 1, 2
- Aspiration hazard, categories 1, 2

no pictogram required

Usage

- Acute toxicity (oral, dermal, inhalation), category 5
- Eye irritation, category 2B
- Reproductive toxicity – effects on or via lactation

Environmental hazards pictograms

Environmentally damaging

Usage

- Acute hazards to the aquatic environment, category 1
- Chronic hazards to the aquatic environment, categories 1, 2

Usage

- Acute hazards to the aquatic environment, categories 2, 3
- Chronic hazards to the aquatic environment, categories 3, 4

no pictogram required

Transport pictograms

Class 1: Explosives

Divisions 1.1–1.3

Usage

Explosives

Division 1.1: Substances and articles which have a mass explosion hazard

Division 1.2: Substances and articles which have a projection hazard but not a mass explosion hazard

Division 1.3: Substances and articles which have a fire hazard and either a minor blast hazard or a minor projection hazard or both, but not a mass explosion hazard

Note

The asterisks are replaced by the class number and compatibility code

Division 1.4

Usage

Explosives

Substances and articles which are classified as explosives but which present no significant hazard

Note

The asterisk is replaced by the compatibility code

Division 1.5

Usage

Explosives

Very insensitive substances which have a mass explosion hazard

Note

The asterisk is replaced by the compatibility code

Division 1.6

Usage

Explosives

No hazard statement

Note

The asterisk is replaced by the compatibility code

Class 2: Gases

Division 2.1

Usage

Flammable gases

Gases which at 20 °C and a standard pressure of 101.3 kPa:

- are ignitable when in a mixture of 13 per cent or less by volume with air; or
- have a flammable range with air of at least 12 percentage points regardless of the lower flammable limit.

Alternative sign

Division 2.2

Usage

Non-flammable non-toxic gases

Gases which:

- are asphyxiant – gases which dilute or replace the oxygen normally in the atmosphere; or
- are oxidizing – gases which may, generally by providing oxygen, cause or contribute to the combustion of other material more than air does; or
- do not come under the other divisions;

Alternative sign

Division 2.3

Usage

Toxic gases

Gases which:

- are known to be so toxic or corrosive to humans as to pose a hazard to health; or
- are presumed to be toxic or corrosive to humans because they have an LC_{50} value equal to or less than 5000 ml/m^3 (ppm).

Classes 3 and 4: Flammable liquids and solids

Class 3

Usage

Flammable liquids

Liquids which have a flash point of less than 60 °C and which are capable of sustaining combustion

Alternative sign

Usage

Flammable solids, self-reactive substances and solid desensitized explosives

Solids which, under conditions encountered in transport, are readily combustible or may cause or contribute to fire through friction; self-reactive substances which are liable to undergo a strongly exothermic reaction; solid desensitized explosives which may explode if not diluted sufficiently

Division 4.1

Usage

Substances liable to spontaneous combustion

Substances which are liable to spontaneous heating under normal conditions encountered in transport, or to heating up in contact with air, and being then liable to catch fire

Division 4.2

Usage

Substances which in contact with water emit flammable gases

Substances which, by interaction with water, are liable to become spontaneously flammable or to give off flammable gases in dangerous quantities

Division 4.3

Alternative sign

Other GHS transport classes

Usage

Oxidizing substances

Substances which, while in themselves not necessarily combustible, may, generally by yielding oxygen, cause, or contribute to, the combustion of other material

Division 5.1

Usage

Organic peroxides

Organic substances which contain the bivalent –O–O– structure and may be considered derivatives of hydrogen peroxide, where one or both of the hydrogen atoms have been replaced by organic radicals

Division 5.2

Alternative sign

Usage

Toxic substances

Division 6.1

Substances with an LD_{50} value ≤ 300 mg/kg (oral) or ≤ 1000 mg/kg (dermal) or an LC_{50} value ≤ 4000 ml/m^3 (inhalation of dusts or mists)

Usage

Corrosive substances

Substances which:

- cause full thickness destruction of intact skin tissue on exposure time of less than 4 hours; or
- exhibit a corrosion rate of more than 6.25 mm per year on either steel or aluminium surfaces at 55 °C

Class 8

Non-GHS transport pictograms

The following pictograms are included in the UN Model Regulations but have not been incorporated into the GHS because of the nature of the hazards.

Class 6.2	**Class 7**	**Class 9**
Infectious substances	Radioactive material	Miscellaneous dangerous substances and articles

Notes[edit]

1. **Jump up ^** Part 1, section 1.4.10.5.1, GHS Rev.2
2. **Jump up ^** Part 1, section 1.4.10.5.2, GHS Rev.2
3. **Jump up ^** Part 1, section 1.4.10.5.3.1, GHS Rev.2

References[edit]

- *Globally Harmonized System of Classification and Labelling of Chemicals (Second revised ed.), New York and Geneva: United Nations, 2007, ISBN 978-92-1-116957-7, ST/SG/AC.10/30/Rev.2* ("GHS Rev.2")
- *"Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006", OJCE (L353), 2008-12-31: 1–1355* (the "CLP Regulation")
- *UN Recommendations on the Transport of Dangerous Goods. Model Regulations (Fifteenth ed.), New York and Geneva: United Nations, 2007, ISBN 978-92-1-139120-6, ST/SG/AC.10/1/Rev.15* ("UN Model Regulations Rev.15")
- *UN Recommendations on the Transport of Dangerous Goods. Manual of Tests and Criteria (Fourth revised ed.), New York and Geneva: United Nations, 2002, ISBN 92-1-139087-7, ST/SG/AC.10/11/Rev.4* ("UN Manual of Tests and Criteria Rev.4")

External links[edit]

Wikimedia Commons has media related to ***GHS pictograms***.

- GHS pictogram gallery from the United Nations Economic Commission for Europe

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Categories:

- Globally Harmonized System